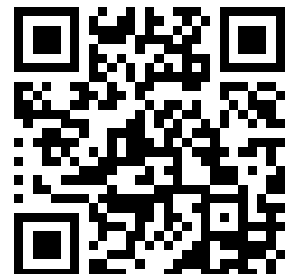

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THE OCTOBER 1987 MARKET BREAK

A Report
by the
Division of Market Regulation
U.S. Securities and Exchange Commission



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*Although the Commission has authorized publication of this report, it has expressed no view regarding the analysis, findings or conclusions herein.

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ACKNOWLEDGEMENT

We wish to acknowledge the extraordinary efforts of Alton S. Harvey, who was responsible for the difficult and time-consuming task of reconstructing trading during the October market break. In addition, we wish to express a special note of appreciation to the following individuals who contributed immensely to the completion of this Study:

Margaret A. Favor - Office of Edgar Management
William H. McDonald, Jr. - Office of Information Systems Management
Sharon L. Mercer - Office of Information Systems Management
Duane Luetkenhaus - Office of Information Systems Management
John Boucher - Office of Information Systems Management
Philip J. Niehoff - Division of Investment Management
James F. Tabellario - Office of Information Systems Management
Judith L. Westbrook - Office of Edgar Management
Lois Lightfoot - Directorate of Economic and Policy Analysis
Kenneth A. Drews - Office of Information Systems Management
Charles F. Kirby - Office of Information Systems Management

The Division wishes to recognize the valuable assistance of the Directorate of Economic and Policy Analysis, the Office of the Chief Economist, the Divisions of Corporation Finance and Investment Management, and the SEC's Regional Offices. We also acknowledge the efforts of the staff of the Investor Services Branch of the Office of Consumer Affairs and Information Services in the preparation of Chapter Twelve, especially Phyllis C. Campbell, John D. Heine, Ellen J. Legel, Dorothy N. Monroe, Richard E. Pullano, Teresa T. Tarver, and Bonnie M. Westbrook, as well as consumer affairs specialists and other staff members throughout the Commission's Regional Offices. In addition, we appreciate the efforts of Robert L. Kraft, Sylvia J. Reis, and Herbert D. Scholl in the preparation of Chapter Six.

Finally, we wish to thank the Department of the Treasury, the Internal Revenue Service, the U.S. Mint, the U.S. Customs Service, and Management Information Consulting for valuable staff and computer support, the Department of Justice's Office Automation Service for excellent graphics, and the SEC's Office of Administrative Services for their printing support.

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INTRODUCTION AND EXECUTIVE SUMMARY

Introduction

During October 1987, the nation's securities markets experienced an extraordinary surge of volume and price volatility. The most widely followed indicator of the U.S. stock market's movements, the Dow Jones Industrial Average ("DJIA") index of 30 New York Stock Exchange ("NYSE") stocks, had reached an intra-day high of 2746.65 on August 27, 1987. On October 2, the DJIA closed at 2640.99. During the week of October 5, the index declined by 158.78 points; during the week of October 12, by 235.47 points. On October 19, the DJIA declined 508.32 points, and by its low point mid-day on October 20 it had declined to 1708.70, or over 1,000 points (37%) below its August 25 high. Even with its erratic but substantial recovery over the next few trading sessions, by October 30, the DJIA stood at 1,994, down over 26% from its August high. Broader indexes also declined for the month of October. For example, the Standard & Poors ("S&P") index of 500 stocks ("S&P 500") declined 21.8%, the composite indexes for the nation's three principal securities markets, the NYSE, American Stock Exchange ("Amex"), and the National Association of Securities Dealers ("NASD") Automated Quotations ("NASDAQ") system for over-the-counter ("OTC") stock trading, experienced declines in October of 21.9%, 27%, and 27.2%, respectively.

Given the extraordinary events of late October, the Chairman of the Securities and Exchange Commission ("SEC" or "Commission") instructed the Commission's Division of Market Regulation ("Division") to conduct a comprehensive study of the causes, effects, and regulatory ramifications of the market break. While this study was conducted in conjunction with similar reviews by others, most notably those of the Presidential Task Force on Market Mechanisms and the Commodity Futures Trading Commission ("CFTC"), the Division's review is designed to provide an independent factual basis to enable the Commission to determine the most appropriate regulatory responses to ensure the soundness of the nation's securities markets and the protection of investors.

Although the staff of the Division primarily was responsible for preparation of the Report, valuable assistance was provided by the Office of Consumer Affairs, the Office of the Chief Economist, the Directorate of Policy and Economic Analysis and the Divisions of Corporation Finance and Investment Management. The major purpose of the Report was to analyze what happened during the October 1987 market break, rather than provide final "answers" to what should be done based on those findings. To the extent the Report suggests items for further analysis and discussion, it bears repeating that these suggestions are solely the responsibility of the Division and do not necessarily reflect the views of the Commission.

Before summarizing the individual Chapters, it is important to put the Report's objectives in focus. As a threshold matter, the Report does not answer the question of why in October of 1987 the value of common stocks was reduced by approximately 30%. We may never know what precise combination of investor psychology, economic developments and trading technologies caused the events of October. Instead, the Report attempts to reconstruct the trading activity during the October market break and analyze how the trading systems for stock and its derivatives (*i.e.*, options and futures) may have contributed to the rapidity and depth of the market decline.

In conducting our analysis, we have adopted the fundamental assumption that extreme price volatility, such as occurred during the market break, is undesirable. We recognize that in one sense volatility is a neutral phenomenon: a measure of how

quickly prices react to new information. Moreover, during periods of increased economic uncertainty it is not surprising that increased volatility occurs. Nevertheless, when price swings reach extreme levels, they can have a number of adverse consequences. First, such volatility increases marketmaking risks and requires market intermediaries to charge more for their liquidity services, thereby reducing the liquidity of the market as a whole. Second, if such volatility persists, securities firms are less able to use their available capital efficiently because of the need to reserve a larger percentage of cash-equivalent investments in order to reassure lenders and regulators. Third, greater volatility can reduce investor confidence in investing in stocks. As a result of these effects, we believe substantially increased price volatility could, in the long run, impact the ability of U.S. corporations to raise capital efficiently through the sale of equity securities.

Executive Summary

The following provides an overview of the subject areas covered in each of the chapters of the Report and summarizes the Division's findings.

Chapter One -- Background and Description of Trading Strategies

This chapter provides background information necessary to understand the market reconstructions discussed in the main body of the Report. The background information covers four areas. First, a description is provided of the various types of index-related trading strategies used during the market break: asset re-allocation and hedging, portfolio insurance, and index arbitrage (cash arbitrage and index substitution). Second, the use of automated stock order-routing systems for the above trading strategies, as well as for other forms of trading "baskets" of stocks, is discussed. Third, a summary is provided of the findings from earlier Commission studies of the impact of derivative index products on the securities markets. And fourth, the chapter outlines the scope of the Division's Report and the methodology employed in the staff's reconstruction of the markets during the market break.

Chapter Two -- Chronology of Trading During October Market Break

Chapter Two provides an overview of trading during the key days of the October market break, including an overall breakdown of trading into institutional, proprietary, and retail components, and a description of the interactions among the various types of index-related trading on the securities and index futures markets. More detailed chronologies of trading on these days are provided in Appendix A to the Report. Chapter Two also discusses significant Commission regulatory actions during the market break.

Chapter Three -- Effects of Derivative Products

This chapter discusses a number of key issues raised by the effects of derivative index products on the securities markets in general, and on trading during the market break in particular. It includes background discussions of the continuing institutionalization of the securities markets, the recent increase in the use of passive asset allocation strategies and the level of trading of "baskets" of stocks, and a summary of the benefits derived from derivative index products, as well as their effects on the securities markets.

Chapter Three provides an overview of trading during the October market break. The staff's review of trading patterns during the period October 6 to October 21-- including a detailed reconstruction of program trading activities (e.g., stock index arbitrage and portfolio insurance) -- leads us to the conclusion that no single factor-- economic, structural or psychological -- was responsible for the size and breadth of the October 1987 market break. To the contrary, the staff believes that a variety of factors came into play during the key trading days that affected investment and trading decisions.

Analysis of trading suggests that the initial decline that immediately preceded the October 19 market break was triggered by changes in investor perceptions regarding investment fundamentals and economic conditions. With these changes as the "trigger," institutional stock selling was the largest single direct factor responsible for the initial opening declines on October 19. Finally, panic selling in a broad range of stocks-- caused by a variety of factors -- coupled with a complete absence of buyers (except at distressed levels), was primarily responsible for the free-fall decline that characterized the final hour of trading on the NYSE on October 19.

Accordingly, futures trading and strategies involving the use of futures were not the "sole cause" of the market break. Nevertheless, the existence of futures on stock indexes and use of the various strategies involving "program trading" were a significant factor in accelerating and exacerbating the declines. During certain critical trading periods, index arbitrage or portfolio insurance -- or both -- accounted for between 30 and 68% of total NYSE volume in the S&P 500 stocks. For example, on October 19, arbitrage and substitution programs sold 37.6 million shares, portfolio insurance strategies sold at least 39.9 million additional shares, and other programs sold an additional 11.8 million shares -- together comprising 14.7% of total NYSE volume and 21.1% of S&P 500 stock volume. During crucial individual time periods, moreover, total program selling represented an even greater portion of total S&P 500 stock volume. Between 1:00 and 2:00 p.m. on October 19th, the combination of selling from portfolio insurance and index arbitrage totalled more than 40% of volume in the stocks comprising the S&P 500 index -- and totalled more than 60% of S&P 500 stock volume in three different 10 minute intervals within that hour. As indicated by these statistics, the Division also found that, in contrast to earlier periods of market volatility reviewed by the staff, portfolio insurance selling in stock and futures was significant during the market break, particularly during October 19th and October 20th. Most of the program stock trading that occurred on October 19th and 20th that was not index arbitrage was accounted for by portfolio insurance selling. Much of that stock selling was done by a single large institutional investor that executed large portfolio insurance trades in both the stock and futures markets.

In addition to direct effects, the existence of futures trading and the use of derivative products in index-related trading strategies, in our view, had a significant indirect impact on the markets -- particularly on October 19th -- in the form of negative market psychology. The knowledge by market participants of the existence of active portfolio insurance strategies created, in our view, a market "overhang" effect in both the futures and stock markets; this resulted in the maintenance of futures discounts that discouraged institutional traders from participating in the stock market on the buy side, specialists from committing capital to maintain fair and orderly markets, and block positioning firms from maintaining normal levels of activity.

Finally, we note that the October market break did not result in merely a dramatic one-time reevaluation of securities markets. The aftershocks of October 19 continue to affect the markets today. Quote spreads, liquidity and continuity on the NYSE continue to be substantially inferior to those indicators before the October market break, and actual market volatility has been substantially higher.

In summary, we believe that three dramatic trends have occurred as a result of trading in derivative index products. First, stock index futures have supplemented and often replaced the secondary stock market as the primary price discovery mechanism for stocks. Second, the availability of the futures market has spawned institutional trading strategies that have greatly increased the velocity and concentration of stock trading. Third, the resulting increase in index arbitrage and portfolio insurance trading in the stock market has increased the risks incurred by stock specialists and has strained and at times exceeded their ability to provide liquidity to the stock market.

We believe that these findings are significant and their implications need to be carefully reviewed by the Commission. We believe that the increased concentration and velocity of futures-related trading and resultant increases in stock market volatility can have long term, profound impacts on the participation of individual investors in the stock market. While many individual investors now participate in the stock market through institutional intermediaries, we believe individual participation remains important both for the additional liquidity it provides and for its contribution to consensus support for the U.S. economic system. We are not sanguine that such participation will remain if price volatility akin to October 19 occurs on even an occasional basis. We continue to believe, however, that derivative index markets provide valuable hedging and market timing benefits to institutions and, as a result, any changes to the regulation of those products must be effected with great care. Nevertheless, we believe a number of responses should be thoroughly explored.

Market Basket Trading

One of several alternatives that may be worthy of examination is the proposal to create one NYSE specialist post where the actual market baskets could be traded. A market basket post would alter the dynamics of program trading, in effect consolidating program trades back to a single order. The index specialist would have the informational advantage, not available to specialists in the individual stocks, of seeing the entire program order. Moreover, focusing institutional program trading at a single post might encourage additional block positioning activities, thereby potentially increasing the liquidity on the NYSE floor. While the feasibility and design of basket trading would require substantial analysis, we believe the concept of basket trading deserves the Commission's and the NYSE's attention.

Derivative Product Leverage

We believe thought should be given to steps to bring the available leverage of derivative products in line with the leverage of stock products. We believe this leverage derives from two sources -- cash settlement and margin.

The availability of cash settlement eliminates the risk that a market participant must liquidate its position prior to the termination of the future or accept delivery (and make payment for) a market basket of stocks. The elimination of this risk increases the willingness of market participants to take larger positions with correspondingly

tighter liquidation triggers. While a requirement for physical settlement of index futures raises a number of practical problems, the staff will continue to review the feasibility of physical settlement for index products.

The other primary difference in leverage between the stock and derivative product markets is margin. The Division recognizes the distinctions between futures and stock margin. Futures margin is, in effect, a performance bond that does not include an extension of credit. Moreover, futures positions are marked to the market daily and all margin calls generally are required to be paid on a same day basis. For these reasons, futures margin has focused entirely on ensuring that both parties satisfy their respective obligations under the futures contract. Notwithstanding the absence of a debt relationship, however, the margin treatment for stock index futures and options provides significantly higher leverage for users of these products that can be achieved under stock margin requirements. Moreover, the increasing popularity of index substitution, index arbitrage, and portfolio insurance has resulted in an increasingly greater percentage of futures positions being taken precisely for the purpose of replicating cash market stock positions. Yet these positions require dramatically less cash to establish than would the equivalent position in the stock market.

The Division believes that the ease with which an institution or investment firm can increase or decrease the percentage of a portfolio invested in equities through the purchase or sale of derivative index products creates an environment in which investors buy and sell much larger positions than they might otherwise. Moreover, low margins contribute to increased speculative trading that, in normal market conditions, contributes to the illusion of almost unlimited liquidity in the futures market. During a market break, however, that liquidity disappears at a rate geometrically larger than does liquidity in the lower-leveraged stock market. For these reasons, the Division believes that relatively low margins may contribute to increased concentrated institutional trading and resulting greater price volatility.

Therefore, we believe the Commission should review carefully with the CFTC the impact on the stock market of present index futures and options margin levels. This review also should consider whether any benefits obtained from reducing the liquidity demands on the stock and derivative markets outweigh the costs and potentially lower derivative product liquidity resulting from higher margin requirements during periods of normal market activity.

Price Limits

Price limits historically have been employed in the futures markets to address extreme price volatility. While the Division believes that price limits, such as those recently imposed by the Chicago Mercantile Exchange ("CME"), may be a rational response to the present leverage levels in the index futures market, we nevertheless believe that there are substantial problems with their effectiveness. Setting price limits on index futures when there is an active alternative pricing mechanism in the stock market is somewhat self-defeating. The ability of institutions to shift their liquidations to the stock market was amply demonstrated on October 19th and 20th. Moreover, we do not believe, as a general matter, that price limits should be imposed on stock trading, although brief trading halts based on pre-set standards may warrant further consideration.

While we do not favor stock price limits, we do believe that greater coordination of stock and derivative index products trading warrants further review. We believe that the dominance of the future as the price setting mechanism is most dramatic at the opening. The existence of a substantial futures price discount discourages specialists and other market participants from offsetting sell imbalances. Moreover, the ongoing trading in the futures may hinder the opening of the component stocks by encouraging additional waves of sell orders. Finally, the ability to trade futures before the component stocks have opened provides opportunities for firms to "front run" their customers' stock orders, possibly to the detriment of those customers. We believe further review should be made as to whether these concerns might be addressed by restricting the opening of index futures and options contracts until a set percentage (in value) of the stocks comprising the index commenced trading. Similarly, such a review should evaluate whether derivative products should stop trading when trading in an identified percentage of the stocks composing the index has been halted.

Short Sale Restrictions

The absence of short sale restrictions in the derivative markets, coupled with the greater leverage of futures, arguably presents the potential for greater speculative selling than could occur in the stock market. Moreover, through index arbitrage, that selling activity can be transferred to the stock market, often without being subject to Rule 10a-1 under the Securities Exchange Act of 1934 ("Exchange Act"), the short sale rule. Accordingly, the Division believes the Commission should review whether reducing price volatility should remain a goal of the short sale rule and, if so, whether steps should be taken to increase its effectiveness.

Reporting Requirements

In its Report on the Role of Index-Related Trading in the Market Decline on September 11 and 12, 1986, the Division noted the need to develop a "cost-effective, routine means of identifying and maintaining easily accessible records of index-related trading." Since then, the Division staff has worked with the staff of the NYSE to design such a reporting system. Despite recent improvements in this area, however, the Division still experienced substantial difficulties in reconstructing the October market break, impairing the ability of the staff to fulfill its oversight responsibilities and coordinate collection of trading information with the CFTC. Accordingly, the staff believes it would be appropriate to revisit the desirability of creating more specific recordkeeping rules at the broker-dealer level and to examine whether it would be feasible to develop a system, similar to the CFTC's large trader reporting system, for rapidly identifying large traders in the stock market.

As a separate matter, it also may be appropriate to consider how to integrate program trade reporting within the current systems of last sale reporting. In contrast to current systems to monitor and report block trades, there is no regularized reporting of program trades. The Division believes it would be appropriate to consider how to integrate program trading within the context of traditional transaction reporting. If, as some have suggested, program trading is the "block trading of the 1980s," then it seems appropriate to consider whether the more accurate and timely reporting of such trades can be made more readily available on a widespread basis.

Manipulation and Frontrunning

The Report provides a general description of concerns raised by the possibility of intermarket manipulation and frontrunning, as well as an overview of the findings of the reviews by the Division, the CFTC, and securities and futures self-regulatory organizations ("SROs") as to each of these areas during the October market break. While the Division found no evidence to question the CFTC's recently published determination that allegations of possible market manipulation on October 20 in the index futures markets were unfounded, the Division noted several instances of firms apparently trading in futures ahead of customer futures and stock programs, which raise significant concerns. Finally, Chapter Three contains a discussion of recent regulatory initiatives to address intermarket abuses. In this connection, the Division intends to work closely with the SROs and the CFTC to enhance futures and securities exchanges' routine access to each other's trading and surveillance data.

Chapter Four -- Exchange Specialists

Specialist Performance

The NYSE specialist system was placed under enormous strain during the market break period. Although there were some instances of questionable individual performance during this time, specialists as a whole met their market making obligations. They increased their aggregate buying activities and generally maintained markets in their stocks. Specialists often were the primary, and sometimes only, buyers during the morning and afternoon of October 19, with very little buying support from upstairs firms. Nevertheless, market quality deteriorated substantially on the 20th, as the market continued to strain under heavy volume and sell pressure. This is further evidenced by the significant number of delayed openings (92) and trading halts (167) on the 20th due to imbalances.

While specialists, in the aggregate, performed satisfactorily, there was a wide variation in individual specialist performance. In particular, a disturbing number of NYSE specialists on October 19 either were net sellers or did not take substantial positions. This inconsistent specialist performance deteriorated further during the afternoon of October 19 and throughout October 20. In addition, the Report identifies a number of instances throughout the market break where the appropriateness of the opening price set by specialists is questioned. While NYSE specialists' obligations to contribute to price continuity and depth must be viewed in the markets for their specialty stocks must be viewed in the context of extraordinary price volatility, volume and futures discounts, the performance of certain specialists appears to have been unsatisfactory. The Division's analysis of Amex specialist performance during the market break period indicated a similar decline in overall specialist performance on October 19 and 20, and a disparity among individual specialists' performance. The Amex, however, also had several stocks that were halted for at least one day during the market break period.

In light of our findings, the Division believes that the Amex and the NYSE should examine carefully individual specialist performance during the market break. In this connection, the Division believes the Amex and NYSE must use their powers to reallocate stock pursuant to their rules where they identify specialists that exhibited a substantial or continued failure to maintain fair and orderly markets. Further, the Division believes the wide disparity in specialist performance underscores the need for the Amex and NYSE to develop relative, objective standards of performance for evaluating specialists.

Equity Specialists' Capital

During the market break, specialists at the NYSE increased their aggregate securities positions to at least twice that of their normal size with some individual specialist units increasing the size of their positions to four times that of their normal size. This increase in the size of positions resulted in the loss of approximately one-half of the buying power usually available to the specialists. At the end of trading on October 19, thirteen NYSE specialist units had no buying power.

The experience on October 19 and 20 demonstrates that the financial position of many specialist firms can become critically strained during a major market break. While specialist capital appears sufficient in normal trading situations, the staff is not confident that it will remain sufficient if the markets continue at their present volatility levels. Although the staff is not able to conclude that additional capital would have retarded to any great degree the market decline of October 16 and 19, the staff believes that additional capital might ensure that in any future down market specialists do not reach the limit of their buying power or become in jeopardy of failing.

In light of the above, the staff believes that further analysis of the specialist financial responsibility system should be conducted. In particular, the staff is concerned that the present minimum capital requirements imposed by the Amex, NYSE and the regional exchanges do not reflect the actual capital needed to ensure the maintenance of fair and orderly markets in different types of securities. Accordingly, the staff believes that the exchanges should consider revising the minimum financial requirements imposed on specialists to reflect more closely the requirements of today's markets. Moreover, the Division will review the appropriateness of applying the Commission's net capital rule to all specialists.

In this connection, the staff also has identified substantial limitations in the exchanges' present system of specialist surveillance. Accordingly, the Division will review with the exchanges possible modification by the exchanges of their existing specialist monitoring systems in order to increase the level of surveillance currently maintained.

Finally, the Division is concerned about potential difficulties specialists may have in obtaining financing during periods of market turbulence. Accordingly, we believe that the exchanges should explore the possibility of requiring all "self-clearing" specialists to maintain a line of credit with a bank or other lending institution or face higher capital requirements.

Chapter Five -- Analysis of Capital Adequacy

Upstairs Firms

In general, the large investment banking and retail firms suffered substantial losses in October as a direct result of the market crash. However, none fell below the net capital early warning levels. Of the approximately 6,700 firms dealing with customers and/or trading for their own account, about 60 were at some time in violation of the net capital rule. Of that number, only three carried customer accounts and only one of those had to be liquidated under the Securities Investor Protection Act. The

remainder of the firms traded solely for their own accounts and/or introduced their customer business on a fully-disclosed basis to another broker-dealer.

In light of the increased volatility in the market, the Division believes that certain matters should be reviewed. First, the minimum net capital required of broker-dealers that (1) carry customer accounts, (2) introduce customer accounts on a fully-disclosed basis to another broker dealer, and (3) are market-makers in OTC securities should be reexamined. Second, the net capital rule should be reviewed to determine whether to require broker-dealers to take haircuts for their securities related futures positions that are independent of margin requirements and are related to the past volatility of the underlying securities. Third, the level and structure of haircuts for equity securities should be reexamined. In this connection, consideration should be given to establishing several levels of haircuts to differentiate among different types of securities. Moreover, attention should be devoted to whether equity haircuts alone are a sufficient leverage limiting device for firms that do not carry customer accounts, but either trade for their own accounts, act as market makers or clear through another firm. Finally, financial activities conducted in affiliates of a broker-dealer should be reviewed for their potential exposures to the broker-dealer and the financial markets generally.

Liquidity of Broker-Dealers

Bank lending to the brokerage community as a whole increased significantly during the week of the market break. While no precise measurement is available, data from the Board of Governors of the Federal Reserve System ("FRB") indicate that loans by banks to purchase and carry securities, including loans to broker-dealers as well as to mutual funds, increased by almost fifty percent during the week of the break.

Following the market break, the availability of credit to broker-dealers did not decrease on a generalized basis. Banks continued to make credit decisions on a client-by-client basis, taking into account the perceived creditworthiness of their customers, the value of securities pledged as collateral for secured loans, and the strength of their security interests. Most banks reported that their clients did not seek loans in excess of the banks' internal lending guidelines and that these loans were usually provided. It is not clear, however, that banks would have continued to provide liquidity to the same extent had the DJIA continued to drop significantly on October 20.

Banks were more cautious in making lending decisions during the market break. In response to the market decline, some banks made intra-day margin calls and lowered advance rates for particular borrowers. Specialists, risk arbitrageurs, and other firms rumored to be experiencing problems, including some major broker-dealers, were required by individual banks to provide additional collateral or to change the nature of their security arrangements. Finally, bank concerns over credit exposures contributed to some delays in futures and options clearing corporation settlements, as well as settlements of foreign currency transactions.

While banks continued to provide broker-dealers necessary financing and settlement assistance, the market break underlined the critical importance of ensuring broker-dealer liquidity when the market system is under strain. The Division believes that the actions of the FRB and the Federal Reserve Bank of New York to encourage major banks to continue their prudent financing of securities firms were critical in avoiding any potential for a liquidity gridlock. In order to reduce risks of liquidity

problems in any future market break, the Division believes that the self-regulatory organizations should review with broker-dealers the desirability of establishing diverse lending relationships with a number of banks, as well as the feasibility of obtaining more committed lines of credit than currently exist.

Options

Total market maker deficits at all options exchanges for those market makers that clear through the 16 clearing firms designated to the Chicago Board Options Exchange ("CBOE") for examination for compliance with financial responsibility requirements increased from approximately \$6.2 million on October 14 to \$137 million on October 23, a net increase of \$130.8 million. On October 20, there were 164 market makers whose accounts were in deficit with an aggregate total deficit of approximately \$217 million. During the October 14 through October 30 period, the market maker equity at all options exchanges for market makers carried by the 16 CBOE designated clearing firms decreased by approximately \$287.5 million, from approximately \$835.9 million on October 14 to approximately \$548.4 million on October 30.

Aggregate net capital of CBOE designated clearing firms increased by approximately \$178 million, from approximately \$121.9 million on October 14 to approximately \$300 million on October 30. The increase was due primarily to capital infusions and dramatic reductions in options market makers' positions. However, some clearing firms experienced severe liquidity problems. A number of factors contributed to the firms' liquidity problems, including: (1) intra-day variation margin calls; (2) difficulties in financing stock and options positions through banks; (3) problems with returned stock loans; and (4) market makers' withdrawals of equities from their accounts.

The liquidity problems experienced by clearing firms suggest that the following issues should be explored: (1) whether market makers should be required to maintain minimum equity in their accounts equal to the perceived risks in their positions; (2) whether there should be concentration haircuts for short options positions, either on a market maker by market maker basis or on a total clearing firm basis; (3) whether the net capital provision providing that aggregate market maker haircuts cannot exceed ten times the clearing firm's net capital for a period exceeding five consecutive business days should be amended to reduce the five business day grace period; (4) whether the provision of the net capital rule that permits some options market makers that are not exempt from the net capital rule to avoid under certain circumstances the haircuts on their option positions should be eliminated; (5) whether self-clearing options market makers should be permitted to carry the accounts of independent market makers without having the net capital requirements of other firms; and (6) whether there should be limitations on the withdrawal of market makers' equity from their accounts.

In addition, the Division believes that the options clearing firms, options exchanges and the Options Clearing Corporation ("OCC") should enter into discussions with banks to encourage them to develop guidelines that would allow them to extend credit with confidence on in-the-money options positions.

Chapter Six -- Issuer Repurchase Activity

In light of the significant number of issuer repurchase program announcements during the week of October 19 to 23, the staff conducted an analysis of repurchase activity of S&P 500 companies during this period. The staff analyzed the impact of repurchase volume and announcements on market price performance, and examined the operations of Rule 10b-18 under the Exchange Act.

The staff found that stock repurchases by many S&P 500 companies represented a significant proportion of the trading volume in their shares during the week. Purchasing activity had a favorable impact on price performance, and the effect on the announcement of a repurchase program also appeared to be positive.

While most issuers apparently followed the requirements of Rule 10b-18, the treatment of block purchases under the rule may effectively negate the volume limitation for many securities. As a result, a number of issuers were the predominant buy force in their common stock after they commenced their repurchase activity. The staff expects to continue its review of the impact of issuer repurchases and the possible need for amendments to Rule 10b-18.

Chapter Seven -- Exchange Operational Performance

Market Information Systems

Market information systems were not subject to any major breakdowns or delays. The central processor for transaction and quotation information for listed equity securities, the Securities Industry Automation Corporation, experienced only two brief outages in reporting transaction information. The NASD experienced some delays on October 19 and October 20 in one of its services for providing transaction and quotation information to securities information vendors. Securities information vendors also did not experience many interruptions or delays in providing service. While the performance of equity information systems did not raise significant concerns, the Division believes that the NYSE should review whether it has adequate personnel and facilities to maintain accurate trade and quote reporting capabilities during periods of sustained high volume.

Although there were no system-wide interruptions or delays in disseminating options transaction and quotation information to securities information vendors, two problems did occur. First, as the value of underlying securities and indexes changed dramatically, the number of new options series that were created was much greater than usual. The addition of these new series to existing data bases strained the resources of several securities information vendors. The second problem relating to options information occurred when premiums reached three digits. Because three digit premiums previously had been a rarity, the options information message format only allowed two digit price information. Consequently, premiums with three digits were incorrectly reported.

Order Handling

The Division's review of order entry and routing procedures did not break highlights at least two areas of concern. First, many broker-dealers appear to

have been nearly overwhelmed by the surge in order flow. Notwithstanding the fact that 600 million share days may not have been within the realm of reasonable expectations, some firms may not be routinely reviewing and assessing their capacities to accept orders from their clients and route the orders to the appropriate destination. Second, it is apparent that at least one major service bureau suffered operational problems that resulted in delays in order routing and execution reporting for a large number of firms. In light of the stress placed on firm order handling systems during the market break, the Division believes that firms should develop contingency plans to cope with unusual volume. These plans should include back-up computer systems, cross-training of personnel and better communication with public customers. In order to ensure that these reviews regularly take place, the self-regulatory organizations and the Division should include a review of operational capacity in broker-dealer examinations. Moreover, because many firms rely on service bureaus to perform external order routing functions and these systems interlock and are dependent on the operations of the routing and execution systems of the exchanges, the entire network should be examined to determine the causes of inefficient operations during the market break. In this connection, the staff will review whether some degree of regulatory oversight of service bureaus is desirable.

Automated Order Routing and Execution Systems

Problems with the NYSE's Designated Order Turnaround ("DOT") system caused many delays in executing trades. Several components of DOT, which permits automated routing of small orders of up to 2,099 shares and the sending of orders in lists of securities, frequently were overburdened.

Moreover, all the small order routing and execution systems of the regional stock exchanges also experienced significant delays, particularly on October 19 and 20, in executing orders through their systems. The Pacific Stock Exchange ("PSE") SCOREX system encountered the most significant problems, losing both orders and trade reports, due to a system capacity overload. The Midwest Stock Exchange ("MSE") and Philadelphia Stock Exchange ("Phlx") also had large queues for orders entering their respective systems. Phlx reverted to a manual execution system during most of the week of October 19 and, under manual mode, dispensed with sending execution reports to member firms until after trading hours. On the other hand, the MSE attempted to increase its system's capacity throughout the week of October 19 and by October 26 was able to add an additional computer to increase capacity.

The problems encountered during the week of October 19 highlight the critical need for all exchanges to implement quickly system improvements to enhance their ability to handle volume surges in the future. Moreover, the Division believes the Commission should consider whether to request that the PSE and Phlx refrain from adding new firms on their systems until they have made progress in increasing system capacity.

The problems during the week of October 19 also underscore the need for the markets to inform, in a timely fashion, member firms of any problems and delays in their systems in addition to any reductions in guarantee limits. Coordination among the markets, especially when systems are down and order flow may have to be sent to another market, also should be improved.

Finally, substantial delays occurred in routing orders through ITS. ITS is a communication system that links the seven major stock exchanges and the NASD. In addition, ITS suffered from the failure of the ITS plan to provide for a pre-opening notification routine after trading imbalance halts, as well as a general lack of communication among the participating exchanges. The staff determined, therefore, that modifications in the exchanges' order routing and support systems and improved communication between exchanges would result in a more efficient performance of ITS during periods of high volume.

Chapter Eight -- Performance of the Options Markets

The options exchanges experienced a number of problems throughout the week of October 19 due to the extreme price volatility in the market for the underlying securities, the absence at times of useful market information concerning conditions in the equity and futures markets, and the difficulty market makers faced in trying to hedge their options positions. The impact of these factors is reflected in the large number and protracted nature of trading halts called in individual equity options and index options; in the fact that prices, or "premiums," charged for option contracts, particularly put contracts, were inconsistent and often unrelated to price movements in the underlying index; and in the notable unwillingness of some options market makers to foster liquidity by trading on a continuous basis. In particular, the options markets did not provide an effective, continuous market for the most actively traded index options classes at certain times on October 19 and for virtually all of October 20. Accordingly, the Division believes there are a number of areas that require review by the Commission and the options exchanges.

First, the Division and the exchanges may wish to reconsider the efficacy of rules that currently permit options on indexes of securities to open prior to the opening of all component securities in the underlying market and to continue trading for a certain time even though underlying component securities are not trading. Second, the options exchanges, particularly the CBOE, need to examine methods to speed up opening rotations. Index option opening rotations were excessively long on October 20, and, in the opinion of the Division, limited the ability of options customers to receive timely executions, and contributed to higher premiums being charged in some options series. Third, the Division believes there is a need for the options exchanges and market information vendors to develop a plan concerning what options series, if any, should be delisted from vendor quotation services when vendor data base capacity is outstripped. Fourth, the Division believes that the performance of small order execution systems during the week of October 19 evidences the need for the CBOE and the Amex to revisit their rules governing market maker participation in these systems. Fifth, the Division believes that the performance of index options market makers on both the CBOE and Amex, particularly on October 20, warrants close examination by these exchanges to determine whether they met their obligations to maintain, to the maximum extent possible, fair and orderly markets.

Chapter Nine -- The OTC Market

During the week of the market break, the prevalence of unreliable quotations, delayed transaction reports, reduced market maker participation, and increased manual order handling, coupled with greater telephonic inquiries, undermined the liquidity and orderliness of the OTC market.

During the market break, the OTC market suffered from a combination of extreme downward volatility and unusually high share volume. An extraordinarily high number of locked and crossed markets disabled the NASD's automated Small Order Execution System ("SOES"), as well as similar systems operated by individual market makers, forcing market makers to execute transactions of small size manually. Because of the difficulty in reaching other market makers by telephone, customer orders for securities whose markets were locked or crossed were often not executed in a timely manner, not executed at all, or executed at prices that reflected only a securities firm's best estimate of the prevailing market.

The NASD has responded to problems encountered during the market break by proposing a number of initiatives. These initiatives include raising the penalty for unexcused withdrawals by market makers from NASDAQ; requiring all NASDAQ market makers to participate in SOES; providing that SOES executions will continue in an OTC/National Market System security when quotes are locked or crossed; eliminating preferencing of market makers when a locked or crossed market exists; and establishing the Order Confirmation Transaction service that will permit firms to access market makers over the computer without voice contract. While the Division believes that these proposals demonstrate a willingness by the NASD to respond to the serious breakdowns that occurred during the market break, we believe there are a number of additional areas that merit attention.

First, the NASD, as part of its self-regulatory responsibility, should review the conduct of market makers during the market break to ascertain whether they complied with the NASD's rules. Second, the large number of transactions reported out-of-sequence by particular firms may be an indication of the firms' inability to comply with the transaction reporting rules. Third, the NASD and the Commission should reconsider, in light of the market break, the need to require market makers to include realistic sizes as part of their quotations. Fourth, the NASD should consider additional steps that would ensure the ability of market makers to execute electronically against other market makers' quotations during high volume periods.

Chapter Ten -- Clearance and Settlement

During October 1987, clearing agencies, broker-dealers, and securities markets cooperated successfully to compare, clear and settle unprecedented sustained daily trading volume. Although the volume placed tremendous strain on personnel and systems, the vast majority of that trading volume was cleared and settled within routine time frames. Volume and record price volatility also increased dramatically the financial risk of loss to clearing agencies and their members. Although some losses were suffered, clearing agency safeguards were effective in preventing significant or widespread losses.

The record trading volume and securities price volatility experienced during October 1987 does suggest, however, the need for improvements in two primary aspects of the clearance and settlement process: (1) post-execution trade processing, and (2) clearing agency safeguards against member default.

The NYSE, NASD and Amex should consider accelerating efforts to compare all trades on trade date. Currently, over 50% of share volume is compared through two-sided trade input that results in compared trades several days or longer after trade date. The October 1987 experience indicates that the current two-sided comparison

process cannot be completed fully on a timely basis with sustained daily trading volume exceeding 600 million shares. Those considerations should include expansion of automated systems which permit comparison at or near the time of trade execution.

Clearing agencies also should consider a variety of enhancements to their risk management systems to reflect increased risks that result from increased price volatility and trading volume. Those considerations should include enhanced member monitoring systems to enable clearing agencies to obtain better and more up-to-date information about members' financial strength, activity in other markets, and customer activity. Clearing agencies also should consider whether risks posed by individual members require increased capital requirements or the deposit of additional assets with the clearing agency.

Options clearing systems and market participants also should reexamine safeguards and consider improvements in light of events in October 1987. As demonstrated in October, equity price volatility can generate geometric increases in options price volatility. The OCC should consider the same member monitoring improvements as equity clearing organizations as well as how those monitoring techniques can provide better early warning of risks and what increased measures should be taken to guard against those risks. Moreover, basic volatility assumptions and margin formulas should be reassessed in light of the record volatility in October. When OCC margin is insufficient to cover intra-day volatility, OCC resorts to variation margin calls to protect itself. Events in October suggest that OCC should reassess the manner and timing of variation margin calls to determine whether it can obtain earlier warning of and protection from potential member insolvency, especially for volatility that occurs late in the trading day near the close of banking hours. Finally, OCC, the commodities industry, and regulators should discuss ways to coordinate margin requirements and settlements for entities involved in securities options and futures market activity.

Chapter Eleven -- Internationalization

The interdependency of the world's securities markets was never more apparent than during the market break. The Commission staff's findings indicate that the major world markets responded quickly and dramatically to movements in other major world markets and that, for the most part, U.S. markets led foreign markets.

To some degree, the interdependency of the markets is the result of cross-border investing by market participants who are seeking new ways to diversify portfolios. Although there were rumors that foreign investors were abandoning U.S. markets when the DJIA turned sharply down, the staff has not found evidence to support this belief. Foreign investor activity does not appear to have had a disproportionate effect on U.S. market moves. U.S. investors also appear to have engaged in substantial trading in foreign markets during the break. Much of this trading, however, was probably pre-negotiated crosses, arranged in the U.S. and executed abroad for convenience.

Although the major world markets may have experienced varying degrees of foreign investor activity during the break, the markets uniformly were besieged by enormous sell pressure. Thus, the staff examined how London, Tokyo and Hong Kong fared under this extraordinary pressure. London operates in a manner similar to the NASDAQ market and, although it continued to function throughout the break, experienced many of the same problems as the NASDAQ market. For example, instances of widened spreads and reduced quote sizes were reported. Market participants also

indicated that some market makers were not answering their telephones and that locked and crossed markets were not uncommon.

Tokyo also suffered under the strain of huge sell-order imbalances. On Tuesday, October 20, the implementation of daily price limits and huge sell-order imbalances halted most trading in that market. Finally, in response to the unprecedented volatility around the world, the Hong Kong markets closed for four trading days in the hope that those markets would avoid the calamitous drops other markets experienced. Nevertheless, upon reopening, the Hang Seng index plunged 1,120 points, a 33% drop.

The growing internationalization of the markets presents many challenges to the world's securities regulators. The events of October 1987 brought to the forefront the degree to which events in one market can affect other markets and emphasized the need for greater international cooperation and initiatives. Regulators can respond positively to these developments by working together to develop trading, clearance and settlement linkages and other arrangements; international trade and quote reporting mechanisms; adequate financial oversight systems; and effective enforcement and surveillance arrangements.

Chapter Twelve -- Investor Complaints

Chapter Twelve is devoted to the detailed analysis of investor complaints and inquiries received by the Commission and the self-regulatory organizations in the aftermath of the October market break. The chapter describes the results of the intensive program undertaken to identify and categorize the types of problems experienced by individual investors, as well as to document the general perceptions of investors during this period. A brief summary of telephone complaints/inquiries is included, with the primary focus on the analysis of the 1,283 letters received through December 15, 1987.

The findings of this study indicate that problems involving order execution accounted for the highest percentage (43.3%) of investor complaints by far. The next two most frequently cited categories, each representing approximately 10% of the market break complaints, were confirmation problems (10.4%) and margin maintenance problems (10.1%). A public commentary category, that tracked letters containing general comments on the market break situation, accounted for an additional 10.7% of the complaints. A majority of these expressed concerns about program trading. Although emphasis was placed on identifying abusive sales practices, the market break complaint data revealed a slight decrease in this area when compared to the percentage of Fiscal Year 1987 sales practice complaints. It may be that these types of complaints were delayed while the investor attempted to resolve the problem with the broker-dealer. Consequently, this percentage may increase over time.

The staff concludes that it is important to move to address systematic problems that impacted order execution and confirmation of orders for small investors. The staff recommends review and modification where necessary of disclosure in account opening agreements concerning margin calls and options risk disclosures. Finally, the staff suggests that information contained in customer complaints be utilized in targeting broker-dealer examinations.

Chapter One

BACKGROUND AND DESCRIPTION OF TRADING STRATEGIES

A. Index-Related Trading Strategies

Several important index-related trading strategies have developed over the past few years. This development has resulted in considerable confusion over terminology, particularly concerning "program trading." The term program trading refers to the buying or selling of a large number ("basket") of stocks simultaneously. Thus, program trading is a generic term that encompasses several different index-related trading strategies.

This Chapter describes some of the basic strategies employed by participants in the index markets, including asset re-allocation, hedging, portfolio insurance, and index arbitrage or substitution. It also discusses other forms of "program" trading such as buying or selling "baskets" of stocks without related transactions in futures or options.

1. Asset Re-Allocation and Hedging

Portfolio managers analyze a number of factors, including macroeconomic developments, market conditions influencing the relative value of individual equity and debt instruments, and client requirements in order to design an investment strategy that allocates funds among various instruments, such as equities, debt instruments, cash or cash equivalents, and other investments (such as real estate). Because these factors undergo constant changes and the amount of fund moneys fluctuates, there are periodic re-allocations of assets.

Because an index option or future is a single instrument that can be used as a surrogate for a portfolio of stocks, it can be employed to adjust stock and debt portfolios quickly and at relatively low commission costs. 1/ Using index futures and options can also significantly reduce transaction costs when additional funds are invested. Moreover, under normal market conditions, investors can execute large transactions using a single index product with much smaller market effects than would be possible if the transactions were executed in the separate stocks. 2/

Stock index products also have served as useful vehicles for hedging against market risk. Under normal market conditions, portfolio managers are able to sell index futures, reducing the overall exposure of their portfolios to stock price movements and

1/ For example, a debt portfolio can be converted rapidly to equity by simultaneously selling bond futures and buying stock index futures. The manager thereby has increased the equity exposure of the portfolio without incurring the relatively higher equity transaction costs. Of course, when and if the stock transactions take place, commission costs are incurred.

2/ A 1985 Kidder Peabody study estimated the difference in market impact as follows: market impact of a \$20 million stock trade would be 0.27%; for a similar futures trade, 0.04%. R. Steven Wunsch, Stock Index Futures (1985).

to shift that risk to those more willing to accept it (either speculators or other hedgers with corresponding positions).

2. Portfolio Insurance

"Portfolio insurance" refers to a variety of dynamic hedging strategies used by investors to control market risk in both equity and fixed income portfolios. ^{3/} These strategies are designed to provide protection against loss at a cost of some limitation on the opportunities for appreciation. While it is difficult to generalize about the numerous strategies encompassed by the term portfolio insurance, the core of these strategies is disciplined buying or selling triggered by pre-set parameters relating to substantial market movements (and usually in the same direction as those market movements). In this manner, portfolio insurance strategies are roughly analogous to the use of "stop-loss" orders in individual securities where a sell order is created if the market price of the security falls to the "stop" price. Traditional "stop-loss" orders, however, generally are placed with an exchange specialist, providing him and indirectly the market as a whole, an indication of potential selling activity. Portfolio insurance, on the other hand, is handled by an upstairs firm and does not provide any prior warning of the amount of potential selling activity it represents -- either to the specialist or other market participants.

While portfolio insurance for equity portfolios initially employed the purchase and sale of stocks, today it is usually implemented through the purchase and sale of stock index futures. As stock prices fluctuate, the portfolio is continually rebalanced between a risky component (stocks) and a riskless component (Treasury bills) so that, in theory, the total portfolio value cannot fall below a specified minimum value. By selling stock index futures while holding a portfolio of the stocks comprising the index, a totally hedged position is created. ^{4/} The stock index future is used in this manner to replicate a riskless security. This hedged position (often called "synthetic cash") provides a return similar to Treasury bills. The "insurance" protection comes through a hedging strategy which involves selling futures, and thus increasing the weighting of synthetic cash relative to stocks, as stock values decline. Conversely, as the value of the stock portfolio increases, stock index futures are purchased, increasing the weighting of stocks relative to synthetic cash. Futures are used instead of stocks because of the increased speed and reduced transaction costs in trading a single product in the futures markets. ^{5/}

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- ^{3/} Because of frequent adjustment of the hedge over time and of changes in the value of the portfolio, this strategy also is called "dynamic hedging." For a discussion of the difficulties in categorization of portfolio insurance strategies and how those difficulties complicated the Division's identification of portfolio insurance activity during the October market break, see Section E of this Chapter on methodology.
 - ^{4/} The effectiveness of the hedge is reduced to the extent that price movements in the portfolio do not perfectly track the index.
 - ^{5/} An argument also can be made that portfolio insurance, by reducing downside risk, increases investor willingness to participate in equity markets.
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Typically, portfolio insurance seeks to assure a minimum value for the portfolio over a specified time period. For example, a typical insurance program might attempt to assure the maintenance of a minimum of 95% of the current portfolio value. The cost of this protection was estimated to be potentially under performing a rising market by two to four percent.

Two things are required to achieve the goal of maintaining a minimum value of the portfolio: the disciplined selling in a declining market (or buying in a rising market) of a set amount of futures at various trigger points and the presence of a pre-assumed level of liquidity in the futures markets. ^{6/} In this regard, the insurance program is intended to be similar to a long-term index put option with a strike price equal to the ending minimum portfolio value.

Some portfolio insurance strategies have recognized that, under certain market conditions (such as when futures prices are substantially lower than prices for underlying stocks), transactions that would ordinarily be sent to the futures markets would be more economical if sent to the stock market -- usually, the New York Stock Exchange ("NYSE"). Accordingly, some strategies provide their money managers with the flexibility to redirect orders to the stock market if conditions warrant.

One other feature of portfolio insurance strategies should be noted. While these strategies have emphasized disciplined buying and selling as one of their distinguishing features, users are not necessarily "locked into" specific trading patterns. Users of portfolio "insurance" can direct the providers of such "insurance" strategies and brokers to refrain from any transaction regardless of the indications of their computer models. ^{7/}

3. Index Arbitrage

a. Cash Arbitrage

If the value of the stocks in an index is known, it is possible to calculate the theoretical value of a futures contract on that index. The theoretical value of an index future normally is slightly higher than the aggregate prices for the component stocks of the index (termed the "cash" price or value). The theoretical value of the future is a function of four factors: (1) the value of the index itself; (2) the time remaining to expiration; (3) the investor's relative carrying costs for stocks and futures (generally the opportunity cost of the capital employed, which is measured by the relevant interest rate); and (4) the dividends to be paid by the stocks in the index through expiration.

^{6/} It should be noted, however, that most portfolio insurance programs provide some discretion to the money manager to vary the amount of futures contracts sold, depending on market conditions. In addition, some programs have a built in delay factor, deferring all or some futures selling for one or more days after a market movement. This delay factor is intended to reduce the costs imposed on the program by short term rebounds in the market. See discussion in Chapter Two.

^{7/} See discussion in Chapter Two.

When sufficient premiums or discounts to the theoretical value occur, 8/ index arbitrageurs buy in the lower priced market (stock or derivative) and sell in the other, higher priced market. 9/ Because the premium or discount must disappear when the future expires, such arbitrage produces a locked-in, "riskless" profit. The arbitrage will be undertaken when this profit produces a return on the capital employed that exceeds competing money market rates.

These offsetting purchases and sales tend to bring the different prices closer in line by raising values in the market that is relatively underpriced and reducing values in the market that is relatively overpriced. 10/ Perhaps because of the five-year bull market that began in 1982, futures have, until recently, often traded at a slight premium to their theoretical value. Accordingly, the most common index arbitrage has involved the sale of index futures trading above theoretical value and the simultaneous purchase of the stocks comprising the index or a basket of stocks whose performance closely simulates the performance of the index. 11/ When the futures contract expires, these positions are unwound by buying back the index futures and selling the component stocks. 12/ Market conditions often will allow these arbitrage positions to be unwound prior to expiration (by buying back the future and selling the stocks in the basket) because the futures temporarily move to or below their contemporaneous theoretical value.

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- 8/ The premium or discount must be sufficient for the arbitrage program to exceed transaction costs.
 - 9/ Index arbitrageurs have implemented their arbitrage principally with index futures rather than index options. The most popular index future for this purpose is the S&P 500 future traded on the Chicago Mercantile Exchange ("CME").
 - 10/ The theoretical value diminishes as the futures approach expiration. Because some futures, such as the Major Market Index ("MMI") contract, have a monthly expiration cycle, while other futures, such as the Standard and Poors 500 Stock Index, NYSE Composite Index ("NYF"), and Value Line Index ("KVL") contracts, have quarterly expiration cycles, the theoretical values for various futures often are disparate. This factor, among others, sometimes results in arbitrage opportunities appearing in one futures contract but not in other contracts. In fact, there may be times in which a sell arbitrage opportunity appears in one futures contract simultaneous with a buy arbitrage opportunity in another contract.
 - 11/ A simplified example would work as follows. Assume on December 1, that the Standard and Poors 500 index future is trading at 319, the composite value of the basket of stocks underlying that index is 315 and the theoretical value of the future is 316. A trader might sell the futures and buy the stocks, capturing the three-point spread between actual and theoretical value (less transaction costs).
 - 12/ At expiration, the arbitrageur could also "roll" the futures position forward to the next expiration month if that contract trades at a sufficient premium. In this case, the arbitrageur would buy back the expiring futures previously sold and sell the next series of futures while continuing to hold the long stock position.
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Index arbitrage also can be implemented by purchasing index futures selling at a discount to theoretical value and selling the index stocks. If the index shares are held in inventory, this arbitrage is no more difficult than long side arbitrage. If the arbitrageur does not hold a sufficient number of the index shares, he may have to sell short to complete the arbitrage. Because short sales of stock, however, must be executed at a price higher than the last different price ("tick test") to comply with Rule 10a-1 under the Securities Exchange Act of 1934 ("Exchange Act"), implementing the short side arbitrage, particularly in a declining market, can be difficult and risky.

b. Index Substitution

Index substitution is a form of index arbitrage that attempts to profit from pricing discrepancies between the index and the future. Typically, such a strategy is employed by an index fund that seeks to replicate the performance of an index by holding each of the component stocks in proportion to its weighting in the index. When a futures contract is selling at a discount to theoretical value, futures can be "substituted" for stocks to add incremental returns to the index fund by selling stocks and buying futures, and investing the proceeds of the stock sales not needed to establish and maintain the futures position in treasury bills or other short-term money market instruments. The stocks would be repurchased and the futures sold when the discount abates, at or before expiration. This strategy, which may permit the index fund to out-perform the replicated index, involves transactions that are identical to short-side index arbitrage with the significant exception that stock sales are not short sales; therefore, they can be executed on minus or zero-minus ticks (*i.e.*, into a declining market).

B. Use of Automated Systems for Programs

Over the last few years, a number of well-capitalized broker-dealers and large institutional investors have developed the expertise and computer capacity to engage in index arbitrage. Because of the number of potential participants any arbitrage transaction often must be executed within a brief "window of opportunity," which may last only a few minutes. ^{13/} The capacity to route equity orders through an automated system reduces the time required to execute the particular program, and therefore increases the arbitrageur's probability of capturing the premium or discount to the index product. Moreover, the use of automated systems, as opposed to manual execution, lowers the transaction costs associated with executing an arbitrage program. Because a basic understanding of the use by programs of automated order-routing systems of the NYSE is necessary to understand the trading during the October market break, an overview of these systems is provided below. ^{14/}

^{13/} Throughout the first quarter of 1987, the fair value of the S&P 500 future was generally within ± 0.8 percent of the actual value of the index. This narrow spread implies an efficient index/futures relationship where opportunities for arbitrage exist only for brief periods.

^{14/} In contrast, so-called "manual" program execution would involve broker-dealers hand delivering individual orders in each of the stocks which were part of the program.

In 1976, the NYSE implemented its Designated Order Turnaround ("DOT") System to facilitate the routing of small orders. ^{15/} DOT originally was designed to eliminate the need to send small customer orders ^{16/} to the member firm floor booth. Through DOT, small market orders could be routed directly from the member firm branch office to the applicable specialist's post. The specialist would then represent the order in the trading crowd and report back an execution to the member firm. ^{17/} Currently, member firms may route orders of up to 2,099 shares through DOT that are market or marketable limit orders. ^{18/} DOT also may accept order sizes larger than 2,099 shares (up to 30,099 shares in the more liquid stocks), but there are greater risks as to the timing of the execution of such orders. ^{19/}

In response to increased use of index products, the NYSE developed a system to facilitate rapid transmission of large orders from member firms. The DOT List Order Processing feature ("LIST") is an application of DOT that allows member firms to send orders through DOT in, as its name implies, a list of securities. For program trading strategies such as index arbitrage, LIST enables members to enter buy or sell orders rapidly in a large number of specific securities (up to 500) they previously identified to be included as a part of a package. Indeed, through personal computers located in their offices, member firms can modify their particular package of securities for execution on an intra-day basis. ^{20/}

^{15/} For a more detailed discussion of DOT, see Chapter Seven.

^{16/} In 1976, the average size of a trade on the NYSE was 559 shares. By September 1987, the average size had increased to 2,099 shares, and in October 1987, the average size was 2,455 shares.

^{17/} As discussed more fully in Chapter Four, specialists trade securities at particular locations on the trading floor called "posts." Because all transactions in exchange traded securities must take place at the "post," often other broker-dealers will congregate around the "post" because of their interest in buying or selling securities traded there. These broker-dealers are referred to collectively as the "trading crowd."

^{18/} A market order is an order to buy or sell a stated amount of a security at the most advantageous price obtainable after the order is represented in the trading crowd at the post. By contrast, a limit order is an order to buy or sell a stated amount of a security at a specified price -- or a better price, if possible -- after the order is represented in the trading crowd. A marketable limit order is a limit order that is immediately executable because the price of the subject security at the time the order is entered is equal to or better than the limit price on the order.

^{19/} Firms must make special arrangements with specialists for handling these larger orders.

^{20/} A number of firms have developed their own proprietary automated systems to "pre-package" a variety of programs. The number of individual stocks and order sizes in the programs are designed to fit specific strategies and arbitrage opportunities in different stock indexes.

The capacity of systems such as LIST to send hundreds of stock orders rapidly and efficiently can be utilized for strategies other than index arbitrage. For example, if a fund uses a portfolio insurance strategy that provides for stock sales under certain market conditions, a program to sell a basket of stocks more or less replicating the S&P index may be sent to the NYSE most efficiently via DOT. Similarly, if an index fund wishes to liquidate or increase a portion of its portfolio, the efficiencies of pre-packaged DOT orders may outweigh the benefits of more selective and gradual transactions on a stock-by-stock basis. Again, the LIST system may be used to pre-package and route these orders into DOT.

C. Prior Commission Studies of Index Trading

1. Background Studies

Since the development of the derivative markets for stock indexes in the early 1980s, the Division of Market Regulation ("Division") has produced several reports on the overall effects of derivative index products on the nation's securities markets. In December 1984, just as the use of index products was reaching significant levels, the Commission, together with the Commodity Futures Trading Commission ("CFTC") and the Board of Governors of the Federal Reserve System ("FRB"), published a report entitled "A Study of the Effects on the Economy of Trading in Futures and Options." ^{21/} This study analyzed the increasing institutional use of index products to hedge stock portfolios, and concluded, among other things, that earlier fears that index products would divert resources from investments in securities to speculation in the futures markets appeared unjustified.

As the magnitude of trading in the derivative markets increased from 1984 to 1986, so did public concerns over the impact of index products on the securities markets. In particular, the media often attributed price volatility in the stock market to the effects of "program trading." In response, in July 1986, the Commission hosted a Roundtable on Index Arbitrage. The background materials for this conference were made publicly available by the Commission. ^{22/} The Roundtable provided a forum for market participants to discuss both the benefits of index products and means to mitigate any adverse effects on stock market volatility, particularly on expirations, without undermining the usefulness of these products. These discussions laid the groundwork for the next round of Commission studies and regulatory initiatives to address market volatility.

2. Expiration Volatility

Subsequent to the Roundtable, the Division has analyzed the effects of index-related trading strategies on price volatility in the stock market in various contexts. One of these contexts has been the price swings often attributed to massive stock

^{21/} FRB, CFTC and SEC, A Study of the Effects on the Economy of Trading in Futures and Options ("Joint Study") (December 1984). The Joint Study includes a discussion of the development and regulation of the stock index derivative markets and an extensive description of the participants and trading techniques.

^{22/} SEC, Roundtable on Index Arbitrage, Background Materials (July 9, 1986). These materials also contain a detailed description of index arbitrage.

buying or selling on expirations -- particularly the quarterly expirations of stock index futures and stock index options and equity options -- days referred to as "Triple Witching Fridays." On several such expirations in 1985 and 1986, the NYSE experienced a last-minute deluge of sell orders (or buy orders) resulting in an abrupt price drop (or rise), which was reversed to a substantial extent at the commencement of trading on the next Monday. The Division has worked with the CFTC and securities and futures markets to encourage the development of remedial measures, including: (1) procedures to disseminate buy or sell order imbalances on NYSE stocks for the purpose of bringing in counterbalancing orders; ^{23/} and (2) encouraging the shift of some expirations to the market opening in lieu of the market close to (i) take advantage of stock opening procedures designed to handle an imbalance, and (ii) provide the stock market the full trading session to minimize the price impact of an influx of buy or sell orders on the opening. ^{24/} While experience with these measures has been limited, they appear to have helped to correct order imbalances and volatility on Triple Witching Fridays.

3. Non-Expiration Volatility

The Division has also reviewed the effects of index-related trading during non-expiration periods when substantial price volatility occurred.

a. September 11 and 12, 1986

On September 11 and 12, 1986 the stock market suffered its sharpest absolute decline in decades on then-record trading volume. ^{25/} Over a two-day period, the Dow Jones Industrial Average ("DJIA") fell 120 points, and a then unprecedented 5 point discount to cash appeared in the Standard and Poor's ("S&P") 500 index future. ^{26/} The media attributed much of this decline to "program trading." The Division, in conjunction with the CFTC, conducted an in-depth review of index-related trading, and, in particular, index arbitrage, on those two days. This review found that the September 1986 price decline appeared to reflect changed investor perceptions of fundamental economic conditions -- primarily, concerns over possibly rising interest rates, which generally create lower expectations of further price rises in stocks.

^{23/} See Securities Exchange Act Release No. 25201 (December 21, 1987), 52 F.R. 48354.

^{24/} See Securities Exchange Act Release No. 25202 (December 21, 1987), 52 F.R. 48355.

^{25/} Volume on Tuesday, September 11, 1986 was 237,569,000 shares -- a record single day volume. On Wednesday, September 12, 1986, volume set another record of 240,490,000 shares.

^{26/} See Division of Market Regulation, Report on the Role of Index-Related Trading in the Market Decline on September 11 and 12, 1986 (March 1987) ("September 1986 Report"), at footnote 15.

While it did not appear that index-related trading artificially changed stock prices, the Division found that index strategies, particularly arbitrage, 27/ were instrumental in the rapid transmission of changed investor perceptions, usually reflected first in futures prices, to individual stock prices. Accordingly, the Division found that index arbitrage may have condensed the time period in which the September 11 and 12 market decline occurred.

b. January 23, 1987

On January 23, 1987, the securities markets experienced extreme price volatility, again on then-record volume of 302 million shares on the NYSE. The DJIA rose 64 points (3%) by 1:39, building upon its then record rise of 51.6 points (2.4%) the day before. Then, in little more than an hour, the DJIA fell approximately 115 points (5.2%). Although the DJIA reversed direction twice after this drop, it closed down 44.15 points for the day.

The Division and the CFTC staff conducted a detailed review of index-related trading on that day. These studies again found the impact of index arbitrage on the January 23 price volatility was essentially the same as on September 11 and 12, 1986--that is, while this trading did not artificially cause the downturn, it may have accelerated price movements in the stock market. 28/ There was at least one significant difference, however, between the two market declines: the September 1986 decline appeared to have been a reaction to fundamental economic news, yet no such news justified the mid-afternoon plunge in prices on January 23.

4. Concerns Over the Cascade Scenario

The Division's September 1986 Report noted that commentators expressed concern that index-related trading strategies could fuel a market decline severe and rapid enough to cause a stock market collapse through the following "cascade scenario:" the scenario begins with index futures prices moving to a sufficient discount (because of fundamental and other factors) to trigger short side index arbitrage, index fund substitution, and unwinding of previously established long arbitrage positions, the resulting block sales of stocks depress the equity market to levels that trigger portfolio insurance programs; these programs, which involve futures sales, further depress futures prices and cause the cycle to repeat itself; the resultant plunge in stock prices triggers stop-loss sell orders in individual stocks, and forces additional liquidations to meet

27/ At the time of the September 1986 market decline, the Division found no evidence that portfolio insurance had reached a level at which it would have played a significant role in the market downturn. The Division noted, however, that there were differing views among market professionals whether the continuing expansion of portfolio insurance use would result in the possible dispersion or convergence of "trigger" points for these strategies. Convergence of these trigger points could increase the chances that these strategies would "fuel" a future market decline. See September 1986 Report, at 22-24.

28/ While the Division reported its findings for January 23, 1987 in a non-public report to the Commission and its Congressional Oversight Committees, the CFTC staff presented its findings in a public report.

margin calls and broker-dealer capital requirements, finally leading to a market collapse. 29/

In its September 1986 Report, the Division noted that the likelihood that this scenario would occur depended on, among other things: the design of portfolio insurance programs, the incidence of the "trigger points" at which programs would generate sell orders, the amount of capital subject to these programs, the extent to which excess funds would be available in regulated entities' and customer accounts to maintain required capital and margin, and prevailing market conditions. Most critical to the scenario was the continued existence of a significant discount in the index futures to the theoretical value of the cash market.

While most market professionals interviewed by the Division in the fall of 1986 acknowledged the possibility of significant market movements up or down, in short time frames, they found the chances of an index-related market collapse remote for several reasons. First, they believed that such a decline would be halted by buying interest as stocks and futures reached lower levels. They believed that index trading strategies do not determine the fundamental values of assets, and at some price stocks would again become attractive to purchasers. Second, they believed that, as futures prices reached lower levels relative to stock prices, portfolio insurance would become increasingly expensive to implement and would likely taper off. Third, they thought that discounted futures purchased in arbitrage or other transactions would tend to stabilize futures prices and mitigate against further arbitrage-related stock sales. Finally, many firms interviewed by the Division believed that portfolio insurance would not be likely to trigger the "cascade scenario" because, as the various strategies matured and found a broader client base, users would implement these strategies at a broader range of times. Such developments would cause the market effects of portfolio insurance to be distributed over a wider range of trading sessions rather than focused at a particular point in time.

In the September 1986 Report, the Division noted that, while these analyses appeared generally sound, "the ability to control substantial stock equivalent positions in index products with a lower investment than is required for the stocks themselves, makes us somewhat less comfortable in th[e] conclusion [that a persistent substantial discount in the futures, the predicate for the cascade scenario, is unlikely] . . . [T]he use of index products may, in rising markets, permit the accumulation of large positions that might be liquidated quickly in falling markets." 30/

D. Methodology of the Division's Market Reconstruction

To reconstruct the trading during the October market break, the Division separately analyzed the heavy volume of trading involving index-related trading strategies, and then placed this in the context of overall trading for firm proprietary, institutional, and retail accounts. This section provides an overview of the Division's

29/ September 1986 Report, at 21; D. Ruder, The Impact of Derivative Index Trading on the Securities Markets, Address before the Bond Club of Chicago, dated October 6, 1987, at 16.

30/ September 1986 Report, at 23-24.

data compilation and analyses concerning index-related and overall trading activity. The results of these analyses are discussed in Chapters Two and Three of the Study.

1. Analysis of Index Trading During the Market Break

The methodology for the Division's analysis of index-related trading during the October market break was essentially the same as that used in our prior studies of periods of non-expiration market volatility such as September 11 and 12, 1986, and January 23, 1987. For those studies, the Division staff and the staff of the CFTC's Division of Economic Analysis compiled detailed, program-by-program data from major firms active in index trading and conducted joint interviews with key market participants. In addition, all data submitted by firms were cross-checked against surveillance information supplied by securities and futures self-regulatory organizations ("SROs"). This index-related trading information was then analyzed for its magnitude and timing to determine what effects this type of trading had on market movements. While certain refinements were made in the October market break study, and the scope of the Division's review was necessarily broadened, the basic methodology was not changed.

a. Data Collection

i. Identifying Major Participants

Before data requests were sent to index firms, the Division took steps to ensure that all major market participants would be included in the surveys. While prior studies had identified most firms then active in index trading, we used additional information sources to determine new market entrants. The following information sources were used: (1) data from the CFTC, CME, and Chicago Board of Trade ("CBT") were used to identify parties whose end-of-day positions in the major index futures changed significantly, indicating active trading; (2) CFTC surveillance information identified any active futures traders whose end-of-day positions might have remained "flat" due to balancing buys and sells; (3) data from the NYSE indicated the level of "program" trades that were routed via automated systems (*i.e.*, LIST) to the exchange floor by major member firms during the market break; and (4) NYSE audit trail information^{31/} identified the 30 member firms with the highest trading volume during the market break.

These information sources confirmed our survey sample. Specifically, the information confirmed that the 11 broker-dealers identified in previous studies remained the key participants in proprietary and customer index trading during October 1987. In addition, the four largest providers of the portfolio insurance strategy were included in our survey because of the possibility that portfolio insurance played a significant role in the October market break. ^{32/}

^{31/} For a discussion of the uses of audit trail systems, see Chapter Three of the Study.

^{32/} Our survey also included an additional firm with significant changes in index futures positions during the market break. This firm's trading was later identified as "speculative," rather than arbitrage or portfolio insurance related.

ii. Preliminary Information

Immediately after the October market break, the Division and CFTC staffs interviewed in joint conference calls the major market participants to capture their views of the markets while memories were still fresh and to ensure that essential data were maintained and prepared for collection. The participants interviewed included traders and compliance staff at broker-dealers and portfolio insurance providers, as well as major institutional money managers. Preliminary information obtained from these interviews consisted of daily aggregate program activity, including index arbitrage and index substitution, portfolio insurance, and other buy or sell programs.

iii. Detailed Program-by-Program Data

By letters dated October 30, 1987, the Division and the CFTC requested that the major index firms provide the following information for the major program strategies. ^{33/} For index arbitrage and index substitution, the following elements were requested: (1) proprietary or customer designation (initially, the identity of a customer was requested only if the customer was another broker-dealer or was affiliated with a broker-dealer); (2) designation of the basic strategy (opening or closing arbitrage or substitution); (3) time of entry for the stock orders; (4) buy/sell/sell short designations for the stock orders; (5) order entry method for the stock orders (automated systems or by phone calls); (6) the market to which the stock orders were routed (the NYSE, other U.S. or foreign exchanges, or the third market); (7) the identity and entry time for any index futures or options contracts traded as part of the program; and (8) the size of the program in approximate dollar size, number of shares, and number of derivative contracts. ^{34/} Essentially the same information was requested for programs to buy or sell baskets of stock for non-arbitrage strategies. Finally, specific timing information was requested for trading as part of portfolio insurance strategies, whether accomplished through transactions in index futures, index options, stocks, or any combination of these instruments.

b. Categorization of Program Strategies

One difficulty encountered in the Division's market reconstruction was in accurately categorizing various program strategies -- particularly portfolio insurance related trading. Because portfolio insurance incorporates a wide range of disciplined selling techniques, a number of users of these strategies now use other terms (such as "portfolio protection" or "tactical asset allocation") to describe their trading, or characterize it as traditional asset re-allocation or hedging. In addition, the traders at

^{33/} See letters from Richard G. Ketchum, Director, SEC Division of Market Regulation, and Paula A. Tosini, Director, CFTC Division of Economic Analysis, dated October 30, 1987. Sample copies of each of the Division's data request letters, whether sent to SROs, broker-dealers, or other parties, are attached as Appendix E.

^{34/} Elements 1-4 and 7 were included in data requests for prior studies; elements 5 and 6 were added to determine if manual order routing or other markets were used to avoid operational problems in automated systems or NYSE voluntary limitations on the use of these systems for programs.

broker-dealers who execute the stock or index futures transactions for customers using portfolio insurance strategies do not necessarily know the customers' strategies. Therefore, the Division requested broker-dealers to identify separately their customers with the largest transactions in index-futures and stocks, and our staff interviewed these customers to obtain an overall description of their investment strategies and explanations of particular transactions. These interviews allowed the Division to supplement its tally of portfolio insurance-related selling. Nevertheless, it is likely that the Study's analysis undercounts, to some extent, the actual number of such transactions. In a preliminary report prepared for the CME, ^{35/} portfolio insurance transactions were aggregated with other institutional selling. Thus, that report's estimation of portfolio insurance is considerably higher than the Division's. It appears reasonable to assume that the actual number of portfolio insurance transactions lies between our conservative estimate and the CME's more inclusive estimate. ^{36/}

c. Analysis of Program-by-Program Data

The Division's analysis of this detailed information is similar to that used in previous studies with two minor modifications. First, because portfolio insurance related futures sales appear to have played a more significant role in the October market break than on September 11 and 12, 1986, on January 23, 1987, a more detailed analysis of this trading is included. The analysis focuses on trading in the most heavily used contract for this strategy during the market break, the December expiration Standard & Poor's 500 index futures ("SPZ") on the CME. Second, because the vast majority of programs, whether for index arbitrage, index substitution, portfolio insurance, or other strategies, involved concentrated buying or selling of NYSE-listed stocks in the S&P 500 index, program activity is analyzed not only as percentages of total NYSE volume for selected time periods, but as percentages of NYSE volume in S&P stocks.

The Division's index-trading reconstruction focuses primarily on the two most active markets for this activity: the NYSE on the stock side and the CME for index futures. Trading in other index futures is discussed when it reaches significant levels.

^{35/} CME Committee of Inquiry, Preliminary Report to Examine the Events Surrounding October 19, 1987 (December 22, 1987).

^{36/} The Division encountered a similar difficulty in identifying arbitrage-related transactions. For example, some transactions which involved the near simultaneous selling of S&P stocks and buying of S&P 500 index futures were characterized as "adjustments to hedges." While this characterization is not necessarily inaccurate, this type of transaction is nonetheless functionally equivalent to index arbitrage. Accordingly, although these and similar transactions are separately identified in the Composite Chronologies of Index-Related Trading ("Composite Chronologies") in Appendix B, they are aggregated with other arbitrage strategies in the Division's breakdown of trading in Chapter Two and more detailed chronologies of trading contained in Appendix A.

Because relatively few programs used index options, 37/ discussion of this trading is limited.

Essentially, the Division's analysis attempts to identify periods in which significant concentrations of program trading coincided with either initiating or reversing intra-day market movements or accelerating on-going market movements. On the index futures side, this entails measuring the percentage of both total volume and institutional volume (in 30-minute intervals) represented by portfolio insurance related selling. For stock trading, the Division conducts a similar breakdown of total NYSE volume and NYSE volume in S&P stocks (in 30-minute intervals and 10-minute intervals) for index arbitrage, index substitution, portfolio insurance, and other program strategies. 38/

The Division's analysis seeks to address the following issues. First, what role did portfolio insurance related selling have in the continuing futures discounts experienced during the market break? Second, what was the level of index arbitrage and index

37/ The following chart provides a breakdown of program selling on the NYSE involving index futures versus index options on the key dates of the October market break:

<u>Date</u>	<u>Index Futures</u>		<u>Index Options</u>	
	<u>No. of Programs</u>	<u>Shares Sold</u>	<u>No. of Programs</u>	<u>Shares Sold</u>
October 6	72	16,069,087	1	156,200
October 14	100	26,627,038	3	765,667
October 15	63	15,427,921	3	333,900
October 16	98	34,982,075	19	4,182,025
October 19	118	37,481,624	1	29,100
October 20	23	3,322,951	0	0

38/ As indicated above, the program data provided to the Division indicates order entry times; obtaining order execution times for each of the hundreds of orders used in each program often requires manually reconstructing trading by reviewing individual tickets, and was impractical for this Study. Therefore, an average time period for order execution (five minutes -- the time period required for DOT orders) was used for the Division's analysis. For example, orders entered from 2:25 to 2:45 would be compared with volume figures for 2:30 to 2:50. Understanding the Division's use of this assumed lag time in order execution is important, not only to compare the breakdown of program trading contained in Chapter Two and the detailed chronologies (attached as Appendix A) with the individual programs presented in the Composite Chronologies (attached as Appendix B), but to account for slight variances from similar breakdowns of trading in other reports, such as the Report of the Presidential Task Force on Market Mechanisms (January 1988)("Task Force Report").

The Division's review indicated that portfolio insurance related selling in the index futures markets, unlike the program trading on the stock side, was usually evenly distributed within half-hour intervals. Therefore, breakdowns of futures trading in 10-minute intervals were not useful.

substitution stock selling resulting from these futures discounts, and what role did these strategies have in accelerating market declines? Third, how did portfolio insurance futures selling and arbitrage stock selling interact. Specifically, was this interaction along the lines of the "cascade scenario" discussed in the Division's September 1986 Report? ^{39/} Fourth, how much portfolio insurance selling was directed to the stock market instead of the index futures markets? And, fifth, how did this program trading interact with other types of firm proprietary, institutional, or retail trading -- including selling related to mutual fund redemptions and margin calls and liquidations?

2. Analysis of Overall Trading During the Market Break

a. Information from Broker-Dealers

The Division used the NYSE audit trail to identify the most active broker-dealers during the October market break. ^{40/} The Division requested these firms to provide a wide range of information on their activities during October 1987, covering areas such as firm operations (including securities clearing and settlement), financial responsibility (including margin debits, calls, and liquidations), order-routing mechanisms, internationalization issues, and customer complaints. ^{41/} The Division also requested the following breakdown of trading in both stocks and index options and futures: (1) daily aggregate stock and index futures purchases and sales on each trade date in October 1987 for firm proprietary, institutional, and retail accounts; (2) within proprietary trading, a separate breakdown of trading for the accounts designated as index arbitrage, "risk" arbitrage, ^{42/} equity trading (including market making and block positioning), and "other" (all remaining proprietary accounts, such as options trading); and (3) a similar breakdown of purchases and sales in hour intervals on October 16, 19, and 20. Because most firm's clearing systems do not capture order entry or execution times, this last request necessarily involved manually reviewing order tickets. Given the magnitude of trading on these key dates and the time constraints of the Study, the Division subsequently modified its request to include hour-by-hour breakdowns of 15 NYSE stocks which were (i) leading capitalization stocks in the S&P 500 index, (ii) representative tertiary stocks, or (iii) "takeover" stocks. ^{43/} Finally, the Division

^{39/} See September 1986 Report, *supra* note 26, at 21-24.

^{40/} The Division originally identified the 30 most active broker-dealers, but this number was adjusted to delete most NYSE specialists (trading by specialists was separately reviewed by the Division for the Study) and to identify separately firms that traded through the same clearing firm. The final number of firms included in the Division's survey was 28.

^{41/} See sample letter dated November 12, 1987 from Richard G. Ketchum, Director, Division of Market Regulation, contained in Appendix E.

^{42/} "Risk" arbitrage involves buying securities of issuers in which there are announced (or, in some cases, rumored) takeover transactions in order to sell these securities after the price appreciation in these securities from these transactions is realized.

^{43/} These stocks were International Business Machines (IBM), Merck & Co. (MRK), General Motors (GM), American Telephone and Telegraph (T), Exxon Corp. (XON), General Electric (GE), E.I. Du Pont (DD), Sears, Roebuck & Co. (S), Coca Cola (K),

supplemented this information through interviews with a wide range of market professionals actively involved in the various firms' trading activities.

b. Information from Mutual Funds

The Investment Company Institute ("ICI") ^{44/} conducted its own survey of its members' experience with redemptions and overall trading activity during the market break. The ICI not only shared the findings from this survey with the Commission, but sent ICI members a supplemental questionnaire produced by the Division staff. This questionnaire requested trading information similar to that we had requested of broker-dealers, including daily aggregate purchases and sales for October 1987 of NYSE-listed stocks and index futures and options, and hour-by-hour breakdowns for October 16, 19, and 20. In order to supplement these data, the Commission's Division of Investment Management and staff from the Commission's regional offices collected information and conducted a number of examinations to evaluate mutual fund performance in October 1987. This information was incorporated into the Division's trading analysis and in the analysis of the international aspects of the October market break in Chapter Eleven.

c. Major Money Managers

The Division also used the records of institutional holdings in securities, filed with the Commission pursuant to Section 13(f) of the Exchange Act, to identify the leading institutional money managers. These managers, as well as other managers identified as active in the index futures markets, were sent questionnaires requesting a broad range of information, including a breakdown of sizeable liquidations of their funds' stock portfolios or positions in index options or futures during the October market break. ^{45/}

d. Self-Regulatory Organizations

Finally, the Division supplemented its data collection from individual market participants with comprehensive information requests directed to the SROs that oversee the various securities markets. These SRO letters covered a wide range of market issues, including: (1) market-making capacity; (2) financial integrity of member firms and their customer accounts; (3) order-entry and reporting systems; (4) clearing, settlement and other operational problems; and (5) complaints or inquiries from investors, issuers,

Phillip Morris (MO), Digital Equipment (DEC), Bell & Howell (BHW), Dayton Hudson (DH), Harley Davidson (HDI), and Ryland Group (RYL). See sample letter from Richard Ketchum, dated November 30, 1987, contained in Appendix E.

^{44/} The Investment Company Institute is the trade association for the mutual fund and investment adviser industry.

^{45/} Other information requested included: (1) statistics (annual from 1983, monthly for 1987) on the funds' relative level of investment in equities, debt instruments, cash or cash equivalents, and index products; (2) the funds' use, if any, of portfolio insurance strategies; and (3) a general description of shifts in investment strategies (and use of portfolio insurance) as a result of the market break. See letter from Richard G. Ketchum, Director, Division of Market Regulation, dated November 17, 1987 (a sample is contained in Appendix E).

and member firms. 46/ The Division's review of these issues is set forth in Chapters Four to Twelve of the Study.

46/ Copies of these letters are contained in Appendix E.

Chapter Two

CHRONOLOGY OF TRADING DURING THE OCTOBER MARKET BREAK

A. Introduction

During October 1987, the nation's securities markets experienced an extraordinary surge of volume and price volatility. The most widely followed indicator of the U.S. stock market's movements, the Dow Jones Industrial Average index of 30 NYSE stocks the ("DJIA"), had reached an intra-day high of 2746.65 on August 25, 1987. On October 2, the DJIA closed at 2640.99. During the week of October 5, the index declined by 158.78 points; during the week of October 12, by 235.48 points. On October 19, the DJIA declined 508.32 points, and by its low point mid-day on October 20 it had declined to 1708.70, or over 1,000 points (37%) below its August 25 high. Even with its erratic but substantial recovery over the next few trading sessions, by October 30, the DJIA stood at 1,994, down over 26% from its August high. Broader indexes also declined for the month of October. For example, the Standard & Poor's ("S&P") index of 500 stocks declined 21.8%, the composite indexes for the nation's three principal securities markets, the New York Stock Exchange ("NYSE"), American Stock Exchange ("Amex"), and the National Association of Securities Dealers Automated Quotation ("NASDAQ") system for over-the-counter ("OTC") stock trading, experienced declines in October of 21.9%, 27%, and 27.2%, respectively.

The nation's index futures markets also experienced large declines. Prices for the most actively traded index futures -- the S&P 500 futures contract ("SPZ") ^{1/} on the Chicago Mercantile Exchange ("CME") -- experienced more extreme fluctuations than prices for the underlying stocks (termed the index's "cash" price). During the weeks of October 19 and 26, the SPZ futures experienced an unprecedented period during which it traded significantly below the index's stock prices. The SPZ traded at levels as low as 181.00, down 44.4% for the month and equivalent to the DJIA reaching 1443.53. ^{2/} Although the theoretical value for index futures normally is at a slight premium to the cash price, ^{3/} from October 19 to October 28, the price relationship between the futures and stocks was inverted, with the futures consistently trading (with a few brief

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- ^{1/} The symbol "SPZ" actually refers to the S&P futures contract with a December expiration. Because relevant CME index trading during the October market break was limited almost exclusively to the December futures contract, all references are to this contract unless a different contract is specifically noted.
- ^{2/} The DJIA closed at 2596.28 on September 30, 1987. Therefore, a 44.4% drop in the DJIA for the month of October 1987 would have the DJIA reach 1443.53.
- ^{3/} See Chapter One.

exceptions) at large discounts to the stocks. 4/ Although the discount eventually disappeared, by the end of October the price of an SPZ contract had fallen to 259.35, roughly in line with the cash market price, and down 24% from its August 25 high point. 5/

The October market break also highlighted the growing interconnections among securities markets internationally. Ripple effects of the market volatility were seen in strong, well capitalized international markets such as London 6/ and Tokyo, 7/ as well as in fast growing, more speculative markets such as the Hong Kong Exchange, which closed for the week of October 19. Review of international trading by the SEC's Office of the Chief Economist, discussed in Chapter Eleven below, shows that stock price changes in various markets were significantly correlated and that the U.S. appeared to lead other markets during this period.

The extraordinary increase in trading volume in the U.S. markets during the market break contributed to the level of concern by market professionals and individual investors. Projections that trading volume on the NYSE would increase steadily from daily averages of less than 200 million shares to daily averages of more than 300 million shares were shattered by consecutive 600 million share trading sessions on the 19th and 20th of October. The Amex and NASDAQ markets were similarly tested by record trading with average daily volume for the week of October 19 of 31.7 and 244.4 million shares, respectively, compared to average daily volume in September of 12.4 and 148.3 million shares, respectively. Similarly, the CME's market in the S&P 500 futures saw trading volume surge from 82,000 contracts on October 13 to 162,000 on October 19.

As discussed in Chapters Four and Seven through Nine of the Study, the record-breaking sell off during the October market break simply overwhelmed market-making capacity on both the securities and futures markets. Weaknesses were highlighted in

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- 4/ Under normal market conditions, any significant deviation from theoretical value for more than a few minutes results in arbitrage programs that act to reduce the premium or discount. While the voluntary restrictions placed by the NYSE on proprietary arbitrage and use of DOT for customer arbitrage eliminated much of this arbitrage activity during this period, this fact, in itself, does not fully explain why futures continued to trade significantly below the prices for the component stocks.
 - 5/ The November contract for the Major Market Index ("MMI") futures, traded on the Chicago Board of Trade ("CBT"), declined 20.5% in October, while the December contracts for the New York Composite Index futures, traded on the New York Futures Exchange ("NYFE"), and the Value Line Index futures, traded on the Kansas City Board of Trade ("KCBT"), declined 20.9% and 27.3%, respectively. In addition, the most active index option for retail investors, the Chicago Board Options Exchange ("CBOE") option on the S&P 100 Stock Index ("OEX"), declined along similar lines.
 - 6/ The London Financial Times-Stock Exchange ("FT-SE") 100 share index fell 500 points (almost 22%) on October 19 and 20, closing the month at 1749.8, down 26.04%.
 - 7/ The Tokyo Nikkei index declined 4456.7 points (16.9%) on October 19 and 20, closing on October 30 at 23,328.91, down 10.31%.
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each of the market-making systems: exchange specialists, exchange market makers, the NASDAQ competitive market-maker system, and the futures markets' open outcry system. 8/

After October 19 and 20, the securities and futures markets did not return to a status even approaching "normalcy" until the end of the month. The final eight trading sessions in October included six sessions in which the DJIA moved (as measured by closing prices) more than 50 points, including the largest one-day rise in the index (186.84 points or 10.1% on October 21), and the second-largest point and sixth-largest percentage decline (156.83 points or 8% on October 26). 9/ In addition, although six of these sessions were shortened to close at 2:00 p.m. (Eastern Time), 10/ daily NYSE volume for the remainder of October exceeded 240 million shares (including a 449 million share day on October 21 and a 392 million share day on October 22). Finally, it was not until October 29 that the aberrational discount to cash in the SPZ futures abated.

The increased market volatility from the October market break receded only gradually by year-end. The implied volatility of the options on March expiration S&P 500 futures ("SPH"), which had skyrocketed from around 20 points prior to the break to over 65 points, was still around 30 to 35 points by December 31, 1987. 11/ By some estimates, the 1987 volatility for S&P stocks is roughly equivalent to 35% of the stock

- 8/ Similarly, while the operational and clearing capacity of the markets met the challenge of this extraordinary trading volume surprisingly well, very real problems were evidenced, particularly for order executions for small investors. Additionally, while the financial integrity protections built into the securities and futures markets over the past decades minimized firm insolvencies and diversions of customer funds, the market break caused strains in this safety net. These areas are discussed in detail in Chapters Five and Ten of the Study.
- 9/ On October 26, the S&P 500 index also fell 20.55 (8.28%). Total NYSE volume was 308.8 million shares, with 1,791 issues declining, 134 gaining, and 104 unchanged. The Amex and NASDAQ composite indexes declined 9.3% and 9.0%, respectively.
- 10/ After the 4:00 close on October 22, the NYSE announced that the exchange's trading hours would be temporarily reduced, with the close moved to 2:00, to permit members to process the enormous trading volume during the market break. All major securities and index futures similarly reduced trading hours. Starting on November 2, trading hours were gradually extended and returned to normal on November 12.
- 11/ There are several methods used to estimate the price volatility of an individual security or group of securities. Unlike the more familiar method which estimates volatility from empirical data, "implied volatility" is a measure of the volatility of the security or security index that is implicit in the actual prices which exist in the market for options in these securities. This method assumes that the actual trade price is representative of the fair price for the option, an assumption more likely to be true for actively traded option series. See L. McMillan, Options as a Strategic Investment, New York Institute of Finance (2nd ed. 1986) at 411.

prices--more than twice the annual level of volatility for 1983 through 1986. ^{12/}

B. Chronology of Trading During the October Market Break

The securities and futures markets experienced massive price declines, record trading volume, and near exhaustion of market-making capacity during the October market break. These events require analyses not only of trading on October 19 and 20, but also of the markets' reaction to fundamental economic news and broad-based market declines during the weeks that preceded October 19. The Division has prepared detailed chronologies of trading on October 6 and from October 14 to October 20 ("Chronologies"), attached as Appendix A to the Study, as a framework for analyzing the factors influencing the October Market Break. This chapter summarizes those Chronologies. ^{13/}

In this chapter, as supplemented by the Chronologies, we present an overview of each day's trading, emphasizing price and volume movements on the primary securities and futures markets. ^{14/} Within this framework, we give a detailed breakdown for October 6 and 14-20, of the information compiled by the Division and the CFTC regarding index-related trading strategies, including index arbitrage, index substitution, and portfolio insurance. Finally, these market movements and index-related trading are placed in the context of other trading including firm proprietary, institutional, and retail trading.

1. October 6

On Tuesday, October 6, the DJIA experienced what was then its largest one day decline, seemingly on little or no fundamental economic news. The DJIA closed at 2,548.63, down 91.55 points (3.47%) on volume of 175 million shares. Although this price decline was relatively broad based, with overall NYSE declining issues leading advancing issues by nearly 4 to 1, the sharp drop in the DJIA resulted largely from price declines in 6 of the 30 index stocks. ^{15/} The overall decline of 1,332 NYSE stocks was

^{12/} One firm has estimated that the representative bid-ask spread on the average S&P 500 stock, which had been 0.45% of market value on September 1, 1987, was still at approximately 0.77% on November 3 as a result of greater market risk from price volatility. Kidder, Peabody & Co., The Impact of October 19 on Transaction Costs in the Equity and Stock Index Futures Markets. A Preliminary Update (November 1987). See also Chapter Three.

^{13/} For additional discussion of market developments in the options, over-the-counter, and international markets, see Chapters Eight, Nine and Eleven, respectively.

^{14/} The Division has focused its reconstruction on trading related to the futures markets because of the substantially smaller amount of index options-related stock trading. For example, our reconstruction of trading on October 6 identified only one arbitrage program out of a total of 72 which used index options instead of index futures.

^{15/} These stocks were International Business Machines (IBM) (close at 151, down 5 1/2), Merck (MRK)(201, down 7), Phillip Morris (MO)(113 1/2, down 4), Eastman Kodak (EK)(101 3/8, down 1 7/8), Procter & Gamble (PG)(99 1/2, down 4), and Du

attributed to investor sensitivity to bearish reports by two influential investment advisors, 16/ arbitrage sell programs, 17/ and general concerns over interest rates. 18/

a. Summary of Market Movements

Shortly after the opening on October 6, the DJIA dropped from the October 5 close of 2640.18 to below 2,620. It quickly recovered about 10 points to 2,627.1 at 10:18, and then declined about 46 points until the last half hour of trading. At approximately 3:30, the DJIA decline accelerated, and it fell over 30 more points to close at 2,548.63. The DJIA's descent was paralleled by an 11 point closing decline (3.3%) in the SPZ futures on the CME. Bond prices climbed abruptly in the last hour of trading. This price rise appears to have been caused, in part, by market professionals reinvesting cash received from stock sales into the Government bond market. 19/

b. Breakdown of Trading

While the DJIA declined throughout most of the day, the sharpest movements were at the opening and close. Over 66% of the decline and most of the arbitrage selling occurred at these times.

i. Portfolio Insurance

Although the SPZ future was trading below theoretical value, portfolio insurance-related trading does not appear to have been a significant contributing factor to that discount. Reported portfolio insurance sales of SPZ futures on October 6 were light, with only 181 contracts sold.

Pont (DD) (118 1/2, down 4 1/4).

16/ Newswires carried reports from interviews with Robert Prechter, the Elliot Wave theorist, and Peter Eliades, editor of the Stock Market Cycles News letter. See Smith & Garcia, Stocks Plunge, Partly in Reaction to Sell Signals from Forecasters, Wall St. J., Oct. 7, 1987, at 3.

17/ Garcia, Stocks Plunge; Interest Rate Fears, Computerized Sell Programs Cited, Wall St. J., Oct. 7, 1987, at 65.

18/ Wiggins, Dow Drops a Record 91.55 Points on Interest Rate and Dollar Fears, N.Y. Times, Oct. 7, 1987, at A1.

19/ Quint, Bonds Rise Abruptly in Final Hour, N. Y. Times, Oct. 7, 1987, at D1.

ii. Other Index-Related Trading

Almost all of the index arbitrage sales of stock, totaling 16.2 million shares, 20/ were executed as part of SPZ programs. 21/ Throughout most of the day, the SPZ contract traded at premiums below theoretical or fair value, 22/ at a level sufficient to enable arbitrageurs to close pre-existing arbitrage positions at favorable prices but not sufficient to enable arbitrageurs to execute sell programs to establish new positions. Almost all of the index arbitrage reported in the SPZ contract was for the purpose of closing previously established buy programs (*i.e.*, short futures - long stock positions).

Although arbitrage and non-arbitrage program sales accounted, during the trading day, for only approximately 12% of volume in all NYSE stocks and 16% of volume in the S&P 500 stocks, stock sales associated with these strategies appear to have been significant contributing factors to the declines in stock prices at the opening and at the close. As described in further detail in the Appendices, stock sales associated with these strategies comprised around 37% of total volume in S&P stocks at the close.

2. October 14-16

During the three day period from October 14 through 16, the DJIA declined 235.48 points, including a 108 point decline on October 16. The Division's review supports the view that the downturn in the markets from October 14 to October 16 was the result of a variety of factors relating to economic news and fears of an impending market correction. The economic news included continuing problems in the nation's trade deficit and its implications for the federal budget deficit, declines in the value of the U.S. dollar, and increases in interest rates. 23/ In addition, there was concern among some market participants that proposals that would substantially increase the tax burden on many acquisitions would reduce prices not only for current "deal" or "takeover" stocks but for the market as a whole. 24/ These economic developments may have led some securities and futures market participants to anticipate that there would be, during the next few weeks, at a minimum, sharp (if short-term) market "corrections" along the lines of October 6. The series of dramatic, broad-based market declines that developed during the week of October 12 apparently culminated in a widespread shift in investor sentiment.

20/ Of the 16.2 million shares of index arbitrage selling, 2.4 million shares (15%) were part of customer programs. Of the total arbitrage selling, only 800,000 shares (4.9%) were sold short. See Tables D-4 and D-5, providing breakdowns of short versus long arbitrage and customer versus proprietary arbitrage for October 6 and October 14-20.

21/ Conversely, most of the index arbitrage buy programs were executed with MMI futures.

22/ See Chapter One for a discussion of the theoretical value of a stock index futures contract.

23/ A more detailed analysis of these developments is provided in Chapter Three of the Study.

24/ See *id.*

a. Summary of Market Movements

The massive price declines experienced on October 14-16 affected all of the nation's primary securities and futures markets.

On the NYSE, the DJIA declined steadily on each trading session, with only minor pauses and weak rallies followed by sharp drops at each session's close. On a daily basis, the DJIA lost approximately 95 points (3.81% of its value) on October 14, 57 points (2.39%) on October 15, and a further 108 points (4.60%) on October 16 (the DJIA's first close-to-close decline of more than 100 points). The 235.48 point decline in the DJIA represented a 9.49% decline for the week, and a 17.5% decline from its August 25, 1987 high of 2,722.42. These declines were mirrored in the S&P 500 index, which dropped 9.29 points (2.95%), 7.15 points (2.34%), and 15.38 points (5.16%) on October 14th, 15th, and 16th, respectively, for a total 10.45% decline for the week.

Price declines occurred on each of the nation's primary securities markets. The NYSE composite index declined 2.7%, 2.22%, and 4.97% on these three days, on increasing trading volume of 210, 266, and 344 million shares on October 14th, 15th, and 16th, respectively. The 344 million shares volume was the highest at the time in the NYSE's history. Similarly, the Amex composite index declined by 1.13% on the 14th, 1.44% on the 15th, and 3.66% on the 16th, and the NASDAQ composite index for OTC stocks retreated 1.49%, 1.35%, and 3.83% on these days. ^{25/}

The leading index futures and options markets experienced comparable declines on each of these days. The CME's market in the SPZ futures declined 10.65 points (3.37%), 6.75 points (2.21%), and 16.00 points (5.36%) on the 14th, 15th, and 16th, respectively, a total of 10.94% for the week. The daily graphs in Appendix D illustrate that prices in the SPZ futures anticipated practically every large movement in the DJIA on these days, with futures selling pressure surging near the end of each day, creating discounts to cash that in turn triggered index arbitrage.

b. Breakdown of Trading

The attached Chronologies present a detailed, program-by-program breakdown of index-related trading on the futures and securities markets on the 14th through the 16th, as well as other types of firm proprietary, institutional, and retail activity. Although the level of such trading, particularly index-related trading, varied at different times on each trading session, the following overview of trading is useful to understand its cumulative effects on this week's markets.

^{25/} The price declines experienced in the U.S. securities markets during the week of the 12th were reflected to a much lesser extent in foreign markets. For example, the London FT-SE 100 index declined only 1.16% on October 14 and 0.90% on October 15 (severe weather effectively closed the London market on the 16th). The Tokyo Nikkei index actually rose 0.93% on the 14th, and declined only 0.82% on the 15th and 0.23% on the 16th, although Tokyo, in effect, trades a day ahead (by the calendar) of the NYSE.

While the sell-off was broad based, institutional selling appears to have been the most substantial component. 26/ Specifically, the Division's review of the broker-dealer data for daily aggregate purchases and sales on October 14th, 15th, and 16th indicates the following overall breakdown of selling on the NYSE:

	<u>Institutional</u>	<u>Proprietary</u>	<u>Retail</u>
October 14	47%	27%	26%
October 15	36%	40%	24%
October 16	39%	35%	26%

i. Index Arbitrage

On each day, significant price declines were first evidenced in the index futures markets -- most notably in the CME's market in the SPZ futures -- and, as is usually the case, were reflected with a short time lag in the underlying equity securities. 27/ This "lag time" provided numerous brief arbitrage opportunities throughout the trading sessions. The index trading information compiled by the Division and the CFTC indicates that a significant amount of arbitrage stock selling occurred on the NYSE in

26/ The Securities Industry Association ("SIA") has estimated that institutional accounts consistently constitute the most substantial component of selling on the NYSE, both prior to and during the October market break:

	<u>Institutional</u>	<u>Proprietary</u>	<u>Retail</u>
October 1987	41%	27%	32%
September 1987	40%	28%	32%
January-October 1987	41%	27%	32%
March-December 1986	42%	28%	30%

Similarly, the SIA has estimated that institutional accounts are leading purchasers on the NYSE:

	<u>Institutional</u>	<u>Proprietary</u>	<u>Retail</u>
October 1987	39%	27%	34%
September 1987	40%	28%	32%
January-October 1987	42%	26.5%	31.5%
March-December 1986	43%	28%	29%

See SIA, Investor Activity Report: October Analysis: "The 1987 Crash", (December 2, 1987).

27/ Although the SPZ commences trading simultaneously with the NYSE opening, at 9:30 a.m. (Eastern Time), its trading begins immediately, while it takes time to open trading in the index stocks on the NYSE, even on non-volatile days. Similarly, because the futures trade as a single contract, while the index consists of price changes in hundreds of individual stocks, intra-day price declines and rises usually develop first in the futures.

relatively concentrated intervals during almost every period of stock price decline over these three days.

For example, on October 14, the DJIA experienced four periods of sharp price declines: (1) opening to 10:00 (DJIA drops 44 points); (2) 12:30 to 1:30 (drop of approximately 24 points); (3) 2:30 to 2:50 (down 10 points); and (4) 3:50 to close (drop of 17 points). While total arbitrage-related selling on the 14th constituted only approximately 27.4 million shares (or 13% of total NYSE volume), 28/ this selling was generally concentrated in these periods of price declines. During the 2:30 to 2:50 decline alone, 3.6 million shares were sold in arbitrage programs, comprising 25% of total NYSE volume in this period and 33% of NYSE volume in S&P 500 stocks. 29/

The concentrated effect of index arbitrage was even more pronounced on October 15. Total arbitrage selling for that day was only 15.4 million shares or 5.7% of NYSE volume. 30/ Yet almost 25% of this arbitrage selling hit the market during the period of the DJIA's sharpest decline -- the 3:30 to 3:50 drop of over 30 points. The 2.9 million shares of arbitrage-related selling during this period constituted 18% of NYSE volume and 24% of S&P volume.

Finally, although arbitrage selling occurred on the NYSE periodically throughout the October 16 trading session, increasing to 37.2 million shares or 11% of daily NYSE volume, 31/ its effects were most pronounced at the end of the session when the SPZ future developed over a 4 point discount to cash. From 3:30 to 3:50, when the DJIA lost over 50 points (breaking the 100 point close-to-close record), arbitrage-related stock selling comprised 30% of NYSE volume and 38% of S&P volume.

ii. Other Futures-Related Trading

The analysis by the CME staff of SPZ futures trading on the 14th to the 16th indicates that, overall, trading by "floor" or "local" traders consisted of normal levels of buying and selling which tended to even out, maintaining more or less "flat" positions

28/ Of this 27.4 million shares, 13.4 million shares (49%) were sold for customer programs, and 5.9 million shares (21.6%) were sold short. See Tables D-4 and D-5.

29/ The program data provided to the Division indicates order entry times; obtaining order execution times for each of the hundreds of orders used in each program often requires manually reconstructing trading by reviewing individual tickets, and was impractical for the Study. Therefore, an average time period for order execution (five minutes -- the time period required for DOT orders) was used for the Division's analysis. In the above instance, orders entered from 2:25 to 2:45 were compared with volume figures for 2:30 to 2:50. Similar analyses are used throughout this Chapter and the Chronologies.

30/ Of this 15.8 million shares, 3.9 million shares (24.7%) were for customer programs and 4.1 million shares (26%) were sold short. See Tables D-4 and D-5.

31/ Of this 37.2 million shares, 18.5 million shares (49.6%) were part of customer programs (including 6.2 million shares sold for index substitution) and 5.4 million shares (14.6%) were sold short. See Tables D-4 and D-5.

by the end of the day. Nor did the CME staff find any unusual level of "speculative" futures trading during this period. Instead, the CME staff indicates most activity in the SPZ futures during these trading sessions appeared to be related to hedging strategies by institutional accounts. ^{32/}

The CME's finding of largely institutional trading in the futures markets during this period is consistent with the index-related trading information obtained by the Division and the CFTC. This information indicates that the level of SPZ futures selling directly attributable to portfolio insurance strategies of institutional accounts was significant, particularly on October 16th. Specifically, the Division was able to identify sales on October 16 of approximately 9,000 SPZ futures, or 6.3% of total volume, (equivalent to approximately 31.7 million shares). ^{33/}

In addition, the Division has identified a small but significant amount of program stock selling directly in the stock market by the afternoon of October 16 that can be directly attributed to portfolio insurance strategies. Although this selling constitutes only roughly 4.6 million shares on the 16th, its significance is that any portfolio insurance related stock selling indicate real or supposed difficulties in selling a sufficient amount of futures economically. Portfolio insurance strategies, under normal circumstances, use sales of index futures to reduce equity exposure in order to take advantage of the lower transaction costs in the futures markets. The fact that the alternative of more expensive stock sales was used late on October 16 suggests lack of liquidity in the futures market and was a precursor of stock selling by portfolio insurers on a massive scale on the 19th. Despite these stock sales, portfolio insurers ended the day with a significant "overhang" of sales of futures or stocks that were called for by the insurance parameters but could not be executed on the 16th. This overhang, and investor knowledge of it, may have contributed to the rapid decline on the afternoon of the 16th and undoubtedly added to selling pressure on the 19th.

Further, the Division also has identified a substantial amount of stock selling, particularly near the close on the 16th, that is attributable to the futures and options expirations on that day. ^{34/} For example, one firm's customers sold approximately one million shares on the October 16 market close to replace expiring S&P 500 index options traded on the CBOE. Non-program stock selling related to expiring options or futures positions of institutional and retail accounts also may have been significant, but the aggregate selling information available to the Division regarding trading outside of "programs" is not specific enough to allow the Division to reach firm conclusions.

Finally, the Division's review indicates that a significant amount of index-related trading on October 14 to 16 was effected off the NYSE, primarily in the London market, as exchanges-for-physicals ("EFPs"). EFPs have been common for years in the futures markets for agricultural and precious metals commodities, and in recent years have been

^{32/} See CME, Preliminary Report, at 10-13, 37.

^{33/} The SPZ closed at 282.25 on October 16, making the value of one contract \$141,125, and 9,000 contracts \$1.27 billion. If an average share price of \$40 is assumed, this would be the equivalent of 31.7 million shares.

^{34/} See Chapter One discussion of monthly and quarterly expiration cycles for derivative products.

increasingly used in financial futures. As used in this Study, EFPs involve simultaneous transactions in a basket of index stocks (a "cash" commodity) and index futures in a noncompetitive transfer of ownership between the parties; one party buys the stocks and simultaneously sells (or gives up a long) futures contract while the other party sells the stocks and simultaneously buys (or receives a long) futures contract. Investors seek at least two benefits from these EFPs. First, subject to floor official approval, noncompetitive futures sales can be effected, prior to the market opening, off the CME floor without violating the exchange's rules or the Commodity Exchange Act ("CEA"). ^{35/} Second, short sales of millions of shares of stock can be effected in London (either before or after the NYSE session) arguably without violating Exchange Act Rule 10a-1 relating to short sales. ^{36/} On October 15, 6.5 million shares were sold short in London EFPs, and 5.9 million shares were sold short on the 16th. ^{37/}

iii. Risk Arbitrage Trading

Both press accounts ^{38/} and the Brady Report ^{39/} have cited selling by risk arbitrageurs ^{40/} as a significant factor in the week of October 12. The Brady Report ^{41/} and the study by the Commission's Office of Chief Economist ("OCE")^{42/} have confirmed that prices in "takeover" or "deal" stocks did suffer significant price declines prior to the market break, perhaps in reaction to news of possible Congressional taxation proposals for certain takeover transactions. ^{43/} While this negative impact on widely followed takeover securities may have had an adverse effect

^{35/} While Section 4c(a) of the CEA prohibits wash sales, cross trades, and fictitious trades, and CFTC Regulation 1.38 requires that transactions "be executed openly and competitively" in a trading pit on an exchange during regular hours, Section 4c(a) of the CEA provides for exchange rules permitting EFPs. CFTC regulation 1.38(b) requires specific recordkeeping for EFPs, and regulation 16.00 requires that EFP volume be reported.

^{36/} See discussion of trading on October 19, *infra*.

^{37/} An additional one million shares were sold long and 1.6 million shares sold short on October 14.

^{38/} See, e.g., Smith, Swartz & Anders, Black Monday: What Really Ignited the Market's Collapse After Its Long Climb, *Wall St. J.*, Dec. 16, 1987, at 1.

^{39/} Report of the Presidential Task Force on Market Mechanisms (January 1988) ("Brady Report"), at III-2.

^{40/} Risk arbitrageurs purchase securities of issuers in which there are reported (or in some cases, rumored) takeover-related transactions pending. The arbitrageurs seek to capture the price appreciation from the time of the reports or rumors to the time of major developments in these transactions.

^{41/} Brady Report, at III-2, Figures 5 and 6.

^{42/} See Chapter Three.

^{43/} See the discussion of this and other news during the market break in Chapter Three.

on the psychology of market participants, the volume of selling by risk arbitrageurs^{44/} does not appear to have been sufficient to depress market prices other than those of specific takeover securities. Nor did selling by these entities appear significantly different in the weeks of October 5 and October 12:

<u>Date</u>	<u>Millions of NYSE Shares Sold</u>	<u>Date</u>	<u>Millions of NYSE Shares Sold</u>
Oct. 5	1.7	Oct. 12	1.9
Oct. 6	2.6	Oct. 13	2.5
Oct. 7	1.1	Oct. 14	0.8
Oct. 8	1.8	Oct. 15	2.9
Oct. 9	4.3	Oct. 16	4.0

While this data does not include liquidations for other arbitrageurs not included in the sample, it does not suggest extraordinary risk arbitrage sales on October 14-16.

3. October 19

On Monday, October 19, the nation's securities and index futures markets suffered their worst decline in history. The negative investor sentiment created over the previous week was reflected in a broad-based selloff throughout the day, and developed into near panic selling by the end of the trading session. As the data detailed below demonstrates, institutional accounts provided the most consistent source of selling pressure throughout the day on the 19th.

On the NYSE, massive sell orders inundated specialists and shattered records set just the week before. The daily volume of 608 million shares almost doubled the October 16 record, and the 16th's record 108 point drop in the DJIA was exceeded in the first hour of trading. For the day on the 19th, the DJIA sustained a 22.6% loss, falling 508.32 points to close at 1,738.40. The NYSE composite index declined by 19.2%. The selloff was so widespread that declining issues led advancing issues by an unprecedented 40-to-1 margin.

This heavy sell pressure was not confined to the NYSE. On the Amex, volume surged to 35.4 million shares, and the exchange's composite index plunged to 282.5, a drop of 41 points or 12.7%. Similarly, the NASDAQ composite index dropped 46 points to close at 360.2, a loss of 11.35%, on volume of 222.9 million shares.

In the derivative markets, the selloff was even greater. The SPZ futures plunged 80.75 points to close at 201.50. This 28.6% decline outpaced even the 22.6% drop in the DJIA. The MMI futures declined 24.38% and the most popular index option for retail investors, the CBOE's S&P 100 index ("OEX") contract, experienced a loss of 21% of the value of the underlying index. ^{45/}

^{44/} These figures are derived from data obtained by the Division from 13 major broker-dealers with risk arbitrage operations.

^{45/} Because the October contracts in the MMI futures (and options) expired on October 16, the decline discussed above refers to the November contracts.

a. Summary of Market Movements

The markets' turmoil was evidenced first in heavy selling on foreign markets prior to the opening of trading in the U.S. On the Tokyo Exchange, the Nikkei index closed down 2.35%, and selling gained momentum during the trading session in the London market, with the FT-SE 100 index 46/ closing down 10.84%.

This heavy sell pressure was evidenced first in the U.S. in the index futures markets. On the CME, the SPZ futures opened at 261.50, down 20.75 points from Friday's close. In the stock markets, large sell order imbalances at the NYSE overwhelmed specialists, delaying openings for a number of bellwether stocks, and making calculations of most major stock indexes virtually impossible. By 10:00, 95 S&P stocks, representing 30% of the index value, were still not open. By 10:30, 11 of the 30 stocks in the DJIA were still closed. While some calculations using prices for stocks already opened showed a 94 point drop in the DJIA to 2153.55 by around 10:30, the actual decline was probably closer to 200 points. 47/ The markets stabilized somewhat by 11:00, and the SPZ discount receded to a slight premium to cash while the DJIA recovered over 60 points by noon to 2103.79. However, the SPZ discount reappeared and prices on the NYSE deteriorated somewhat between 12:00 and 1:00, and again between 1:30 and 2:15. Finally, a 51 point rally around 2:15 to 2:45 was followed by the SPZ discount spiking to approximately 19 points 48/ after 2:50 while a precipitous 252 point plunge in the DJIA resulted in its closing at 1738.40.

Until about 11:00 to 11:30 a.m. on the 19th, the difficulty in obtaining firm stock prices and the resulting unreliability of index valuations made trading in the derivative markets chaotic. Although the SPZ futures appeared to have opened at over a 20 point discount to cash, most market professionals indicate that they recognized that the actual discount was considerably less because of the number of NYSE stocks that had not opened. Nevertheless, as demonstrated by the daily graphs in Appendix D, the SPZ discount throughout the remainder of the 19th was of a different dimension from the week before; the October 19 discount was chronic and much larger than the discount during the preceding week. 49/

46/ The trading session on the International Stock Exchange ("ISE") in London overlaps that of the NYSE. On October 19, therefore, the price declines on the NYSE contributed to the negative investment sentiment on the ISE.

47/ See the discussion of discrepancies between the reported and actual values of the S&P 500 stock index on October 19, contained in infra note 49.

48/ Again, for perspective, prior to the market break any futures discounts to cash were aberrational, discounts of 1 or 2 points were extremely rare, and discounts greater than 5 points were considered extraordinary.

49/ It has been widely suggested that the apparent substantial discounts in the futures market on October 19 and 20 were more apparent than real once the number of delayed openings are taken into account. In an effort to evaluate this view, the Commission's Directorate of Economic and Policy Analysis ("DEPA") analyzed the "reported" S&P 500 value in half-hour increments during October 19 and 20 in comparison to two implied S&P 500 values, i.e., S&P 500A recomputed the S&P 500 value assuming that halted stocks declined in value equal to those

While the volatility of the markets on 19th made any comparison of futures and stock prices difficult, the trading strategies of market professionals on that day clearly were based on the assumption that there was a significant (if indeterminate) discount in the futures market. Significant numbers of index arbitrage programs were effected throughout the day. In addition, as discussed below, many users of portfolio insurance strategies shifted from futures transactions to liquidation of their stock portfolios directly.

b. Breakdown of Trading

It is not possible to reconstruct all selling that occurred on October 19. The data received by the staff indicate that the selling on the NYSE was broad based, with institutions accounting for approximately 50.7%, retail public for 33.3%, and proprietary trading for 16% of the total activity surveyed. 50/

A number of factors, however, can be identified that were significant on that day.

stocks that had opened and S&P 500B recomputed the S&P 500 value using the value at which the halted stocks actually did open. See Charts 2-1 and 2-2 at the end of this Chapter. The data, as set forth in these charts, demonstrate that between 9:30 and 11:30 on October 19 the "reported" S&P 500 value overstated the degree of the discount. For example, at 10:00 the "reported" S&P 500 value was 273.17, although the SPZ was trading at 261.50. If, however, the reported value is adjusted for the 95 stocks that were not yet opened (representing 38% of the S&P 500), the adjusted S&P 500 value was 259.88. By 11:30 the "reported" value (263.85) had achieved approximate parity with the SPZ (265.50) and the adjusted value (263.33) was roughly equal to the "reported" value, with only 1.8% of the S&P value (12 stocks) not yet open. Thus, from 11:30 on (when all the SPZ 500 stocks were open) the SPZ discounts were real and substantial. Indeed, by 1:30 the SPZ was trading at a 22 point discount to cash.

The persistence of these discounts is highlighted by activity on October 20. At 9:30, the SPZ opened at 225.00; by 11:30 it had declined 15.1% to 192, a 30 point discount to cash, even adjusted for the 38 S&P 500 stocks (11.4% in value) that had not opened.

We are not suggesting that, for purposes of arbitrage trading, the difference between the "reported" and actual S&P value was insignificant on October 19th. The differences, in conjunction with wide bid/ask spreads in the futures markets, impaired the ability of index arbitrageurs to effect arbitrage transactions.

50/ The Division was able to use the trading information submitted by 20 of the most active broker-dealers during the October market break to account for approximately 378.3 million shares of selling (62.2% of NYSE volume) on October 19. A substantial component not accounted for by these numbers is trading activity by specialists. The percentages of institutional, retail, and proprietary selling cited above and throughout the Chapter and the Chronologies are derived from this sampling of broker-dealer data (cross-checked against audit trail data).

i. Portfolio Insurance

First, portfolio insurance related futures selling was significant throughout the trading day, accounting for at least 16.7% of SPZ volume. Significantly, while selling pressure directly attributable to portfolio insurance strategies that we have been able to identify represented only 5.6% of SPZ volume from 9:30 to 10:00, it grew to 32% from 10:30 to 11:00, and 25% from 12:00 to 1:00. While futures selling emanating from portfolio insurance providers was not particularly concentrated, this persistent sell pressure appears to have acted as an "overhang" on the market throughout the day, making a sustained price recovery in the futures difficult. 51/

In addition, significant direct stock selling hit the NYSE periodically on the 19th in "programs" as part of portfolio insurance strategies. As discussed above, portfolio insurance strategies generally employ sales of futures contracts as the preferred vehicle to reduce equity exposure in a declining stock market because transactions in futures normally have lower transaction costs. Some strategies, however, provide for the alternative of reducing equity through stock sales, either in lieu of futures transactions or as a supplement, if this alternative appears more efficient. The chaotic conditions on the futures and securities markets near the close on October 16 and on October 19, including persistent discounts of futures to cash, evidently influenced some users of these strategies to implement this alternative. 52/ The Division identified one major pension fund that sold 27.3 million shares on October 19 to supplement its futures sales (the fund also sold a total of approximately 7,000 SPZ contracts, equivalent to approximately 17.6 million shares, with a dollar value of \$705 million, on the 16th and 19th). 53/ Stock selling by this institution was spread throughout the day (after 10:30) as thirteen 2 million share programs. In fact, had market conditions permitted, the fund's insurance strategy would have indicated sales of at least an additional 27 million shares, or their futures equivalent, in the final hours of the 19th. 54/ Overall, the Division's review found that at least 39 million shares of institutional selling hitting the NYSE floor as programs, in fact, were attributable to portfolio insurance strategies--

- 51/ The daily graphs in Appendix D show the relationship between portfolio insurance futures selling and total SPZ volume on the CME throughout the trading session.
- 52/ The money managers interviewed by the Division indicated that they recognized at the time that the apparent "discount" in the futures markets on the morning of the 19th was at least partially a function of the failure of many S&P stocks to have opened on the NYSE. Nevertheless, this situation influenced their decision to employ stock sales as a prudent supplement to futures transactions. The discounts on the afternoon of the 19th do not appear to reflect non-trading stocks to any significant degree, because most major stocks were trading frequently throughout this period.
- 53/ On October 19, the SPZ settlement was 201.50, making the value of one contract \$100,750 -- giving 7,000 contracts a value of \$705 million. If an average share price of \$40 is assumed, this would equal 17.6 million shares.
- 54/ Instead, this program was halted shortly after 2:00 on the 19th. Market conditions, however, permitted the sale of an additional 9.9 million shares of stock on the NYSE on October 20.

and that this form of selling was at least as significant (in terms of aggregate sell pressure) as selling programs from index arbitrage strategies. 55/

ii. Other Futures-Related Trading

The Division's findings concerning the significant level of portfolio insurance futures selling on the 19th are consistent with the CME's analysis of this activity. Overall, the CME found that most of the selling in the SPZ futures on October 19 was institutional in nature. While there was a considerable amount of activity by floor members and more speculative accounts, 56/ this activity encompassed both buying and selling and, as during the week of 12th, resulted in most of these accounts maintaining more or less flat positions.

iii. Index Arbitrage

The discounts between the price for the SPZ futures on the CME and the underlying S&P stocks on the NYSE also brought in significant sell arbitrage programs. Overall arbitrage programs accounted for selling of approximately 37.6 million shares (6.1% of total NYSE volume, and 8.8% of NYSE volume in S&P stocks) on October 19. Of this arbitrage-related selling, 9.4 million shares (25%) were sold short, 57/ and 19 million shares (50%) of the 37.6 million shares were sold for customer accounts, including 2.8 million shares sold as index substitution. 58/

While the aggregate amount of arbitrage-related selling was smaller on a percentage basis than during October 14-16, arbitrage programs may have played a significant role in the market decline. Because the discounts that appear during market downturns are calculated and acted upon almost simultaneously by a number of well-capitalized firms and some large institutional investors, arbitrage programs often hit the market as highly concentrated selling pressure which may further speed the drop in

55/ In combination with index arbitrage and other programs identified, the Division has been able to account for approximately 98.9% of the 79.7 million shares of sell volume on the 19th routed to the NYSE through DOT using the List Order Processing System ("LIST"). Of the total of 89 million shares of program selling on the 19th identified by the Division (including volume sent through DOT with proprietary systems other than LIST or sent by phone to the NYSE floor) 77.5 million shares (87%) were sold either as part of portfolio insurance strategies or index arbitrage. The remaining 13% of program selling consists of additional institutional activity.

56/ For example, on October 19 one large speculative account bought almost 5,000 SPZ futures, considering them underpriced. The CME's analysis shows that speculators were both buyers and sellers of futures on the 19th and 20th. See CME Preliminary Report, chart of change in positions of large traders, following p. 28.

57/ An additional 3.3 million shares were sold short for two customer accounts as a hedge for short index futures and options positions which were "frozen" pending liquidation.

58/ See Tables D-4 and D-5.

stock prices. Such concentrated selling occurred at several market downturns on October 19, accounting for 14% of S&P volume from 9:30 to 10:00 (when the reported DJIA had declined approximately 68.10 points, or 3%, from the 2246.70 opening), 59/ 27% from 10:00 to 10:30 (as the DJIA dropped another 26 points or 1.2%), and 45% around 1:20 to 1:30 (at the same time that a minor market rally evaporated).

The periodic sell pressure from portfolio insurance related programs and more concentrated arbitrage sell programs sometimes hit the NYSE simultaneously. In particular, total program selling constituted 63.4% of NYSE volume in S&P stocks from 1:10 to 1:20 and exceeded 60% for two intervals from 1:30 or 2:00. 60/ After 3:00, however, arbitrage programs became less significant as order execution problems on the NYSE mounted. 61/ Short-sale restrictions also limited index arbitrage on the afternoon of the 19th, because upticks were infrequent and unpredictable. Nevertheless, non-arbitrage sell programs, primarily for portfolio insurance strategies, continued to be entered, with total program selling constituting approximately 16% of S&P volume from 3:00 to the market close as volume surged and the DJIA plunged over 200 points.

During this last hour, the large discount of futures to cash may have affected stock prices even though direct transmission of the selling pressure in the futures market to the stock market through index arbitrage was limited in scope. Stock traders may have reacted to the discounts by selling stock in the belief that the futures markets were accurately signalling further stock declines. Potential buyers of stocks also may have reacted to the discounts either by purchasing cheaper futures instead or by withholding buy orders until stocks had retreated further.

Especially during the afternoon of the 19th, it was also common knowledge that portfolio insurers had substantial unexecuted sell orders that had been postponed temporarily due to market conditions. This "overhang" could be expected to diminish buying interest in both the stock markets and the futures markets.

iv. Mutual Fund Redemptions

The Investment Company Institute ("ICI") conducted a survey of its members' shareholder redemption experience and trading activity during the market break. While the data indicated that redemptions increased on October 16 and 19, only approximately 2% of equity mutual fund shares were redeemed on these days and at most funds redemptions were met from available cash reserves. However, there was a significant

59/ The only London EFP reported on the 19th also contributed to concentrated arbitrage selling at the opening. That EFP was for 3.25 million shares, which a customer sold short to a major U.S. broker-dealer prior to the NYSE opening. This broker-dealer then sold this position (viewing it as a long position) as part of an index arbitrage program on the NYSE opening.

60/ The daily tables and graphs in Appendix D provide a breakdown (in 10-minute and 30-minute intervals) of index-related trading on the NYSE and its relationship to total NYSE volume and volume in S&P stocks. Copies of these graphs also are reproduced at the end of the Chapter.

61/ Order-entry problems on the NYSE and other markets are discussed in more detail in Chapter Seven of the Study.

amount of selling by one major mutual fund complex. This fund complex sold a total of 25.8 million shares on October 19, with orders to sell 17.5 million shares entered before 10:00. ^{62/} This major fund, had a policy of being fully invested. Therefore, it was forced to effect substantial sales to respond to weekend redemptions as well as additional redemptions on Monday. Data regarding other funds on October 19 indicated that they were, in the aggregate, net buyers. ^{63/}

v. Margin Calls

Relatively little selling occurred throughout the day as a result of forced liquidations of customer margin accounts. As discussed in detail in Chapter Five, the staff's survey of the 28 most active firms indicates that the responding firms sold at most around 7 million shares (1% of NYSE volume) ^{64/} on October 19 as liquidations to meet unpaid customer margin calls. In addition, some customer stock positions may have been sold by customers (as opposed to firms) in order to raise cash for both securities and futures margin calls, although the level of this selling could not be quantified by the firms contacted by the Division.

vi. Foreign Selling

Finally, a number of persons interviewed by the staff from the firms' institutional sales and block trading desks indicated that they believed there was substantial,

^{62/} Unlike most program orders, which are sent to the NYSE floor in concentrated packages via the exchange's automated order-routing systems, this fund expected the firms handling the orders to "work the orders" in segments to maximize the prices received to raise cash for redemptions. The impact on stock prices of these sell orders, therefore, is more difficult to quantify for selected 10 minute or 30 minute intervals than is the case for program orders. For example, the fund estimates that slightly less than one-half of its sales entered before 10:00 were actually executed before 10:00. In addition, the fund has represented that the level of its trading on the 19th, under 4.5% of total NYSE volume, was not aberrational since the fund's transactions constituted roughly 3.6% of NYSE volume in October 1987 and ranged up to 4.4% in July 1987. Nevertheless, the magnitude of this fund's sell orders on the 19th and the fact that most of this activity was concentrated on the sell-side indicate that it did play a significant role for the day, and particularly in the morning.

^{63/} See Letter to David S. Ruder, SEC Chairman, from David Silver, ICI President, dated November 24, 1987. More detailed fund information was separately sent by the ICI to the Division. The Commission staff conducted limited inspections of 52 non-ICI member funds and found that the redemption and portfolio sales activities of these funds were generally less, percentage-wise, than that reported by the ICI for its member funds.

^{64/} Firms reported that margin liquidations on the 19th totaled \$293 million, but could not determine which types of stocks were sold in these liquidations. Accordingly, the Division is unable to determine what percentage of margin liquidations involved sales of NYSE stocks. If the assumption were made that all of this \$293 million involved NYSE stocks, and a \$40 per share average price were used, this translates to only 7.3 million shares sold for this reason.

although not extraordinary, foreign selling on the morning of October 19. Although a few firms indicated that there was significant selling by Japanese investors, most firms stressed that most of the foreign selling came from European investors, a trend that had begun earlier in the month and accelerated on the 19th and 20th. ^{65/} Quantifying the amount of such foreign selling is extremely difficult because much of the activity is settled through U.S. banks, and, therefore, cannot be easily distinguished from activity by U.S. institutions. Nevertheless, through examining settlement information from the Depository Trust Company ("DTC"), the staff identified four major sell programs in U.S. stocks through foreign banks totalling over 9 million shares.

Perhaps as significant as any foreign selling during October 19, was the drying up of foreign buying interest. Traders at one major firm indicated that buying interest from Japan had been a significant support to the market during 1987. On October 19, however, they indicated that Japanese buying interest disappeared.

c. Summary

While it is not possible to reconstruct all trading during October 19, the above breakdown permits the Division to reach the following determinations.

Overall, the predominant source of selling pressure throughout the day was from institutional accounts, including portfolio insurance selling, mutual fund liquidations, margin liquidations, and selling by foreign accounts. In particular, this institutional selling, when combined with index arbitrage-related selling, accounts for the vast majority of opening volume on the NYSE. This early institutional selling, in turn, appears to have developed as a direct result of the market decline of October 14-16.

The most significant factors during the afternoon downturn appear to have been the convergence of stock selling from index arbitrage and portfolio insurance strategies around 1:30 to 2:00, and continued selling from a broad range of sources including portfolio insurance strategies thereafter. While the Division's review is unable to provide the same level of specificity for trading in the final hour of the October 19 trading session, it appears that continued institutional selling, combined with the near exhaustion of market-making capacity on the securities and futures markets and the uncertainty created by the number of DOT orders lacking "fill" reports, ^{66/} contributed to the panic selling before the close.

4. October 20

Tuesday, October 20, saw a continuation of the extraordinarily high volume and volatility of Monday. Unlike October 19, however, price movements resembled a roller coaster -- demonstrating both tremendous nervousness on the part of market participants and the exhaustion of market-making capacity in virtually all stock and derivative markets. As a result, the securities and futures markets reached a point,

^{65/} In a news account, a trader indicated that the level of selling by both Japanese and European investors required pre-clearance by his firm. See Smith, Swartz & Anders, *Black Monday, What Really Ignited the Market's Collapse After Its Long Climb*, Wall St. J., Dec. 16, 1987, at 20.

^{66/} See Chapter Seven.

around mid-day, when heavy sell pressure overwhelmed market-making capacity in both the securities and futures markets. At about noon, trading in a large number of NYSE securities were halted and most derivative markets ceased trading. Around this time, however, the convergence of a number of factors, including news of pending corporate buy-backs of stocks and assurances of sources of liquidity for NYSE specialists, as well as the dissipation of stock selling and the return of investors seeking to buy at "bargain" prices, resulted in a remarkable market recovery. The DJIA gained around 118 points (6.8%) from 12:20 to 1:00, maintaining a 102.27 point (5.88%) recovery for the day, and closing at 1,841.01 on record NYSE volume of 613.7 million shares. ^{67/} This recovery, however, did not extend to the Amex and NASDAQ markets, which closed down 8.64% and 9%, respectively.

a. Summary of Market Movements

The bearish investor sentiment of the 19th was not limited to the U.S. markets. Major foreign markets suffered record or near-record percentage declines. The Tokyo Nikkei index closed down 14.90% (and very likely would have dropped further except for the fact that price limits were reached on many individual stocks) and the London FT-SE 100 index closed down 12.22%.

Notwithstanding downward trends in the foreign markets, prices on both the leading U.S. index futures market (the CME) and securities market (the NYSE) opened sharply higher. The SPZ futures on the CME opened up 23.50 points at 225, and quickly rose another 16 points to 241 by 9:53, trading at an apparent premium to the index stocks of up to 10 points. Trading on the NYSE began with the DJIA rising to 1,935.7, up 197.30 by 10:28.

Heavy sell pressure on the CME, however, caused SPZ prices to decline, trading by about 10:00 at a slight discount to cash as the DJIA peaked. Despite the relatively low level of index arbitrage, ^{68/} the DJIA fell 227 points by 12:21. As discussed in more detail in Chapter Four of the Study, this renewed sell pressure severely strained market-making capacity on the NYSE. By 12:30 p.m. (Eastern Time), trading had been halted due to order imbalances in 145 NYSE stocks (including 77 stocks in the S&P 500, representing 24.6% of the index value), and the NYSE informed the Commission that it was considering closing the Exchange. Meanwhile, selling pressure on the SPZ was heavy, ^{69/} halts in trading for significant numbers of SPZ stocks continued, and the CBOE had halted trading in the S&P 100 index. The CME halted SPZ trading at 12:30 p.m. (Eastern Time). At this time, trading of most other index futures and options also was at a halt, with the exception of the MMI futures traded on the Chicago Board of Trade ("CBT").

^{67/} This volume figure, which is larger than the often cited volume of 608,120,000 shares, is derived from NYSE audit trail tapes.

^{68/} The Division's review indicates that the voluntary restrictions placed by the NYSE on member firms' use of the Exchange's automated order-routing systems for both proprietary and customer index-arbitrage program trading resulted in these strategies playing negligible roles on this day. See discussion, *infra*, at 2-22.

^{69/} The SPZ had fallen 57 points from its early peak to 183.00 by 12:15.

During an interval of about 20 minutes, beginning at approximately 12:30, the MMI futures staged an extraordinary 90 point rally, rising from a discount of about 60 points to a 12 point premium. The DJIA recovered 126.2 points to 1834.9 by 1:12 p.m.. ^{70/} About the same time, renewed buying interest appeared in the stock markets, causing the NYSE to decide to remain open. While the rise in the MMI may have had a psychological impact on stock prices, it appears to have had no direct effect on trading on the NYSE. During that time period only one small arbitrage program was effected employing the MMI.

After the CME re-opened at 1:05 p.m., the rally on the NYSE faded, with the DJIA falling back 80 points in 27 minutes. The SPZ opened at a discount to cash of more than 16 points, increasing quickly to over 31 points with the onset of the decline in stock prices. Shortly after 2:00, the DJIA, despite continued discounts on both the SPZ and MMI futures, staged a third rally of nearly 170 points to 1,920.3 by 3:55. It then declined about 80 points to close the day at 1,841.01, up 102.27 points for the day.

b. Breakdown of Trading

i. Portfolio Insurance

Overall, it appears that portfolio insurance futures and stock selling played a significant role on October 20th in dampening price recoveries in both markets. In particular, selling pressure on the CME from portfolio insurance strategies reached its highest level for the October market break, accounting for approximately 28,000 contracts, or 25.5% of total SPZ volume on October 20. Portfolio insurance appears to have been a substantial factor in moving the SPZ price to a discount to cash value a number of times during the trading day. For example, while the SPZ opened at a substantial premium to fair value, that premium dramatically reversed to a slight discount by approximately 10:00. During this period, portfolio insurance strategies accounted for sales of at least 4,885 contracts, or roughly 26% of SPZ volume. Portfolio insurance strategies accounted for at least an additional 2,621 sales of SPZ contracts (25% of volume) between 10:00 and 10:30, as the apparent discount to the cash value increased in excess of 16 points and the DJIA began its plunge from the high of 1935.70. For the next hour, while the DJIA declined by over 170 points, portfolio insurance accounted for more than 34% of SPZ sell volume. While many portfolio insurance sales were cancelled after the 19th and never executed, portfolio insurers appear to have used periods of strength in the futures market, such as the opening price surge, to sell some of their "overhang" of sales from the prior day.

In addition, the portfolio insurance stock selling, which had reached 39.9 million shares on the 19th continued on October 20. The selling, however, was at a reduced level, totaling 10.5 million shares or 1.7% of NYSE volume and 2.4% of S&P volume on the 20th.

^{70/} As discussed in detail in Chapter Three of the Study, the Division's analysis of index-related trading during this period does not provide any direct evidence to support press allegations that MMI futures were used to manipulate the prices for bellwether NYSE stocks to turn the market around. It is not possible to quantify the effect on market psychology, however, of the price rise experienced at that moment of time in the MMI index.

ii. Index Arbitrage

Prior to the opening of trading on October 20, the NYSE requested that its members refrain from using the DOT LIST processing feature to route index arbitrage programs to the NYSE floor. On October 21, the NYSE also requested that firms refrain from effecting proprietary arbitrage programs until further announcement. As a result, the index futures and stock markets were effectively decoupled and relatively little index arbitrage was effected the remainder of the week. ^{71/} Given the relatively low level of index arbitrage reported to the Division, ^{72/} it does not appear that arbitrage, itself, was instrumental in transmitting futures price movements to the equity market on the 20th. ^{73/} Nevertheless, as on the 19th, the persistent futures price discounts may have had the effect of encouraging additional speculative stock selling and discouraging buying by market professionals and institutional investors. ^{74/}

iii. Margin Calls

The level of firm liquidations of customer stock positions to meet outstanding margin calls increased from a value of approximately \$292.6 million on October 19 to approximately \$425.8 million on the 20th. At most, this would account for approximately 10.5 million shares of selling (1.7% of NYSE volume). ^{75/} As on the 19th, however, on October 20 customers also may have voluntarily sold stock to raise cash for actual or anticipated margin calls.

^{71/} Effective on November 3, 1987 the NYSE permitted programs entered for customer or proprietary accounts to be routed through the DOT system if entered prior to the opening. On November 6, the NYSE announced that commencing November 9, 1987, members firms would be allowed to use DOT to execute orders for program trades throughout the day.

^{72/} This low level of arbitrage is consistent with the results of the NYSE's monitoring of "program" orders sent through the Exchange's automated order-routing systems.

^{73/} No EFPs were reported for October 20.

^{74/} See Chapter Three.

^{75/} As noted in the discussion of October 19, this maximum number of shares assumes that all selling involved NYSE (versus Amex and NASDAQ) stocks -- an assumption which is almost certainly unrealistic.

iv. Dividend Capture Strategies

Press accounts 76/ and the Brady Report 77/ have cited selling related to dividend capture strategies 78/ as possibly contributing to selling pressure during the market break. The Division's interviews with major market participants confirmed that at least one firm active in these strategies did suffer significant reverses due to forced liquidations of stock and options positions. Nearly its entire portfolio of approximately \$600 million was liquidated from October 20 to 22. Overall, however, the Division did not find direct evidence that dividend-related selling was a significant factor during the market break. For example, only two of the 30 DJIA stocks went ex-dividend beginning October 19 and 20. While these securities experienced trading volume surges and sharp price movements during the break, volatility for the two ex-dividend issues on key dates was not significantly different from that on other trade dates in October. 79/

v. Other Trading

The Division's review of trading on the 20th has not identified dominant sources of selling pressure during the mid-morning market downturn. This selling appears to have been broad-based, with the largest segment of selling derived from institutional accounts (45% on the 20th, compared to 50.7% on the 19th) and only slightly higher levels of selling from retail and proprietary accounts (37.4% retail and 17.5% proprietary on the 20th, compared to 33.3% retail and 16.0% proprietary on the 19th). 80/ Some sellers, especially portfolio insurers, may have sought to take advantage of the morning's price recovery as an opportunity for liquidations prior to another market drop.

Similarly, the trading information available to the Division does not highlight any particular sources for the resurgence of buying interest that precipitated the mid-day market recovery on the NYSE. Again, this buying appears to have come from all types

76/ Crossen, Dividend-Capture Plans Came Up Short, Wall St. J., Nov. 3, 1987, at 6.

77/ Brady Report, at III-21.

78/ Dividend capture strategies involve the short-term purchases and sales of securities and options on those securities (of available) to obtain dividends (subject to favorable tax treatment for corporate clients) with minimal commitment of funds.

79/ The two stocks were Proctor & Gamble Co. ("PG") (the stock went ex-dividend on October 19 and declined 6% on October 16, 28% on October 19) and McDonalds Corp. ("MCD") (stock went ex-dividend on October 20 and declined 17% on October 19 and gained 8.25% on October 20). While these figures indicate that PG declined more than the DJIA on the 16th and 19th and MCD declined less on the 19th and gained more on the 20th, these discrepancies are consistent with the stocks' performance relative to the DJIA on other days such as October 6, when PG lost 4% while the DJIA lost 3.5%.

80/ The sampling of broker-dealer data used for these percentages accounted for 386 million shares (63% of NYSE volume).

of accounts (45.9% institutional, 38.1% retail, and 16.0% proprietary). Nor does it appear that buying by corporate issuers on the 20th (although announced for the near future) accounted for a significant segment of this buying interest. Our survey of issuers in the S&P index with outstanding repurchase programs indicates that those issuers only accounted for 21.94 million shares or 3.57% of buying on the NYSE (or 5.14% of volume in S&P stocks). We cannot ignore, however, the psychological significance of the announcement of issuer repurchase programs during October 20. For example, during the critical period between 11:30 and 1:00 that day, eight issuers in the S&P 500 index announced repurchase programs. ^{81/}

C. Commission Regulatory Actions During the Market Break

The following section of the chapter provides an overview of Commission actions during the October market break.

1. Commission Monitoring and Supervisory Activities

Under the federal securities laws, primary supervision of the operations and trading in the securities markets resides in the self-regulatory organizations -- the exchanges and the National Association of Securities Dealers ("NASD") -- with active oversight by the Securities and Exchange Commission. ^{82/} Thus, the NYSE, the Amex, the NASD, the CBOE, and the regional stock exchanges maintain systems and procedures to monitor trading and to handle operational problems (such as order imbalances) in their markets. Moreover, the markets, in close cooperation with the major clearing corporations, regularly monitor the financial and operational conditions of the brokerage and trading firms.

The Commission's direct monitoring role is more limited. The Commission relies in part on the extensive systems, procedures, and expertise of the self-regulatory organizations ("SROs") to monitor trading and financial health in the securities markets. The Commission performs its oversight function through regular and frequent communication with the SROs and through a program of regular inspections of the various SRO program areas. The Commission also maintains a market surveillance staff in the Divisions of Market Regulation and Enforcement as a further oversight measure.

When markets are more volatile, or suffer significant declines, the staff oversight role increases to provide the Commission with information concerning reasons for the volatility (to assist decision making on regulatory and market issues) and concerning any financial or operational difficulties of firms subject to Commission jurisdiction. Because the two weeks preceding the October 19 market decline were periods of increased volatility and market price erosion, the staff had already stepped up its market oversight functions.

For example, following the October 6, 1987, drop in the market, the Commission immediately contacted the NYSE and the CFTC to initiate a review of trading activity on that day. In addition, the Commission staff interviewed market participants to

^{81/} For a more complete discussion of issuer repurchase programs, see Chapter Six.

^{82/} See, e.g., Sections 6(b)(2) and 15A(b)(2) of the Securities Exchange Act of 1934.

determine who engaged in trading on that day, for what purposes, and in what amounts. The Commission also requested the NYSE to supply trading data that would allow reconstruction of the day's events. The actions that we took in response to the October 6 decline were subsequently repeated for October 14, 15, and 16, in response to the precipitous drops in the DJIA on those days. Beginning on October 14, Commission staff also began to canvas the various SROs concerning the financial condition of the broker-dealers that they examine. At the time the SROs advised the Commission that their firms were not experiencing any financial difficulties.

Because of the significant declines that occurred during the week of October 12, 1987, and in particular the then-record 108 point decline in the DJIA on Friday, October 16, 1987, preparation was begun over the weekend for possible disruptions in Monday's markets. For example, at the Commission Chairman's request, senior staff of the Division of Market Regulation held weekend discussions to plan for market monitoring on Monday, October 19; previously scheduled business travel was postponed to ensure adequate senior staff supervision of market conditions on Monday; and the Commission arranged with the NYSE to receive pre-opening indications for major stocks on Monday morning to get a sense of market conditions in advance of the opening. This last procedure had been used previously in unusual market environments -- such as in connection with monitoring "Expiration Friday" trading. 83/

On October 19 the Commission received indications of steep price declines in Tokyo and London prior to the opening on the NYSE. In addition, the Commission received indications from the NYSE of significant order imbalances on the sell side--indicating a significant market decline at the opening. The Commission requested the NYSE surveillance department to keep it informed on an on-going basis of any operational problems at the Exchange. The Commission also requested information on specialist positions and up-dates on order imbalances. Immediately after the opening, Chairman Ruder spoke with John Phelan, Chairman of the NYSE, and was briefed as to the size of sell order imbalances that morning. In response to the early sell-off, Division of Market Regulation staff, using in-house automated market information systems, began to monitor the securities and futures markets minute-by-minute.

Throughout the day, and continually, day-by-day, for the next two weeks, Commission staff, working in specialized teams, kept in close contact with the stock exchanges, options markets, clearing agencies, major broker-dealers, and order-routing firms. The Commission monitored the operation of each market's order entry and automatic execution systems; the operation of the NASDAQ computerized quote system; the capacity of the major stock and options clearing operations to process a record number of transactions; the financial condition of broker-dealers and clearing agencies; and the capacity of order-routing firms to handle unprecedented volume. In addition, the Commission staff conducted a series of on-site reviews of broker-dealers and a major service bureau which had reported delays in public customer order executions due to increased volume. The staff also responded to numerous questions from market participants, including issuers, investors, and members of the securities bar.

The Commission also monitored, through its Division of Investment Management, the effects of market activity on the investment company industry. Division staff in

83/ See discussion of Commission monitoring of expiration market volatility in Chapter One.

Washington and SEC regional office staff contacted fund and fund transfer agents in their regions by phone or visit. These monitoring efforts focused on the level of mutual fund shareholder inquiries and redemption requests, as well as the capacities of the fund to keep up with the extra paperwork generated by the crisis and to price their shares on a timely basis.

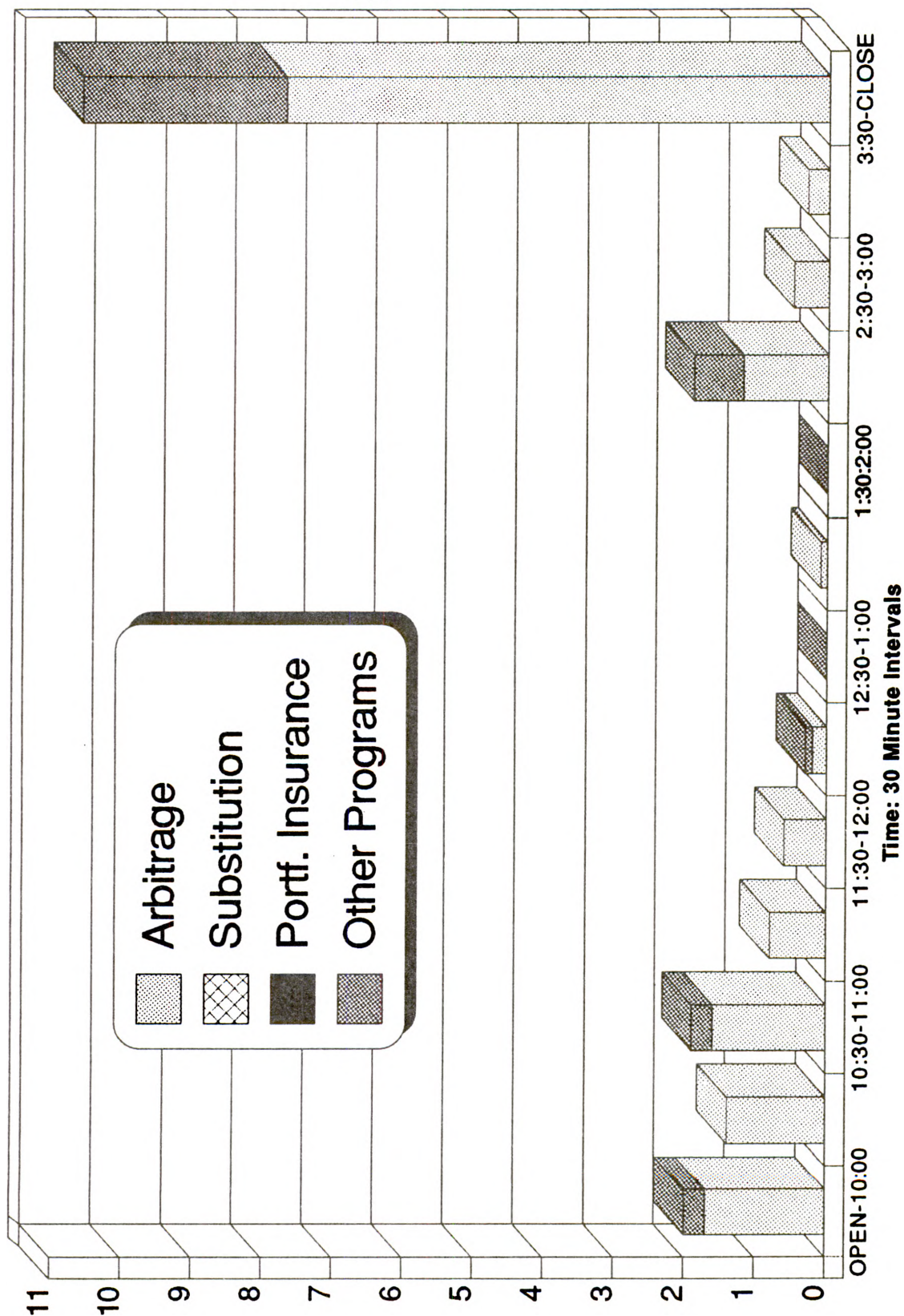
2. Commission Consultation and Decision Making Activities

In addition to these monitoring functions, the Commission played a primary role in consultation with the NYSE, other major securities exchanges, the NASD, and the CFTC and other governmental agencies, in making certain key decisions throughout the weeks of October 19 and October 26. These significant activities related to, among other matters, curtailing program trading on the NYSE; the NYSE's order imbalance problems on the 20th; early closing of the exchanges; assuring financial viability of certain specialists; the liquidity problems of options market-making clearing firms; increasing margin requirements on stock index options contracts; clarifying interpretive questions relating to the acquisition by corporations of their stock; and dealing with problems raised in the area of mutual fund regulation.

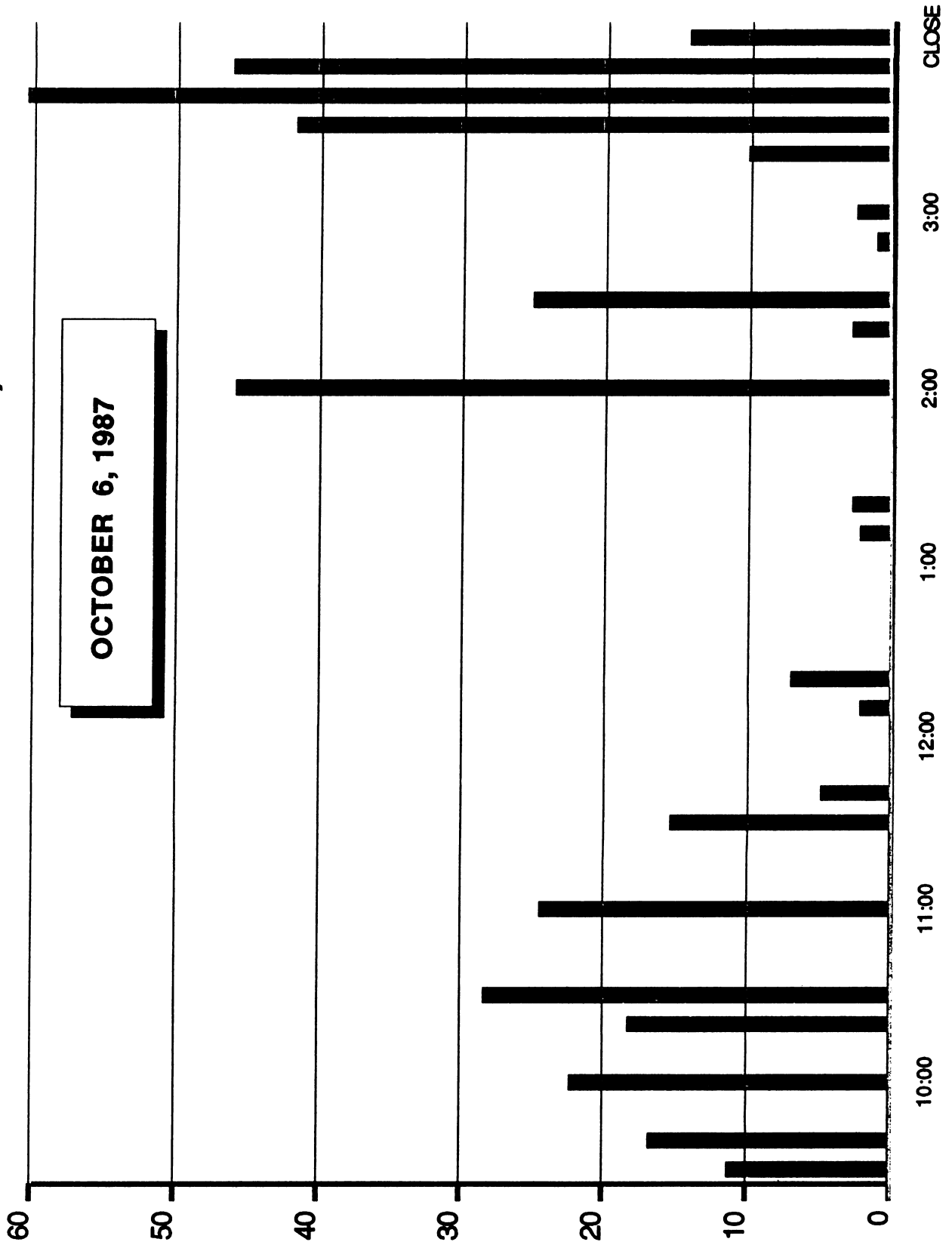
**CHARTS
AND
GRAPHS**

Thirty Minute Breakdown of Index-Related Selling on NYSE (October 6, 1987)

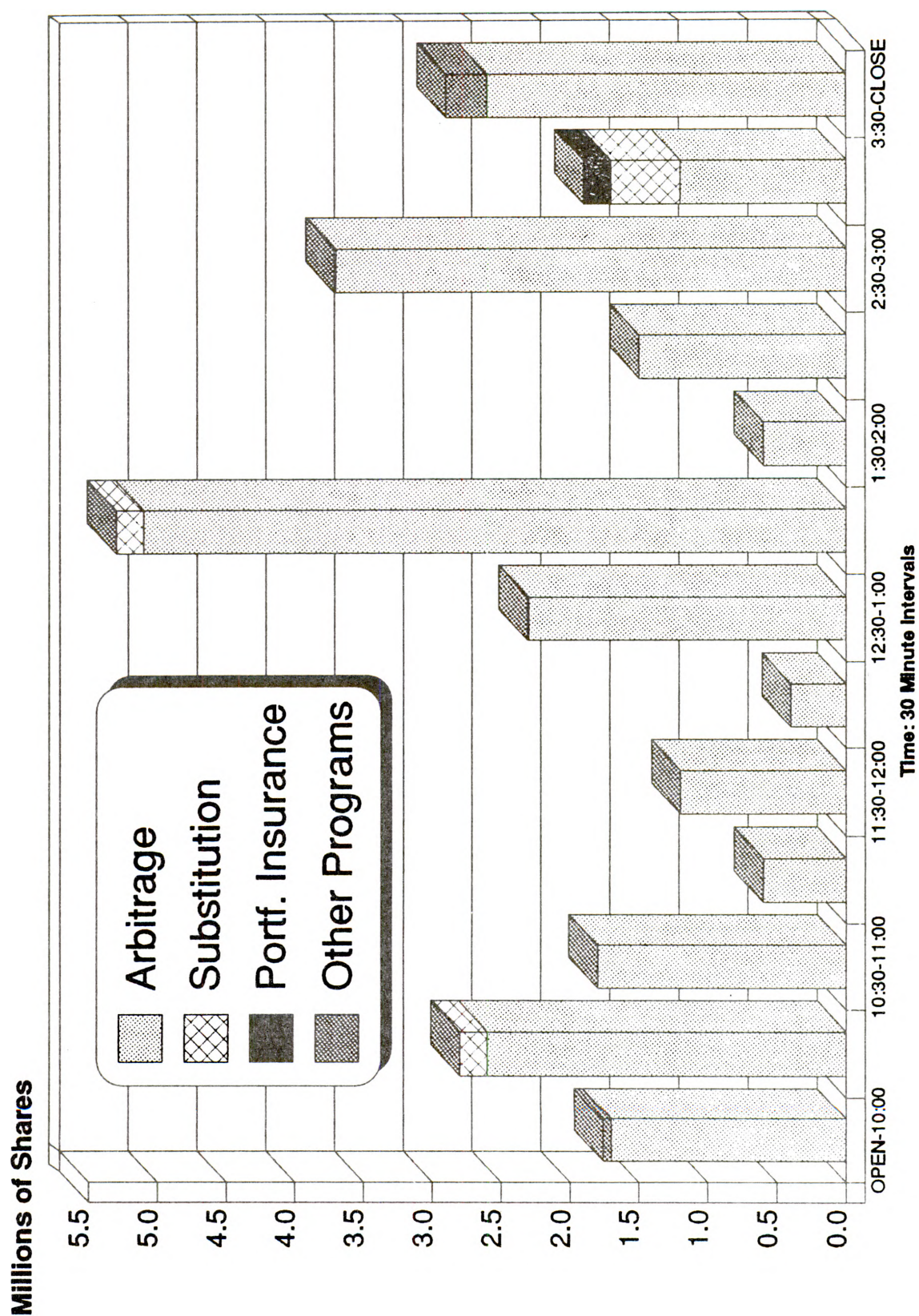
Millions of Shares



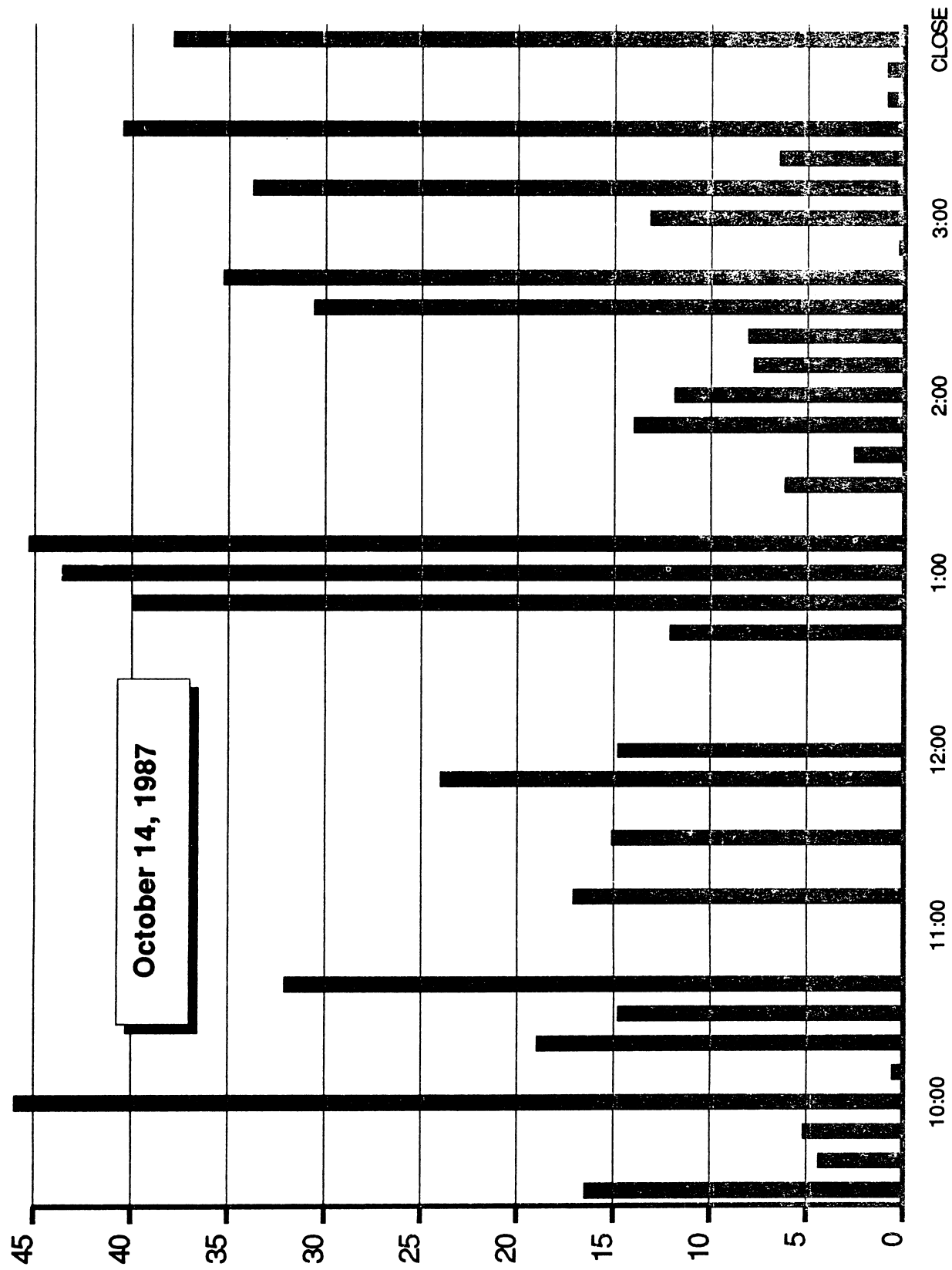
Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)



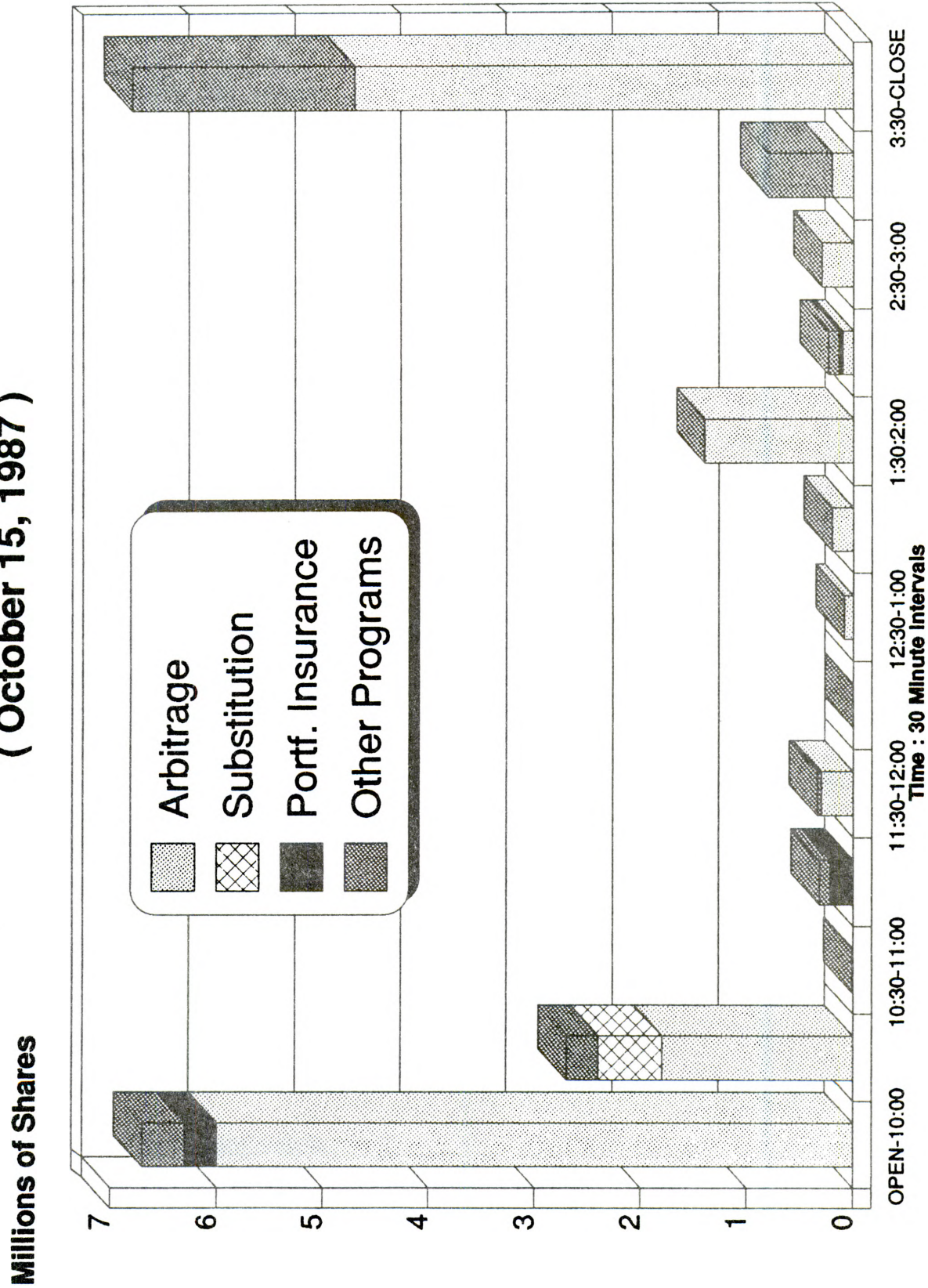
Thirty Minute Breakdown of Index-Related Selling on NYSE (October 14, 1987)



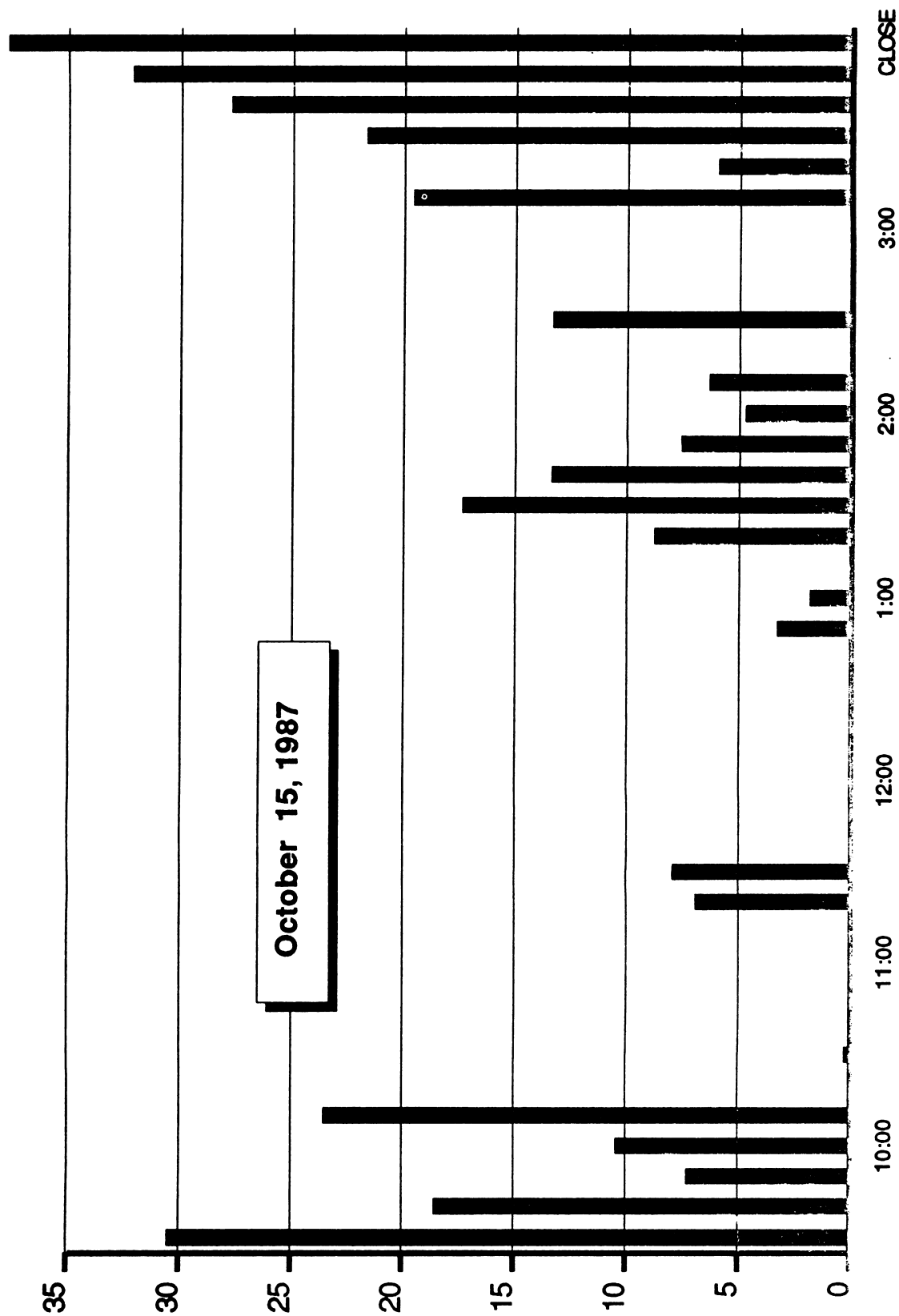
**Total Program Selling on NYSE as % of Volume in S&P Stocks
(10 Minute Intervals)**



**Thirty Minute Breakdown of Index-Related
Selling on NYSE
(October 15, 1987)**

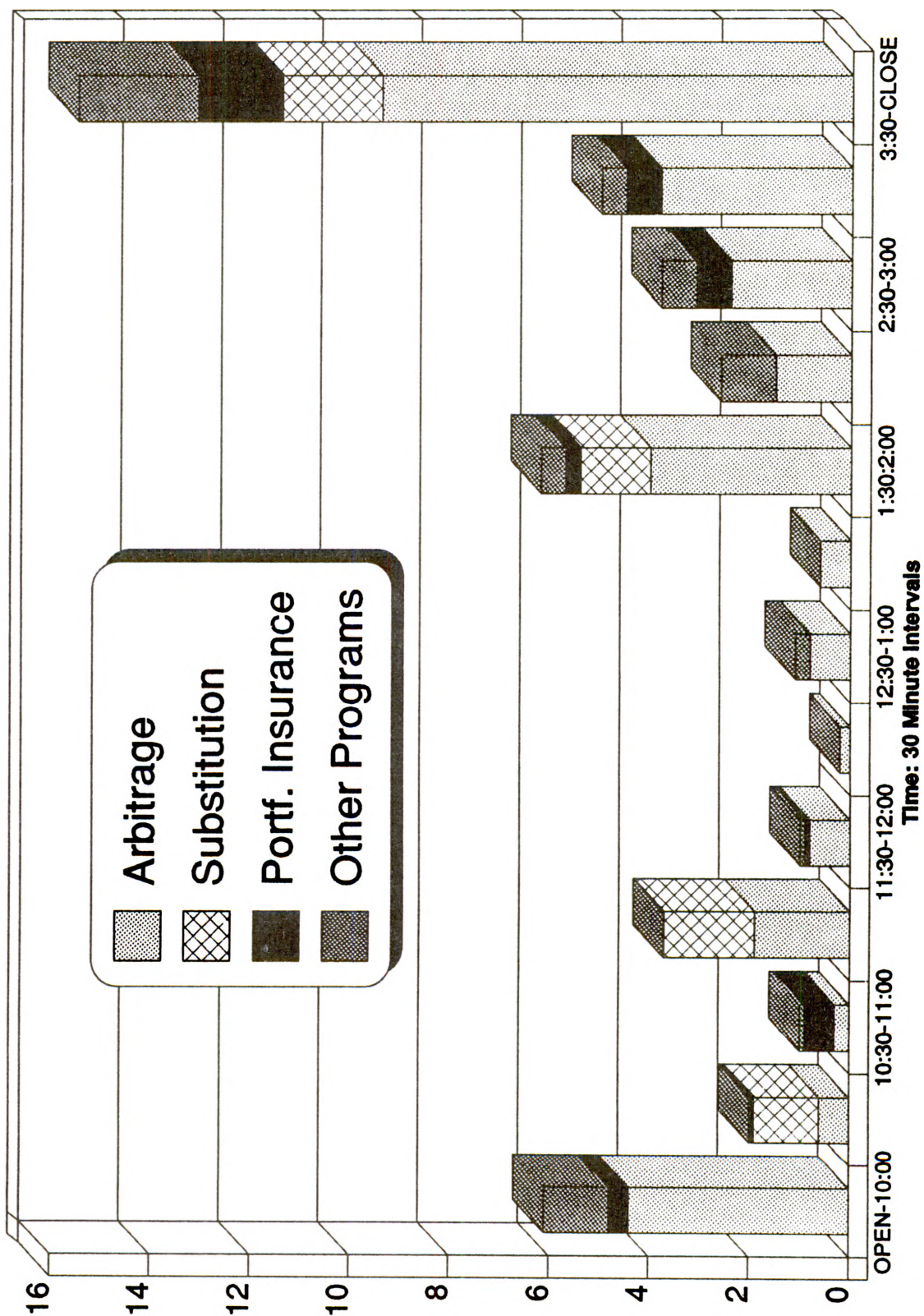


Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)

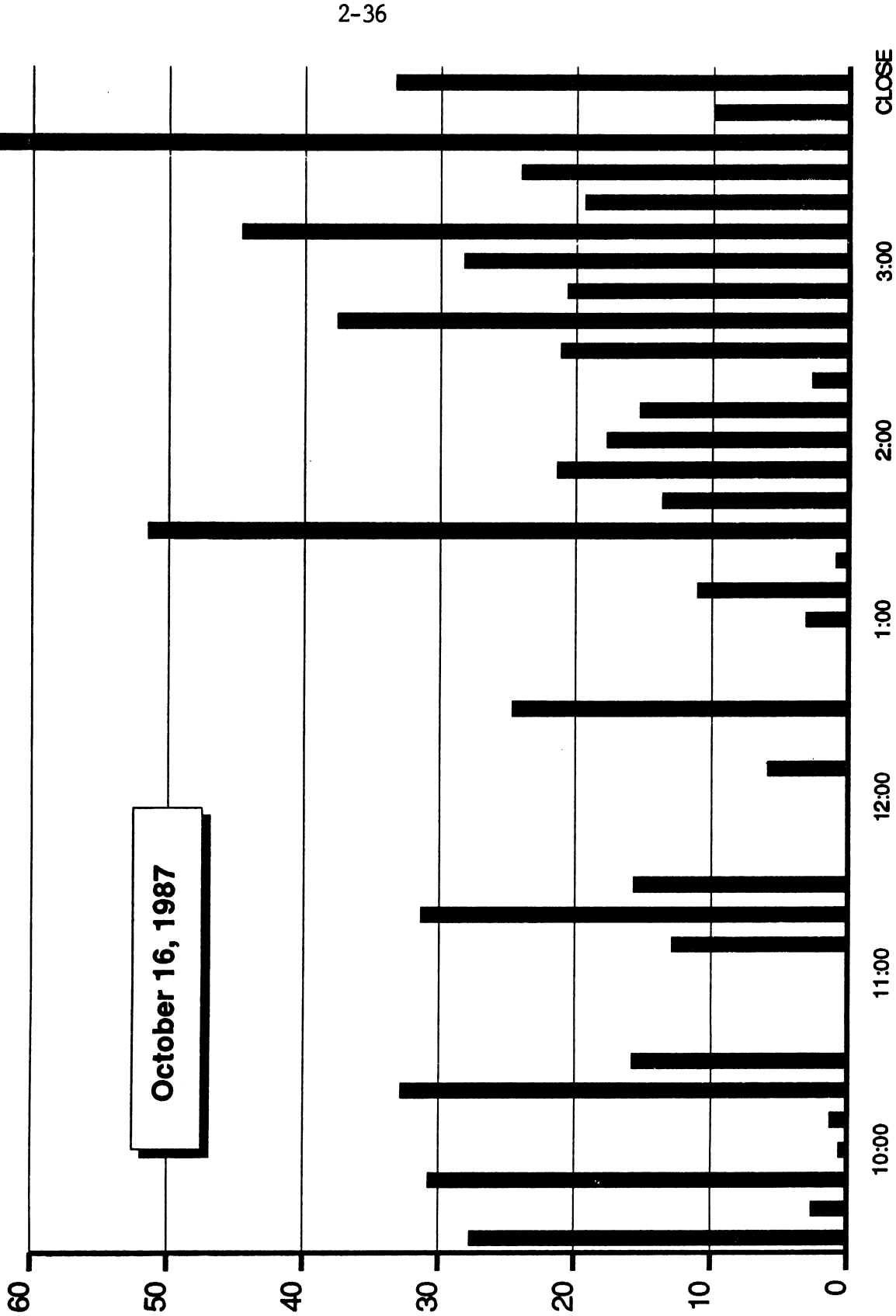


Thirty Minute Breakdown of Index-Related Selling on NYSE (October 16, 1987)

Millions of Shares

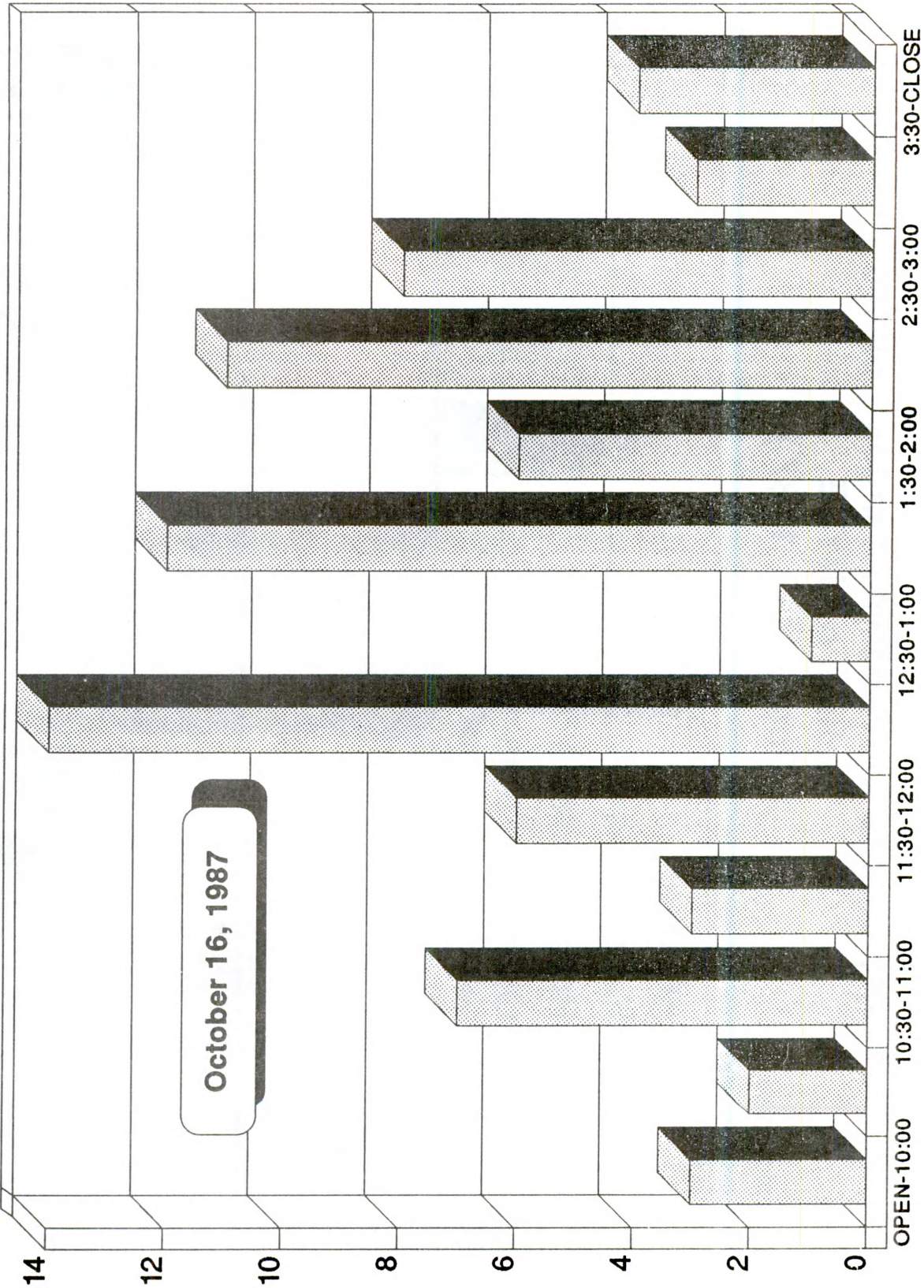


**Total Program Selling on NYSE as % of Volume in S&P Stocks
(10 Minute Intervals)**



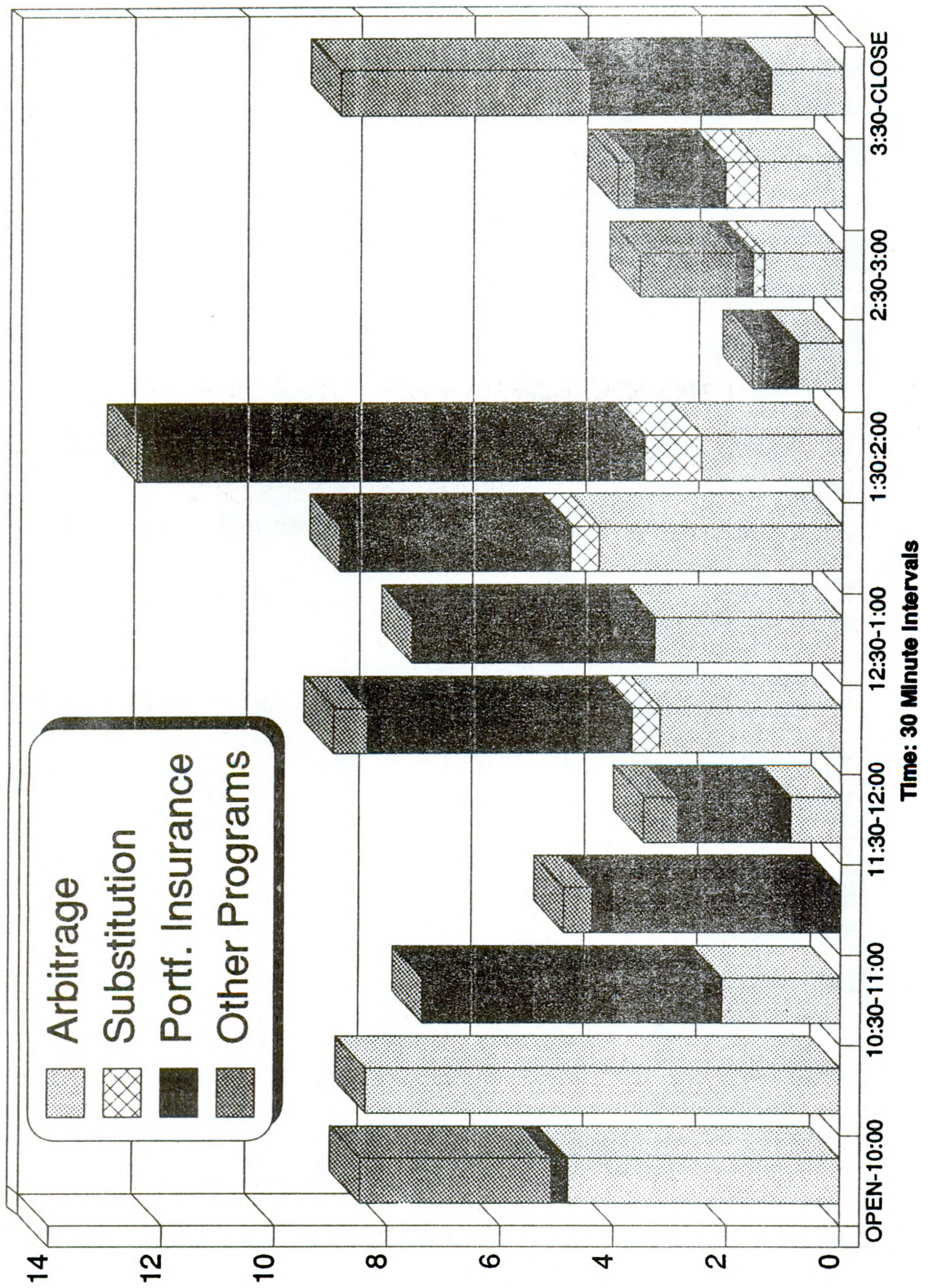
Portfolio Insurance Futures Selling Percentage of CME Volume

Percentage of
Total Volume

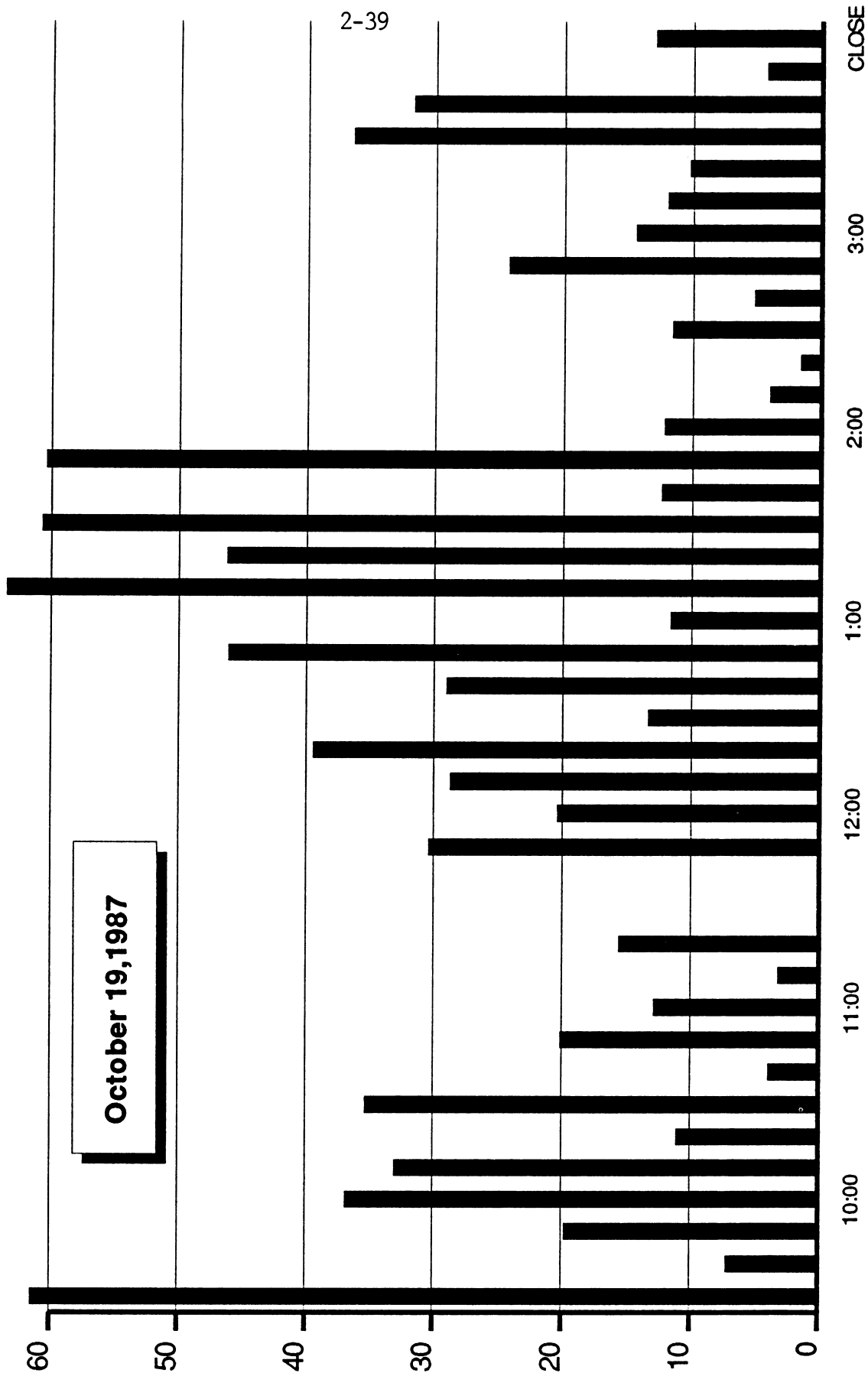


Thirty Minute Breakdown of Index-Related Selling on NYSE (October 19, 1987)

Millions of Shares

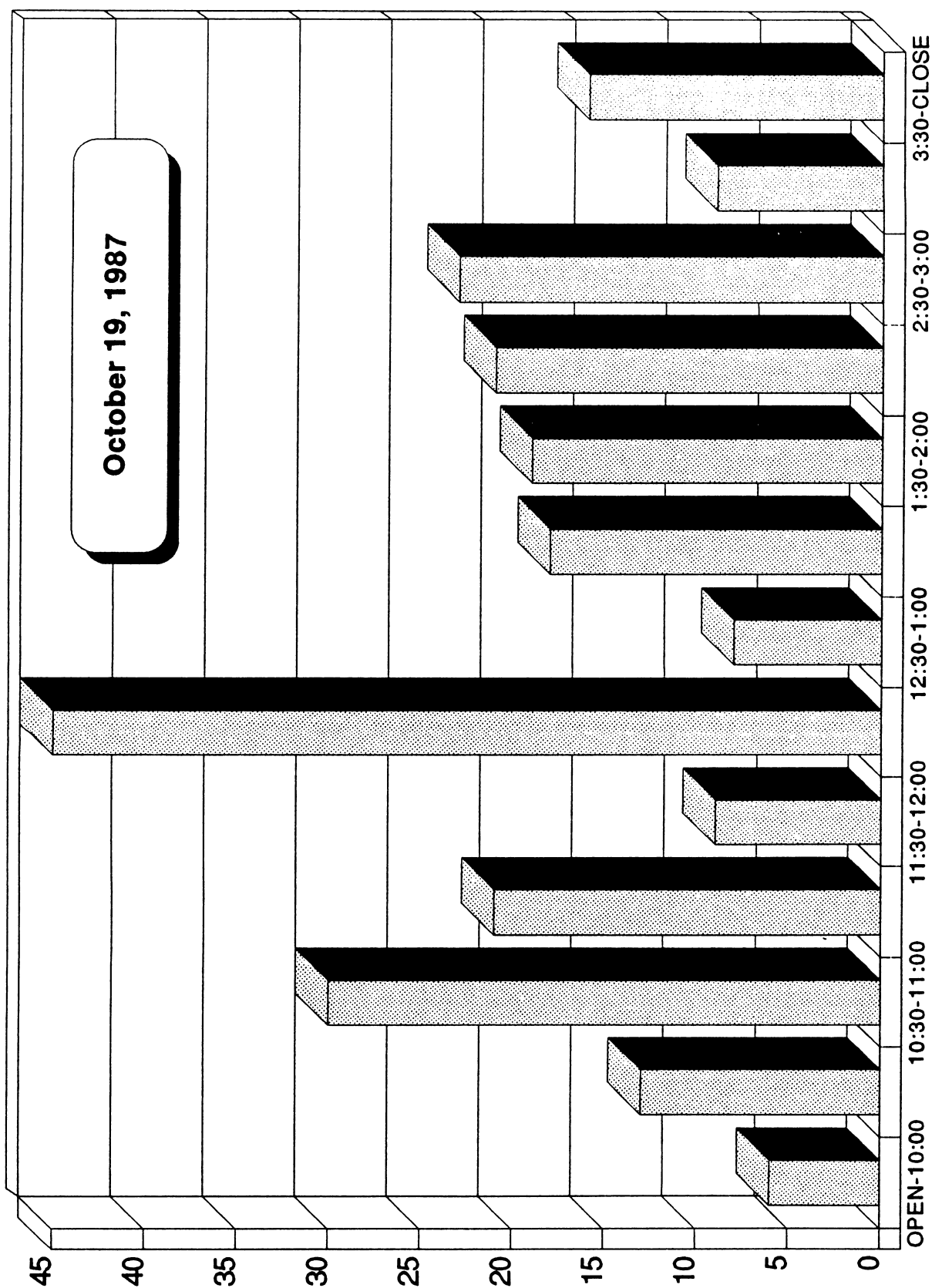


Total Program Selling on NYSE as % of Volume in S&P Stocks
(10 Minute Intervals)



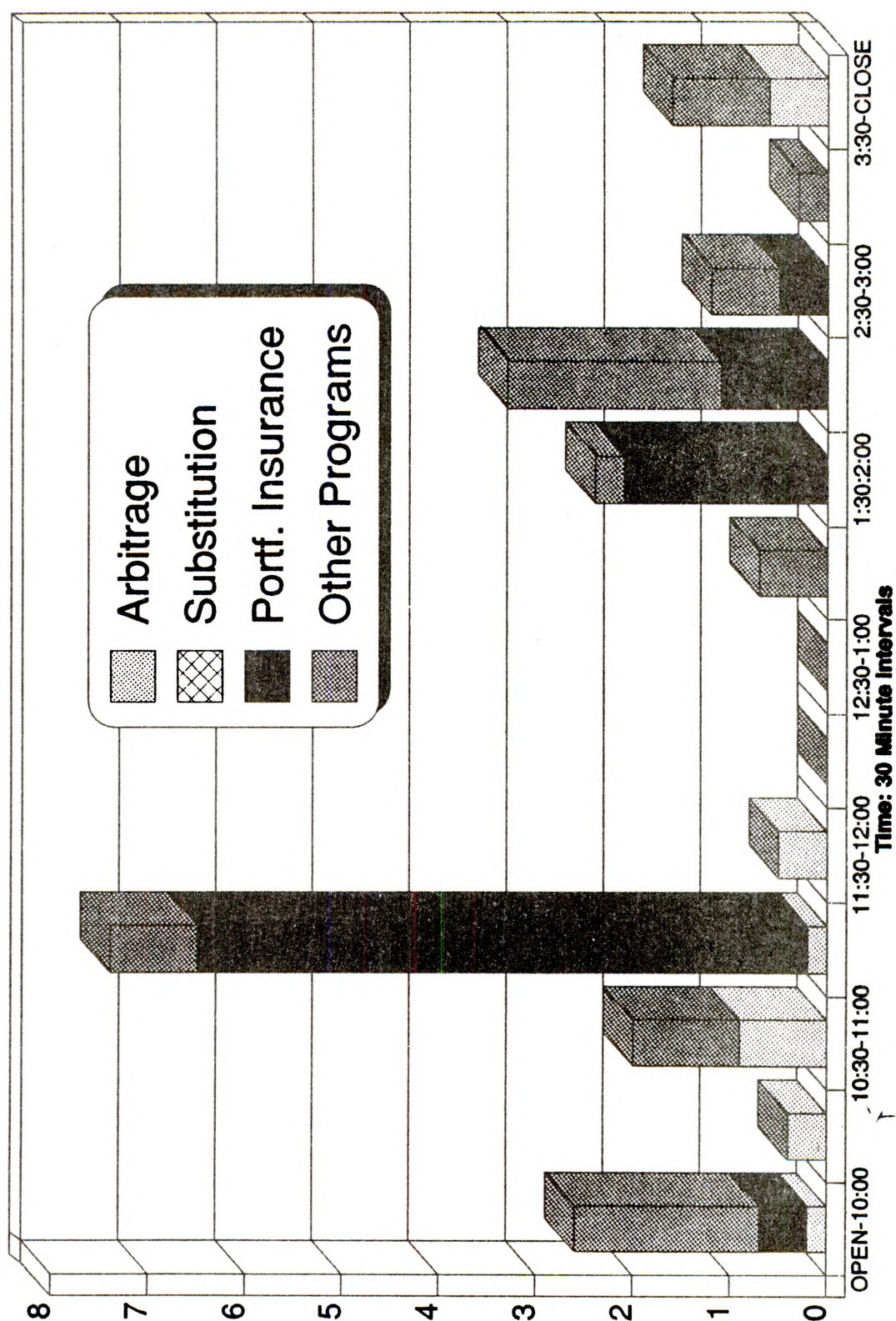
Portfolio Insurance Futures Selling Percentage of CME Volume

Percentage of
Total Volume

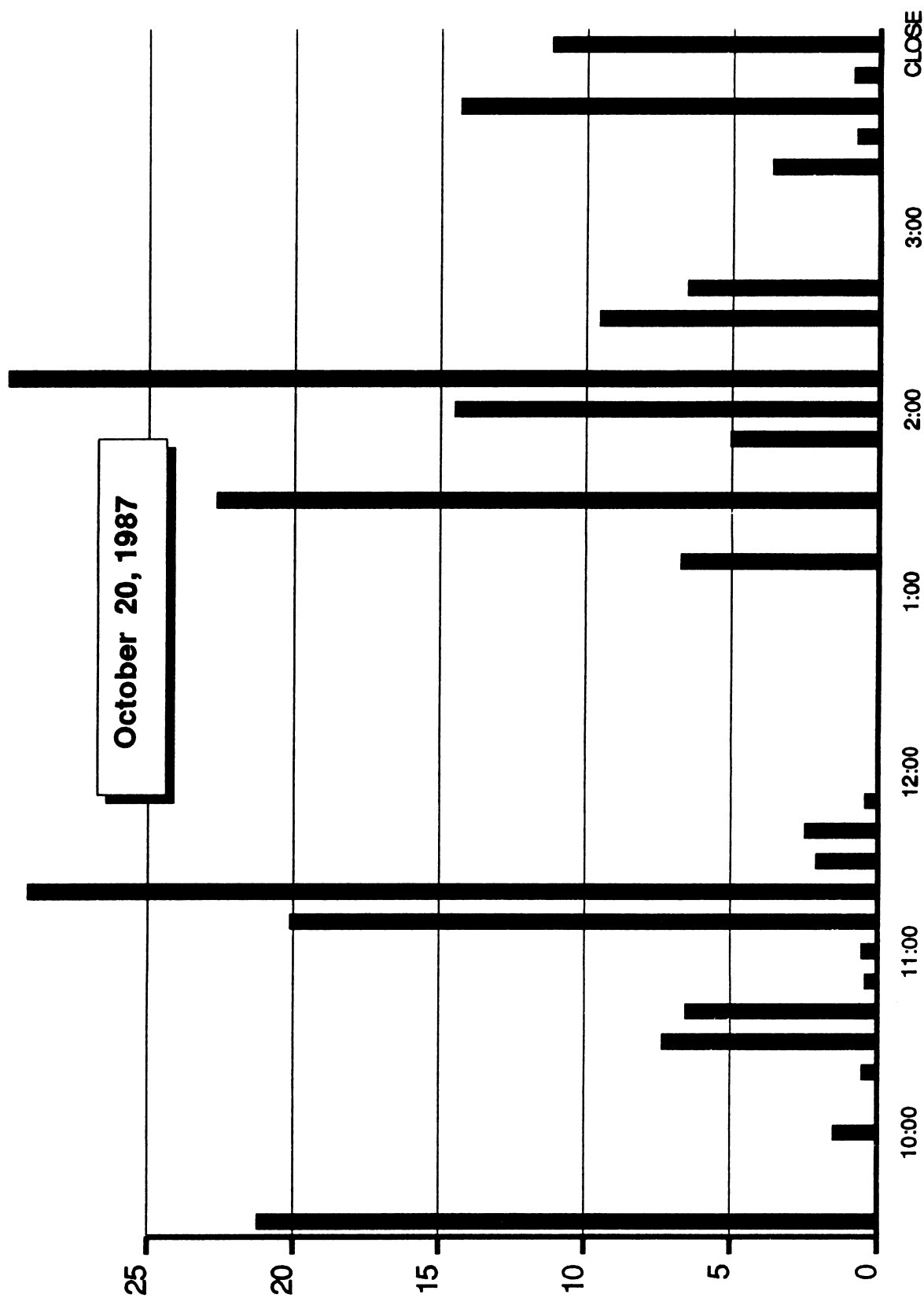


Thirty Minute Breakdown of Index-Related Selling on NYSE (October 20, 1987)

Millions of Shares



Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)



Portfolio Insurance Futures Selling Percentage of CME Volume

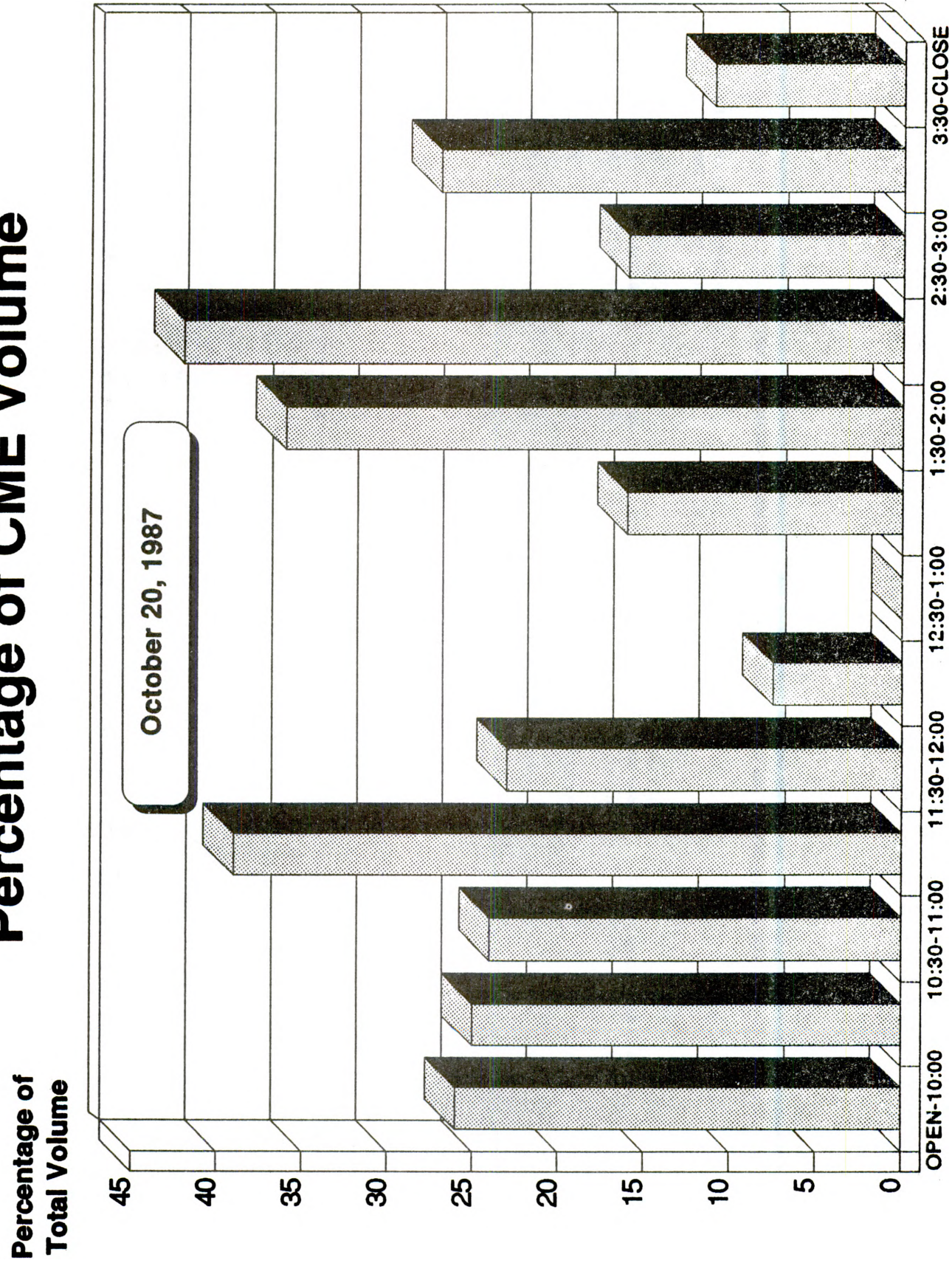


CHART 2-1
S&P500 ADJUSTED TO COMPENSATE FOR
NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 19, 1987

TIME	NUMBER OF NYSE STOCKS HALTED		MARKET VALUE OF NYSE S&P500 STOCKS HALTED (\$Millions)	PERCENT OF S&P500 MARKET VALUE	REPORTED S&P 500	ADJUSTED S&P 500 -- AS IF PRICE OF HALTED STOCKS :		S&P 500 FUTURES PRICE
	TOTAL	S&P 500				MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT	
10:00	154	95	731198.97663	38.01780	273.17	267.6360	259.8816	261.5
10:30	121	73	636923.50225	34.03813	265.77	262.1060	254.2109	253
11:00	69	37	231681.27125	12.73551	258.38	257.3357	254.4144	263
11:30	30	12	32901.9975	1.771126	263.85	263.7931	263.3308	265.5
12:00	18	6	21017.3615	1.125273	265.28	265.1422	264.9265	257
12:30	11	2	9532.9015	0.520978	259.89	259.7131	259.7144	254.5
1:00	5	2	9532.9015	0.526488	257.17	257.0050	256.9944	254
1:30	0	0	0	0	255.7	255.7	255.7	235
2:00	1	0	0	0	247	247	247	227
2:30	1	0	0	0	245	245	245	233
3:00	0	0	0	0	243.93	243.93	243.93	226
3:30	1	1	4520.885	0.272333	235.78	235.7384	235.7675	226
4:00	2	2	20029.1525	1.262042	225.41	225.2457	225.4521	219

TOTAL NUMBER OF STOCKS HALTED DURING THE DAY 167
S&P500 107

SOURCE : SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS

CHART 2-2
S&P500 ADJUSTED TO COMPENSATE FOR
NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 20, 1987

TIME	NUMBER OF NYSE STOCKS HALTED TOTAL	NYSE STOCKS HALTED S&P 500	MARKET VALUE OF NYSE S&P500 STOCKS HALTED (\$Millions)	PERCENT OF S&P500 MARKET VALUE	REPORTED S&P 500	MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT	S&P 500 FUTURES PRICE
10:00	79	52	524157.105	31.24602	238.26	244.3353	247.0138	238
10:30	39	19	200625.79325	11.62309	245.16	245.7104	245.3477	228
11:00	31	15	93224.8915	5.560117	238.14	237.4480	237.3335	209
11:30	57	38	179889.60663	11.41745	223.78	222.7536	222.2108	192
12:00	112	63	328024.79723	21.04423	221.39	221.9694	219.8405	183 (Closed)
12:30	145	77	374906.34823	24.57924	216.64	216.5250	215.0907	183 (Closed)
1:00	123	57	264392.95335	16.44209	228.39	231.0580	227.6398	183 (Closed)
1:30	81	33	110345.4855	6.938737	225.87	225.9709	225.8754	207
2:00	61	23	83773.5235	5.283044	225.22	225.4354	225.1800	214
2:30	46	17	55111.936	3.433922	227.95	228.3235	227.8864	219.5
3:00	35	10	13932.48875	0.838034	236.13	236.2758	236.0634	221
3:30	15	3	1351.21325	0.079897	240.2	240.2076	240.1779	225.5
4:00	10	1	565.3535	0.033775	237.74	237.7404	237.7395	218.5
TOTAL NUMBER OF STOCKS HALTED DURING THE DAY			215	SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS				
			S&P500	127				

CHART 2-3
S&P100 ADJUSTED TO COMPENSATE FOR
NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 19, 1987

TIME	NUMBER OF NYSE STOCKS HALTED		MARKET VALUE OF NYSE S&P100 STOCKS HALTED (\$Millions)	PERCENT OF S&P100 MARKET VALUE	REPORTED S&P 100	MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT
	TOTAL	S&P 100					
10:00	154	29	435555.26075	49.42343	265.64	257.8366	250.0552
10:30	121	25	415982.09275	48.03421	261.04	256.9274	245.8949
11:00	69	8	103091.8635	12.30536	252.53	251.3800	249.4893
11:30	30	2	8776.10025	1.021216	259.04	259.4429	259.0027
12:00	18	1	7488.204	0.870445	259.31	259.6376	259.31
12:30	11	1	7488.204	0.890219	253.55	253.8171	253.55
1:00	5	1	7488.204	0.897940	251.37	251.6726	251.37
1:30	0	0	0	0	249.85	249.85	249.85
2:00	1	0	0	0	240.53	240.53	240.53
2:30	1	0	0	0	239.12	239.12	239.12
3:00	0	0	0	0	237.95	237.95	237.95
3:30	1	1	4375.05	0.576658	228.69	228.6808	228.7075
4:00	2	2	19755.15	2.744124	217	216.7678	217.1721

TOTAL NUMBER OF STOCKS HALTED DURING THE DAY	167	SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS
S&P100	37	

CHART 2-4

S&P100 ADJUSTED TO COMPENSATE FOR

NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 20, 1987

TIME	NUMBER OF NYSE STOCKS HALTED TOTAL	NUMBER OF NYSE STOCKS HALTED S&P 100	MARKET VALUE OF NYSE S&P100 STOCKS HALTED (\$millions)	PERCENT OF S&P100 MARKET VALUE	REPORTED S&P 100	MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT
10:00	79	24	371678.66138	48.59011	230.57	244.3822	241.9915
10:30	39	9	144513.43288	18.26659	238.47	239.3609	237.8325
11:00	31	7	78381.282	10.19605	231.72	230.2775	230.1131
11:30	57	13	123514.032	16.79018	221.74	220.5145	219.5137
12:00	112	19	220648.0065	30.79276	216.01	214.8010	214.1306
12:30	145	23	228372.291	32.41558	212.36	211.9126	210.1712
1:00	123	15	163548.0125	21.79490	226.19	229.7489	225.4320
1:30	81	6	46629.6575	6.353616	221.22	221.0709	221.7172
2:00	61	5	32654.3015	4.439342	221.72	221.9300	221.7815
2:30	46	3	14575.918	1.948029	225.54	225.7928	225.6132
3:00	35	1	5257.71	0.672559	235.64	235.7176	235.6282
3:30	15	0	0	0	238.89	238.89	238.89
4:00	10	0	0	0	233.71	233.71	233.71

SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS

TOTAL NUMBER OF STOCKS HALTED DURING THE DAY 215
S&P100 42

2-47

CHART 2-5

NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 19, 1987

TIME	NUMBER OF NYSE STOCKS HALTED TOTAL	TOTAL PRICE OF XMI STOCKS HALTED	PERCENT OF XMI VALUE	REPORTED XMI	ADJUSTED XMI -- AS IF PRICE OF HALTED STOCKS :			FUTURES PRICE
					MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT		
10:00	154	8	744.375	53.01698	428.81	415.1093	403.2697	415
10:30	121	8	744.375	53.63107	423.9	418.3594	398.3597	404
11:00	69	1	43.5	3.249079	408.9	408.4146	407.8310	412
11:30	30	0	0	0	422.21	422.21	422.21	424
12:00	18	0	0	0	419.43	419.43	419.43	413
12:30	11	0	0	0	408.59	408.59	408.59	407
1:00	5	0	0	0	408.16	408.16	408.16	410.5
1:30	0	0	0	0	405.6	405.6	405.6	395
2:00	1	0	0	0	390.45	390.45	390.45	375
2:30	1	0	0	0	388.05	388.05	388.05	383
3:00	0	0	0	0	384.52	384.52	384.52	373.7
3:30	1	0	0	0	367.98	367.98	367.98	363
4:00	2	0	0	0	344.7	344.7	344.7	333

TOTAL NUMBER OF STOCKS HALTED DURING THE DAY 167
XMI 11

SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS

2-48

CHART 2-6

XMI ADJUSTED TO COMPENSATE FOR
NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 20, 1987

TIME	NUMBER OF NYSE STOCKS HALTED TOTAL	NUMBER OF NYSE STOCKS HALTED XMI	TOTAL PRICE OF XMI STOCKS HALTED	PERCENT OF XMI VALUE	REPORTED XMI	MOVED SAME PERCENT AS MON-HALTED	EQUAL TO FIRST PRICE AFTER HALT	FUTURES PRICE
10:00	79	13	811.125	69.10363	368.74	413.8567	384.8007	387
10:30	39	5	375.125	30.78166	382.84	380.8785	374.3972	370
11:00	31	2	249	21.15327	369.79	359.7606	361.6221	333
11:30	57	4	327	29.14961	352.41	341.8046	343.2997	312
12:00	112	8	627	56.88017	346.29	334.3120	339.7714	306
12:30	145	7	582	53.06141	344.57	337.2979	336.8733	308
1:00	123	4	369.875	31.56192	368.15	370.8999	362.6916	360
1:30	81	2	88.875	7.890973	353.82	352.6033	354.9587	352
2:00	61	1	23.375	2.065595	355.5	355.0125	355.6963	348
2:30	46	0	0	0	364.51	364.51	364.51	360
3:00	35	0	0	0	383.85	383.85	383.85	379
3:30	15	0	0	0	388.97	388.97	388.97	387
4:00	10	0	0	0	372.08	372.08	372.08	357

SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS

TOTAL NUMBER OF STOCKS HALTED DURING THE DAY 215
XMI 17

Chapter Three

THE EFFECTS OF DERIVATIVE PRODUCTS

Derivative products, particularly futures on stock indexes, play an increasingly significant role in the securities markets. For example, the trading volume of stock index futures has grown spectacularly since their introduction in 1982. By the week preceding the October market break, trading in the Standard & Poor's ("S&P") 500 index futures contract ("SPZ") was averaging 106,400 contracts. ^{1/} This daily contract volume (based on the value of the S&P 500 index during the week preceding the market break) was the equivalent of approximately \$16 billion worth of equity securities, and represented more than two times the average daily dollar volume of trading on the New York Stock Exchange ("NYSE") during September 1987. ^{2/} Similarly, options on stock indexes were the fastest growing segment of the options market in 1987 and, by October 1987, on average accounted for more than 43% of total options contract volume. ^{3/}

The growth of derivative products reflects, in part, the trends toward greater institutionalization of the markets and of market basket trading, coupled with the changing nature of investment strategies. Analysis of these trends sheds light on the growing impact of futures trading in the securities markets.

A. Institutionalization

During the last ten years, institutional investors have held an increasingly large percentage of all outstanding equities. In particular, the growth of United States pension funds and mutual funds, and the accompanying changes in investment policy and asset allocation, primarily are responsible for the increasing institutionalization of the securities markets. ^{4/}

At the end of 1975, institutions held 35.3% of the \$685.1 billion total market value of all NYSE-listed stocks. At that time, pension funds held a total of \$252 billion in assets, \$113 billion of which were equity holdings. ^{5/} By the end of 1980, the market

^{1/} See Divisions of Economic Analysis and Trading and Markets, Interim Report to the Commodity Futures Trading Commission ("CFTC") on Stock Index Futures and Cash Market Activity During October 1987, November 9, 1987, Table 2.

^{2/} See NYSE, Marketing Research Report (November 1987).

^{3/} Total volume for options contracts traded on all exchanges for the period from January to October 1987 was 276,570,000. The volume for index option contracts traded for the same period on all exchanges was 119,535,000 contracts. Index option contracts generally are one-fifth the size of index futures contracts.

^{4/} See Chart 3-1 (overview of pension fund growth and management trends).

^{5/} See J. Light & A. Perold, The Institutionalization of Wealth: Changing Patterns of Investment Decision Making, in Wall Street and Regulation 98 (1987, ed. S. Hayes).

value of all NYSE-listed stocks had increased to \$1.2 trillion, while the institutional investors' share of that market value had remained constant, increasing only .1% to 35.4%. At that time, however, the total value of pension fund assets had increased to \$485 billion, \$220 billion of which were equity holdings, which accounted for 14% of all equities outstanding. 6/ By 1985, pension funds had more than doubled their 1980 level of equity investment, to almost \$500 billion worth of stocks, which accounted for 22% of all equities outstanding. 7/

The 1980s have seen not only a substantial growth in the market value of institutional holdings, but also a surge in the percentage of the total trading volume on the NYSE accounted for by institutional investors. 8/ Large block transactions, 9/ a gauge of institutional participation in the stock market, have increased sharply since 1977. A total of 54,275 large blocks, accounting for 1.2 billion shares (\$34 billion), were traded in 1977. 10/ These transactions accounted for 22.4% of the reported volume on the NYSE for that year. By 1983, these figures had more than doubled. In that year, 363,415 block transactions occurred, accounting for 9.8 billion shares (\$346.92 billion), and representing 45.6% of reported volume on the NYSE. A record average of 2,631 daily block trades occurred in 1986, up from an average of 2,139 daily block trades in 1985, representing 49.9% of reported volume on the NYSE. Moreover, the total number of block transactions on the NYSE increased 23.5% in 1986 from the previous year. This represented a 25.2% increase in the number of shares accounted for by those trades. 11/ As further evidence of the rapid growth of these institutional transactions, on April 10, 1986, a new record was set when 48.8 million shares of Navistar International were traded, which was the largest block transaction in history as of that date. 12/ Prior to April 10, 1986, the largest block transactions in history had occurred on May 25, 1983, when 7.0 million shares of Ramada Inns were traded, and on November 30, 1983, when 6.35 million shares of AT&T changed hands. 13/

B. Market Basket Trading

The types of institutional transactions that occur and the investment decisions made by money managers also have changed as a result of evolving investment and trading strategies. Institutional money managers have made increasing use of passive

6/ Id.

7/ Id.

8/ See Chart 3-2.

9/ Large block transactions are transactions of 10,000 or more shares.

10/ See Chart 3-2.

11/ See Chart 3-2: 539,039 block transactions occurred in 1985, accounting for 14.2 billion shares (\$501.26 billion). In comparison, 665,587 block transactions occurred in 1986, accounting for 17.8 billion shares (\$685.3 billion) traded.

12/ NYSE, Fact Book 12 (1987).

13/ Id.

asset management strategies. In 1980, money managers reported a total of \$9 billion in indexed assets. ^{14/} This figure rose to \$48.2 billion at the end of 1984. By 1985, index fund managers reported \$81 billion in indexed assets, almost a 70% increase over the previous year's figure. As of May 31, 1987, the value of indexed assets for U.S. pension funds grew to \$187.96 billion, \$124.07 billion of which tracked U.S. equity indexes. ^{15/}

As a result of the proliferation of index funds and the growth in indexed assets, along with investment tactics that require the simultaneous trades of large blocks of stocks, institutional investors increasingly have used program trades. Index fund managers began program trading in the mid-1970s. ^{16/} Currently, an estimated 25% of all institutional trading is accomplished by use of program trades. ^{17/} These trades include straight execution of multi-stock orders, as well as index arbitrage and substitution strategies, among others. The increase in this activity appears to have accelerated in 1987. For example, in January 1987, an average of 12.1 million shares per day was executed through the List Order Processing ("LIST") capability of the NYSE's Designated Order Turnaround ("DOT") system but by August 1987, that number had increased to an average of 16.6 million shares.

C. The Effects of Futures

The increasing institutionalization of the markets and the growth of passive investment strategies, such as indexing, ^{18/} have been accompanied by the increasing use by institutional investors of derivative products such as index options and financial futures. By 1984, only two years after the introduction of cash settled stock index options and futures, a number of institutional investors were using or actively considering using derivative markets to earn incremental returns on managed money, allocate assets to adjust for market risk, and manage various commercial and financial risks. ^{19/} Forty of the top 200 pension funds were using stock index futures at that time. Their use of derivative products, however, did not include dynamic hedging or portfolio insurance to any large extent. In 1984, only an estimated \$200 million in

^{14/} Christman, Indexed Assets up 70% in 1985, Pensions & Investment Age 6 (Dec. 23, 1985).

^{15/} Berkowitz, Indexed Assets Top \$187 Billion, Pensions & Investment Age 3 (July 13, 1987).

^{16/} See, e.g., Investment Dealers' Digest 25 (March 2, 1987).

^{17/} Light & Perold, supra note 5, at 110.

^{18/} Indexing involves holding stocks in proportion to a widely followed index like the S&P 500.

^{19/} Board of Governors of the Federal Reserve System ("FRB"), Commodity Futures Trading Commission and the Securities and Exchange Commission ("SEC"), A Study of the Effects on the Economy of Trading in Futures and Options (Dec. 1984) ("Joint Study") at IV-17.

pension fund assets were dynamically hedged. 20/ This changed rapidly over the next three years as pension funds expanded their use of dynamic hedging or portfolio insurance strategies. In 1985, portfolio insurance was applied to an estimated \$6 billion of pension fund assets. 21/

By 1986, the amount of pension fund assets committed to portfolio insurance strategies had increased to at least \$8.5 billion, forty times greater than the value of pension fund assets that were dynamically hedged in 1984. 22/ By October 19, 1987, stock valued at more than \$60 billion, mostly held by pension funds, was reported to be managed under portfolio insurance strategies. 23/

The Division of Market Regulation ("Division") has attempted to verify the total dollar value of portfolio assets that were subject to some type of portfolio insurance or protective hedging program during the October 1987 market break. Division staff spoke with the major vendors of portfolio insurance programs, with broker-dealers and banks that manage large portfolios, and with many corporate pension plan managers. Based on these interviews, the staff has identified a minimum of approximately \$55 billion in portfolio assets that were committed to some type of portfolio insurance strategy. This figure is a minimum estimate of portfolio assets subject to some type of portfolio insurance or protection plan. 24/ Moreover, staff interviews with market professionals indicate that a wider range of institutions actively use the futures markets. While these institutions do not employ the precise trading strategies dictated by portfolio insurance, they do employ the futures market to quickly adjust their relative equity holdings in a manner that can have effects on the market similar to portfolio insurance trading.

1. Benefits

As the staff has noted in prior analyses, the impact of index-related trading on the markets should be viewed in the context of the benefits provided by such trading. Various studies conducted before the October 1987 market break concluded that futures

20/ Ring, Funds Watch as Others Try Program Trades, Pensions & Investment Age 1 (April 28, 1986).

21/ Ring, Dynamic Hedging Grows Despite Debate, Pensions and Investment Age 3 (April 14, 1986).

22/ Id.

23/ Ring, Execs Ponder Compatibility of Strategies, Pensions & Investment Age 15 (July 27, 1987).

24/ While this figure is smaller than estimates ranging from \$60-\$100 billion that have appeared in the press, we have attempted to the maximum extent possible not to double count portfolio assets. Various portfolio insurance programs are licensed by vendors. As a result, obtaining an accurate estimate of the amount of portfolio assets subject to some type of portfolio insurance strategy is difficult because information obtained from licensees also may have been provided by vendors.

and options on stock indexes offer significant benefits to today's capital markets. ^{25/} These studies found that the markets for these index products, especially the market for SPZ futures, add substantial liquidity and pricing efficiency to equity markets generally. Moreover, using these products, investors are able to control the risks in their portfolios in accordance with their particular needs. As a result, the markets perform their various economic roles more efficiently.

a. Liquidity Efficiencies

As described in Chapter One, an index option or future is a single instrument that can be used as a surrogate for many stocks. Substantial market making capital is concentrated in the more successful of these products, especially the SPZ future and the S&P 100 index option. In addition, market makers and hedgers are afforded favorable margin requirements, enabling them to effect transactions at lower cost. These factors contribute to the futures market's liquidity, allowing investors to execute large transactions with much smaller market effects than is possible in the separate stocks. ^{26/}

b. Transactional and Hedging Efficiencies

The availability of derivative index products has substantially enhanced institutions' and other market professionals' hedging and market timing capabilities. Index futures and options also significantly reduce transaction costs when assets are reallocated among such as stocks, bonds and cash equivalents in a portfolio, or when additional funds are invested. ^{27/} Because commission rates, as well as execution costs, are lower for futures than for stocks, institutions changing the proportion of stocks in a portfolio can do so at lower cost by initially using the futures rather than the stocks themselves. For example, a debt portfolio can be converted rapidly to equity by simultaneously selling bond futures and buying stock index futures. In doing so, managers can increase their equity exposure without incurring the relatively higher transaction costs of the stock and bond markets. Thus, futures not only allow for the rapid reallocation of a portfolio, but create substantial savings in execution and

^{25/} See, e.g., Joint Study, *supra* note 19, at IV-35; H. Stoll & R. Whaley, Expiration Day Effects of Index Options and Futures (1986) ("Stoll Study").

^{26/} A 1985 study by the investment firm of Kidder, Peabody & Co. estimated the difference in costs as follows: the cost of executing a \$20 million stock trade in terms of the effect on the price of the stock would be 0.27%; for a similar futures trade, 0.04%. R. Wunsch, *Stock Index Futures* (Kidder Peabody & Co., April 23, 1985). More recently, Morgan Stanley estimated the market impact cost of a \$120 million S&P 500 basket as 1.30 index points (or \$520,000) in the stock market versus .05 index points (or \$20,000) in the SPZ. R. Johnson, *Program Trading Presentation* (Morgan Stanley, July 9, 1987).

^{27/} Of course, the cost of executing a program has changed over time. According to Fredric A. Nelson of Bankers Trust, a \$50 million S&P 500 program would have cost an investor \$290,000 to execute in 1984, \$165,000 to execute pre-October 1987, and \$345,000 to execute after October 1987. F. Nelson, *Trading Strategies and Execution Costs* (Bankers Trust Company, December 3, 1987).

transaction costs. Of course, when and if the stock transactions take place, commission costs are incurred.

Moreover, as hedging vehicles, stock index products can offer investors substantial benefits. Through the sale of futures contracts, pension, endowment and other institutional investors can quickly, at relatively low cost, shift risk to those more willing to accept it.

2. Price Impacts of Futures

The existence of an active futures market in stock indexes has created, in effect, an alternative or "synthetic" stock market for the growing number of institutional investors who choose to trade passively by investing in funds tied to specific indexes or who are interested in buying and selling stocks in "baskets." The data set forth in the Market Chronology (Chapter Two) demonstrate the substantial impact this alternative stock market can have on the equity market, especially by increasing intra-day price volatility.

When futures on stock indexes were introduced, little attention was paid to the possible "price discovery" aspect of this new product or to its ability to displace the stock market as the preferred vehicle for trading baskets of stock. The primary emphasis was on the significant potential for hedging investment risk that was offered by a cash-settled future. Nevertheless, it is our view that, as a result of the increasing use of the futures market by institutional investors, including investors employing passive investment strategies and dynamic hedging techniques, ^{28/} the character of the market has changed to the point where the "price discovery" feature of the derivative market is leading, rather than following, price trends in the underlying equity markets. Moreover, through index arbitrage, the prices "discovered" in the futures pit are quickly transmitted to the floor of the NYSE where prices adjust to the general market sentiment expressed in the futures arena.

There are several reasons for the increased impact of futures. First, low transaction costs, low margin requirements, and normally high levels of liquidity, the very benefits cited by futures proponents, have made the futures market the "market of choice" for many active institutional traders. Many institutional traders who use futures reported to the staff that they did so because futures were a "cheaper" alternative to buying individual stocks. Some believed that they could increase or decrease market exposure virtually instantaneously, with little market or liquidity costs. For this reason, as noted above, the underlying market value of index futures traded daily generally exceeds the dollar volume on the NYSE. ^{29/} Accordingly, institution-led market movements are usually observed first in the futures markets.

^{28/} Dynamic hedging involves rebalancing a market portfolio to increase or decrease the proportion of equity exposure depending on market movements.

^{29/} The dollar value of SPZ 500 futures contracts traded daily has exceeded the dollar value of daily transactions on the NYSE since the last quarter of 1983. See N. Katzenbach, An Overview of Program Trading and Its Impact on Current Market Practices, 10 (December 21, 1987).

Second, the capital available for index arbitrage has increased substantially. In the early developmental stages of index arbitrage strategies, large broker-dealer firms trading for their own proprietary accounts dominated the business. These same firms continue to be the major players in index arbitrage, but today much of their business is as agent for institutional customers. Moreover, the availability of an efficient order routing system for baskets of stock (the NYSE LIST system) has decreased the time, and therefore the execution risk, involved in executing program trades. Efficient order routing also has increased the speed with which market movements in futures can be transmitted to the stock market.

Institutional investors also can make greater use of index arbitrage strategies than firms can trading for their own accounts. As noted below, the ability to initiate a so-called "short" arbitrage (*i.e.*, buy futures, sell stocks "short") is limited by the Commission's and exchanges' short sale rules, which require that the "short stock" portion of the arbitrage be executed on "plus" ticks or "zero plus" ticks ^{30/} for each of the stocks comprising an arbitrageur's basket. Many institutional investors, particularly those who manage passive or index funds, already own the stocks underlying the index and, therefore, can initiate an arbitrage transaction involving stock selling without considering the short sale rule, because their sales would be "long" sales and not subject to the "tick" test provisions of the short sale rule. Moreover, because these institutions already own the securities comprising the index, the return they must receive on the arbitrage is less than would be required by other market participants. Accordingly, they are willing to effect arbitrage transactions with a smaller spread between the futures price and theoretical fair value.

The result of all these trends has been to increase the speed and frequency with which index futures price movements are transmitted to the stock market. There is, of course, nothing inherently wrong with index futures providing price discovery for the stock markets. Indeed, such close coordination of two related markets generally enhances pricing efficiency. The emergence of futures as a stock price leader, however, has had a significant impact on the stock market.

First, it increases the difficulty of enforcing marketmaking obligations imposed on specialists. As discussed in detail in Chapter Four, stock specialists are generally expected to buy or sell securities to offset temporary imbalances in supply and demand and to provide price continuity, depth, and liquidity, the general indicia of fair and orderly markets. Interviews with specialists confirm, however, that if the future is trading at a discount or premium to its theoretical value, specialists are unwilling to act aggressively to offset imbalances because the discount or premium indicates that more arbitrage selling or buying will enter the market. ^{31/} Other market participants may be equally reluctant to trade against pricing signals emanating from the futures market.

^{30/} A "plus tick" is a trade at a price greater than the immediately preceding transaction and a "zero-plus tick" is a trade at a price greater than the last transaction at a different price (*e.g.*, a trade at 20 would be a plus tick if the prior trade was 19 7/8, and a zero-plus tick if the two prior trades were 19 7/8 and 20).

^{31/} See Chapter Four, *infra* for a discussion of specialist obligations and performance standards.

Second, the relatively low margins and absence of short sale restrictions in the futures market may encourage additional trading that might not occur if the derivative index products did not exist, in that large stock equivalent positions can be established or liquidated more quickly. The price movements caused by this increased trading velocity are then rapidly assimilated into the stock market through arbitrage, because arbitrage liquidations and index substitution activity again can occur consistent with short sale restrictions.

The staff believes that these two effects of futures price leadership (greater difficulty in maintaining orderly stock markets and an increase in the velocity of trading) have converged to contribute to increased intra-day volatility in the stock market. Indeed, recent studies have indicated that while, prior to 1987, inter-day stock price volatility was not out of line with prior periods, intra-day volatility was increasing. Moreover, by early 1987, inter-day volatility appeared to be increasing as well. ^{32/}

This price impact does not appear to occur because of speculative activity in the index futures market. Neither our examinations of price volatility on September 11 and 12, 1986 and January 23, 1987 nor our analysis of futures trading during the October market break indicates that speculative activity in the futures market was predominant. Rather, as detailed in Chapter Two, institutions, not speculators, were the primary net sellers of futures on October 19, the day of the greatest market decline.

^{32/} See, e.g., Cowan, Whether Swings Will Continue is Uncertain, N.Y. Times, January 2, 1988, at 31, col. 3 ("It used to be that, on a given day the [DJIA] moved up or down by more than 2[%] only about once a month. Since May, such swings increased in frequency to almost once every three weeks, and by the fourth quarter of 1987, they occurred almost every other day on average"); N. Katzenbach, supra note 29, at 21-23; F. Edwards, Financial Futures and Cash Market Volatility: Stock, Index and Interest Rate Futures 18 (September 1987) ("Beginning in 1986, . . . volatility began to rise, and in 1987 increased even more. This pattern is evident for all measures of volatility, which show similar movements [footnote omitted].") According to Professor Edwards, from 1985 to 1986, the standard deviation of the high-low estimator for the S&P 500 increased from 0.3534 to 0.5832, while the mean of that indicator increased from 0.7809 to 1.1204. It should be noted, however, that Professor Edwards also stated: "It is doubtful that the rise in stock market volatility is due to anything associated with futures trading.")

We would note that some of the studies which have sought to measure market volatility before and after the introduction of stock index futures have done their comparisons using the Spring of 1982 as the relevant "event date" because that is when such futures were first introduced. However, such an "event date" does not accurately capture the full effects of futures trading. The dollar equivalent of stock trading via futures did not exceed NYSE trading volume until late 1983, proprietary index arbitrage did not become significant until Spring/Summer of 1984, index substitution programs only came into play during 1985-86, and dynamic hedging became considerably greater in 1986-87. Thus, whether such pre-/post-studies can ever "prove" that the market has been more or less volatile since the introduction of stock index futures, such studies should, at least, use a more finely textured "event date."

The important issue, therefore, to examine in evaluating institutional futures trading is whether the trading strategies employed by those institutions contributed to a net increase in stock market activity during the October market break. For the reasons discussed below, we believe they did.

D. Analysis of October 1987 Trading

The staff's review of trading patterns during the period October 6 to October 20 leads us to the conclusion that no single factor, economic, structural or psychological, was responsible for the size and breadth of the October 1987 market break. To the contrary, the staff believes that a variety of factors came into play during the key trading days that affected investment and trading decisions.

Analysis of trading during the two-week decline that immediately preceded the October 19 market break suggests that the decline was triggered by changes in investor perceptions regarding investment fundamentals and economic conditions. Market participants interviewed by the staff enumerated a number of fundamental factors which could have contributed to these changed perceptions. As noted above, these included: (1) rising interest rates, (2) persistent United States trade and budget deficits, (3) concerns relating to the possible overvaluation of stock prices generally resulting from the rapid increase in prices during 1986 and the first eight months of 1987, and (4) declines in the value of the United States dollar relative to other currencies. Also cited as a negative factor, particularly with respect to declining stock prices on and after Wednesday, October 14, was a possible adverse change in the tax treatment of interest payments for securities used to finance takeovers.

Historically there has been a strong inverse relationship between interest rates and stock price performance. ^{33/} For over four years during the bull market, short-term interest rates had been trending downward in most of the major financial markets. Short term interest rates in the United States bottomed out, however, in October 1986. As can be seen in Charts 3-4 and 3-5, short-term interest rates reversed their general downward trend in many other countries in the spring or summer of 1987.

Increasing budget and trade deficit pressures and a tightening of the money supply exerted upward pressure on interest rates in late 1986. The increase in monetary aggregates began to slow in the United States about the time that short-term interest rates turned upwards. Charts 3-6 and 3-7 illustrate that the money supply measures, M1 and M2, began to decline compared to the gross national product in the last quarter of 1986. ^{34/} Although these pressures eased in subsequent months, they forcefully reemerged by the fall of 1987.

While interest rates were steadily rising, returns on equity investments were on the decline. By August 1987, stock markets in the United States and around the world

^{33/} Chart 3-3 shows this relationship over the past decade for the S&P 500 index and U.S. short-term Treasury bill rates.

^{34/} Heinemann, Placing Bets on the Volatility of Global Casino, American Banker, November 23, 1987, at 9; Stockmarkets Growing Menagerie, The Economist, December 16, 1987, at 80, 82.

generally had experienced five years of dramatic price increases. Further, stock prices increased faster than earnings through much of the period from late 1984 to late 1987. As seen in Chart 3-8, the ratio of common stock prices to earnings declined for two quarters in 1986 but continued after that to approach historical highs in 1987. As a consequence, the yields represented by stocks' dividend payouts declined from levels above 4.5 percent in late 1984 to historically low levels well below 3.0 percent in 1987. By October 1987, stock yields reached record low levels relative to the rate of interest on U.S. government securities.

The further weakness of the dollar, relative to other major currencies, contributed to investors' fears concerning the future prospects for inflation. There was speculation in the financial press that a further decline in the United States dollar could result in the withdrawal of funds by foreign investors from the United States securities markets.

Finally, a tax bill reported out of the House Ways and Means Committee that would have severely limited tax deductions for interest paid on debt used to finance takeover activity may have had an effect on stock prices. ^{35/} Preliminary data prepared by the Commission's Office of Chief Economist ("OCE") indicate a correlation between events concerning the tax bill and stock price movements during the market break. OCE examined movements in the S&P 500 index, the NYSE composite index, and a portfolio of takeover stocks after five significant announcements about the tax bill. OCE preliminarily found that announcements indicating favorable action on the bill (e.g., the announcement that it had been agreed to by the Committee) were followed by drops in stock prices and that announcements indicating that the tax provisions might be dropped, including an announcement by the Committee Chairman that he would agree to a reasonable compromise on the bill, were followed by increases in stock prices. ^{36/}

Data provided by firms to the NYSE and published by the Securities Industry Association ("SIA") ^{37/} indicate that institutional investors began adjusting their portfolios in response to these changes in September 1987. Institutional investors averaged net purchases of 2.8 million shares daily on the NYSE through August; in September, institutional net sales averaged 300,000 shares daily. Institutions' negative outlook toward stocks intensified in the first half of October, with net sales increasing to 4.4 million shares or about \$160 million daily. Observers noted that large accounts raised sizeable amounts of cash by selling equities to lock-in profits earned during the

^{35/} See New Tax Bill Threatens to Kill Most Debt Financed Takeovers, Investment Dealers Digest 16 (Oct. 19, 1987).

^{36/} OCE has not, however, completed its analysis of this issue. Moreover, it should be noted that other factors arguably may have influenced price movements on these days. In particular, as discussed above, there were significant political and economic developments in September and early October that caused considerable uncertainty in the markets about the course of interest and inflation rates. See also Report of the Presidential Task Force on Market Mechanisms (January 1988) ("Task Force Report") at 15-17 and Takeover Issues Soar Over Rostenkowski Tax Comments, Dow Jones News Service, Oct. 29, 1987.

^{37/} The SIA is the trade association representing over 500 securities firms headquartered throughout the United States and Canada.

previous five years ^{38/} and switching to bonds to take advantage of double-digit bond yields.

Just as investor perceptions about fundamental factors appear to have been the "trigger" for the market declines during October 14-16, on October 19, 1987, institutional stock selling was the largest single direct factor responsible for the initial opening declines in the popular stock averages: the Dow Jones Industrial Average ("DJIA") and the S&P 500. Moreover, brokers reported to the staff the presence of significant selling at the opening by foreign investors. Finally, it appears as if panic selling in a broad range of stocks caused by a variety of factors coupled with an absence of buyers (except at distressed levels) were primarily responsible for the free-fall decline that characterized the final hour of trading in stocks.

Accordingly, futures trading, and strategies involving the use of futures, were not the "sole cause" of the so-called market break. Nevertheless, the existence of futures on stock indexes and the use of the various strategies involving "program trading" (i.e., index arbitrage, index substitution and portfolio insurance) were a significant factor in accelerating and exacerbating the declines. ^{39/} For the three critical trading days--October 16, 19, and 20--we have been able to attribute 6.3%, 16.7%, and 25.5%, respectively, of futures trading to portfolio insurance selling. In response to the resulting real or apparent futures price discounts, index arbitrage and portfolio insurance strategies represented significant percentages of volume on the NYSE in the stocks comprising the S&P 500 on each of these days. Moreover, during certain critical trading periods, index arbitrage or portfolio insurance or both accounted for between 30 and 68% of total NYSE volume in the S&P 500 stocks.

On October 16th, the principal direct effect of futures trading on stock prices was in the form of index arbitrage and substitution, which accounted for approximately 37.2 million shares of trading (10.8% of NYSE and 14.8% of S&P 500 volume). Of greater significance, however, was the fact that during the critical last half-hour of trading on Friday, October 16, index arbitrage was a major factor in the significant

^{38/} U.S. Debt Issues Rise Strongly, N.Y. Times, Oct. 20, 1987, at D1.

^{39/} In the Division's September 1986 Report, the staff identified concerns that index-related trading strategies could fuel a market decline severe and rapid enough to create a stock market collapse or "cascade scenario." Briefly, the scenario involves index futures prices responding to bad fundamental news and moving to a sufficient discount to theoretical value to trigger short-side index arbitrage, index fund substitution and unwinding of previously established long arbitrage positions. The resulting stock selling drives equity and futures prices to levels that trigger portfolio insurance programs. These programs further depress futures prices and cause the cycle to repeat itself. The resultant plunging stock prices trigger stop-loss sell orders in individual stocks and force additional liquidations to meet margin calls and broker-dealer requirements, leading to panic selling and a market collapse. As is clear from the discussion in the text, this scenario is far more simplistic than the multitude of factors influencing trading during the October market break. Nevertheless, the effect of futures selling on the stock market is relevant to what occurred. See SEC, Division of Market Regulation, The Role of Index-Related Trading in the Market Decline on September 11 and 12, 1986 (March 1987) ("September 1986 Report") at 21.

decline in the DJIA that occurred during that period. In particular, between 3:40 and 3:50 p.m., approximately 6.6 million shares were sold as arbitrage and index substitution, which, with one million more shares sold in non-arbitrage programs, constituted 52.1% of NYSE volume and 67.9% of volume in S&P 500 stocks.

On October 19, both index arbitrage and portfolio insurance strategies were present and significant. For the day, total index arbitrage selling amounted to 37.6 million shares. This represented 6.2% of total NYSE volume for the day and 8.9% of S&P 500 volume, and was less, both in absolute and percentage terms, than the levels of index arbitrage found in the staff's review of trading during the market decline on September 11 and 12, 1986. ^{40/} During several crucial periods, however, index arbitrage represented a significant portion of total S&P 500 stock volume. From 10:00 to 10:10 a.m., index arbitrage accounted for 36.9% of total S&P 500 stock volume. Similarly, between 1:20 and 1:30 p.m., when the DJIA fell sharply after a late morning rally, index arbitrage and substitution accounted for more than 45% of S&P 500 stock volume.

Overall, however, the role of index arbitrage was much less pronounced than was the impact of portfolio insurance strategies effected both in the stock and futures markets. Unlike the findings of our September 1986 Report, portfolio insurance selling in stock and futures was significant, particularly during October 19 and October 20. Most of the program stock trading not attributable to index arbitrage that occurred on October 19 and 20 was accounted for by portfolio insurance selling. Further, much of the portfolio insurance selling was done by a single large institutional investor that executed large trades in both the stock and futures markets.

The impact of the portfolio insurance stock selling combined with the impact of index arbitrage trading was the dominating force in the stock market during certain periods. On October 19, the combination of selling from portfolio insurance and index arbitrage totalled more than 63% of stock volume from 1:10 to 1:20 p.m. and over 60% both from 1:30 to 1:40 and 1:50 to 2:00 p.m.. Likewise, on the morning of October 20, when stock prices began to decline rapidly, more than 6.3 million shares of portfolio insurance selling occurred.

In addition to direct effects, the use of derivative products in program trading strategies had a significant indirect impact on the markets -- particularly on October 19 -- in the form of negative market psychology. Although difficult, if not impossible, to quantify, the staff believes that futures trading during the critical periods had a disproportionately negative effect on the market considering the absolute number of contracts or shares sold in arbitrage or portfolio insurance strategies. First, the knowledge by market participants of the existence of active portfolio insurance strategies created a market "overhang" effect in both the futures and stock markets. Institutional traders were able to anticipate significant selling in futures and stocks coming from portfolio insurance. Thus, they refrained from entering the market as buyers and their absence acted as a damper to price rises. More important, however, was the effect on market psychology of the persistent discount that appeared in the S&P 500 future on October 16 and continued at record levels on October 19 and throughout that week.

^{40/} Index-related arbitrage accounted for 42.1 million shares on September 11, 1986 (18% of NYSE volume) and 41.9 million shares on September 12, 1986 (17% of NYSE volume). September 1986 Report, supra note 39, at 9.

A number of institutional investors have informed the staff that these discounts acted to discourage institutional participation in the stock market on the buy side, particularly in the afternoon of October 19 when the market suffered its steepest declines. To those investors, the persistent, and enormous, discounts between futures and equities indicated that the market was headed lower and thus that buyers should wait to purchase stocks at even lower levels. As we noted, to some extent these discounts may have been illusory on the morning of October 19; nevertheless, they were sufficient to spur substantial arbitrage activity. Moreover, it was not the actual size of the discounts that was significant, but the effect that the discounts had in convincing many institutions to focus their portfolio insurance liquidations on the stock market and in discouraging potential buyers from purchasing stocks.

Persistent discounts in futures not only kept buyers out of the market, but also discouraged participation of block positioning firms, or at least discouraged them from risking their firm's capital, to position large blocks of equities. As discussed in Chapter Four, block positioning firms sharply reduced their activity on October 19 and 20. Moreover, some firms reported in staff interviews that they were willing to position blocks only in relation to the price in the futures market, a level far below stock prices disseminated simultaneously.

It is difficult to quantify with any precision the overall effect of derivative products on the size of the decline in stock prices that occurred on October 19 and the weeks that preceded it. Other factors were present in the markets at that time, including those fundamental factors that we discussed above. Also, present were such non-economic factors relating to world politics as the attack by U.S. military forces on an Iranian oil platform. And, as we note in other parts of this report, operational breakdowns and stresses, coupled with financial stresses, were a significant part of the overall picture during this period.

Moreover, the conclusion that futures-related trading contributed significantly to selling pressure in the equity markets during the October market break does not diminish the role that futures played in providing liquidity to "synthetic" stock sellers. The availability of futures absorbed some amount of selling pressure that otherwise might have resulted in direct selling in the stock market. For example, on October 19, 162,000 SPZ futures contracts changed hands, the equivalent of nearly \$20 billion of equity securities in the stocks that comprise the S&P 500 index. After deducting the trading engaged in by floor traders, who accounted for about 31% or 50,000 contracts, the futures market traded more than \$14 billion in "synthetic" stock sales, an amount equal to 58% of the NYSE dollar volume for October 19.

At the same time, however, it is important to emphasize that futures liquidity was reduced substantially during the October market break. ^{41/} In fact, it was well below

^{41/} For example, "evidence of the relatively low level of activity in derivative markets is that for the week [of October 19] as a whole, the equity value of index futures traded was only 68% of stock [dollar] value traded, a figure that is usually in excess of 200%. Also, the exercise value of index options traded was 37% of stock value traded, a figure that in the previous week was 298% of stock value traded." J. Hill, Commentary on the October 1987 Stock Market Crash (Kidder, Peabody & Co., October 23, 1987) ("Kidder, Peabody Commentary") at 3. See Toy & Zurack, Stock Index Options and Futures . . . sifting through mid-

the levels anticipated by institutions with portfolio insurance strategies. Indeed, one study indicates that futures transaction costs "exploded" on October 19 and 20. ^{42/}

It is difficult to measure the degree to which portfolio insurance and other institutional trading strategies contributed additional selling that, but for the availability of the futures markets, would not have occurred. In analyzing this question, it is important to note how portfolio insurance diverges from more traditional asset allocation strategies. Many traditional asset allocation strategies attempt to shift fund assets from stock to bonds or other investments based on a determination as to which investment will bring higher returns in the near to intermediate term. Asset allocations are made based on fundamental value indicators and attempt to be predictive of future price increases. As the strategy has been employed, it did not involve adjusting a portfolio so quickly as to require substantial trading in a short period of time. ^{43/}

In contrast, portfolio insurance provides for disciplined and immediate selling after the market turns down. Moreover, most portfolio insurance selling generally is triggered by a single event, a market downturn, rather than widely divergent views as to the future course of the stock market. In interviews with pension plan managers and portfolio insurance brokers, it became clear that their strategies depend on increased and concentrated trading rather than on more gradual stock sales that characterize traditional asset allocation strategies.

The increasing popularity of portfolio insurance has had a number of identifiable effects on the market. First, because portfolio insurance, in effect, acts as undisclosed selling pressure, it has a significant overhang effect. Disciplined portfolio insurance attempts to emulate a put option, limiting the total loss that will be experienced by a portfolio during a downturn. When puts are purchased, however, they send a bearish message to the market, with price increases in the put options being translated into price decreases in the component stocks through arbitrage or options market makers

October's market (Goldman Sachs, 1987) ("During [the] week [of October 12] the December S&P 500 futures contract fell 9.42%, heavy losses forced many locals and other speculators to the sidelines and drained liquidity from the S&P pit."); Szymczak, A Major League Lesson for Floor Traders, *Futures* 48 (December 1987).

^{42/} S. Bodurtha, The Impact of October 19 on Transaction Costs in the Equity and Stock Index Futures Markets: A Preliminary Update (Kidder, Peabody & Co., undated). Bodurtha reports that in September the average price change between reported trades in the December S&P 500 was 0.05 index points, 0.02% of the index value, but that "[t]he average price change between reported trades exploded on October 19 to a level of 0.66, and to 0.89 on October 20. In percentage terms, 0.89 represents 0.41% of the average price of the December S&P 500 futures on October 20 [a 487% increase over early October]." In addition, Bodurtha estimates that, in September, the average bid/ask spread in S&P 500 stock was \$0.23 per share, or 0.45% of market value in September, but that, in November, this spread increased to \$0.29 per share representing 0.77% of market value. See Toy & Zurack, *supra* note 41 ("the bid/ask spread on the futures contract widened dramatically [on October 19] making it very difficult to determine at what price S&P 500 futures could be purchased").

^{43/} Light & Perold, *supra* note 5, at 115.

hedging their short positions. With portfolio insurance, on the other hand, no bearish message is sent to the market even though the investment strategy adopted by the institution is essentially identical. Accordingly, instead of a direct message sent through a put purchase, the market becomes generally aware that there is an increasingly large commitment to sell futures, stocks or both, anytime the stock index price moves downward. The market suffers from limited information that does not permit it to calculate selling interest successfully. The impact of this limited information is to discourage buying activity during market downturns because market professionals cannot determine whether any rebound in the market will be overwhelmed by an avalanche of portfolio insurance futures selling and resultant index arbitrage selling in the stock market.

Second, by the very nature of the strategy, portfolio insurance increases the concentration and velocity of institutional trading. As discussed in detail above, portfolio insurers were very active sellers on October 19 and 20, with a single pension fund selling 36 million shares of stock over the two days. The fund also sold almost 7,000 SPZ futures contracts, the equivalent of approximately 19 million shares, over October 16 and 19. In our interview with senior personnel of that pension fund manager, they indicated that their determinations to maintain relatively high equity investments were made, in part, because of reliance on the risk-reduction capability of portfolio insurance. The Task Force Report survey confirms this impression. ^{44/} The survey indicated that institutions employing portfolio insurance had an average of 56% of funds under management invested in equities as compared to 46% for other money managers who did not use this strategy. Moreover, four of the portfolio insurers responding to that survey indicated programs calling for the liquidation of anywhere from 22% to 50% of their equity holdings in response to a 10% S&P 500 index price decline. ^{45/}

While the actual liquidations effected were apparently less than the programs called for (perhaps due to the inability to sell the full amount desired at acceptable prices), our review leads to the conclusion that portfolio insurance dramatically increases the amount and velocity of trading and permits a group of institutions that manage a relatively small proportion of total pension fund assets to have a substantially disproportionate impact on stock market volatility. In contrast, the responses to both the SEC and Task Force Report surveys of institutions suggest that institutions following more traditional investment strategies were not major sellers during the break. The SEC staff surveyed the 23 pension fund managers with the largest amount of money under management. Of the 20 that responded, 14 did not use portfolio insurance and one had not employed the strategy since 1986. During the week of October 19, these managers were relatively inactive. Indeed, on average, these managers sold only 1.4% of their portfolios. Perhaps even more significantly, at least four of these managers were net buyers on both October 19 and 20. ^{46/} The Task Force Report survey shows a

^{44/} Task Force Report, supra note 36, Study V: Surveys of Market Participants and other Interested Parties ("Study V"). See also Task Force Report at 9.

^{45/} Study V, supra note 44, at V-15.

^{46/} Although a questionnaire was sent to 23 money managers, only 11 entities (47.8%) responded with data regarding net purchases and sales for these days. Thus, while our survey shows 17.4% of the money managers surveyed were net buyers,

similar trend, with 74% and 71% of those money managers not using portfolio insurance taking no action on October 19 and 20, respectively. Moreover, of the remainder, a greater percentage apparently purchased equities than sold.^{47/} Our staff interviews of institutions that were active traders on October 19 provide another example. One manager of a major university endowment reallocated the endowment's portfolio from two-thirds stock to one-third stock during August and September, 1987. During the week of October 19, however, he responded to low stock prices, and the discounts available in the futures markets, by purchasing 4,000 SPZ futures contracts, which is the approximate equivalent of 10,750,000 shares of stock.

In reviewing the events of October 1987, it is important to emphasize that the increased concentration of trading in derivative index products is not attributable only to portfolio insurers. While more difficult to quantify, we believe that low execution costs and margin requirements for derivative index products have encouraged a wider group of institutions to depend on the liquidity of the index futures markets to liquidate substantial portions of their equity portfolio more quickly than they would be able to through the stock market. As demonstrated on October 19, however, the assumed liquidity levels of the futures market become dramatically lower during a market plunge, resulting in large futures price discounts and spillover stock selling.

The third significant effect portfolio insurance, combined with the resultant program selling in declining markets, has had on the market has been to substantially increase the risks for equity specialists. In traditional institutional block trading, the specialist generally is a peripheral player. Blocks are negotiated upstairs by major block positioning firms and crossed on the floor with only limited participation by specialists, who may provide some liquidity for that block. Even when an institution chooses to "work" a block by gradually selling it on the floor, the specialist is not expected to absorb most of the selling interest but, instead, to cooperate in its relatively passive selling.

The impact on specialists of program selling of blocks is very different. The orders arrive through the NYSE's LIST system in rapid succession. The specialist has no means to estimate when the rush will stop. Moreover, block positioning firms, which ordinarily would find both sides to the trade, simply send the programs down to the floor with the expectation that the specialist generally will be on the other side of the program orders, either as principal or agent. Thus, while institutionalization of the markets for years has deemphasized the role of specialist marketmaking, program trading suddenly has reelevated that role and placed the specialist in the position of having to take much greater proprietary positions than ever before. The specialists' difficulties in accommodating institutions' expanded needs during the October market break is discussed in detail in Chapter Four.

E. Summary and Issues Requiring Further Review

In summary, we believe that three dramatic trends have occurred as a result of trading in derivative index products. First, stock index futures have supplemented and often replaced the stock market as the primary price discovery mechanism for stock

this percentage actually could be larger.

^{47/} Study V, supra note 44, at V-18.

price levels. Indeed, due to the linkages between the two markets, the futures market has become the market of choice for many institutions that trade actively. Second, the availability of the futures market has spawned institutional trading strategies that have greatly increased the velocity and concentration of stock trading. Third, the resultant increase in index arbitrage and portfolio insurance trading in the stock market has increased the risks incurred by stock specialists and has strained their ability to provide liquidity to the stock market.

We believe that the result of these three interwoven trends has been to increase the probability of abrupt market price swings. We note that the October market break was not just a dramatic one-time reevaluation of securities markets. The aftershocks of October 19 continue to affect the markets today. As discussed in detail in Chapter Four, quote spreads, liquidity and continuity on the NYSE continue to evidence the decreased liquidity that has characterized the market since the October market break. Moreover, actual market volatility has been substantially higher. Indeed, implied future volatility as measured by options premiums remains at over twice the level set before October 19.

We cannot confidently conclude that the impact of futures trading will be reduced substantially because of lessons learned during the October market break. Although the Task Force Report survey and our interviews indicate that a significant number of pension plan managers have reevaluated the use of portfolio insurance, we believe it is inevitable that many institutions will continue to rely on the futures market to liquidate large amounts of stock positions after market downturns have commenced. Moreover, while the reduction of portfolio insurance may make individual sellers more restrained, the steadily increasing number of institutions employing the futures market for other strategies may, in the aggregate, continue to increase the impact on the stock market of futures trading. The market will, of course, "self-correct" to some degree. However, continued volatility, such as the 140-point drop in the DJIA on January 8, 1988, suggests that any self-correction has not as yet been sufficient to prevent large price swings that do not appear to be fully explained by economic fundamentals.

The Division continues to believe that derivative index markets provide valuable hedging and market timing benefits to institutions. As a result, any changes to the regulation of those products must be effected with great care. Nevertheless, we believe a number of responses should be thoroughly explored. In particular, we believe that the Commission should weigh the costs and benefits of (i) initiatives that might increase the capacity of the stock market to provide liquidity for more concentrated institutional trading, and (ii) actions that might retard the increased velocity and volume of intermarket trading. The following discussion considers certain initiatives that might address these goals.

1. Market Basket Trading

We remain concerned over the impact of market basket activity on the liquidity of the stock market. To some extent, it may be possible to address liquidity concerns by increasing the capital of stock specialists. While we favor steps to encourage such an increase, we are doubtful that increased capital alone will result in greater liquidity under present trading conditions. Irrespective of the amount of capital, specialists are unlikely to provide greater liquidity when they are unable to identify the nature and amount of additional index-related selling that will hit them. This is particularly true

if, as occurred during the October market break, upstairs block positioning firms substantially reduce their capital commitments during market price drops.

We suggest that an alternative approach be examined. Presently, program trades must be broken up and distributed around the stock floor with the resulting substantial transaction costs and effects discussed above. The creation, however, of one or more posts where the actual market baskets could be traded might alter the dynamics of program trading. The availability of basket trading on the NYSE would, in effect, restore program trades to more traditional block trading techniques. The basket specialists would be able to identify the nature of each trade and we are hopeful that this would encourage block positioners to again become active in providing capital to position the program blocks. While arbitrage would continue to flow directly to the individual stocks to maintain their pricing efficiency, other institutional trades could be focused on the basket posts where the specialist and trading crowd could provide an additional layer of liquidity to the system and cushion somewhat the individual stocks from the intra-day volatility caused by program activity. 48/

The feasibility and design of basket trading would require substantial analysis. To be useful, it would require an extremely well-capitalized specialist, perhaps affiliated with a major block positioning firm, and perhaps additional supplementary market makers. While the product would require physical settlement of the basket, this would not appear to impose greater burdens than exist in settling program trades today. A requirement that any participant have the capability to settle the trade through automated book-entry delivery of the securities, however, may be appropriate. In addition, the design and need for more than one basket raises difficult questions. There are already a number of futures and options now trading based on a wide variety of indexes. Moreover, many educational institutions are prohibited from purchasing certain stocks that logically might be included in any basket because of social and political policies. While these issues are substantial, we believe the concept of basket trading warrants consideration. 49/

48/ Similar ideas have been discussed in S. Grossman, *An Analysis of the Implications for Stock and Future Price Volatility of Program Trading and Dynamic Hedging Strategies* (Working Paper, CSFM - #158, June 1987); N. Katzenbach, supra note 29, at 29; H. Stoll & R. Whaley, *Program Trading and the Monday Massacre* (November 4, 1987); H. Stoll, *Portfolio Trading* (September 1987, Working Paper No. 87-14); and H. Stoll, *Index Futures, Program Trading and Stock Market Procedures* (Revised, September 1987, Working Paper No. 87-13, forthcoming *Journal of Futures Markets*).

49/ It is beyond the scope of this study to consider changes that might be made in the futures markets to better accommodate portfolio trading and its effects. The Division notes, however, that there is an ongoing debate in the futures community regarding how, if at all, the futures markets can more efficiently handle large, block-size transactions. See, e.g., K. Pierog, *How Will the Futures Industry Handle Block Trading?*, *Futures* 78 (October 1987). The securities markets have facilitated the execution of such trades by establishing special procedures both in the stock [NYSE Rule 127] and options [Chicago Board Options Exchange ("CBOE") Rule 6.74(b)] markets that provide a mechanism, including size precedence, to allow upstairs block positioner capital to interact with the floor so that trades can be executed with minimum price impact and maximum public participation.

2. Derivative Product Leverage

The evolution of futures trading strategies has increased the degree and concentration of institutional trading, which in turn has increased the probability of wide price swings such as occurred during the October market break. While increased institutional trading is not something the staff believes should be discouraged, it does raise concerns when it becomes so concentrated that it overwhelms the ability of any organized market to maintain orderly trading. For this reason, we believe that thought should be given to harmonizing the available leverage of derivative products with the leverage permitted for stocks. 50/ We believe this leverage derives from two sources--cash settlement and margin.

The availability of cash settlement eliminates the risk that a market participant must liquidate its position prior to the termination of the future or accept delivery (and make payment for) a market basket of stocks. The absence of this risk may increase the willingness of market participants to take larger positions with accompanying tighter triggers for the sale of those positions if the market reverses direction. In particular, portfolio insurers, who often have segregated their futures trading in a different firm from the one that handles their stock portfolios, may be reluctant to take such large futures positions if they faced the risk of accepting delivery of the actual basket of stocks.

Requiring physical settlement of index products, while an obvious remedy, raises a number of practical problems. First, unless some cash settlement exception was made for public investors holding small futures positions, physical delivery would be unwieldy and expensive. Second, a physical delivery requirement might impose extremely high risks on options writers who, unlike futures holders, would be subject to exercise (and

Similarly, to the extent some of the large discounts to cash in the futures market reflect the price effect of block trades, efforts by the futures markets to provide better systems for integrating block trading may help ameliorate these price effects. Accordingly, it may be appropriate for the CFTC and futures markets to consider amending their rules to permit block positioning. Such efforts by the futures markets would complement NYSE efforts to facilitate portfolio trading in that both efforts would provide additional procedures and capital for the trading of portfolio-sized transactions (e.g., 200 SPZ futures are roughly equivalent to a \$25 million stock program).

50/ Our analysis has focused on futures trading because index futures, not index options, have been the primary tool employed by portfolio insurers and index arbitrageurs. Nevertheless, index options could be employed as a substitute for futures. Indeed, increased usage of protective put programs has been discussed as an alternative to dynamic hedging models designed to create a synthetic put, although high put premiums apparently have made such an alternative uneconomical. Accordingly, we believe that any consideration of regulatory changes should apply equally to the index options and the index futures market.

therefore required to take or provide delivery) at any time. ^{51/} Nevertheless, the staff will continue to review the feasibility and desirability of physical settlement for index products.

The other primary difference in leverage between the stock and derivative product markets is margin. For example, before October 19, a purchaser (or seller) of an SPZ futures contract trading at an index value of 300 was able to acquire (or sell) approximately \$150,000 worth of stock for an initial margin payment of \$10,000 (6% of the contract's value). An investor who qualified as a hedger had to put down only \$5,000, which was only 3% of the contract's value. Index options margin is computed on a percentage basis, imposing a margin requirement for short options positions of 5% of the index value plus the premium paid. As demonstrated by Chart 3-9, the resulting options margin, as well as the margin for the other actively traded index futures contract, the Chicago Board of Trade's ("CBT") Major Market Index ("MMI") future, was comparable to margin on the SPZ 500 future.

After October 19, the value of the SPZ dropped and the amount of margin was raised in a series of steps to \$20,000 (\$15,000 for hedgers). In December, however, SPZ margin levels were reduced to \$15,000 (\$10,000 for hedgers) so that today an investor buying or selling an SPZ futures contract need only put down approximately 12% of the contract value (8% for hedgers). Similarly, index options margin has been increased to 10% of the index value plus premium. Thus, the futures and options markets have increased margins to a level more consistent with the higher volatility of the markets. Nevertheless, these margins are far lower than the 50% margin requirement for investors in stocks, as well as the effective 20-25% levels at which specialists and self-clearing broker-dealers generally are able to finance their stock positions.

The impact of current margin levels is that an institution could use the SPZ futures contract to establish a speculative long position in order to increase quickly its stock portfolio position or a speculator could buy or sell the SPZ futures contract, and, with a margin deposit of \$1 million, could control a stock-equivalent position of over \$8 million. Similarly, a portfolio insurer or other institution wishing to adjust its portfolio quickly through the sale of futures could create a hedged short futures position with a market value exceeding \$12 million, with the same \$1 million deposit. This is significantly higher leverage than can be achieved under stock margin requirements. Moreover, the increasing popularity of index substitution, index arbitrage, and portfolio insurance, has resulted in an increasingly greater percentage of futures positions being taken precisely for the purpose of replicating cash market stock positions. Yet these positions require significantly less cash to establish than would the equivalent position in the stock market.

Leverage historically has been a fundamental concern underlying federal margin regulation. ^{52/} Section 7(c) of the Securities Exchange Act of 1934 ("Exchange Act"),

^{51/} We also note that the only index future providing for physical delivery, the Osaka 50 Stock Index, did not meet with initial success, although trading volume recently has increased.

^{52/} See, e.g., H.R. Rep. No. 1383, 73rd Cong, 2nd Sess. 8 (1934); S. Rep. No. 1455, 73rd Cong., 2d Sess. 11 (1934); Stock Exchange Practices, Hearings on S.2693 Before the Senate Comm. on Banking and Currency, 73rd Cong., 2nd Sess. 6494

which applies to extensions of credit by broker-dealers on other than exempted securities, was part of the original legislation adopted by Congress in 1934 as a means to regulate credit in the securities markets. Section 7(c) generally requires that any extension of credit made by a broker-dealer to permit a customer to purchase securities must be made in conformity with rules promulgated by the FRB. 53/

In contrast to the securities markets, futures markets are not subject to federal margin levels. The CFTC has authority to prescribe margin levels for futures only in emergency situations. Otherwise, margin levels are set by the commodities exchanges. 54/

The Division recognizes the distinctions between futures and stock margin. Futures margin is, in effect, a performance bond that does not include an extension of credit. 55/ Futures margin has focused entirely on ensuring that both parties satisfy their respective obligations under the futures contract. Futures positions are marked to the market daily 56/ and all margin calls usually are required to be paid on a same day basis.

The Division believes, however, that low derivative product margins may contribute to the increased velocity of institutional trading in two ways. First, the Division believes that present margin requirements permit institutions to buy and sell larger futures positions without being required to substantially increase the amount of

(1934). See also FRB, A Review and Evaluation of Federal Margin Requirements (December 1984).

53/ The FRB is responsible for setting margin regulations, while enforcement of the regulations is the responsibility of the Commission. The FRB rules that regulate securities margin are Regulations T, U, G, and X. Regulation T governs the extension of credit for securities by broker-dealers. See 12 CFR Sec. 220. Although the FRB has authority to set both initial and maintenance margin levels, it has to date chosen only to set initial margin requirements. Regulation T currently requires that upon purchasing a stock a customer of a broker-dealer must post 50% of the security's value as margin. A short seller must post initially 150% of the value of the security sold.

Broker-dealers also are subject to the maintenance margin requirements of the NYSE or NASD. NYSE Rule 431 and Appendix A to the NASD's Rules of Fair Practice require that a broker dealer maintain at least 25% of the value of all long securities in the customer's margin account. More detailed formulae establish the minimum maintenance margin requirements for short positions.

54/ See Secs. 8a(a) and 5a(12) of the Commodity Exchange Act ("CEA"), 17 U.S.C. Secs. 12a(9) and 7a(12) (1982).

55/ Margins required of short stock sellers and of uncovered options writers also could be characterized as "performance bonds", although they are regulated as "extensions of credit" under current securities margin regulation.

56/ The phrase "marked-to-market" refers to the exchange and clearing entity practice of updating margin requirements based on intra-day movements in the asset's price.

their assets maintained in cash equivalents. ^{57/} Second, low margins contribute to speculative trading that, under normal market conditions, contributes to the illusion of almost unlimited liquidity in the futures market. During a market break, however, that liquidity disappears at a rate geometrically larger than liquidity in the lower leveraged stock market. ^{58/} For these reasons, the Division believes that there should be a review of the impact on the stock market of present index futures and options margin levels.

The Division makes this suggestion, however, with the recognition that higher margin requirements would increase the costs of trading futures and options. Accordingly, any analysis of margin requirements also must consider whether any benefits obtained from reducing the liquidity demands on the stock and derivative markets outweigh the costs and potentially lower derivative product liquidity during periods of normal market activity. ^{59/} In making this observation, we would note two points. First, the development of equivalent index futures margin does not require that those margin levels be identical to stock margin requirements. The mark-to-the-market requirements for futures act as a leverage limit by forcing market participants to make arrangements to have sufficient cash to meet those marks in volatile periods. Second, stock and options regulation always has permitted lower margin requirements, and thus greater leveraging, for market makers in order to enhance market liquidity. In light of the indications that futures floor trading did not directly contribute to the selling pressure during the October market break, we would expect that even if futures margins are increased for investors, similar exceptions might be appropriate for futures floor traders. This would limit the liquidity cost of any increase in futures margins.

^{57/} The Division recognizes that the futures exchanges permit top-tier institutions to employ letters of credit to meet initial margin requirements. Also, portfolio insurers and other hedgers could borrow against their stock positions to obtain the cash required for higher futures margin deposits, although presumably collateral would have to be deposited for such borrowing. Thus many institutional investors would not necessarily be affected substantially by higher margin levels. Nevertheless, given the segregation of stock and futures management effected by many portfolio insurers and the usual bank requirement that any such letter of credit be fully collateralized, we believe that increased futures margins would reduce the concentration and velocity of futures trading by institutions employing strategies such as portfolio insurance.

^{58/} See Kidder, Peabody Commentary, *supra* note 41.

^{59/} In this regard, it may be desirable, to review alternative means to address the leverage differences of the derivative and stock markets and to ameliorate concentrated liquidity demands during periods of price volatility. Chairman Ruder has suggested that it may be appropriate to consider system-wide position limits for stock index products -- both futures and options. D. Ruder, the Impact of Derivative Index Trading on the Securities Markets, Address Before The Bond Club of Chicago, dated October 6, 1987 ("Ruder Speech") at 16. Such an approach would recognize the functional equivalence of index futures and options and the potential cumulative impact of such products on the stock market.

3. Price Limits

Price limits historically have been employed in the futures markets to address extreme price volatility. Price limits operate by prohibiting trading outside the limits for the remainder of the trading day. ^{60/} Price limits attempt to address two concerns. First, during periods of extreme volatility, the futures trading floor may be unable to maintain an orderly market with acceptable depth and liquidity. Second, unlimited price movements may expose futures clearing corporations to greater loss exposure. ^{61/}

On October 23, the CME established price limits for the SPZ contract. ^{62/} The limit was set to, in effect, cause trading to cease if the future moved 30 points in one day, roughly a 12% move. The only times in the history of the SPZ in which a move of that magnitude occurred were on October 19 and also on October 22, when the future opened down approximately 55 points, at a dramatic 21% discount to the cash value of the index.

The Division believes that price limits may be a rational response to the present leverage levels in the index futures market. Nevertheless, we believe that there are substantial problems with their effectiveness. Price limits on index futures when there is an active alternative pricing mechanism in the stock market are somewhat self-defeating. The ability of institutions to shift their liquidations to the stock market was amply demonstrated on October 19 and 20. Price declines in the stock market after the future hit the price limit and trading in the futures ceased would place futures traders at substantial risk because of the inability to adjust their futures positions.

^{60/} The price limits instituted by the CME on October 23, 1987 work on a three-day cycle using daily up or down limits of 30 and 45 points. A daily limit up or down of 30 points from the previous day's settlement value exists. If on any two consecutive days, the price limit is reached, the limit would increase to 45 points. If trading on the third day reaches the 45-point limit in the same direction, trading would cease and the next day's limit would remain 45 points. If, however, the 45-point limit was not reached on the third day, the limit on the following day would revert to 30 points.

^{61/} See generally Brennan, A Theory of Price Limits in Futures Markets, 16 *J. Fin. Econ.* 213 (1986); S. Khoury & G. Jones, Daily Price Limits on Futures Contracts: Nature, Impact and Justification, 3 *Rev. Research in Futures Markets* 22 (1984).

^{62/} In response to the market events of October 19-20, other futures exchanges adopted price limits for their stock index futures. The CBT implemented a daily 40-point price limit for its MMI contract on January 13, 1988. This 40-point price limit would increase to 60 points if a contract closed at the 40-point limit in three or more delivery months on two consecutive trading days. The CBT also established daily price limits for its Institutional Index futures contract. Similarly, the New York Futures Exchange implemented a 25-point limit, which would increase to 35 points if the 25-point limit were met for two consecutive days, for all its stock index futures contracts. These were effective through January 21, 1988. The Kansas City Board of Trade also has a 30-point price limit for the Value Line futures contract it trades. This limit remains in effect.

Moreover, we do not believe, as a general matter, that price limits should be imposed on stock trading, although brief trading halts based on pre-set standards may warrant further consideration. The automatic closure of stock trading for the remainder of the day, in our view, imposes unacceptable burdens on those market participants who wish to liquidate their positions and increases the potential that a volatile market situation can slide into panic. ^{63/} As discussed in more detail in Chapter Eleven, the closure of the Hong Kong Stock Exchange provides a graphic example of the risks entailed in closing a stock market. ^{64/}

While we do not favor stock price limits, we do believe that greater coordination of stock and derivative index trading warrants further review. The CME price limit action was taken, in part, in response to concerns expressed by the Division to the CFTC and CME over the impact that substantial discounts of opening futures prices to the previous day's closing stock prices, as on October 22, could have on the opening of stocks composing the index. We believe that the dominance of the future as the price setting mechanism is most dramatic at the opening. The existence of a substantial futures price discount discourages specialists and other market participants from offsetting sell imbalances. Moreover, ongoing trading in the futures may hinder the opening of the component stocks by encouraging additional waves of sell orders. Finally, as discussed in a later section of this Chapter, the ability to trade futures before the component stocks have opened provides opportunities for firms to "front run" their customers' stock orders, possibly to the detriment of those customers.

We believe further review should be made as to whether these concerns might be addressed by prohibiting the opening of index futures and options contracts until a set percentage in value of the stocks comprising the index commenced trading. Similarly, such a review should evaluate whether derivative products should automatically stop trading when trading in an identified percentage of the stocks comprising the index has been halted. ^{65/}

4. Short Sale Restrictions

Restrictions on short sales (e.g., selling an index future without owning the underlying component stocks) have never been imposed on options and futures products. Moreover, the difficulties of extending such restrictions to options and futures products would be substantial. The Commission's short sale rule, Rule 10a-1 under the Exchange

^{63/} Such automatic limits should be distinguished from the temporary trading halts imposed by the NYSE and other equity markets in response to order imbalances. An order imbalance halt is in response to the particular need to seek additional liquidity for a particular stock.

^{64/} We acknowledge that price limits on individual stocks may have reduced price drops on the Tokyo Stock Exchange ("TKE") on October 19. This was accomplished, however, at the cost of eliminating any ability of market participants to adjust their positions on most TKE stocks for the day. Moreover, the dominance of four broker-dealers, as well as a greater propensity to hold stocks longer term, may make it easier to stabilize the Tokyo market.

^{65/} In this connection, we note that index options presently are required to halt trading if 20% of the stocks composing the index are halted.

Act, prohibits persons from selling stocks short at a price below the last sale price ("minus tick") or when the last trade involving a change in price was a minus tick ("zero-minus tick").^{66/} Yet index futures or options quotations normally would respond to downward movements in the cash index by adjusting downward. To restrict a futures or options trader from selling short on a minus tick when he is simply responding to price declines in the cash index imposes unacceptable risks on that person. To design a short sale restriction that takes into account movements in the underlying cash index would be extremely complicated and impose substantial compliance burdens.

Nevertheless, the absence of short sale restrictions, coupled with the greater leverage of futures, arguably presents the potential for greater speculative selling than could occur in the stock market. Moreover, through index arbitrage, that selling activity generally can be transferred to the stock market. Accordingly, it appears appropriate to review the manner in which index arbitrage is treated under short sale regulation.

Rule 10a-1 contains a number of exceptions to permit certain types of trading activities that are believed to be beneficial to the markets or that carry little risk of the kind of manipulative or destabilizing trading that the Rule was designed to address. For instance, paragraphs (e)(7) and (e)(8) of the Rule exempt certain bona fide arbitrage transactions from compliance with the provisions of the Rule. Moreover, paragraph (e)(13) of the Rule allows a block positioner who is selling a security in that capacity to disregard, in determining whether it is long or short, a proprietary short position in that security to the extent such short position is the subject of one or more offsetting positions created in the course of bona fide arbitrage, risk arbitrage or bona fide hedge activities. The definition of "bona fide arbitrage," however, does not include index arbitrage involving the short sale of stocks against long futures positions. As a result, short index arbitrage generally is subject to the "tick" requirements of Rule 10a-1.

The Division has taken an interpretive position that provides a narrow exception to Rule 10a-1 for certain liquidations of index arbitrage positions. Specifically, the staff has permitted the "unwinding" of existing index arbitrage positions involving long baskets of stock and short index futures or options without aggregating short positions in these stocks with other proprietary accounts if those short positions are fully hedged.^{67/} The Division took this position because the unwinding of an existing long arbitrage position did not create a new short position, nor should any price decline resulting from the selling benefit the firm because its remaining positions are "fully hedged." Nevertheless, this no-action position did facilitate the ability of firms to take

^{66/} See discussion at 3-7 and note 30, *supra*. The Commission's short sale rule generally is tied to the consolidated tape (i.e., the stream of last sale prices from all equity markets in NYSE securities). On the NYSE, pursuant to an exchange rule authorized under Exchange Act Rule 10a-1, compliance is measured with regard to the last sale on the NYSE.

^{67/} See letter to Merrill Lynch, Pierce, Fenner & Smith, Inc. (December 17, 1986).

index arbitrage positions by reducing restrictions on their ability to liquidate those positions. 68/

Several commentators have argued that the restrictions on short index arbitrage that result from application of the short sale rule hinder pricing efficiency. Moreover, these commentators suggest that if short sale restrictions had not applied, short index arbitrage would have eliminated the large discounts on October 19 and ameliorated price volatility on that day. 69/

The Division is not in a position to conclude whether the absence of restrictions on short index arbitrage would have eliminated the index futures price discount on that day. Given the risks in executing arbitrage on October 19, however, we believe it likely that substantial, although perhaps smaller, discounts would have remained. We also cannot determine whether increased arbitrage on October 19 would have reduced stock market volatility on that day. Arbitrage closes index futures discounts by raising the price of the future (through buying) and lowering the price of the stock (through selling). While reduction of the index futures discount might have encouraged portfolio insurers and other institutions to continue selling in the futures markets rather than shift to stocks, and might have encouraged specialists and other potential stock buyers to purchase stocks, it also might have encouraged portfolio insurers to liquidate a larger portion of their portfolio, as called for by their insurance programs. Moreover, we have no basis to conclude that the "billboard" effect of the futures discount had a larger or smaller negative impact on stock market prices than would have occurred from additional stock selling resulting from short arbitrage activity.

In summary, the Division does not believe that the extension of short sale restrictions to the derivative markets is operationally feasible. Nor do we believe that the staff interpretive position providing for a narrow exemption from the Rule for certain bona fide arbitrage activity substantially contributed to price volatility during the market break. We do believe, however, that the ability of institutions to engage in index substitution activity without being subject to the short sale rule in combination with exchange for physical stock/futures transactions effected in London, has impacted the effectiveness that rule may have had in reducing stock market volatility. The Division believes the Commission should review whether reducing price volatility should remain a goal of the Rule and, if so, whether steps should be taken to increase its effectiveness.

5. Reporting Requirements

While the topics discussed above relate to questions regarding how to better integrate the stock index futures and stock markets, other matters also warrant further

68/ In response to a survey sent to 13 brokerage firms, only one firm quantified its transactions in reliance on the no-action position in unwinding index arbitrage positions in October. The most significant unwinding transaction by this firm occurred on October 16th. Other firms have been unable to quantify the extent to which they relied, or have advised as that they did not rely, on the no-action position during October.

69/ See, e.g., Crossen, Program Traders Find an Unlikely Ally in Bid to Abolish Uptick Rule on the Big Board, Wall St. J., Jan. 11, 1988, at 53.

consideration. Specifically, the Commission's recordkeeping and reporting rules may be inadequate to maintain effective oversight of the increasing level of portfolio trading.

In its September 1986 Report, the Division noted the need to develop a "cost-effective, routine means of identifying and maintaining easily accessible records of index-related trading." ^{70/} Since then, the Division staff has worked with the staff of the NYSE to design such a reporting system. Although such a reporting system was not in place before October, since the October market break the NYSE has required its members to provide a variety of information regarding their program trades. Moreover, because many, if not all, program trades are effected through the NYSE's LIST system and because broker-dealer firms must be able to monitor program trades for billing and other purposes, the ability of firms and the exchange to identify such trades has improved.

Despite these improvements the staff still experienced substantial difficulties in reconstructing trading during the October market break. First, the firms had no uniform procedures for reporting program trades, and some firms failed to provide, in response to the Division's initial data request, details concerning index-related trading effected outside the United States. Second, there was considerable definitional difficulty in identifying portfolio insurance activity. Third, unlike the futures market's large trader reporting system, there was no readily available means to identify quickly the large stock customers who bought and sold on October 19 and 20. ^{71/} These difficulties substantially impaired the ability of the staff to fulfill its oversight responsibilities and to coordinate gathering of trading information with the CFTC. Accordingly, the staff believes it would be appropriate to revisit the desirability of creating more specific recordkeeping rules at the broker-dealer level and developing a system, similar to the CFTC's large-trader reporting system, for rapidly identifying large traders in the stock market.

As a separate matter, it also may be appropriate to consider how to integrate program trade reporting within the current systems of last sale reporting. Today there is a well-developed system for reporting securities transactions on a real-time basis. These systems have readily accommodated the development of block trading because such transactions can be reported as easily as smaller-sized trades. Indeed, because of the importance of block trades, which may contain new information, the various securities information processors have developed systems for monitoring block trades on a real-time basis. The leading financial publications regularly report the breakdown of such trading activity.

In contrast, there is no regularized reporting of program trades. Only those broker-dealers and other professionals with sophisticated computer techniques (or floor

^{70/} September 1986 Report, supra note 39, at 3. See Ruder Speech, supra note 59, at 17-18.

^{71/} Although certain institutional money managers have to report their quarterly stock holdings pursuant to Section 13(f) of the Act, the so-called Section 13(f) reporting system was not designed to provide regularized access to trading activity by those money managers. See Lemke & Lins, Disclosure of Equity Holdings by Institutional Investment Managers: An Analysis of Section 13(f) of the Securities Exchange Act of 1934, 43 Bus. Law. 93 (1987).

traders in the futures and securities markets) can estimate the activity related to such trading. Thus, only the leading broker-dealers, based on their own trading activity (both proprietary and agency) and estimates (or reports) of other trading activity, readily can identify the amount of program trading. The Division believes it would be appropriate to consider how to integrate program trading within the context of traditional transaction reporting. If, as some have suggested, program trading is the "block trading of the 1980s," then it is appropriate to consider whether the more accurate and timely reporting of such trades can be made more readily available on a widespread basis. The development of a market basket trading of stocks would, of course, facilitate such a reporting system.

F. Manipulation and Frontrunning

The continuing rapid expansion of trading in index products also raises significant surveillance and enforcement concerns. These concerns focus primarily on the potentials for intermarket manipulation and frontrunning. This section of the Chapter provides a general description of each of these areas of concern and an overview of the findings of the reviews by the Division, the CFTC, and securities and futures self-regulatory organizations ("SROs") as to each of these concerns during the October market break. Finally, there is a discussion of recent regulatory initiatives to address intermarket abuses.

1. Market Manipulation

a. Regulatory Concerns

In the Division's September 1986 Report, we discussed concerns by some market commentators that if firms, through their trading, could push the index futures price out of line with the cash index prices, opportunities could be created to execute programs for their clients' and their own proprietary accounts. ^{72/} Under these hypothetical scenarios, if trading volume in a futures index contract was relatively light, and there was no significant news pending, an entity could begin purchasing or selling the futures contract. This buying or selling, in turn, could induce local traders to cover their short positions or close out their long positions, thus increasing the futures price disparity. As this pricing disparity increases, an index arbitrage opportunity would be created, resulting in arbitrageurs selling, for example, the overpriced futures and buying the stocks that comprise the index. This buying activity would increase the price of the individual stocks, permitting entities holding pre-existing long positions to liquidate their positions at a profit. ^{73/}

Since the October market break, there have been renewed concerns that index products could be used to manipulate the securities markets. While there generally has

^{72/} See, e.g., Dean Witter Reynolds, Equity Trading Bulletin Technical Market Comment, No. 1936 (December 15, 1986).

^{73/} It is important to note that the scenario requires the manipulator to take an extremely large risk as the result of maintaining the futures price at a disparity to the underlying stock prices. If the manipulator is unsuccessful in attracting a large market response as a result of his activities, substantial losses could be suffered.

been a consensus that the market downturn itself was initiated by changed investor sentiment based upon a variety of factors, including economic news and anticipation of a market correction, there have been allegations that manipulation using index futures may have occurred once the market break was underway. In particular, at least one press account ^{74/} has referred to possible manipulation in the MMI futures around mid-day on October 20 (the low point of the market break) to manipulate the stock market into a dramatic turnaround that precluded closing the NYSE.

b. Overview of Findings

Neither the futures trading data and reports provided by the CFTC and CBT nor the trading data compiled by the Division provide evidence to support allegations of manipulation of MMI futures between 12:00 and 1:00 on October 20.

A recent report by the CFTC's Division of Trading and Markets identified three CBT clearing member firms that reported the largest purchases over this period. ^{75/} These firms purchased 513 MMI contracts on a net basis all for customer accounts. More significantly, however, these trades were not executed during the more limited period between 12:30 and 12:50 p.m. when the November MMI contract rallied by approximately 80 points (27%) to 375. ^{76/} Identified purchasers over this period were even more dispersed, consisting mostly of small lot transactions between CBT locals. Two floor traders and one foreign investment firm were identified in the CFTC report as the largest purchasers between 12:30 and 1:00 p.m.; however, these purchases were not inconsistent with other trading activity during the day. ^{77/}

There also have been press accounts that question the integrity of the trading data supplied to the CFTC and some fine points in the methodology of the CFTC analysis of this material. ^{78/} The Division's review of trading in the MMI futures on October 20 has used the trading data supplied by the CFTC. The Division's analysis of this surveillance material has, however, focused on the ten-minute period in which the MMI premium first appeared, as well as the 30-minute period reviewed by the CFTC. The CFTC/CBT surveillance information reviewed by our staff indicates that buying

^{74/} Hertzberg & Stewart, Terrible Tuesday -- How the Stock Market Almost Disintegrated a Day After the Crash, Wall St. J., Nov. 20, 1987, at 1.

^{75/} See CFTC Division of Trading and Markets, Analysis of Trading in the Chicago Board of Trade's Major Market Index Futures Contract on October 20, 1987 (January 4, 1988) ("CFTC MMI Report").

^{76/} See CFTC MMI Report at 9-12. Thereafter, the November MMI contract fell to 350.00 by 1:30 p.m.

^{77/} CFTC MMI Report at 12-14. The report also noted that the foreign investment firm traded in the December MMI rather than the more active November MMI contract during this period.

^{78/} Stewart & Ingersoll, CFTC Report on Major Market Index Spurs New Questions on Its Oct. 20 Surge, Wall St. J., Jan. 7, 1988, at 3. The CBT has denied the allegations reported in this article. See CBOT Denies Giving False Data for CFTC Inquiry, Wall St. J., Jan. 8, 1988, at 3.

activity in the MMI futures was not unusually concentrated in any one entity; nor were purchases effected for the proprietary accounts of any major registered securities broker-dealer. In sum, the Division's analysis has found no evidence of manipulation of the MMI futures.

This determination is reinforced by the Division's review of index-related trading on the NYSE during this period of time. Our review was based upon the detailed program-by-program trading information compiled by the Division in conjunction with the CFTC's Division of Economic Analysis. As discussed in Chapter Two, this information was obtained directly from the major broker-dealers who are active in index trading. ^{79/} This information indicates that one of the essential elements of the manipulative scenario raised in the September 1986 Report appears to have been absent on October 20. Specifically, although a premium of 3 to 5 points appeared around 12:40 to 12:50 p.m., only one resulting index-arbitrage program was identified by the program data from the broker-dealers. This arbitrage program consisted of the purchase of 40,000 shares of stock and the sale of 25 MMI contracts executed at 12:49 p.m., and constituted less than 0.10% of NYSE volume from 12:30 to 1:00 p.m. While we do not minimize the potential impact on market psychology of any futures premium at that critical moment, the information presently available to the Division does not appear to support the proposition that manipulation of the MMI futures was present in the market turnaround on October 20.

2. Frontrunning

a. Regulatory Concerns

The Division also is concerned over the potential for other types of cross-market trading abuses such as frontrunning. Frontrunning in the options markets occurs when a broker-dealer effects options transactions with the knowledge of non-public information about an impending block transaction in the underlying stock(s). Securities exchanges have issued written statements to their members advising them of the exchanges' policies against such frontrunning. ^{80/} Recently, exchanges have reminded their members that the prohibition against frontrunning applies to index products as well as to individual equity options. ^{81/}

^{79/} This trading information has been cross-checked against other trading and position data routinely compiled by the securities and futures SROs.

^{80/} Although none of the exchanges has a specific rule proscribing frontrunning, each exchange's policy prohibits this activity as conduct inconsistent with just and equitable principles of trading rules. *See, e.g.,* Philadelphia Stock Exchange ("Phlx") Rule 707.

^{81/} The options exchanges have issued circulars stating that trading in index options by persons possessing material, non-public information concerning imminent transactions in component stocks of an index may violate exchange rules regarding just and equitable principles of trade. *See, e.g.,* CBOE Circular No. 23, Revised July 1987; NYSE Information Memorandum No. 85-36, November 6, 1985. Circulars from the CBOE, NYSE, Phlx, National Association of Securities Dealers ("NASD"), and the American ("Amex") and Pacific ("PSE") Stock Exchanges were filed with the SEC as rule changes, and became effective upon filing, pursuant to

Frontrunning in the futures markets is not subject to the same regulatory scheme as exists in the options markets. Nevertheless, officials of the CME and CBT have stated to the Division staff that their rules also prohibit frontrunning of customer orders. In addition, the CFTC has indicated that the antifraud provision of the CEA may, in certain cases, prohibit such activity depending on the circumstances of the case and the persons involved. 82/

b. Overview of Findings

i. Frontrunning of Customer Futures Sales

Division staff reviewed surveillance data supplied to the Commission by the CME. This review sought to determine whether CME member firms known to be active portfolio insurance vendors or executing brokers traded ahead of customer orders implementing portfolio insurance strategies on October 16, 19, and 20, 1987. While the Division's review of this surveillance data indicates that some further inquiries appear justified in a few instances, most of the trades reported for CME member firm proprietary accounts in the data reviewed did not support the conclusion that portfolio insurance vendors or brokers traded ahead of customer orders. 83/

Specifically, the Division's review concentrated on an examination of SPZ sales reported for those CME member firms known to be active portfolio insurance vendors or brokers. The Division identified proprietary transactions effected shortly before or simultaneously with sell orders executed by the same CME firm for customer accounts. 84/ Since portfolio insurance trading was active during the last hour of trading on October 16 and the first hours of trading on October 19 and 20, the Division chose these periods as representative samples for examining whether frontrunning of agency orders occurred on these days.

A total of 1,997 SPZ contracts were sold for the proprietary accounts of these firms in 104 transactions during the last hour of trading on October 16. In seven transactions, firm proprietary orders were executed at prices higher than substantial

Section 19(b)(3)(A) of the Exchange Act, in October 1987. Securities Exchange Act Release No. 25233 (December 30, 1987), 53 FR 296.

82/ See Joint Study, supra note 19, at VII-40 to VII-41.

83/ However, because proprietary trades executed through another CME member clearing firm would be reported as customer trades, the Division is not able to exclude the possibility that some firms may have traded ahead in this manner. In addition, the Division is not able to identify from the data supplied to the Commission the trading of portfolio insurance vendors who are not CME member firms.

84/ The Division generally reviewed those agency orders executed within one minute of the proprietary trade because data on the times customer orders were received by CME member firms were not available to the Division. Of course, using a one minute time-frame may artificially narrow the scope of identified activity. It appears reasonable to assume that, in light of the firms' fiduciary obligations, most agency orders were entered and executed shortly after the orders' receipt.

customer orders executed by the firm in the following minute. The number of contracts sold for customer accounts by these member firms varied from 33 to 149 contracts. Similarly, during the first hour of trading on October 19 and October 20, the Division identified six and three proprietary transactions, respectively, executed immediately before substantial institutional sales handled by the firm as agent.

While these trades raise troubling questions, it should be noted that only three of the suspect trades involved transactions of ten or more contracts. Moreover, without further analysis, the Division cannot determine whether the reported times of execution are correct. Finally, on days such as October 19 and 20, there were legitimate reasons for firms to buy or sell for proprietary accounts in the futures markets, as well as in the stock and options markets, at the same time as conducting transactions for customers accounts.

Nevertheless, questions remain as to the propriety of firms possibly trading ahead of agency orders, such as the massive portfolio insurance transactions on those days, to the detriment of customers. The incidence of the questionable trades identified by the Division argues for careful review by the securities and futures SROs of potential frontrunning transactions by their member firms. 85/

ii. Firm Selling at the Opening

The Division also attempted to identify instances of firms trading in the futures markets ahead of customer activity in the stock market. The Division previously has been concerned over frontrunning in conjunction with Expiration Friday activity where a single firm might be aware of a large number of customer arbitrage programs that must be closed out before the opening. Similar concerns existed at the opening on October 19 and 20, when firms had information of massive customer sell (on October 19) and buy (on October 20) imbalances. Accordingly, the Division focused on firm proprietary activity at the opening on October 19 and 20 to determine whether firms may have sold futures (or bought futures on October 20) based on the knowledge of large institutional stock orders they were attempting to execute at the opening.

The Division's review again raised some troubling questions. Specifically, 13 firms included in the Division's survey sold 771 SPZ futures (4% of total CME volume) between 9:30 and 10:00 on October 19 before most of the component stocks had opened. Two major firms accounted for 57% of this proprietary selling activity. Similarly, on October 20, these same 13 firms purchased 484 SPZ futures (3% of total CME volume) between 9:30 and 10:00, with 3 firms accounting for 74% of that buying activity.

It is important to underline that this activity is not classic frontrunning. There were many indicators in addition to a firm's particular customers' orders that may have indicated that the market would open particularly low on October 19 (or higher on the 20th). Nevertheless, the impact of the firms' trading activity on those days inevitably was to somewhat increase the futures discount on October 19 (premium on the 20th) and contribute to delayed openings and customers receiving executions at lower prices on

85/ In addition, questions have been raised, which are being reviewed, concerning firms buying futures on October 20 in anticipation of announcements of corporate customer buy-back activity. See Ricks, Practice of "Intermarket Front-Running" Faces Scrutiny After Task Force Study, Wall St. J., Jan. 14, 1988, at 6.

October 19 (higher on the 20th) than might otherwise occur. Accordingly, the Division believes that proprietary trading by firms at the opening in the derivative markets that may disadvantage customer orders they represent in the stock market should be thoroughly reviewed.

3. Regulatory Initiatives

In the September 1986 Report, the Division noted that, because index-related trading entails functionally equivalent investment instruments and involves trading across markets that are regulated by different federal agencies and SROs, existing market surveillance capabilities needed to be enhanced. Since the September Report, the Commission, the CFTC, and the various securities and futures SROs have been developing enhanced surveillance capabilities and lines of communication among the various regulators.

Detection of manipulation and frontrunning requires the identification of the parties to individual trades and the specific times at which trades occurred. For this purpose, all major securities exchanges have developed and use detailed, automated audit trails. ^{86/} In addition, effective October 1, 1986, ^{87/} the CFTC required all futures exchanges to have in place systems designed to capture trade data for all transactions effected on their floors within one minute of execution. ^{88/} Audit trails permit accurate reconstruction of trading in an accurate and timely manner, thereby facilitating surveillance.

The availability of futures audit trail information greatly enhanced the Division's and the CFTC's capability to reconstruct trading in order to review potentially manipulative or abusive trading during the market break. Enhanced audit trail information alone, however, is not sufficient to ensure detection of manipulative activity and frontrunning. It is important that all of the futures, options, and stock exchanges refine their surveillance programs to detect, on a routine basis, suspicious trading activity that may indicate manipulation or frontrunning.

Equally necessary to accomplish this goal is the efficient sharing of surveillance information and coordination of investigations and, in appropriate instances, enforcement actions by the various regulators. In 1981, under the Commission's auspices, the senior surveillance staffs of the major stock and options exchanges formed the Intermarket

^{86/} An "audit trail" is a time sequenced compilation of trading activity including certain characteristics of the trade (i.e., price, quantity, time, principal/agency designations, and identification of clearing firms and executing brokers) obtained from trade tickets submitted by the executing parties.

^{87/} See 51 FR 2684 (January 21, 1986).

^{88/} CME audit trail data include the following elements of each trade: (1) futures contract identification; (2) transaction price; (3) transaction size; (4) time bracket; (5) buy/sell designation; (6) executing brokers; (7) clearing member organizations; and (8) type of account. All trades must identify the account category for which the trade was executed as either for a CME floor trader or local, for a clearing member proprietary account, for another local present on the floor or for any other customer, member firm or broker not present on the floor.

Surveillance Group ("ISG") to facilitate this information sharing and regulatory coordination. Since the September 1986 Report, staff members of the CFTC and futures SROs have participated in several ISG meetings, and consideration is being given to expanding the ISG framework to include, on a formal basis, the futures markets. The Division intends to work closely with the ISG to ensure that futures exchanges have full access to securities information necessary to detect intermarket manipulations and frontrunning. Similarly, we believe that the securities exchanges must have efficient access to futures trading information.

Chapter Four

SPECIALIST PERFORMANCE

A. Market Maker Performance

1. New York Stock Exchange ("NYSE")

a. Introduction

The stock exchanges trade securities in what is termed "a continuous two-sided auction market." 1/ In this market, each security which is traded on an exchange is traded at one designated place on the "floor" of that exchange called a "post." At each post there are one or more exchange members who are registered with that exchange as "specialists" in one or more securities. At the larger exchanges, each equity security is allocated to a single specialist. 2/ These specialists are awarded, in effect, a monopoly right to make a market in that security on the exchange floor, in return for which the specialist undertakes certain responsibilities.

With respect to the securities in which they specialize, specialists perform the dual functions of brokers and dealers. In the capacity as a broker, the specialist holds and executes buy and sell orders for others. Generally these orders are forwarded to the specialist by exchange members. The orders may be "market" orders (*i.e.*, orders to buy or sell a security at the best current market price), but are usually "limit" orders (orders to buy or sell a security at a specific price), or "stop" orders. 3/

The primary mechanism used by the specialist to handle limit and stop orders is the specialist's "book." The specialist is the only broker who has the "book". Limit and stop orders are entered into the book in the sequence in which they are received

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- 1/ In an auction market, investors or brokers representing them trade directly with each other as opposed to a dealer market where most trades are made through a dealer at the dealer's bid or ask price. In a continuous market, trades in a security may take place at any time during an exchange's business hours as opposed to a call market where a security is traded only at specific times during the day.
- 2/ There is an exception for a relatively small number of inactive securities which are traded through a "cabinet" order matchup system (*i.e.*, no specialist is assigned a security and orders to buy or sell are left in the "cabinet" to await the arrival of offsetting orders.) As of December 1987, there were 55 specialist units operating on the NYSE with more than 400 individual specialists registered in approximately 1,625 common stocks. The largest specialist unit on the NYSE floor currently handles 125 stocks with 24 registered specialists on the floor. The next two top firms handle 78 stocks and 77 stocks, with 22 and 19 registered specialists, respectively. The smallest ten specialist units, in terms of number of specialty stocks allocated, trade 81, or about 5%, of the total number of common stocks traded on the NYSE and handle 15 stocks or less per unit.
- 3/ Stop orders require the specialist to buy or sell a security once a certain price level has been reached. Once the market reaches that price, the stop order effectively becomes a market order.
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with the appropriate price, number of shares, and the name of the firm which forwarded the order. 4/ The specialist usually charges a commission for this activity.

The specialist's second function is to act as a dealer to the extent necessary to maintain fair and orderly markets. As a dealer, the specialist is responsible for purchasing and selling securities in a manner that contributes to the maintenance of a fair and orderly auction market in the particular security or group of securities to which he is assigned.

The specialist's activities are circumscribed by Section 11 of the Securities Exchange Act of 1934 ("Exchange Act") 5/ and the rules thereunder, and by the rules of the exchange where the specialist is registered. Commission Rule 11b-1(a)(2), which articulates the primary responsibilities of a specialist, states that a specialist's course of dealings must be designed to "assist in the maintenance, so far as practicable, of a fair and orderly market." 6/ The specialist must adhere to this standard at all times in buying and selling his specialty stock(s) as a broker or as a dealer.

The rules of the NYSE, which will be examined here as a model for specialist regulation, provide detailed additional regulation of specialists. For example, NYSE Rule 104, the primary rule governing the activities of specialists at the NYSE, requires the specialist to maintain a fair and orderly market, as measured by the maintenance of price continuity and depth, and the minimization of the effects of any temporary disparity between supply and demand. 7/

A specialist's dealer responsibilities are referred to as "affirmative" and "negative" obligations. 8/ Pursuant to their affirmative obligations, specialists are obliged to trade for their own accounts to minimize order disparities and contribute to continuity and depth. 9/ Conversely, pursuant to their negative obligations, specialists are precluded from trading for their own accounts unless such dealing is necessary for the maintenance of a fair and orderly market. In view of these obligations, the price trend in a security should be determined not by specialist trading, but by the movement of the incoming orders that initiate the trades. The specialist, however, is sometimes

4/ Historically, the specialist's system for recording stop and limit orders is called the "book" because orders are, in fact, recorded in a physical loose-leaf binder. Increasingly, however, the stop and limit order recordkeeping function is being handled electronically through the use of computerized stop and limit order files.

5/ 15 U.S.C. Sec. 78k.

6/ 17 CFR 240.11b-1(a)(2).

7/ See NYSE Rule 104.10(1).

8/ These obligations derive from Section 11(b) of the Exchange Act, Rule 11b-1 thereunder, and NYSE Rule 104.

9/ NYSE Rule 104.

responsible (e.g., at the opening) for helping to determine the appropriate price level for the specialty stock. 10/

The specialists' responsibilities to trade do not require them to stem general downward or upward price movements, but only to temper sudden price movements and keep any general price movements orderly. In this regard, the specialists are expected to buy for their own accounts to offset order imbalances when the price of their stock is falling and to sell when the price is rising. This proprietary specialist activity is expected to alleviate temporary disparities between supply and demand so that advances and declines will occur smoothly. When this cannot be accomplished because the order disparity is too great, the exchange may halt trading (or delay opening the stock) so that quote indications can be disseminated to determine the price level at which the disparity is low enough for the imbalance to be corrected.

The specialists also are regulated by certain NYSE rules designed to guard against inappropriate specialist dealer activity. NYSE Rule 104 sets forth most of these "negative" obligations. These include prohibitions against specialist trades on destabilizing ticks (i.e., purchases on plus or zero plus ticks and sales on minus or zero minus ticks). Other examples are prohibitions under certain conditions against buying more than 50% of an outstanding offer if such offer represents substantially all the selling interest in the market, or selling to more than 50% of the bid if it represents substantially all the buying interest. 11/

Specialist market making performance is reviewed daily by the NYSE. To evaluate whether the market for a specialty stock is orderly, the NYSE examines a number of factors, such as continuity (absolute price change on continuous sequences), depth (absolute price change in 1,000 share sequences), and spreads between the bid and ask. To further analyze specialist dealer performance, dealer participation figures are compiled indicating specialist trading as a percentage of total volume. Stabilization

10/ In contrast to the specialist, an over-the-counter ("OTC") market maker has few affirmative and negative obligations. The primary affirmative obligation requires OTC market makers to maintain a two-sided quote for their own accounts on a continuous basis. While options specialists and market makers have the affirmative obligation to maintain a fair and orderly market, traditional indicators of orderliness, such as continuity and depth, are difficult to apply to a derivative product. (See Chicago Board Options Exchange Rule 8.7). Traders in the stock index futures pits have no market making obligations. While certain prohibitions limit their activities, there is no obligation that futures traders ensure that markets established by their crowds are fair and orderly. In addition, there are no requirements that price movements in stock index futures be smooth or orderly. The futures markets depend upon competition to provide the necessary incentives to ensure deep and liquid markets.

11/ See NYSE Rule 104.10. The Rule contains an exception. A specialist is permitted to make such a trade, with the approval of a floor official, when in less active markets, such trades "are an essential part of a proper course of dealings and where the amount of stock involved and the price change, if any, are normal in relation to the market." Id.

rates are also compiled to determine the percentage of specialist trades executed on stabilizing ticks. ^{12/}

This chapter reviews specialist performance during the October market break. The first portion of the chapter examines the specialists' performance in attempting to contribute to the depth, liquidity, and orderliness of the market. The second discusses the adequacy of specialist capital.

b. Methodology

Over the past 25 years, the Commission has analyzed specialist performance on the NYSE several times. In its 1963 Report of the Special Study of Securities Markets,^{13/} the Commission examined in depth the exchange markets and the NYSE specialist system. Although the study did not find widespread abuses or patterns of illegality among the NYSE specialists, it did find serious problems in the specialist system as it operated at that time and in its surveillance and regulation by the NYSE. The Study's recommendations regarding the specialist system resulted in a series of significant regulatory changes relating to, among other things, the specialists' obligation under Section 11(b) and exchange surveillance of specialists and their capital compliance.

The 1971 Institutional Investor Study Report ^{14/} analyzed general market making performance of 30 NYSE specialist units and the impact of institutional trading on the specialists' market making function. The study examined the ability of specialists to handle price disparities and fluctuations and to provide liquidity and depth to the market through their stabilizing activity. By grouping NYSE specialists into high, medium and low proprietary activity categories, ^{15/} the study concluded that "high inventory" specialists did a better job than the others in stabilizing price fluctuations in their stocks and were more willing to adjust inventories to provide liquidity and decrease day-to-day price changes. The medium/low activity groups were less likely to purchase stock to improve liquidity and reduce price disparities. Overall, there were wide variances in market making performance among specialists.

In addition to these two extensive studies, the Division of Market Regulation ("Division") staff consistently has reviewed various aspects of the NYSE specialist

^{12/} A stabilizing trade is a purchase (sale) at a price that is below (above) the most recent different price of the stock. For example, if the stock trades at 50, 50 1/2, and 50 1/2 again, if the specialist sold at the 50 1/2 trades the sales would be stabilizing. If the specialist had bought at the 50 1/2 trades, they would not be stabilizing.

^{13/} SEC, Report of the Special Study of the Securities Markets, H.R. Doc. No. 95, 88th Cong., 1st Sess. (1963).

^{14/} SEC, Institutional Investor Study Report of the Securities and Exchange Commission, H.R. Doc. No. 64, 92nd Cong., 2nd Sess. (1971).

^{15/} High category specialist units had average net proprietary activity exceeding \$155,000 per day, medium category units had between \$90,000 and \$155,000 and lower category units had net proprietary activity below \$90,000 per day.

system. ^{16/} Further, the Division, as part of its oversight responsibility over self-regulatory organizations ("SROs"), regularly examines and reviews NYSE surveillance of specialist performance.

To analyze specialist activity during October 1987, the Division concentrated on 67 stocks. These issues contain 50 of the most heavily capitalized stocks as well as several less active issues and takeover stocks selected for comparison purposes. Of the 67 stocks, the Division selected nine for a more in-depth review of specialist activity during October 19 and 20: Coca-Cola, Dayton Hudson, Exxon, General Electric, General Motors, Household International, International Business Machines, Merck and Co., and Newmont Mining. ^{17/}

The Division examined the general indicators of specialist performance for the 67 securities (continuity, depth, quote spread, and specialist participation) as well as specialist handling of openings and trading halts. The Division also examined specialist activity during the key periods of declines and advances (the afternoon of October 16, the morning and afternoon of October 19, and the morning of October 20) to determine whether specialists were buying or selling during steep price movements. Finally, the Division reviewed general measures of specialist performance for October 26 (and later where available) to determine the extent to which specialist performance was still being affected by the October 19 decline.

The Division obtained most of its data from the NYSE. This included audit trail information, ^{18/} Form 81's, ^{19/} and various measures of specialist activity (e.g., continuity and depth analyses). Part of the data was unavailable or unusable for some of the 67 stocks. ^{20/} Consequently, several types of analysis have been performed using less than 67 stocks. Where this has occurred, the number of stocks used is shown. The Division, in conjunction with the Commission's Directorate of Economic and Policy Analysis ("DEPA"), also examined broader measures of NYSE trading activity such

^{16/} See, e.g., SEC, Staff Report on the Securities Industry in 1979 (Directorate of Economic and Policy Analysis) (July 1980).

^{17/} These stocks are handled by nine different specialist units, comprising 16% of the total number of specialist units on the NYSE.

^{18/} The audit trail is a transaction journal that matches tape submissions with clearing information. The audit trail provides time, price, size and participants (including clearing members) of each trade, and whether the trade was agency or proprietary. Even on normal volume days, however, the audit trail is not completely accurate, and the increased volume on the days in question exacerbated that situation.

^{19/} A Form 81 is compiled by a specialist firm to show its trading activity in specialty stocks for the day, whether the proprietary trades occurred on an uptick or downtick, and the changes in position in the specialist's trading accounts. The forms are submitted when requested by the NYSE.

^{20/} The Division has relied upon data transmitted by the specialists to the NYSE. The Division has not been able to verify the accuracy of all the data transmitted.

as bid-ask spreads. ^{21/} In addition, staff from the Division interviewed NYSE staff responsible for specialist surveillance and the specialists in 12 stocks. ^{22/}

c. Market Performance During the October Market Break

In reviewing the objective measures of specialist performance, several general observations are important. First, specialist capital is limited; it is modest compared to the capital of upstairs firms (*i.e.*, large firms which regularly facilitate positioning block orders away from the exchange floor). ^{23/} Second, the specialist system did not assume that specialists would engage in unlimited buying and selling to correct any magnitude of imbalance; rather, it assumed that specialists' trading would be sufficient to keep the markets orderly and continuous. Third, upstairs firm activity, whether block positioning or equity trading, was regarded as providing an additional source of liquidity to the specialists, an activity that became more important with the increasing institutionalization of the market. During the market break, these assumptions did not work. Specialists were confronted with extraordinary imbalances that required unprecedented capital commitments and the upstairs firms did not provide the anticipated liquidity.

During the week prior to the market break, the NYSE was subject to unusually high volatility. The intra-day volatility experienced over the entire week was particularly disturbing. Beginning on Wednesday, October 14, measures of intra-day volatility began to surpass the average for the previous several months; for the week, intra-day volatility more than doubled that for September. Further, the volatility during the week was accompanied by increasing volume and selling pressure, culminating in the then record volume and Dow Jones Industrial Average ("DJIA") point loss on October 16.

During the week of October 19, intra-day price volatility reached historic proportions. For October 19 and 20, DEPA found that intra-day volatility measures were 10 times higher than during August and September, and the volatility for the entire week increased 380%. ^{24/}

The volatility also was reflected in a decline in market quality. DEPA found that, entering the week of October 19, the quality of the markets for NYSE issues had deteriorated relative to those prevailing in August and September 1987, especially in the

^{21/} At the end of this Chapter there are various charts on market quality prepared by DEPA. For most of the charts, DEPA has broken down NYSE issues by decile, according to capitalization weight.

^{22/} The Division staff had an extremely limited time in which to review the relevant information. The key NYSE data took weeks to collect and aggregate. Moreover, because of the huge volume of data, it was not possible to analyze all of it. After analyzing the data, the Division also spoke with several specialists.

^{23/} Indeed, some market participants have criticized the specialist system as inadequate in light of the increased volume and size of trading over the past several years. *See* The Chicago Board of Trade's Response to the Presidential Task Force on Market Mechanisms, December 1, 1987, Part III at 13-15.

^{24/} *See* Chart 4-2. DEPA calculated price volatility relative to average trade price.

large capitalization stocks. Average quote size diminished and bid-ask spreads began to widen, indicating specialists' difficulty in maintaining deep and tight markets. ^{25/}

The Division has examined specialist performance during the market break to determine how specialist market making fared during this stressful period. The analysis contained in this section is divided into four sections. The first reviews specialist proprietary activity during the crucial periods of the market break -- the afternoon of October 16 to the close on October 20. The second examines specialist performance generally during October 19 and 20. The third reviews specialist activity on October 26 and after the break. The fourth discusses upstairs firm activity in relation to specialist performance.

(1) Specialist Proprietary Activity

(a) October 16 and 19

On October 16, the last trading day before October 19, specialist activity was mixed. Although the DJIA declined 108 points that day, only 36 of the 67 specialists ^{26/} were net buyers on October 16. ^{27/} By the end of October 16, the specialists had net long positions in 57 of 67 stocks. The average position, however, was only 33,400 shares per long stock.

Nevertheless, some early signs of the burden placed on the specialist system throughout the week of October 19 surfaced on October 16. First, specialist participation and buying increased. The specialists' participation rate for the sample stocks for the day, or TTV, ^{28/} increased to 12.63%, from a January through September average of 11.7%. The heavier participation occurred during record volume, so that specialists participation by share volume was even more significant. During the last hour of trading on October 16, when the DJIA dropped 57 points and over 18 million

^{25/} For example, the average bid-ask spread relative to share price increased from \$0.25 in September to \$0.32 during October 12-16 for the highest capitalized NYSE issues, and from \$1.65 to \$1.97 for the lowest capitalized stocks. Similarly, quote depth as a percent of average trade size had decreased over 30% by October 15 from its level on September 18, 1987, for both the high capitalization stocks (September 18 average of 245% for bid, 313% for ask) and smaller issues (385% for bid, 271% for ask). See Chart 4-1.

^{26/} The same specialist may have been responsible for more than one stock, but we refer to each stock as though it had a distinct specialist.

^{27/} Collectively, the specialists in the 67 stocks were net buyers of 287,000 shares, averaging 4,300 shares bought per specialist. Specialists overall that day were net buyers of 3.9 million shares. For October 14 to 16, specialists were buyers of 9.6 million shares.

^{28/} TTV, or "twice total volume," indicates the relative frequency of specialists' proprietary activity in their specialty stock. The equation represents specialist purchases plus sales (not netting) divided by twice the total volume. Because specialists can never be on both sides of a trade for their own accounts, the highest percentage TTV they can achieve is 50%.

shares of program related selling reached the floor, an increased majority of specialists were buyers. During that hour, 35 specialists were net buyers, 19 were net sellers and 3 specialists were flat (proprietary specialist intra-day trading information was not available for 10 of 67 stocks for October 16). Second, there was mixed specialist activity during the afternoon decline, even though specialists were called on to participate to a larger degree than normal. For example, the 22 specialists that were net sellers or flat had a below average TTV of 9.35%.

Specialists interviewed by the Division indicated that they were very nervous during the weekend before October 19 concerning the possibility of massive selling on October 19. This, along with the volatility experienced on October 16, provided specialists with a great deal of concern heading into Monday morning.

Before the opening on October 19, specialists were faced with large sell imbalances in many stocks. Some stocks had sell imbalances of several hundred thousand shares. 29/ The imbalances forced delayed openings in a total of 183 stocks. 30/ Of the 30 DJIA stocks, 13, representing 54% of the DJIA's price weight, were opened at 10:00 a.m. or later. 31/ Twenty-four of the 67 stocks studied by the Division were also unopened by 10:00 a.m. Some imbalances facing specialists were extremely large. For example, Eastman Kodak had a sell imbalance of 257,800 shares, and Exxon, 361,200 shares.

In response to the imbalances, specialists moved down the prices of their stocks at the opening to the point at which other buying interest would supplement the specialist. In Coca-Cola, for example, 273,700 shares traded at the 9:53 a.m. opening, with the price dropping 3 1/2 points to 36 1/4 from the previous day's close. In Eastman Kodak, 398,400 shares traded at the 10:40 a.m. open, with an opening price of \$76 per share, 13 1/2 points lower than the close on October 16. In Exxon, opening (10:47 a.m.) volume was 1,380,000 shares, with a price of 40, down 3 1/2 points from the previous close.

29/ The imbalances do not include limit orders, only market orders. The direction and magnitude of the market orders, however, provide a reasonable approximation of the total imbalance in each stock.

30/ If there is a large imbalance on one side of the market that would cause a substantial price change from the previous day's close, the specialist may not open the stock unless he has Floor Official approval. A delayed opening in the stock may be called because of the imbalance. During the delay, the specialist will disseminate indications of interest (issuing quote indications) to attract orders on the other side to reduce the imbalance. Under NYSE procedures, the specialist is required to wait at least 15 minutes from the first indication before opening the stock. If more than one indication is issued, the specialist must wait an additional 10 minutes if the last and preceding indications do not overlap or an additional 5 minutes if the last and preceding indications overlap.

31/ The dramatic impact on the DJIA is highlighted by the fact that only 40% of the S&P 500 and 36% of the NYSE Composite Index (as measured by index value) were not opened by 10:00 a.m. Similarly, on October 20, although 53% of the DJIA had not yet opened by 10:00 a.m., only 38% of the S&P 500 and 34% of the NYSE Composite had not opened.

By 10:00 a.m., the DJIA had dropped 68 points, or 3.4%, to 2,178, with many stocks still not open. ^{32/} During this drop, most specialists were relatively heavy buyers. Of the stocks opened by 10 a.m., specialists were net buyers in all but five of the stocks, and only in Schlumberger, Inc., was the specialist a significant seller (31,500 shares). ^{33/} The specialists who were net buyers averaged approximately 72,500 shares purchased per stock. Assuming an average stock price of \$50, ^{34/} these specialists bought an average \$3.6 million worth of stock at the opening in our sample stocks.

Considering the magnitude of the sell imbalances and the level of specialist participation, the delayed openings and openings at prices substantially below the closing price may well have been reasonable in most stocks. Nevertheless, the size of some of the gaps raises concerns. For example, Eastman Kodak fell 15% at the opening, with the specialist purchasing over 130,000 shares. Similarly, the Coca-Cola specialist purchased 88,000 shares in the opening, and the stock dropped 9%. ^{35/} In all, the Division identified seven stocks in the pilot group whose prices dropped 10% or more by the opening, or shortly thereafter, from their October 16 closing price, and which had a significant price rebound by noon. The Division appreciates that the specialists in these stocks were called on to accept substantial risks in positioning a large part of the order imbalance in order to open the stock. Nevertheless, openings involving such large price movements followed quickly by price recoveries should be scrutinized by the NYSE to assure that the specialist met his obligations to ensure a fair and orderly market.

During the remainder of October 19, specialists were subjected to unprecedented volume and imbalances. Orders came in so quickly that specialists could not keep up with the order flow. ^{36/} Although the DJIA fell over 200 points from 10:00 to 2:00, the specialists were extremely mixed in their net buying and selling during this period. During the middle of the morning, the brief rally in the DJIA allowed many specialists to sell some of the long positions they had accumulated at the opening. ^{37/} Even after

^{32/} If all of the DJIA stocks had opened together at 9:30 a.m., at their eventual opening prices, the DJIA would have dropped over 200 points at the opening. Due to the staggered openings, however, not all of the openings were reflected in the average at one time.

^{33/} Schlumberger had dropped 4 points (10%) by 10:00 a.m. from its October 16 close.

^{34/} The average closing stock price for the 67 stocks on October 16 was \$56. The opening prices for the stocks on October 19 were much lower.

^{35/} Twenty minutes after the opening, Eastman Kodak regained eight of the 13 1/2 points lost in the opening. By 11:30, Coca-Cola had regained most of its opening loss.

^{36/} For the week of October 19 to 23, the typical NYSE specialist handled 93% more trades than normal and 31% more shares per trade. These figures were even greater on October 19 than for the rest of the week.

^{37/} Most specialists do not use options or futures to hedge their positions. The specialists interviewed by the Division all stated that they do not hedge with derivative products. The NYSE questioned all of the specialists, and found seven

the rally, specialists were mixed as to their buying and selling, including specialists whose stocks opened after 10:00 a.m. Indeed, some specialists were net short for the day by the early afternoon. 38/

At 2:00, the last major wave of selling began. Institutional buy orders had dissipated, and the upstairs firms were not buying much stock. 39/ From 2:00 p.m. to the close, the DJIA dropped over 200 points, although a minor rally occurred from 2:15 to 2:45. From 2:00 until 4:00 p.m., a majority of specialists were net buyers. Overall, 39 of the 67 specialists bought more than they sold in those two hours. During that period, however, the total net specialist buying and selling activity was almost flat. 40/

Broken down into hour time brackets, from 2 to 3 p.m., 35 of the 67 specialists were net sellers, aggregating 434,800 shares sold. From 3 to 4 p.m., specialist buying increased somewhat, as 47 of the 67 specialists were net purchasers. The total net purchases amounted to only 655,000 shares, and the net buyers averaged only approximately 31,300 shares net bought per specialist.

Further, there were examples of heavy specialist selling during rapid drops in the price of some stocks. For example, the Atlantic Richfield specialist was a net seller of 36,700 shares during the last hour, during which time the price of the stock fell from around 72 to 65 (9.7%). The DuPont specialist was a net seller of 68,100 shares during that hour; DuPont stock fell from 90 to 85 (5.5%). The BellSouth specialist sold 188,700 shares (including 25,800 short) while the price of the stock fell approximately 3 points to 29 (9.3%).

Some of the selling occurred when an occasional block buy order reached the floor late in the day, allowing the specialist to sell some of his long position. For example, the WalMart specialist sold 208,000 shares during the last hour of trading, of which 200,000 was against a block buy order. Similarly, the Exxon specialist managed to sell short 106,500 shares, all of which was in the last trade against a block buy order.

An analysis of five selected stocks provides a capsule view of the specialist activity on October 19.

that used derivative products to hedge, but only to a small degree.

38/ By 2:00 p.m., specialists had a long position of less than 10,000 shares (or were short) in 14 of 67 stocks.

39/ See infra for a discussion of upstairs firm activity. From time to time during the last half hour, however, a large buy order hit the floor in a few stocks.

40/ The net sell figure averages out to approximately 560 shares sold per specialist during that period, which represents a very small percentage of actual specialist activity. That figure may be skewed somewhat by the trading activity in WalMart Stores stock. From 2 to 4 p.m., the WalMart specialist sold 233,300 shares. Taking that figure out of the sample, specialists were average net buyers of approximately 9,900 shares, still a small portion of their overall proprietary activity.

1. Merck opened at 10:47 at 162, down 22 points. The specialist bought 106,000 shares and sold 45,000 shares until 11:00 (the majority of selling occurred from 10:50 to 11:00 as the stock rebounded). The specialist's activity was mixed generally from 11:00 until shortly before 3:00, with the stock trading up at several points, peaking at 175, but returning to around 164 shortly before 3:00. During the last hour, the stock dropped 13 points to 152, but there was less specialist activity than in the morning. During this period he bought 34,000 shares and sold 5,000 shares. For the day the specialist was a net buyer of 73,600 shares.

2. Coca-Cola opened at 9:53 at 36 1/4, down 4 1/2 points. The specialist bought 87,000 shares from the opening until 10:00. His activity was primarily as a seller until approximately 3:00 p.m., with the stock trading up briefly before declining to 35. During the last hour, the stock dropped five points to 30; the specialist bought 84,000 shares, but sold 81,000. For the day, the specialist was a net seller of 5,700 shares.

3. IBM opened at 10:44 at 124, down about 10 points. The specialist bought 120,000 shares and sold 60,000 shares by 11:00 a.m. The stock remained steady until 1:00, during which time the specialist was primarily a seller. From 1:10 to 2:00 the stock dropped about 10 points, with the specialist buying 65,000 shares and selling 52,000. From 3:00 until the end of trading, IBM dropped from 116 to 103, during which time the specialist bought 42,000 and sold 80,000 shares. For the day the specialist was a net seller of 24,300 shares.

4. General Motors opened at approximately 9:30 at 65, down one point. From 9:30 to 10:00 the specialist bought 50,000 and sold 29,000 shares. From around 1:00 to the close, General Motors dropped 14 points to 50, with the specialist buying 157,000 shares, but selling 161,500. For the day the specialist was a net buyer of 26,600 shares.

5. Exxon opened at 10:47 at 40, down 3 1/2 points. The specialist bought 107,710 shares of the 1,380,800 share opening. From 12:00 to 2:00, the stock dropped six points to 34 1/2, with the specialist a net buyer of 78,000 shares. From 2:30 to 2:55, the stock rebounded 2 1/2 points to 37, and then dropped to 33 1/2 at 3:58, before rebounding to 35 at the close. From 2:00 to 4:00, the specialist bought 27,000 shares and sold 257,000 shares, of which 106,500 shares were sold short on the last trade of the day. ^{41/} For the day, the specialist was a net seller of 239,000 shares.

Some interesting points emerge regarding specialist trading on October 19. First, not surprisingly, most specialists were net buyers for the day. For 50 of the 67 stocks surveyed, specialists were net buyers, with an average of approximately 44,500 shares net bought that day, or approximately \$2.2 million per stock. Overall NYSE data indicates that specialist units increased their net long positions by \$470 million during the day on October 19. As discussed in more detail in Section B of this Chapter, these long positions were enormous compared to the positions normally maintained by the specialist firms, and substantially depleted specialist buying power. Compared to the buying power of the large trading or investment banking houses, however, these positions were not particularly large. For example, four large broker-dealers lost \$421 million on their equity portfolios from October 16-30, 1987. Further, 15 of the major investment houses suffered combined equity portfolio losses during that two week period of between \$800 and \$900 million.

^{41/} On the last trade, Exxon rose a point on 135,000 shares.

Second, the specialists were forced to participate in far more trades on October 19 than usual. From January to September 1987, all specialists had a combined TTV of 11.7%. On October 19, the TTV increased to 17.5%. This increase is more impressive considering that the volume on this day was almost three times the average. Interestingly, the TTV varied significantly among stocks. For example, Exxon and R.J. Reynolds had TTVs of 6.5% and 8.8% respectively, while WalMart had a TTV of 27.7%.

Third, the performance of specialists varied greatly. ^{42/} While most specialists were buyers on the 19th, some were significant sellers. Buying and selling activities also varied greatly in the last hour of trading. Moreover, as discussed above, specialists differed in the amount they participated in trading. Some of the differences in the specialist performance may be attributed to the order flow peculiar to the various stocks. However, the trends were so strong and pervasive across stocks that the differences seem to have derived primarily from individual specialist skills, capital, willingness to accept risk, and trading strategies. One explanation suggested for specialists selling or lack of buying in some stocks is that they were increasingly long in other specialty stocks, and thus did not want to raise their long exposure in all stocks. The Division believes that all stocks should be subject to adequate specialist performance; activity by a specialist in one specialty stock is not relevant to evaluating performance in a different specialty stock.

b. October 20

Prior to the opening on October 20, specialists again faced large order imbalances in a great number of stocks. Unlike Monday, however, the imbalances were mixed from stock to stock, with the most significant imbalances on the buy side. As a result of these imbalances, and the prior day's unprecedented volume, many stocks delayed opening on the 20th. Fifteen of the 30 DJIA stocks, representing 52.3% of the price weight, were not open by 10 a.m. All together, 92 NYSE stocks had delayed openings on the 20th, including 26 of the 67 stocks studied by the Division.

One of the important aspects of the delayed openings on October 20 was the size of the bid-ask spreads in the pre-opening indications. The size of the spreads in many of the indications were so large as to provide little guidance as to where the stock might eventually open. Faced with the record setting market drops and volume of the previous two trading days, and another surge of pre-opening orders on Tuesday morning, it appears that a number of specialists were unable to identify opening prices for their stocks. For example, General Electric, which closed at 41 7/8 on Monday, had an initial pre-opening indication of 45 bid, 65 ask at 9:52 a.m., then another indication of 40 bid, 55 ask, at 10:33 a.m., before opening at 10:55 a.m. at a price of 46 1/2. Newmont Mining, which closed at 33, had a pre-opening indication of 22 bid, 33 ask at 12:29 before opening at 1:18 p.m. at a price of 29. The J.P. Morgan specialist, whose stock had closed at 27 3/4, put out pre-opening indications of 35 bid, 45 ask, then 40 bid, 50 ask, before opening the stock at 47 at 10:08 a.m., up 69% on 500,000 shares.

^{42/} The NYSE already has undertaken several investigations of specialist performance during the week of October 19 which have resulted in specialists in two stocks agreeing to withdraw as specialist in those stocks.

Many specialists did not even put out a pre-opening indication until several hours after 9:30. For example, Goodyear, which closed at 39, had a pre-opening indication of 30 bid, 40 ask at 12:20 p.m. ^{43/} A number of smaller issues did not have opening indications until after 2:00 p.m.

As on October 19, the substantial imbalances resulted in some large gap openings. For example, Allied-Signal had a pre-opening market order imbalance of 86,000 shares, and opened at 10:26 a.m. at 33, up 5 points on 150,000 shares. General Motors reported a market order buy imbalance of 324,100 shares, and opened up 15 points at 65 on 560,500 shares. Exxon had a market order buy imbalance of 107,200 shares, and opened 5 points higher on 1,065,000 shares. Further, many specialists opened up their stocks on gaps without putting out pre-opening indications; still others had significant gap openings on seemingly small imbalances. For example, the Atlantic Richfield specialist had a market order buy imbalance of 13,000 shares. The stock, however, opened up 10 points at \$75 per share on total opening volume of 267,600 shares.

Specialists were extremely heavy sellers on the opening transactions and during the first 30 minutes of trading on October 20, as many used the opportunity to liquidate their large positions from the previous day. Specialists in 35 of the 41 stocks opened by 10 a.m. were net sellers. Cumulatively, specialists in those stocks sold 2,691,100 shares, or approximately 65,600 shares per specialist.

Specialists also were sellers for stocks experiencing delayed openings. For those stocks, ^{44/} specialists were net sellers of 426,700 shares at the opening, for an average of 17,800 shares sold per specialist. By 10:30 a.m., most stocks had opened, including 26 of the 30 DJIA stocks and 60 of the 67 stocks studied by the Division. During that one hour period, the DJIA had risen 196 points, a gain of 11.3%. A significant portion of that rise apparently was a result of the large gap openings. Eighteen of the twenty-six DJIA stocks open by 10:30 opened at prices two or more points higher than their closing prices on the 19th. The percentage price gain resulting from gap openings ranged from a 6.8% rise in Texaco to a 33.3% rise in Coca-Cola. ^{45/}

It is difficult to generalize on the performance of NYSE specialists during the opening on October 20. With the unprecedented volatility of the day before and the uncertainty entering the opening, it was inevitable that the market would need time to find its place, and that each specialist would need time to sort out a particular stock's situation. The fact that over 85% of the S&P 500 stocks opened by 10:00 a.m. in these circumstances is testimony to special efforts undertaken by some of the specialists. On the other hand, unusual circumstances, even in the extreme case of October 20, can not excuse specialist inadequacy. The Division has noted several instances of specialist performance in opening their stocks that raise questions about the specialist's

^{43/} Immediately before Goodyear opened that day, it had a market order imbalance of -75,800 shares. The imbalance was probably greater earlier in the day.

^{44/} Two stocks, DuPont and Digital, were excluded from the analysis of the October 20 opening, because they remained closed until 12:52 and 2:10, respectively.

^{45/} For the 18 stocks with gap openings on October 20, five had increases of less than 10%, 7 had increases of 10% to 19%, and 6 had increases in excess of 20%.

maintenance of a fair and orderly market. ^{46/} The Division also is concerned about the dissemination of quote indications in some stocks that were so wide as not to be useful in communicating a likely opening price and the failure to disseminate pre-opening indications in securities that opened significantly away from the previous day's close. As with October 19, the Division believes openings on October 20 deserve scrutiny by both the Commission and NYSE.

The rapid morning rebound in the DJIA did not last. From 10:30 until noon, the DJIA lost 209 points, or 10.8% of its value, eliminating the gains made during the first hour. ^{47/} For 15 of the 18 gap-opened stocks, the opening price represented the high price for the day. For example, Atlantic Richfield opened up at 75 at 10:27 a.m., up 10 points from the close, but lost five points in the next 30 minutes and five more points in the following 30 minutes. In all but three of the gap-opened stocks, the price fell below the previous day's close by noon. For two others, the opening price was not exceeded until after 3 p.m., and then only after the price of those stocks had dropped precipitously during the course of the day.

From 11:00 a.m. until noon, specialists became net buyers as prices dropped during that period. Of the 67 stocks, 59 maintained trading during that period. Of that group, 34 specialists were net buyers, purchasing a total of 1,574,200 shares, or 46,300 shares per specialist. While this is significant activity, it is considerably smaller than the selling activity done by the specialists at higher prices on the opening transactions. The 25 specialists who were net sellers during that period sold in smaller amounts, totalling 625,300 shares sold, or approximately 25,000 shares per specialist.

Around mid-day, evidence of a de facto market halt began to emerge. The other eight of the 67 sample stocks did not trade at all from 11:00 to noon. An additional eight of the 67 stocks called trading halts during that hour; thus, trading in 16 of the 67 was halted. Market-wide, trading halts were called in 167 stocks on October 20, 141 of which were commenced between 10:30 and 12:30, during the rapid price drop from the market's opening rise. Again, these halts were called because of large order imbalances. Unlike the delayed openings of earlier that morning, the majority of significant imbalances were sell imbalances. While it is impossible to reconstruct the exact imbalances at the time, the specialists in the 16 stocks examined provided approximations of the imbalances. ^{48/} The sell imbalances ranged from 30,000 shares in Westinghouse Electric to over 800,000 shares in Primerica Corporation, and averaged over 200,000 shares. Further, there were some instances where stocks which had delayed openings with large price increases halted trading shortly after opening with sell imbalances. For example, IBM opened at 10:23 at 120, up 16 3/4 from the previous day's close. By 11:34, the specialist asked for a trading halt as the price had receded to 112 and the specialist had a 300,000-500,000 share sell imbalance. The specialist for

^{46/} See note 42 concerning NYSE specialist surveillance.

^{47/} The S&P 500 future declined from 229 to 183 (21.8%) during this time.

^{48/} The NYSE does not keep records of share imbalances when halts are called. In the future, the Division believes the NYSE should record the amount of order imbalances at the time it determines to halt trading in a stock. During the Division's analysis of the NYSE data, the Division requested the NYSE to ask the specialists to give their estimates of the imbalances at mid-day on October 20.

Sears, Roebuck experienced a similar situation. Sears opened at 10:03, up 7 1/4 to 38. By 11:24, the price had dropped back to 34, and trading was halted with a sell imbalance of 370,000 shares. The Philip Morris specialist opened at 10:16, up 7 1/2 points to 95. At 11:31, trading was halted at 77 1/2, with a sell imbalance of 125,000 shares.

In interviews, the specialists all claimed that they stopped trading, not because they could not afford to buy more stock, but because as a business matter they did not want to buy more. Many lost substantial amounts on Monday as a result of the heavy proprietary trading they undertook as part of their specialists' responsibilities. With the market declining so swiftly on Tuesday, they did not want to repeat Monday's experience of heavy buying. Essentially, at that point in time on Tuesday, the specialists concluded that there was almost no buying interest in their stocks (which represented a large percentage of the capitalization of NYSE listed companies) at current prices. They would begin trading their stocks only at a price that would attract other buyers. 49/

Discussions with institutional investors and broker-dealers indicate that the de facto market halt allowed investors to reassess the market. During this period, additional buying interest responding to quote indications put out by specialists reassured investors that the market decline did indeed have a bottom. This helped attract additional buy orders back into the market. For example, Merck, which had a 500,000 share sell imbalance when halted, had a 14,000 share market order imbalance to sell before reopening. IBM's sell imbalance was eliminated before reopening.

The quote indications for most of the halted stocks, while large for normal times, do not appear out of proportion considering the heavy sell imbalances and market volatility. For example, IBM had an indication of 105 bid, 120 ask before reopening at 112, its price before the halt; Eastman Kodak had an indication of 38 bid, 43 ask before reopening at 43, off one point; Primerica Corp. had an indication of 27 bid, 32 ask before reopening at 32, its price before the halt; and Phillip Morris had an indication of 74 bid, 80 ask before reopening at 79, 1 1/2 points from its halted price.

2. General Market Making Analysis

a. Continuity

In analyzing NYSE specialist performance and market quality during the October market break, the Division reviewed much of the same data usually employed in NYSE specialist evaluations to determine the overall quality of the market. First, the Division reviewed continuity data for 57 stocks. 50/ Continuity exists if each succeeding execution price within the auction market process for a single stock bears a reasonable relationship to the execution price which immediately preceded it. Therefore, continuity

49/ The S&P 500 future halted trading at 12:15 p.m. and reopened at 1:05 p.m.

50/ For 10 of the 67 stocks, not all of the data was available in time to include in every analysis. The group of 57 stocks, however, contains all DJIA issues as well as some smaller capitalization and takeover stocks.

is best evaluated by examining changes in the price of consecutive transactions over a given period of time. 51/

Data for October 19 reveal that continuity was well below average in the markets for the selected stocks. The Division calculated trades moving the market 1/8 of a point or less as a percentage of overall trades for that day. On average, only 73.90% of trades were within the 1/8 point or better range, as compared to 92.59% within that range for the same stocks for September 1987. Historically, in 1986, 90.2% of all trades executed in all stocks on the NYSE were within the 1/8 point parameter; in 1985, the figure was 92.3%. 52/

All 57 stocks experienced at least a minimal decline in continuity, ranging from declines in excess of 25% in highly capitalized companies such as Eastman Kodak (97.5% September average decreased to 67.4%) and Atlantic Richfield (91.2% to 63.0%) to 7.8% in Exxon (99.2% to 91.4%), 7.6% in General Motors (97.8% to 90.2%) and 3.2% in Texaco (99.9% to 96.7%). Many stocks with lower average trading volume, although having continuity figures comparable to the higher capitalized stocks for September, experienced more dramatic declines in continuity. For example, Household International declined 45.0% from its September average (84.8 to 39.8); Irving Bank, 40.9% (90.1% to 49.2%); and Bell and Howell, 33.6% (75.8% to 42.2%).

For October 20, decreased overall continuity, with more dramatic drops in smaller stocks, continued. Again, all 57 stocks showed a decline in continuity from their September averages (43 of the 57 experienced further declines from October 19), with 69.28% of the transactions resulting in price movements of 1/8 point or less, representing a decline of 23.31% from September and a further decline of 4.62% from October 19.

The Division also explored whether the market experienced a greater percentage of excessively wide price movements during October 19 and 20. Again, using September as a comparison point, the percentage of large price jumps (1/2 point or more) increased dramatically over those two days. For September, only 0.26% of transactions in the 57 stocks were 1/2 point or more. For October 19, that figure rose to 3.89%, and for October 20, it increased further to 7.81%.

The Division continued an in-depth examination of the sample nine stocks in its review of specialist performance and market quality. The percentage of trades by price change for the nine stocks for October 19 and 20 are as follows:

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- 51/ The Presidential Task Force found the usefulness of continuity and depth as measures of performance to be negligible on October 19 and 20. (See Report of the Presidential Task Force on Market Mechanisms, January 1988, at p. VI-32-40). The Division believes that continuity and depth provide useful supplements to analysis of actual specialist transactions, even during periods of volatility.
- 52/ NYSE, Fact Book at 15 (1987). The fact that the September average for the 57 stocks was higher than the total 1986 average may be due to the fact that the 57 stocks are, on average, more highly capitalized and more liquid than the average NYSE stock. Included within the group of 57 securities are 29 of the 30 leading stocks in terms of market value and 20 of the 25 most active stocks for 1986.
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	<u>October 19</u>	<u>October 20</u>	<u>September Average</u>
Dayton Hudson (DH) - closing price, 10/16/87 - 44 3/4			
% 0-1/8	77.7	69.3	97.9
% \geq 1/2	0.3	3.8	0.07
General Electric (GE) - 50 3/4			
% 0-1/8	83.2	82.1	98.4
% \geq 1/2	0.4	0.3	0.05
General Motors (GM) - 66			
% 0-1/8	90.2	78.4	97.8
% \geq 1/2	1.0	1.8	0.1
Household International (HI) - 52			
% 0-1/8	39.8	41.2	84.8
% \geq 1/2	13.3	13.4	0.08
International Business Machines (IBM) - 135			
% 0-1/8	76.6	80.1	97.4
% \geq 1/2	7.0	8.2	0.07
Coca-Cola (KO) - 40 1/2			
% 0-1/8	86.7	85.7	96.5
% \geq 1/2	0.8	0.7	0.08
Merck and Co. (MRK) - 184			
% 0-1/8	66.8	51.4	67.2
% \geq 1/2	23.8	39.3	3.3
Newmont Mining (NEM) - 45 5/8			
% 0-1/8	53.0	48.6	93.2
% \geq 1/2	5.7	10.9	0.3

Exxon (XON) - 43 3/4

% 0-1/8	91.4	86.4	99.2
% ≥ 1/2	1.8	1.0	0.08

From the sample group of stocks, we can conclude that continuity on October 19 and 20 was down significantly market-wide, regardless of the characteristics of the stocks. 53/

b. Depth

To assess further the quality of the market on October 19 and 20, the staff reviewed trading statistics to analyze the depth of the market for 57 NYSE stocks. Depth is measured by assessing price changes over continuous trades totalling 1,000 shares in a given stock (but excludes block trades). As with its analysis of continuity, the staff followed NYSE format and calculated depth as a percentage of trades of 1,000 shares that moved the market by 1/8 point or less as a percentage of total 1,000 share sequences. The depth of the market continued to demonstrate a significant decline, using the 1/8 point dividing line. Fifty-four of the 57 NYSE stocks experienced a decline in depth on October 19, as compared to their September figures, 54/ ranging from significant declines of 50.5% by Household International (82.0% to 31.5%), 42.0% by Newmont Mining (93.5% to 51.5%), and 36.8% by DuPont (97.2% to 60.4%), to minimal declines of 1.5% by Texaco (100.0% to 98.5%) and 2.2% by Exxon (99.9% to 97.7%). Overall, the 57 stocks declined on average 18.38% from September, dropping from 92.50% to 74.12%.

These figures did not improve for October 20, and, in some cases, the depth figures deteriorated further. The percentage of trade sequences of 1,000 shares moving a stock's price by 1/8 point or less dropped farther that day, to 67.62%. Fifty-six of the 57 stocks declined from their September figures, and 44 of the 57 experienced further declines from their October 19 performance. 55/ The declines were significant regardless of price, liquidity, or capitalization.

As with the continuity figures, the number of large price movements in the depth analysis increased for October 19 and 20. For September, the number of 1,000 share sequences resulting in price changes of 1/2 point or more was 0.02%. In fact, the majority of the sample stocks had no price changes of 1/2 point or more for the month

53/ We observed significant continuity decreases in high and low capitalized stocks, high and averaged priced stocks, as well as very liquid and less liquid stocks.

54/ Only Merck (64.7% to 65.4%), a high priced stock with the lowest depth average for September among the pilot stocks, and F.W. Woolworth (95.0% to 95.3%) registered an increase. The depth figures for price changes of ≥ 1/2 point for Merck on October 19 indicate a huge increase. Navistar, the only other issue not to experience a decline on the 19th, was priced in the 3-6 dollar range. Its depth figures for October 19th matched its September figure of 100%.

55/ Only F.W. Woolworth experienced increased depth from its September performance, and that increase was minimal (95.0% to 97.2%).

of September on 1,000 share sequences. For October 19, that figure increased to 3.55%, and, on October 20, the figure was 7.99%.

The depth figures for the nine selected stocks are as follows:

		<u>October 19</u>	<u>October 20</u>	<u>September</u>
Dayton Hudson - closing price, 10/16/87 - 44 3/4				
%	0-1/8	73.3	65.1	99.0
%	≥ 1/2	1.3	2.7	0.0
General Electric - 50 3/4				
%	0-1/8	88.2	89.9	99.2
%	≥ 1/2	0.3	0.3	0.0
General Motors - 66				
%	0-1/8	89.9	85.4	98.7
%	≥ 1/2	0.7	0.6	0.0
Household International - 52				
%	0-1/8	31.5	31.8	82.0
%	≥ 1/2	15.7	26.1	0.7
IBM - 135				
%	0-1/8	76.2	79.7	97.6
%	≥ 1/2	7.9	8.1	0.0
Coca-Cola - 40 1/2				
%	0-1/8	91.5	90.4	97.7
%	≥ 1/2	0.7	0.0	0.0
Merck & Co. - 184				
%	0-1/8	65.4	41.7	64.7
%	≥ 1/2	21.2	47.5	3.9
Newmont Mining - 45 5/8				
%	0-1/8	51.5	41.7	93.5
%	≥ 1/2	10.5	8.3	0.1

Exxon - 43 3/4

%	0-1/8	97.7	95.3	99.9
%	≥ 1/2	1.6	0.0	0.0

As with the continuity statistics, the depth statistics were down market-wide on October 19 and 20, regardless of the characteristics of the stocks.

c. Spreads

Analysis of the spread between the bid and ask in a particular security is the third primary method of assessing specialist performance. A wide spread usually is an indication of a disparity between buy and sell orders. At times that disparity may be too great for the specialist to bridge, and an exchange-approved trading halt may be called for. Generally, however, specialists are expected to narrow the quote by making the necessary bid or offer for their own accounts. Analysis of the spread, therefore, is an important indicator of the quality of the market. Narrow spreads indicate a highly liquid market, in which the costs of buying and reselling stock are lower. When the spread is wider and, therefore, transaction costs are also higher, the specialists can profit from the wider market. This occurs because a large portion of the dealer transactions of the specialists are based on the quote; that is, the specialists buy at the bid and sell at the ask, and their profit is directly related to the size of the spread. Therefore, wide spreads may indicate, among other things, the inability or unwillingness of specialists to meet their affirmative obligations to trade.

The NYSE traditionally evaluates specialist performance regarding spreads as an analysis of percentage of spreads within a certain parameter, usually 1/4 point. The Commission followed that analysis, but also compiled data on the percentage of spreads 1/2 point or wider. Except for extremely high priced stocks, a 1/2 point spread is generally considered wide.

The data examined for October 19 and 20 demonstrated a broad overall decline in the quality of spreads in the stocks studied. On average, 75.29% of quotes for the group of stocks for September had spreads of 1/4 point or less. ^{56/} On October 19, the average figure for the 57 stocks had dropped to 32.03%. All but one stock experienced a decline in spread quality for that day. ^{57/} The largest declines for individual stocks for the 19th were Bristol Myers, which fell from 96.3% to 10.6%, and Eastman Kodak, which decreased from 83.9% to 5.5%. The smallest decreases were in Texaco, which experienced a decline from 99.8 to 96.4%, and Navistar, a lower priced stock, which experienced a decline from 100.0% to 95.5%. As with the analyses of

^{56/} This figure represented an improvement over recent historical market-wide data. In 1986, 69.8% of spreads on the NYSE were 1/4 or better, in 1985 the figure was 70.6%.

^{57/} The one stock, Geico, is a high priced, generally illiquid issue. The September spread figures for Geico were by far the lowest (4.2%), and, even with its improvement on October 19, to 6.6%, Geico was in the bottom 10% of the stocks studied.

continuity and depth, the declines were significant regardless of price, capitalization or trading volume.

Examining the percentage of wide spreads for October 19 and 20 also yielded significant results. For the 57 stocks for the month of September, only 6.55% of quote spreads were 1/2 point or greater. Further, even that average is colored by the presence of two higher priced issues in that group (Merck and Geico, which had 63.4% and 94.9% of their spreads, respectively, at 1/2 point or greater for September). On October 19, however, the 57 stocks had an average of 49.36% of spreads 1/2 point or wider. Even the most liquid stocks experienced dramatic increases in the occurrence of wide spreads. ^{58/} Indeed, the largest overall spread increases were among the most highly capitalized issues. For the 10 highest capitalized stocks, bid-ask spreads increased from an August average of \$0.24 to \$0.57 for the week of October 19, compared to an increase from \$0.21 to \$0.29 for the lower capitalized stocks.

On October 20, the spread figures continued to deteriorate. Overall, the percentage of spreads 1/4 point or less decreased further to 24.26%, while the percentage of spreads 1/2 point or wider increased to 62.23%. For all NYSE issues, bid-ask spreads widened more than 50% for the week, and were most pronounced on October 20, when spreads averaged \$0.49.

The spread figures for the nine selected stocks are as follows:

	<u>October 19</u>	<u>October 20</u>	<u>September Average</u>
Dayton Hudson - closing price, 10/16/87 - 44 3/4			
% 1/8-1/4	43.0	25.0	83.3
% ≥ 1/2	35.7	62.0	1.8
General Electric - 50 3/4			
% 1/8-1/4	38.8	41.4	94.5
% ≥ 1/2	40.6	32.9	0.9

^{58/} For the 5 most active NYSE stocks for 1986, the figures are as follows:

	<u>Spreads ≥ 1/2</u>	
	<u>September</u>	<u>October 19</u>
AT&T	0.2	53.5
IBM	1.2	46.3
USX	0.4	20.3
Mobil	2.8	41.3
Eastman Kodak	3.6	90.6

The percentage changes for AT&T and USX are even more notable when their volume and moderate stock price are taken into account.

General Motors - 66

% 1/8-1/4	64.5	31.6	97.9
% \geq 1/2	18.9	35.4	0.5

Household International - 52

% 1/8-1/4	3.8	11.3	43.8
% \geq 1/2	93.3	85.6	1.5

IBM - 135

% 1/8-1/4	46.9	25.2	92.0
% \geq 1/2	46.3	71.8	1.2

Coca-Cola - 40 1/2

% 1/8-1/4	41.5	47.0	80.6
% \geq 1/2	30.1	27.2	0.4

Merck & Co. - 184

% 1/8-1/4	1.3	0.0	23.7
% \geq 1/2	98.1	100.0	63.4

Newmont Mining - 45 5/8

% 1/8-1/4	10.5	9.6	74.4
% \geq 1/2	81.6	86.6	8.4

Exxon - 43 3/4

% 1/8-1/4	59.7	33.3	95.6
% \geq 1/2	20.5	38.5	0.0

The nine stocks showed a sizeable widening of spreads on October 19 and 20. Half of these stocks had significantly worse spreads on October 20 than on October 19. Again, the deterioration in this market indicator occurred in all types of stocks.

DEPA provided data on the size of the specialist's quotes in NYSE stocks. Quote size expresses the number of shares bid or offered for a particular stock. During the week of October 19, the share size of the bid and ask quotes for all NYSE issues were about 62% of the norm. Moreover, on October 19 and 20, the average size of quotes

for many NYSE issues fell below the average trade size, whereas on normal days average quote size is generally 2.5 to 3.0 times the average trade size. In addition, hundreds of quotes in IBM and several other companies were non-firm on October 19, 20, and 22. ^{59/} These figures show the lack of liquidity in the marketplace that day, as well as the specialists' unwillingness to make deep markets during a period of extreme volatility.

d. Upstairs Firm Activity

A number of large broker-dealers operate so-called block trading desks and/or equity trading desks. These firms, called "upstairs" firms (as opposed to specialists and other traders on the floor of the NYSE), provide an additional source of liquidity for NYSE-listed issues through their trading activities. The block desks provide liquidity by their ability to "shop" their customer's block order upstairs and find contra-side interest for the order. In addition, these firms will often take a position by buying the block from the customer and selling it to other customers, and the opposite for orders to buy blocks. The risk these firms take in positioning the blocks helps to smooth the impact large block trades would otherwise have on a stock's price. Without this liquidity, institutional orders would be "worked" against incoming order flow and slowly liquidated, or specialists would be forced to be the contra-side to large blocks, which could result in trades at gapped prices.

On October 19, the activity of most block desks and trading desks was reduced. Through interviews with the block desks of several major trading firms, the Division has found that most firms did much less proprietary trading on October 19. Some block positioning was effectuated for clients, but on a much reduced scale. Moreover, firms generally were unsuccessful in "crossing" blocks upstairs. Basically, the firms reported difficulty in finding institutional clients willing to buy a piece of a block.

Data collected by the Division on upstairs firm proprietary activity suggest that upstairs firms were mixed as to buying and selling on October 19. A sample of 14 large upstairs trading firms shows purchases of 33,264,125 shares and sales of 27,599,099 shares of NYSE stocks on October 19, resulting in net buying of only about 400,000 shares per firm for all NYSE issues. This is consistent with data the Division has received from seven large trading desks for October 19 for the 67 NYSE issues. Most of the firms were sellers in most of the issues on October 19; only two firms did significant buying (and only in a few issues). ^{60/}

These results are also consistent with data collected by the Securities Industry Association ("SIA"). The SIA's data indicate that upstairs firms were net sellers for most of early October as the market declined. ^{61/} From October 1 until October 14,

^{59/} A non-firm quotation means that there is no assurance that an order can be executed for the quoted size at the bid or ask price.

^{60/} No firm had activity in all 67 issues, and some had no activity in most of the 67 issues.

^{61/} The SIA data came from forms filed by firms with the NYSE weekly, listing round-lot share volume effected on the NYSE. These data are published in the Wall Street Journal.

upstairs firms were net sellers of 14 million shares for their proprietary accounts. Thus, firms were reducing their equity exposure as the October market decline began. On October 15 and 16, the firms changed directions, and were net buyers of 5.1 and 4.7 million shares. Then, on October 19, firms turned sellers again, and sold a net 4.6 million shares.

The uncertainty as to how far the market would drop on October 19 made firms unwilling to buy stocks that were cheaply priced compared to the prior week, and spurred them into selling stocks bought on the previous two trading days. This upstairs selling is in contrast to the specialists' net buying of 21.2 million shares on October 19. Thus, the upstairs firms provided little or no buying support to the market on October 19.

On October 20 and 21, upstairs firms continued to sell, and were net sellers of 9.6 and 17.7 million shares on those days. Specialists were net sellers of 9.1 and 18.2 million shares on October 20 and 21.

e. October 26 and Afterwards

For several weeks following October 19, the stock market continued to experience heavy volume and daily price movements that, compared to 1986 trading, were quite large. For example, on October 26 the DJIA dropped 157 points (8.0%) on 331 million shares (in a shortened trading day); on October 29 it rose 91 points (4.9%) on 309 million shares; on November 3 it dropped 51 points (2.5%) on 243 million shares; and on November 12 it rose 61 points (3.2%) on 240 million shares. Even when volume stabilized, swings in the market kept occurring. 62/

It is reasonable to assume that part of the reason for these relatively large changes was that the willingness of the specialists and the upstairs firms to take large positions diminished greatly in light of the market crash. Indeed, with historical measures of volatility rendered obsolete by October 19 and 20, the willingness of all market participants to take risks was substantially reduced. 63/ Although fear of increased market volatility has affected all market participants, the Division has given particular attention to whether specialist performance has continued at a diminished level since October 19.

To determine the extent to which specialist performance has contributed to the market spikes, the Division examined sample specialist activities on October 26 and in late November. On October 26, the DJIA opened sharply lower, down 75 points by 10:00. There were numerous delayed openings, with 75 of the S&P 500 stocks failing to open by 10:00. Except for brief rallies of 10 to 15 points at 10:15 and 12:50, the DJIA

62/ For example, on November 17 the DJIA opened at 1,947, dropped to 1,895 by noon, then rose to 1,922 at the close on 180 million shares. By January, volatility figures were still high. The historical 30 day volatility for the S&P 500 index for January 15, 1988 was 38%, compared to 16% for September 15.

63/ Interviews with major block desks in December indicate that institutional buying is still reduced from pre-break days, and that block positioning activities are more restrained.

fell steadily the rest of the day, with a 35 point drop during the last hour of trading (1:00 to 2:00).

The specialists were overwhelmingly net buyers in early trading. Of the 55 of 67 sample stocks that opened by 10:00, specialists were net buyers in 48. The size of their buying was much smaller than on October 19, averaging only 21,000 shares per net buyer. If the two largest buyers are excluded, the net buying comes to 16,700 shares per buyer. The volume of activity on October 26, however, was lower than on the previous Monday, with 200 million shares traded by noon as compared to 259 million shares traded by noon on October 19.

After the opening buying activity on October 26, many of the specialists turned net sellers, but not in large amounts. From 10:00 until 1:00, when the DJIA dropped 30 points, specialist activity continued to be mixed, with slightly more buying than selling. During the last hour of trading, even though the DJIA dropped almost 2%, specialists were not significant buyers. Only 34 of the 67 specialists were net buyers during the last hour, while 31 were net sellers (two had little or no activity). For the day, specialists were net buyers, but at a much reduced level from October 19. For the day, all NYSE specialists were net buyers of 4.4 million shares, totalling \$176 million. In our sample, 42 of 67 stocks had net buying for the day.

The other indicators of specialist performance (continuity, depth, and spreads) showed improvements from October 19 and 20, but still were considerably below prior averages. Continuity analysis revealed that 82.72% of transactions on the 26th resulted in price changes of 1/8 point or less, an improvement of 13.4% from October 20, but still significantly lower than the September average of 92.58%. Large price changes ($\geq 1/2$ point) occurred 1.96% of the time, still up from the September average of 0.26%, but lower than the 7.81% for October 20.

Spread data for October 26 displayed similar trends. Spreads at 1/4 or less improved almost two-fold from October 20, to 46.97%; however, this was still significantly lower than the September average of 75.29%. Wider spreads remained prevalent, as well, with 31.14% of spreads on October 26 set 1/2 point or wider, as compared to 62.23% for October 20 and 6.55% for the month of September.

Depth figures for October 26 were similar. For the day, 81.18% of 1,000 share sequences were done at 1/8 point change or less and 2.32% done at 1/2 point or more, compared to 67.62% and 7.99% for October 20 and 92.5% and 0.02% for September.

The Division also examined some general indicators of specialist performance for November. Performance improved significantly, but was not back to the levels for September. First, specialist continuity figures for the month of November show that 86.4% of all trades took place at variations of 1/8 point or less. This is better than the 66.9% for October 20, but less than the pre-October average of over 90%. Second, the depth statistics for sequences of 1,000 shares moving the market 1/8 point or less were 83.2% for November, an improvement from October 20, but still below the 92.5% figure for the pre-break period. Third, spreads of 1/4 or tighter occurred 61.4% of the

time in November, compared to 24.3% for October 20 and the 70 to 75% range for pre-October. 64/

The improved figures for specialists in November coincided with the reduced necessity to trade. The overall TTV for specialists normally is 11.7%; 65/ but it was 17.5% and 18.1% on October 19 and 20. During the first week in November the TTV declined to 13.7%, and further declined to 12.3% as of November 23.

In interviews with Division staff, specialists evaluated their performance since the week of October 19 in a manner consistent with these data. They agreed that their trading was still affected by the market crash, and suggested that it may be several more months before their performance returns to pre-crash levels. The specialists were particularly worried about the impact of program trading. Some stated that they monitor the S&P 500 future's value constantly, and become apprehensive when the future is trading at a sizeable discount or premium.

f. Analysis

The Division's analysis suggests a number of general conclusions about specialist performance during the market break. Not surprisingly, the available data indicate that specialist performance in the aggregate declined on October 19 and 20, and overall indicators of performance show that markets were much less liquid on these days. Nonetheless, the Division believes that most (but not all) specialists performed reasonably in light of the unusual circumstances of October 19. Although subject to extraordinary pressure, they increased their aggregate buying activities and maintained reasonably regular markets in their stocks. Without the substantial specialist buying on October 19, it is highly likely that the market decline would have been even worse. Specialists often were the primary, and sometimes the only, buyers during the morning of October 19, and many were substantial buyers during the afternoon of October 19. Very little buying was effected by upstairs trading firms. Nevertheless, specialist buying on October 19, while extremely large when compared to usual activity, was not particularly large compared to upstairs firm trading. Moreover, although specialists were substantial buyers at the opening on October 19, when the final wave of sell orders came late in the afternoon they were incapable of stemming the subsequent decline.

While most specialists performed well under the circumstances on the morning of October 19, there were several instances of questionable specialist activity. A number of stocks were opened at prices well below their October 16 close, without large sell imbalances or substantial specialist buying. Moreover, while specialists in the aggregate were net buyers, a disturbing number were net sellers on October 19 in securities whose

64/ A Kidder Peabody study has found that as of November 3, representative bid-ask spreads for S&P 500 stocks were \$0.29 per share, as compared to \$0.23 per share on September 1, 1987. As a percent of stock price, the November spread was .77% of market value, compared to .45% on September 1. S. Bodurtha, *The Impact of October 19 on Transaction Costs in the Equity and Stock Index Futures Markets: A Preliminary Update*, Kidder Peabody & Co. (undated).

65/ That figure represents the average for January to September 1987.

prices dropped substantially. This problem was highlighted in the afternoon, when specialists reduced their buying and the instances of poor performance increased.

The Division believes that on October 20 specialist performance was uniformly weak, and reflected the panic and exhaustion prevalent on the NYSE floor. General measures of market making performance were lowest on that day, spreads were extremely wide, and markets were thin. Moreover, there were several stocks in which the specialist's handling of the opening was questionable. Finally, during much of the morning specialists in several stocks had difficulty in even making a market.

In part, specialists' difficulties on both October 19 and 20 underline the important function of upstairs trading and block positioning firms. The absence of upstairs firm participation during October 19 demonstrates the precarious position of the specialist in the current institutional market. If market participants come to rely, and expect, substantial liquidity in equity products -- whether through stock equivalents in futures or upstairs block positioning -- and that liquidity suddenly evaporates (or is simply overwhelmed), the specialists will be called upon to act as the buyer (or seller) of last resort. 66/ Under circumstances such as those encountered on October 19, this is a role the specialist cannot, and should not, be expected to perform.

We also believe it is important to emphasize that the market break has had lasting effects on specialists. The initial result was an increased receptivity to acquisition by integrated firms with more capital, as illustrated by the acquisition of A.B. Tompane by Merrill Lynch. On the negative side, the stock market has become more volatile and less liquid as measured by traditional standards. While specialist performance was closer to normal indicators by late November, it was still more sensitive to supply and demand disparities than before the market break. 67/ Some specialists may have developed a "flinch" reflex whereby whenever substantial buy or sell orders entered the market, especially when accompanied by significant discounts or premiums in index futures, trading prices would change more rapidly than before. Due to the diminished upstairs firm participation, and fear of sudden program orders, specialists, when faced with order imbalances, may be willing to let the price of their stocks rise or fall farther before they become participants. This could account, in part, for relatively large market moves with lesser volume during late November and December. 68/ Although more analysis should be done to test this assumption, the increased market volatility since October raises continuing concerns over liquidity in the market and the specialists' performance during volatile periods.

Finally, the analysis done by the Division raises many questions about specialist performance during the market break. Individual performance varied greatly, and not all

66/ It may be particularly important to review the specialists' role during periods of heavy program trading. Brief periods of program trading may overwhelm the specialists' ability or willingness to provide liquidity except at a price gap.

67/ In effect, all market participants are today paying a risk premium as the market adjusts to the new volatility measures.

68/ This could also account, in part, for the huge one-day decline in the DJIA on January 8, 1988, when the DJIA dropped 140 points, including over 100 points in the last two hours of trading.

specialists performed adequately during the relevant period. The staff believes that, whatever the structural implications of the October market break regarding program trading and the institutionalization of the markets, the NYSE must assume greater responsibility to monitor the performance of individual specialists. As a first step, the NYSE should evaluate the appropriateness of all gap openings and trading halts on October 19 and 20 as well as the compliance by individual specialists generally with their affirmative and negative market making obligations.

In conducting its evaluations, the NYSE should not be hesitant to use its authority under NYSE Rule 476 to reallocate stocks. This rule allows the NYSE to withdraw a specialist's allocation in one or more stocks if, after a disciplinary proceeding, the specialist is found responsible for a substantial or continued failure to maintain a fair and orderly market. This disciplinary power is in addition to the NYSE's reallocation authority under Rule 103A. 69/

In the past, the NYSE has been reluctant to use its reallocation powers. From 1978 until very recently, no specialist had been subject to reallocation. Since the market break, two specialists have relinquished their registration in a specialty stock in connection with performance during the week of October 19, and the NYSE is investigating others. 70/ The Division will review carefully the willingness of the NYSE to use its reallocation and other enforcement authority to address poor specialist performance during the market break and thereafter.

In addition, the market break highlights the need for the NYSE to reevaluate its performance measures. For over 10 years, the Commission has had a continuing dialogue with the NYSE over the proper method to evaluate specialist performance. The NYSE has devised performance measures that use absolute standards to evaluate performance, such that a specialist has to be graded below a certain unacceptable level on the SPEQ 71/ or other performance criteria to be subject to reallocation. The Division has found these measures to be only a limited deterrent to substandard specialist performance because it is extremely unlikely that a particular specialist would be rated unacceptable under these standards. 72/

The Commission has urged the NYSE to adopt relative performance measures so that specialists who were regularly among the lowest ranked specialists would be subject to performance reviews, regardless of whether their performance met an arbitrarily

69/ Rule 103A permits reallocation if a specialist's performance is below acceptable levels of performance, as measured by specialist evaluation questionnaires ("SPEQ") filled out quarterly by floor brokers. The NYSE is in the process of amending the rule to include other indicia of performance.

70/ The affected stocks were J.P. Morgan & Co. and Gould, Inc.

71/ The SPEQ provides different categories of evaluation. The floor brokers rank specialists on a numeric scale in each category, and each specialist's scores are totalled on an adjusted basis. A total score below a certain level set by the exchange is deemed substandard performance.

72/ See, e.g., letter from Douglas Scarff, Director, Division of Market Regulation, to John Phelan, President, NYSE, dated November 10, 1981.

determined level of unacceptable performance. A NYSE task force headed by then NYSE Chairman Batten on the specialist system in 1976 made findings consistent with the Commission's views. ^{73/} Nonetheless, the NYSE has retained its absolute measures because it believes that relative standards may punish a specialist whose performance is not necessarily unsatisfactory.

The Division's findings on specialist performance during the market break underscore the need for relative measures. Both the Division and the Presidential Task Force have found a wide disparity in specialist performance during this period. ^{74/} If one or several specialists' performance are widely divergent from the best performing units, then the NYSE should ensure that these specialists have their performance reviewed and, if necessary, reallocate stocks. ^{75/}

The Division does not conclude, however, that the specialist system itself should be substantially revised. As is discussed throughout this Report, each form of market making system had difficulty handling the extraordinary volume and risk exposures during October. In neither our interviews with upstairs trading firms nor surveys of institutional investors was the specialist system singled out as performing particularly poorly. While, as discussed later in this Chapter, steps to ensure that specialists have access to sufficient capital are needed, it should be emphasized that we do not believe that additional specialist capital would have improved substantially overall specialist performance during the market break. ^{76/} Instead, the Division believes that ongoing analysis by the NYSE and Commission is necessary to evaluate individual specialist efforts to maintain fair and orderly markets.

2. American Stock Exchange ("Amex")

a. Introduction

The Amex is the smallest of the three major marketplaces for primary listings in the U.S., with 843 listed common stocks and warrants. Aside from several dozen listed issues with high capitalization and active trading, Amex issuers are generally smaller companies whose shares are lower priced with average daily volume much less than NYSE issues.

^{73/} The 1976 New York Stock Exchange Report of the Committee to Study the Stock Allocation System, at p.3.

^{74/} Report of the Presidential Task Force on Market Mechanisms, January 1988, at 49-50 and Study VI.

^{75/} Moreover, the Division further believes that in light of the increased volatility of the marketplace, poor performance during volatile periods such as the market break should be weighed heavily against any specialist in allocation determinations for new listings.

^{76/} The Division indicated in Chapter Three, *supra*, that it may be appropriate to consider the trading of market baskets on the floor of the NYSE. As discussed in detail in that Chapter, such a step might alleviate some of the order imbalances now imposed on specialists in individual stocks as a result of program trading.

The Amex operates a specialist system almost identical to the NYSE. The Amex imposes affirmative and negative obligations on its specialists equivalent to those of the NYSE. ^{77/} The Division undertook an evaluation of Amex specialist performance during the market break to determine if the Amex specialists fulfilled these obligations.

The Amex market was subject to extreme volume and volatility during the October 16 to 23 period, but its decline followed a slightly different pattern from the NYSE. On Friday, October 16, the Amex experienced a recordbreaking day, with 18.4 million shares changing hands in 15,097 trades. ^{78/} The Amex Market Value Index dropped 12.25 points, a 3.7% decline, compared to the 4.6% decline in the DJIA. On October 19, the Amex went through a steep and active sell-off, similar to the NYSE, with 35.4 million shares traded in 28,838 transactions, approximately three times the volume and number of transactions of the average trade day in September 1987. Large sell imbalances in major Amex stocks caused delayed openings in several of the heavier capitalized securities, and the Amex Market Value Index dropped 2% in the first hour of trading. Thereafter, the Amex experienced a "gradual" 11% decline for the rest of the day, with no major rallies and only a brief period around noon when the market stabilized for an hour. The total 13% decline for the day on the Amex was not as steep as on the NYSE.

The next day, October 20, the Amex continued its decline, with a third straight day of record-breaking volume. From 9:30 a.m. until 11:15 a.m., the Amex declined slightly in value, in contrast to the opening rally on the NYSE. Around 11:15 a.m. the Amex had a 7.7% decline in approximately five minutes, and declined another 3.2% by 3:00 p.m. During the last hour the Amex rallied 2%. For the day, the value of stocks traded on the Amex dropped 9% with 43.4 million shares trading in 31,010 transactions, in contrast to the DJIA which rose 6% that day. The remainder of the week of October 19 and Monday, October 26 saw high volume and heavy selling, pushing the price of Amex-listed stocks downward. ^{79/}

^{77/} Amex Rule 170.

^{78/} In September 1987, the average volume per day was 12.4 million shares traded in 9,683 transactions.

^{79/} On Wednesday, October 21, the Amex Market Value Index rose 23.84 points, but resumed its fall the remainder of the week.

	<u>Volume</u>	<u>Trades</u>	<u>Closing Amex Market Value Index</u>
October 16	18.4 million	15,097	323.55
October 19	35.4 million	28,838	282.50
October 20	43.4 million	31,010	258.16
October 21	34.6 million	30,895	282.00
October 22	26.6 million	22,026	269.02
October 23	18.7 million	13,434	264.21
October 26	22.4 million	15,926	239.67

Part of the difference between the Amex and NYSE market movements can be attributed to the normal lag in movements between large capitalization stocks and secondary stocks. Perhaps as important, stock index baskets are comprised mainly of NYSE issues, so that index arbitrage and portfolio insurance selling do not affect as many Amex stocks directly. 80/

To determine how the specialists on the floor of the Amex reacted to the heavy volume and the extent to which they satisfied their market making responsibilities, the Division analyzed data on the performance of the specialists responsible for nine listed stocks: Amdahl Corporation ("Amdahl"), Dillard Department Stores ("Dillard"), De Laurentiis Entertainment Group, Inc. ("DEG"), Giant Food Inc. ("Giant Food"), GTI Corp. ("GTI"), The New York Times Co., Unicorp American Corp. ("UAC"), Wang Laboratories, Inc. ("Wang"), and The Washington Post. Some of these stocks were chosen for evaluation because they are among the Amex's most active listed companies; others were selected because they experienced serious problems during the market break, such as trading halts and wide price swings. Four of the stocks are in the S&P 500. 81/ The Amex provided audit trail information on the nine selected securities for October 16, 19, 20, and 26. The information was examined to assess specialist market making performance during this period, with emphasis on price continuity, 82/ size of quotation spreads, 83/ and the positions the specialists assumed in their stocks. 84/ Comparisons were made to historical data provided by the Amex. 85/ Finally, the Division examined delayed openings and trading halts generally on the Amex to compare the disruptions in that market to those experienced on the NYSE.

80/ Seven Amex stocks are included in the S&P 500.

81/ Amdahl, Dillard, Wang, and Giant Food.

82/ Amex Rule 170, like NYSE Rule 104, requires specialists to assist in the maintenance of fair and orderly markets in their assigned securities when trading for their own account. To this end, transactions effected by specialists in assigned securities should be reasonably calculated to reduce the possibility of extreme price fluctuations. To assess specialists' maintenance of continuity in their stocks, the Division reviewed trades in the nine selected stocks for price changes of 1/8 point or less and 1/2 point or more on October 19 and 20.

83/ Quotation spreads were examined to ascertain the percentage of quotes resulting in spreads of 1/4 point or less and 1/2 point or more.

84/ Specialist positions in the nine selected stocks were examined to determine whether the specialists were willing to support the market by buying and selling stocks for their own accounts to relieve imbalances between supply and demand. To obtain specialist participation rates in the selected stocks, the Division staff reviewed data provided by the Amex that track and tabulate specialist positions (*i.e.*, the number of shares bought and sold by specialists for their dealer account) in the selected stocks. The Division found several discrepancies between the data involving opening positions and the trading by the specialists. The Division has not been able to verify the accuracy of the specialist data it received.

85/ Division staff also interviewed three floor brokers and three specialists.

b. General Analysis of Market Making Performance

Entering October 19, the Amex specialists were long in eight of the nine stocks, with total net long position in the nine stocks 98,174 shares. This was not due to across-the-board buying activity on October 16. Although the Amex floor brokers and specialists interviewed reported that specialists took on heavy positions on Friday, October 16, the data did not completely support this claim. Specialists in five of the nine selected stocks did increase their long positions on October 16, but only by a total of 41,339 shares. Three of the nine sold more than they bought on the 16th, and one purchased only 2% more stock than he sold. The latter four stocks were subject to price fluctuations throughout the day, with each declining 8%, 6%, 3%, 2% for the day. The specialists' TTV in all nine stocks, however, increased substantially for the day, and averaged 26%, compared to a September average of 14.7%. The specialists generally entered the market on October 16 on the buy side at the opening, but as the day progressed they became sellers. This pattern was fairly consistent, but not uniform, for the sample stocks for October 19, 20, and 26.

On October 19, specialist activity was mixed again, as three specialists sold more than they purchased, 86/ and three others accounted for over 20% of the sell volume in their stocks. 87/ Each of these six dropped a minimum of 7% during the day. 88/ For the day, the five stocks in which specialists were net buyers had total net specialist purchases of 140,580 shares, while their stocks' combined volume was 1,332,500 shares. TTV for the day for the eight stocks that traded was mixed, as some were higher than the September averages and some were lower. This trend continued on October 20, when specialists were net buyers in only three of the five sample stocks that

86/ Dillard, DEG, and Wang.

87/ GTI, Giant Food, and New York Times.

88/

	Oct. 16 Close	Oct. 19 Close	% Drop in Price	Net Specialist Activity	Closing Positions
Dillard	42	39	7%	- 2,100	Long 10,907
DEG	4 5/8	3 7/8	16%	- 200	Long 800
Wang	16 3/4	12 1/4	27%	-23,500	Long 11,097
GTI	7 1/4	4 1/8	43%	+21,900	Long 17,717
Giant	31 5/8	25 5/8	19%	+27,800	Long 42,789
NYT	35 7/8	29 1/4	19%	+25,500	Long 40,341
Amdahl	43	33 3/8	22%	+62,100	Long 83,385
UAC	9 1/2	8	16%	+ 3,280	Long 13,339

The Washington Post did not trade on October 19 and 20 and is therefore not included in our calculations for these trade dates. The Washington Post was trading on October 26 and is included in our figures for that day. See discussion infra at 4-36.

experienced a price decline that day. 89/ The specialists TTV for October 20, however, was generally higher than in September.

The following Monday, October 26, volume remained high at 22.4 million and the Amex Market Value Index continued its descent to 239.67. Specialist proprietary activity was mixed as to net buying and selling, and participation levels were generally lower than the previous week. 90/

The Amex specialists in the nine stocks experienced deteriorating continuity and had wider spreads beginning on October 19 and into October 20, as had the NYSE specialists. Reduced continuity was more pronounced on October 20 than on the 19th in the eight selected stocks that traded. The declines in continuity, however, were generally not as extreme as they were with the NYSE stocks reviewed.

Continuity

	<u>October 19</u>	<u>October 20</u>	<u>September Average</u>
Amdahl (AMH) - closing price, 10/16/87 - 43			
% 0 - 1/8	96.2%	87.2%	97.5%
% ≥ - 1/2	1.9	1.7	.4
GTI Corp. (GTI) - 7 1/4			
% 0 - 1/8	82.9%	95.3%	97.1%
% ≥ - 1/2	4.3	0	0

89/ On October 20, the specialists in 4 stocks were net buyers and 4 were net sellers.

	<u>Oct. 19 Close</u>	<u>Oct. 20 Close</u>	<u>% Change in Price</u>	<u>Net Specialist Activity</u>
Dillard	39	34	(13%)	2,500 net purchases
DEG	3 7/8	3 1/2	(10%)	4,500 net sales
Wang	12 1/4	11 1/4	(8%)	800 net purchase
GTI	4 1/8	4 1/8	-	15,800 net sales
Giant	25 5/8	29	13%	1,100 net purchases
NYT	29 1/4	32 3/8	10%	31,200 net sales
Amdahl	33 3/8	30 5/8	(8%)	68,600 net sales
UAC	8	6 5/8	(17%)	15,600 net purchases

90/ On October 26, five specialists were net buyers, while the remaining four specialists were net sellers. Overall, the participation rate for specialists in the nine selected stocks was 18% as compared to the September average of 14.7%, and participation rates of 26.9%, 21.7%, and 22% for October 16, 19, 20, respectively.

Unicorp American Corporation (UAC) - 9 1/2

% 0 - 1/8	71.4%	75%	84.1%
% ≥ - 1/2	4.8%	2.8	0

Wang Laboratories, Inc. (Wan.B) - 16 3/4

% 0 - 1/8	81.9%	71.9%	99.5%
% ≥ - 1/2	.2	1.3	0

Dillard Department Stores (DDS A) - 42

% 0 - 1/8	55%	43%	86.9%
% ≥ - 1/2	2	17%	0

DeLaurentiis Entertainment Group (DEG) - 4 5/8

% 0 - 1/8	98%	79%	97.8%
% ≥ - 1/2	0	0	.1

Giant Food Stores (GFS A) - 31 5/8

% 0 - 1/8	84%	63%	86.2%
% ≥ - 1/2	1	.4	.2

The New York Times (NYT A) - 35 7/8

% 0 - 1/8	79%	70%	91.4%
% ≥ - 1/2	1	2	0

Quotation spreads at 1/4 point or less in the eight stocks overall also decreased significantly when compared to the September averages, and spreads at 1/2 point or greater in the selected stocks increased when compared to the September averages. As with the NYSE stocks, the spreads usually widened more on October 20 than on October 19.

Spreads

	<u>October 19</u>	<u>October 20</u>	<u>September Average</u>
Amdahl (AMH) - 43			
% ≤ 1/4	89.5%	99.9%	99.9%
% ≥ 1/2	10.5	0	0
GTI Corp. (GTI) - 7 1/4			
% ≤ 1/4	100%	100%	100%
% ≥ 1/2	0	0	0

Unicorp American Corp. (UAC) - 9 1/2			
% ≤ 1/4	95.5%	54.5%	77.8%
% ≥ 1/2	4.5	9.1	0
Wang Laboratories, Inc. (Wan.B) - 16 3/4			
% ≤ 1/4	78.7%	62.8%	99.5%
% ≥ 1/2	5.9	1.8	0
Dillard Department Stores (DDS A) - 42			
% ≤ 1/4	6%	5%	99.2%
% ≥ 1/2	4	84	.1
DeLaurentiis Entertainment Group (DEG) - 4 5/8			
% ≤ 1/4	100%	99%	100%
% ≥ 1/2	0	0	0
Giant Food Stores (GFS A) - 31 5/8			
% ≤ 1/4	80%	17%	99.4%
% ≥ 1/2	7	6.2	0
New York Times (NYT A) - 35 7/8			
% ≤ 1/4	52%	36%	99.7%
% ≥ 1/2	2	3	.1

c. Trading Halts and Delayed Openings

The Amex, like the NYSE, experienced severe liquidity problems during the week of October 19 that resulted in numerous delayed openings, trading halts, and failures to open stocks. While the incidence of delayed openings was comparable to the NYSE, there were more cases of extremely long delays. Of all Amex listed stocks, 26 experienced delayed openings on October 19. Ten opened by noon, five by 12:34 p.m., five between 1:15 p.m. and 2:52 p.m., and six did not open on the 19th. ^{91/} Ten stocks experienced trading halts on October 19. One halt lasted 1 hour and 46 minutes, two lasted for 1 hour and 22 minutes, two opened within 50 minutes, and five reopened within 30 minutes.

^{91/} Of the six stocks that did not open on October 19, four stocks did not open because of order imbalances, while the remaining two stocks failed to open due to pending and/or dissemination of news.

On October 20, 30 stocks experienced delayed openings. Ten opened by noon, six by 2:15 p.m., four by 3:02 p.m., and ten never opened that day. ^{92/} One hundred and three stocks experienced trading halts. Twenty-eight lasted for over four hours, 10 lasted from three to four hours, 22 lasted from two to three hours, 27 lasted from 1 to 2 hours, and 16 reopened within an hour. In addition, of the nine stocks we examined, Dillard, Amdahl, Giant Food, The New York Times, and Wang each experienced trading halts and/or delayed openings, sometimes accompanied by gap pricing upon reopening.

The Washington Post, one of Amex's top ten listed companies by market value, ^{93/} did not trade on October 19 and 20. On Friday, October 16, the price of The Washington Post stock dropped steadily from its opening price of 235 to close at 221. On that day, 14,700 shares traded in 40 transactions, with the specialist participating in 21.5% of the volume primarily as a buyer. At the end of the day the specialist was long 16,413 shares. The Washington Post did not open for trading on Monday, October 19, due to pre-opening sell order imbalances of 2,400 market orders and 2,100 limit orders priced between 177 and 240. The specialist posted two indications at 10:06 a.m. and 2:01 p.m. ^{94/} of a 180 bid and a 210 ask and a bid-ask of 150 and 200, respectively. ^{95/} The stock did not open for trading until 12:11 p.m. on October 21. ^{96/} The stock opened at a price of 194, down 27 points, on a volume of 11,400 shares. The audit trail data indicates that the specialist was a seller of 8,000 shares. The stock rose to 204 by 3:20 p.m., during which time the specialist was almost exclusively a seller. The stock dropped to 199 on trades of 5,200 shares, of which the specialist bought 100 shares.

The opening quote on Monday, October 26 was 175 bid, 185 ask. As a result of an imbalance of orders, no trading occurred until 11:53 a.m., when 6,800 shares were sold at 180. ^{97/} Within twenty minutes, the price dropped another nine points to 171, with the specialist purchasing 100 shares of the 2,200 shares that traded. From 12:22 p.m. to 1:38 p.m. the price remained stable at 173 and then dropped a total of 8 points

^{92/} Order imbalances precluded trading in 7 of the 10 stocks; the remaining 3 stocks, on the other hand, did not open for trading because of pending and/or dissemination of news.

^{93/} Amex 1986 Fact Book, at 13.

^{94/} The specialist had a market order imbalance of 6,900 sell orders and 7,600 limit orders at 2:01 p.m.

^{95/} Amex specialists often post indications during a delayed opening (or a trading halt) in a stock when it appears that they will open (or resume trading) for trading in a stock within a short period of time. An indication generally signifies the price level at which a stock is expected to open.

^{96/} The Amex informed the Division that part of the reason for halting trading in the stock on October 20 was that important news was about to be disseminated by the company. The only news released over the tape during the week occurred on October 20 concerning significantly positive earnings results by the company.

^{97/} Five hundred shares were bought by the specialist.

in four trades totalling 400 shares, of which the specialist bought 300 shares. The stock closed the day at 165.

There was no trading in classes A and B of Restaurant Associates on October 19 and 20 because of order imbalances. ^{98/} Their last trades on October 16 occurred at 17 1/8. On Wednesday, October 21, their openings were delayed until 10:46 a.m. when 4,000 class A and 8,500 class B shares were traded at 12. On Thursday, October 22, they opened for a short period but trading was halted at 9:43 a.m. because of an imbalance of orders. They resumed trading at 1:31 p.m. with 2,700 shares trading at 12 1/4 and 2,300 shares trading at 12 1/2 for the class A and B stock, respectively.

d. Individual Specialist Performance in the Selected Stocks

1. Amdahl Corporation

Entering October 19, the specialist was long 22,828 shares. On October 19, the opening of trading in Amdahl was delayed due to an imbalance of sell orders; the stock opened for trading at 1:15 p.m. at a price of 35 1/2, down 7 1/2 points from its closing price of 43 on October 16. Opening volume was 220,000 shares, of which the specialist purchased 51,500 shares (or 23.4%) as dealer for his own account.

After the opening, the price of the stock rose for approximately 20 minutes, then began a gradual decline of very small price variations, until 3:22 p.m., at which time the exchange halted trading in the stock for the remainder of the day due to an order imbalance. ^{99/} At that point the specialist was long 83,385 shares, and was a net buyer, with purchases for his dealer account exceeding sales by nearly 3 to 1. After the opening, however, the specialist's trades were net buys by only 9,800 shares.

On October 20, Amdahl opened at 33, down 3/8 point on volume of 51,400 shares. The specialist was a buyer on the opening, purchasing 3,900 shares for his dealer account. Trading in the stock was halted at 11:02 a.m. due to an order imbalance. The final quote displayed prior to the trading halt indicated 28 bid-32 ask. Upon the resumption of trading at 1:58 p.m., the price of the stock plunged four points (12%) from 33 3/4 to 29 3/4 on volume of 70,000 shares. The specialist made a single purchase of 100 shares as dealer for his own account on the reopening of trading. The stock closed down (8%) for the day at a price of 30 5/8 on volume of 645,100 shares. The specialist was a net seller for the day with sales exceeding purchases by 2 to 1.

^{98/} At 9:30 a.m., there were no pre-opening orders to buy or sell any shares of class B of Restaurant Associates. Thus, according to the Amex, the order imbalance in class B occurred within the trading crowd, thereby making the task of reconstructing and providing precise order imbalances to the Commission extremely difficult and time consuming. At 9:43 a.m., there were no orders to buy shares of class A of Restaurant Associates, but there were 15,000 orders to sell at limit prices between \$14-\$15.

^{99/} At 1:38 p.m., the stock dropped 1 5/8 points in one trade of 30,000 shares. The specialist was the principal buyer in the transaction, purchasing 29,000 shares for his dealer account.

2. GTI Corporation

The stock of GTI Corporation opened down 1/8 point at a price of 7 1/8 on October 19. The price of the stock declined for the remainder of the trading session and closed down 3 1/8 points (43%) at a price of 4 1/8 on volume of 59,500 shares. The specialist was a major participant in the market on October 19, principally as a buyer. His participation rate was 39.4%, compared with an average September 1987 participation rate of 9.9%. He bought 34,400 and sold 12,500 shares during the day, resulting in a net long position of 21,900 shares at the close of trading. 100/

On October 20, the price of the stock generally remained around \$4. GTI closed unchanged for the day at a price of 4 1/8 on volume of 72,500 shares. The specialist's participation rate for the day was 21.2%, well above his September average of 9.9%. The specialist was primarily a seller on the 20th, in contrast to his activity on October 19. The specialist sold three times as many shares from his dealer account as he purchased. Eighty percent (80%) of his sales occurred from 10:00 a.m. to 11:40 a.m. as the price of GTI rose 5/8 point.

3. Unicorp American Corporation

On October 19, Unicorp American Corporation opened down 1/2 point at a price of 9 on volume of 4,100 shares. The price of the stock continued this downward trend for the remainder of the day. Unicorp American closed down 1 1/2 points (16%) at a price of 8 on volume of 25,500 shares. The specialist was a net buyer on October 19, purchasing 5,880 shares while selling 2,600 for his dealer account. His participation rate for the day was 16.6%, a 2.3% decline from his September average participation rate (18.9%).

On October 20, Unicorp opened down 1 1/4 points (16%) at a price of 6 3/4 on volume of 16,700 shares. The specialist was the primary purchaser on the opening, buying 16,100 shares (or 96.4% of the volume) as principal for his proprietary account. Unicorp closed down 1 3/8 points (17%) for the day, on volume of 35,500 shares. After the opening, the specialist purchased 4,600 shares and sold 5,900 shares for his own account; his net purchases for the day totaled 15,600 shares. The specialist's participation rate for October 20 was 39.2%, twice the October 19 participation rate and September average participation rate.

4. Wang Laboratories, Inc.

On October 19, trading in Wang Laboratories opened at 11:02 a.m., down 3 5/8 points (22%) at a price of 13 1/8 on volume of 216,200 shares. The specialist was a buyer on the opening transaction, purchasing 33,600 shares as principal for his proprietary account. During the following hour, Wang traded within the \$13-\$15 range until 2:00 p.m., at which time the stock began a steady decline into the \$12 range on

100/ As indicated above, the Amex provided data detailing specialist positions during the market break. There appear to be discrepancies in the data which Amex officials attribute to "DKs" (don't know trades) or trades that appear to be misplaced. The data provided by the Amex indicate that the specialist in GTI closed long 17,717 shares on October 19, a 4,000 share difference from our calculations computed from Amex audit trails.

1/8-1/4 point trades. The stock continued to decline falling into the \$11 range at 3:00 p.m., but closed at a price of 12 1/4, down 4 1/2 points (27%) for the day. Total trading volume for the day was 867,500 shares. The specialist was a net seller that day of 23,500 shares. The specialist's participation rate for the day was 12.3%, exceeding his average September participation rate of 7.9%.

On October 20, Wang opened up 3/8 point at a price of 12 5/8 on volume of 51,500 shares; however, the specialist did not participate in the opening trade. The price of the stock generally rose during the next one and a half hours, but began to decline into the \$11-\$12 range at 11:00 a.m. Wang continued to trade down into the \$9 range shortly after noon, but rebounded back into the \$10-\$11 range, eventually closing at a price of 11 1/4, down 1 point (8%) for the day. Total share volume was 1,270,800 shares. Although the specialist was a net buyer on October 20, his purchases as principal exceeded his sales by a slim margin of 800 shares. His participation rate of 13.3% for the day was well above the 7.9% average participation rate for September.

5. Dillard Department Stores

On October 19, Dillard stock opened at 40 3/4, down 1/4 point. The price of the stock declined to its low for the day of 37 1/4 at 11:03 a.m., and then rose to between 38 and 39 where it remained for the day. Dillard closed at 39 (down 7%) on volume of 178,500 shares. The specialist was a net seller of 2,100 shares, and had a participation rate of 20%. Most of his participation on the buy side occurred during the first hour of trading; most of his participation on the sell side occurred from 12:30 p.m. to 3:30 p.m., when the stock rose 5/8 point. At the close of trading, he had a net long position of only 10,907 shares.

On October 20, Dillard opened at 38 1/4. By 12:22 p.m. the stock price dropped from its opening price to 35 1/2. At that point the specialist had bought 9,800 shares. A trading halt was called at 12:38 p.m., and one hour and thirty-seven minutes later the stock reopened at 35, with the specialist purchasing 3,000 of the 10,400 shares traded at the reopening. The stock closed at 34, down five points (13%). The specialist's participation rate was low, 9%, and he bought only 2,500 shares more than he sold. Moreover, as the data indicate (see, tables on pages 4-33 through 4-35) the price continuity and quotation spreads for Dillard substantially worsened on October 20.

6. DeLaurentiis Entertainment Group ("DEG")

DEG opened at a price of 4 1/8, down 1/2 point, on Monday, October 19, with the specialist purchasing 5,300 of the 5,500 shares that traded at the opening. In the opening hour the stock continued to drop another 1/2 point, to its low of 3 5/8. It fluctuated between 3 5/8 and 4 for the remainder of the day, and closed at 3 7/8 (down 16%). After the opening, the specialist purchased 300 shares and sold 5,800 shares during the day.

On October 20, DEG opened at a price of 3 3/4, down 1/8 point. Trading was halted at 12:41 p.m., shortly after the stock hit its low of 3. Prior to the halt, the specialist was a net seller of 6,500 shares (out of a total volume of 23,200 shares). When the stock reopened fifteen minutes later at 3 3/8, the price stabilized and closed at 3 1/2. For the day, the specialist sold 10,500 shares and purchased 6,000 shares. Volume for the day was 28,100 shares.

7. Giant Food Inc.

On October 19, Giant opened 2 1/2 hours late, at 30, down 1 5/8 (5%). On the opening trade, the specialist purchased nearly half (25,100 shares) of the opening volume of 56,600 shares. The price declined slowly throughout the day to close at 25 5/8 (down 19%) on volume of 158,400 shares. For the day the specialist bought 59,700 shares and sold 31,900 shares. Fifty-seven percent of the specialist's buying occurred at the opening. Eighty-two percent of his selling occurred from 1:00 p.m. to 2:00 p.m. when the price of the stock increased by a quarter of a point.

On October 20, Giant opened at a price of 25, down 5/8. The day's volume increased to 171,100 shares and the price fluctuated between 24 1/8 and 29 1/4. The price hit its low for the day within 40 minutes of opening, and climbed slowly to its high of the day shortly before the close. More than 74% of the specialist's buying occurred during the first two hours of trading; 58% of his selling occurred during the last hour and one-half. The specialist bought 47,800 shares and sold 46,700 shares for the day.

8. New York Times

The New York Times opened on October 19 at 11:23 a.m. at 31, down 4 7/8 (13.6%). The specialist purchased 118,000 shares of the 211,700 shares at the opening. A half hour later the stock rose to 33, but for most of the day it traded between 31 and 32 5/8. After a 739,400 share volume day, it closed at 29 1/4 (down 19%). Overall, the specialist bought 231,600 shares and sold 206,100 shares. Almost half of his sales occurred from 11:30 a.m. to 1:00 p.m., when the stock rose 1/2 point. From 1:00 to 3:00, during which time the stock dropped 1/2 point, the specialist purchased 5,700 shares.

On October 20, the New York Times opened up 2 3/4, at 32. The price remained above 32 for two hours, when it dropped in an hour to 28 3/4. The price slowly rose again to close at 32 3/8. The specialist sold 156,700 shares and bought 125,500 shares. Twenty-one percent of his sales occurred at the opening and 30% of his sales occurred from 9:50 a.m. to 10:42 a.m. during which time the price of the stock rose 1/8 point. During the stock's drop, the specialist was a net purchaser of 31,100 shares.

e. Analysis

The Division's analysis of specialist performance on the Amex indicated a general decline in performance on both October 19 and 20. As discussed above, in almost all the stocks examined there were substantial decreases in continuity and the number of quotes with spreads at 1/4 point or less. Our analysis indicates, however, that the specialists' performance as indicated by these measures was mixed.

Specialists' performance in buying and selling participation also was mixed. The majority of specialists examined entered the market long on October 19, but not substantially. Although a number of the specialists increased their long positions on the 19th, three of the specialists examined decreased their long positions. The Division would have expected almost all specialists to be substantial net buyers on October 19 and to end the day substantially long. On October 19, specialists were buyers primarily at the opening and throughout the morning, and were more likely to be sellers in the afternoon as the market decline continued. The Division identified several situations that raise questions as to specialist performance. Some stocks opened on October 19

significantly down from the previous day's close, but not all of these had substantial specialist buying at the opening.

Specialist performance was poorer on October 20 than it had been on October 19. For example, spreads were considerably wider on the 20th. From our analysis, it appears that some Amex specialists came into the 20th unwilling to increase their long positions substantially. In fact, one of the specialists who was a buyer on October 19 became a substantial seller on the 20th, even though his stock fell for the day. Further, the four specialists that were net buyers on the 20th did not substantially increase their long positions, but attempted to remain relatively flat in their overall positions. To some extent this was due to the more moderate price changes these stocks experienced as compared to the overall Amex market.

An examination of individual stocks highlights the differences in performance among specialists. Some specialists' trading activities were designed to support a stock's price, while other specialists were much less active in maintaining an orderly market.

As noted above, four stocks never opened on October 19 and seven stocks never opened on October 20 due to trading imbalances. In contrast, the NYSE, which trades more than double the number of common stocks as Amex, failed to open trading in only one common stock on the 19th and one other common stock on the 20th due to imbalances. Amex was unable, however, to provide any market for a total of 11 different stocks on the 19th and 20th. As discussed above, this included the Washington Post, one of the most heavily capitalized stocks on the exchange. The Division is concerned about the inability of Amex specialists to provide a liquid open market in these 11 stocks.

In summary, the Division observed mixed specialist performance on October 19 and 20. Although some specialists appeared to perform well under adverse conditions, others did not. For stocks with large price movements, the Amex should evaluate whether individual specialists performed adequately in fulfilling their responsibilities to maintain a fair and orderly market. Further, the Amex should examine delayed openings and the large number of trading halts to determine whether the halts were justified and the stock was opened or reopened in a timely fashion at a fair price. ^{101/} In addition, the Division is particularly concerned about the number of stocks that could not be opened due to order imbalances. As noted, a major Amex stock did not trade at all during October 19 and 20. The Division will monitor closely Amex's review of specialist performance in these stocks.

^{101/} Most of the analysis and recommendations in this section are similar to those set forth in the section on NYSE specialists.

3. Regional Exchanges

a. Introduction

There are nine registered national securities exchanges. ^{102/} Five of them, the Boston, Cincinnati, Midwest, Pacific and Philadelphia Stock Exchanges, account for most of trading in exchange listed securities conducted outside the NYSE or Amex. ^{103/} Regional stock exchanges provide two types of equity markets: a primary or sole marketplace for smaller, often local, companies and a secondary market for larger companies traded on the NYSE and Amex. The growth of the NASDAQ system during the 1970s, however, enabled it to replace the regional exchanges as the largest marketplace for smaller, growing companies. Consequently, today most of the volume on regional exchanges derives from trading in NYSE and Amex listed securities.

^{102/} The nine are the Amex, Boston Stock Exchange ("BSE"), Cincinnati Stock Exchange ("CSE"), the Chicago Board Options Exchange ("CBOE"), Philadelphia Stock Exchange ("Phlx"), the Midwest Stock Exchange ("MSE"), the NYSE, the Pacific Stock Exchange ("PSE") with floors in both Los Angeles and San Francisco, and the Spokane Stock Exchange ("SSE"). The Intermountain Stock Exchange became inactive on October 31, 1986 and currently trades no securities.

^{103/} The CBOE currently trades only options. The Commission, however, is reviewing a proposed rule change from the CBOE (SR-CBOE-85-50) that would permit it to trade equity securities. The SSE differs from the other regional exchanges in that trading on the SSE is generally limited to smaller, local companies for which it is the sole market. In addition, due to its small size, the limited volume of shares traded, and the local nature of the stocks traded, the SSE is exempt from the requirement under Rule 11Aa3-1, 17 CFR 240.11Aa3-1 (1987), to submit transaction reports and last sale reports on SSE listed stocks to the consolidated transaction reporting system. For these reasons, the SSE is not included in our analysis of the performance of regional stock exchanges during the October market break.

Listed below are stock market statistics on the volume of equity sales on U.S. securities exchanges (except for the SSE) for the month of September and October 19 and 20, 1987. The NYSE and Amex rank first and second, respectively, in terms of shares traded. The NYSE and Amex differ from the regional exchanges in that they are a primary market for the stocks they list.

<u>Registered Exchanges</u>	<u>September</u> (data in thousands) %	<u>October 19th</u> (data in thousands) %	<u>October 20th</u> (data in thousands) %
New York	4,066,581 (83.13%)	599,819 (87.26%)	597,711 (86.00%)
American	266,647 (5.45%)	35,410 (5.15%)	43,430 (6.25%)
Midwest	260,395 (5.32%)	22,711 (3.30%)	25,574 (3.68%)
Pacific	156,789 (3.21%)	15,899 (2.31%)	14,746 (2.12%)
Boston	66,547 (1.36%)	5,189 (.75%)	5,952 (.86%)
Philadelphia	62,454 (1.28%)	6,749 (.98%)	6,501 (.93%)
Cincinnati	12,336 (.25%)	1,588 (.23%)	1,447 (.21%)

To function as secondary markets, regional exchanges routinely apply for and obtain unlisted trading privileges in NYSE/Amex listings, pursuant to Section 12(f)(1)(B) of the Exchange Act and Rule 12f-1. 104/ The exchanges' role as secondary markets is also facilitated by the Intermarket Trading System ("ITS"). 105/ ITS links the primary and secondary markets by computer in 1,523 stocks. 106/ Authorized in 1978, ITS constituted a step toward the creation of the national market system, because the linkage permits orders entered in one market to be executed on another, if a superior price and comparable size are available. ITS also has provided regional specialists with an efficient, low cost method of reducing stock positions in order to limit their exposure. 107/

Each of the regional stock exchanges (except the CSE) uses a specialist system like that on the NYSE. The listings are allocated to specialists on each exchange. These specialists must maintain continuous, two-sided quotations in their stocks, and theoretically compete against specialists on other regional exchanges and the primary market specialist. The quotations of each marketplace are displayed for each stock through the consolidated quotation system. In addition, to compete for order flow, the regional exchanges have implemented small order routing and execution systems, or have, at a minimum, implemented rules that guarantee the execution of transactions in securities traded via ITS at the best ITS displayed price for a specific number of shares.

To examine the performance of the regional specialists or market makers during the October market break, the staff selected 22 stocks that trade on most, if not all, of the regional exchanges. The issues represent a cross section of the 67 issues reviewed for NYSE specialist performance. Seven are active, highly capitalized stocks ("blue chips"); three are takeover targets; and the remaining 12 issues are less active, smaller capitalized issues ("small cap"). 108/ The data available to evaluate regional specialist

104/ 17 C.F.R. Section 240.12f-1. Securities may be multiply listed. Many large corporations maintain listings for their common stocks on a primary exchange (i.e., the NYSE or the Amex) and on one or more regional exchanges.

105/ See Chapter Seven, *infra*.

106/ As of November 30, 1987.

107/ Due to the relatively limited capital resources of most regional specialists, it is necessary for them to be able to reduce or "lay off" stock positions assumed in the course of their market making activities, and thereby reduce their exposure. Accordingly, regional specialists frequently utilize ITS as a vehicle to lay off their positions on primary markets, such as the NYSE or Amex.

108/ The 22 stocks (and their corresponding symbols) are listed below by category. The seven blue chip stocks are: Coca-Cola Company ("KO"); Eastman Kodak ("EK"); General Motors ("GM"); International Business Machines ("IBM"); Merck & Company, Inc. ("MRK"); USX Corporation ("X"); and Zenith Laboratories, Inc. ("ZEN").

The 12 small cap stocks are: Bell and Howell Company ("BHW"); Cineplex Odeon Corporation ("CPX"); GEICO Corporation ("GEC"); Genrad Incorporated ("GEN");

performance are limited because it is difficult to devise useful market making measurements for non-primary specialists. Thus, the staff concentrated on the following areas of specialist performance. First, were the specialists net buyers or sellers on the relevant days? Second, what size positions did the specialists take? Did they increase or decrease their positions? Third, how did specialists lay off their positions and set their quotations? Finally, did specialists attempt to better the primary market quotation?

In reviewing the performance of the regional exchanges, the Division examined specialist proprietary trading data for October 16, 19, 20, and 26, and regional exchange audit trails. The data analysis was supplemented by interviews with specialists, floor brokers, and officials of the five regional exchanges.

b. Regional Performance Generally

The five regional exchanges experienced dramatic increases in the number of executions and the volume of stocks traded during the October market break. 109/ On

Harley Davidson ("HDI"); Holly Farms ("HFF"); Household International, Inc. ("HI"); Malaysia Fund ("MF"); Ryland Group, Inc. ("RYL"); Shoe-Town, Inc. ("SHU"); Towle Manufacturing Company ("TOW"); and Universal Matchbox Group, Ltd. ("UMG").

The three takeover stocks are: Dayton-Hudson Corporation ("DH"); Lone Star Industries, Inc. ("LCE"); and Newmont Mining Corporation ("NEM").

109/

**Trades and Share Volume on
the Five Regional Exchanges**

	<u>September</u> <u>1987</u> <u>Average</u>	<u>October 19th</u> (and as a % of September)	<u>October 20th</u> (and as a % of September)
BSE			
trades	3,107	10,023 (323%)	11,076 (356%)
volume	3,030,406	5,189,105 (171%)	5,952,065 (196%)
CSE			
trades	492	903 (183%)	1,087 (220%)
volume	939,400	1,588,000 (169%)	1,447,900 (154%)
MSE			
trades	13,969	37,424 (267%)	46,722 (334%)
volume	12,326,418	22,711,906 (184%)	25,574,422 (207%)
Phlx			
trades	5,482	17,085 (311%)	15,246 (278%)
volume	3,136,090	6,749,700 (215%)	6,501,100 (207%)
PSE			
trades	11,527	37,175 (323%)	35,877 (311%)

October 19 and 20 the number of transactions on the BSE, MSE, Phlx, and PSE was approximately three times the average daily number of transactions for September 1987, and the share volume on those exchanges was approximately double the average daily volume for September. The number of transactions and the share volume on the CSE for October 19 and 20 was approximately double the daily average for September 1987. 110/

From the available data and interviews, the staff reached four conclusions about regional specialist performance. First, regional specialists throughout the four day period were more often net sellers than net buyers. Even on October 19, selling specialists outnumbered buyers. The selling trend was especially pronounced in the blue chip and takeover stocks. For example, three of the five regional exchanges (BSE, CSE, MSE) were net sellers of Eastman Kodak on the 16th. On the 19th, again, three of the five regional exchanges (CSE, Phlx, PSE) were net sellers resulting in a combined net change in position for the specialists and market makers in Eastman Kodak on all the regional exchanges for the 19th of -53,327 shares. Only on Monday, October 26, were more regional exchanges net buyers (BSE, MSE, Phlx, and PSE) than net sellers (CSE). The total for the combined net change in position for all regional markets from October 16, 19, 20, and 26, on Eastman Kodak was -80,509 shares.

Similarly, specialists on all five regionals were net sellers for General Motors on the 19th, producing a combined net position change for all regionals of -89,278 shares. Of the seven blue chip issues in our sample, specialists at the regional exchanges were net buyers for the four day period only in USX, with a combined net change of +20,292. All the other blue chip issues sampled ended the four day period as net selling issues with combined net changes for all regional exchanges of -4,019 for IBM, -3,293 shares for Coca-Cola, -2,763 shares for Merck, and -159,393 shares for Zenith.

Specialist activity was mixed for small cap issues in our sample. Except for October 16, when sell activities predominated on the regional exchanges, specialists tended to be buyers more than sellers. On October 19, specialists were net buyers in six of 10 secondary issues. 111/ On October 20 and 26 no buying or selling trend emerged.

Interestingly, the increased trading activity by the regional specialists was due primarily to increased small order flow. The percentage of block volume on the regional exchanges as compared to the September 1987 average did not increase nearly as much as the percentage increase for small orders. 112/

volume	7,379,676	15,899,200 (215%)	14,746,000 (200%)
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110/ This section only examines the performance of regional specialists during the market break. An analysis of the individual performance of the five regional exchanges is set forth in Appendix F.

111/ Although the Division's sample group of stocks contained 12 secondary issues, only 10 of these were traded on the regional exchanges during the period of the market break.

112/ See the chart in Appendix F at F-9.

Second, regional specialists and market makers throughout the four day period, and especially on October 19 and 20, generally did not assume large closing positions, except on the CSE. ^{113/} Among the four regional exchanges utilizing the specialist system (the BSE, MSE, Phlx and PSE), specialists tended to take either relatively small long closing positions or relatively larger short closing positions. For example, long closing positions for the 19th in Eastman Kodak ranged from long 978 shares on the BSE to long 3,800 shares on the MSE. The only short closing position in that stock was by the PSE specialist on the San Francisco ("SF") trading floor, short 6,192 shares. On the 20th, the only long closing position in Eastman Kodak was on the Phlx, long 1,053 shares, with the other regional exchanges closing with short positions ranging from short 3,840 shares on the BSE to short 16,362 shares by the PSE's Los Angeles ("LA") specialist.

As a further example of the relatively small closing positions assumed by regional specialists among the four exchanges, on October 16, when the DJIA declined 108 points, no specialist assumed a long closing position of 10,000 shares or more for the seven blue chip issues in our sample. On October 19, again, no specialist on the four regional exchanges closed with a long position of 10,000 shares or more in any of the blue chip issues. ^{114/} On October 20, PSE specialists closed with short positions of 10,000 shares or more in four issues: Eastman Kodak (short 32,114 shares); General Motors (short 14,665 shares); IBM (short 21,579 shares); and Zenith (short 12,244 shares). The MSE specialist for IBM closed with a short position of 11,169 shares. No other specialist in any of the other blue chip issues on the four regional exchanges closed with positions, long or short, of 10,000 shares or more on the 20th. On the 26th, again, no specialist in the seven blue chip issues on the four regional exchanges closed with a position, long or short, of 10,000 shares or more. ^{115/}

Similarly, of the 12 small cap issues in our sample, most specialists on the regional exchanges during the four day period closed with a position, long or short, of not more than 2,000 shares. ^{116/} For the three takeover issues in our sample for the four day period, there was only one instance in which the specialist closed the issue with a position of 10,000 shares or more (Newmont Mining closed short on the MSE on October 20, 12,465 shares).

In contrast to the other exchanges, CSE market makers frequently assumed relatively large, usually long, positions for the four day period in the seven blue chip issues in our sample, although the data does not specify the degree to which that

^{113/} See *infra* for CSE discussion.

^{114/} Specialists on the PSE's LA and SF trading floors both closed short on the 19th in Zenith with a combined short position of 10,119 shares.

^{115/} Indeed, our data indicate that throughout the four day period for the seven blue chip stocks, specialists on the four regional exchanges assumed closing positions, long or short, of greater than 4,000 shares only 29 times. Accordingly, the vast majority of closing positions were substantially under 10,000 shares.

^{116/} One specialist on the BSE closed short more than 2,000 shares on two occasions.

trading activity was due to trades executed on the CSE or in the third market. ^{117/} These positions were typically much larger than the positions of specialists on the other regional exchanges. For example, for IBM on the 19th and 20th, CSE market makers had combined closing positions long 142,117 shares and 111,263 shares, respectively. The largest closing positions for IBM on those days among the other regional exchanges was MSE on the 19th, short 2,549 shares, and PSE on the 20th with a combined closing position short 21,579 shares. Nevertheless, activity on CSE's floor in IBM was relatively low on October 19 and 20. On October 19, for example, our data indicates CSE market makers bought a total of 3,261 shares and sold 3,190 shares on the CSE floor or through ITS. On October 20, CSE market makers in IBM bought a total of 55 shares on the floor and sold a total of 10,952 shares. Accordingly, it appears that the substantial long positions of CSE designated dealers may have been primarily the result of their upstairs market making activity. ^{118/}

Third, as discussed elsewhere, although regional specialist usage increased dramatically during the market break, in the view of the regional specialists, ITS did not provide a sufficient means to lay off positions acquired on the 19th and 20th. Accordingly, many specialists used the services of NYSE member firms that had direct access to the NYSE floor, so called "correspondent brokers," to lay off their positions on the primary market. ^{119/}

^{117/} The data provided by the CSE on designated dealers' open/close positions include not only trading done on the floor of CSE and through ITS, but also over-the-counter trades. Accordingly, although many of the open and close positions indicate very large long positions, most of the buying and selling activity occurring on the CSE floor or through ITS in the stocks examined was very small. In addition, as noted below, CSE market makers entered October 19 very long and proceeded to reduce their positions by selling throughout the day. Despite this, their positions at the close were substantially higher than those of the other regional specialists.

^{118/} We also note that the CSE uses competing market makers rather than a single specialist for a security.

^{119/} In addition to the delays encountered with ITS, regional specialists and floor brokers we spoke with stated that they had difficulty obtaining accurate and current quotations from other markets (see Chapter Seven infra for a discussion of quote reporting).

There appear to be two reasons why the regional specialists perceived that the market information they received was not accurate or current. First, under the extremely fast market conditions of October 19 and 20, it may have been impossible to avoid a gap between execution prices and the prices being displayed to the regional specialist on the high speed tape. Second, because regional specialists generally were required to forego ITS and obtain executions on the primary market through a correspondent broker, delays in those executions combined with the extraordinary price volatility frequently resulted in orders being executed at prices that were different from the quoted price at the time the order was sent.

Fourth, as a response to the tremendous volume and price volatility encountered generally on the 19th and 20th, regional specialists generally acknowledge that they widened their quotation spreads and avoided bettering the NYSE or Amex quote.

C. Analysis

In reviewing overall regional exchange specialist performance during the market break period, the role of the regional markets must be considered. Under normal trading conditions, the regionals compete for order flow on ITS issues. Regional specialists generally do not take particularly aggressive positions in buying and selling as do the primary market specialists. Instead, the regional specialists generally buy and sell as the trading day dictates and lay off any particularly large position on the primary market. As discussed above, the inability of specialists to be assured that positions could be laid off on the primary market had an effect on the positions the regional specialists were willing to take. The overall data substantiate this conclusion; the majority of specialists we examined sold more than they bought on October 19 and did not take on large positions despite the explosive growth in volume. ^{120/} Moreover, it appears many of the specialists had difficulty pricing orders because of the first moving market and, accordingly, did not attempt to better primary market quotations.

Despite these problems, the regionals provided an alternative market for many small customer orders. Comments from member firms and from floor brokers indicate that some firms on October 19 began to reroute orders to the regionals when queuing problems on the NYSE developed. As explained in more detail in Chapter Seven on order routing systems, these orders soon overloaded the regional systems. Thus, during the week of October 19, the regionals generally did not provide better or quicker markets than the NYSE. Moreover, with the exception of the CSE, regional specialists essentially took no meaningful long positions in the face of selling during the market break. It is debatable whether in view of their smaller capitalized specialists, and the sudden influx of volume, regional specialists could reasonably have been expected to assume such positions. Nevertheless, the Division believes that the regional exchanges should reevaluate the capacity of their specialists to handle increased order flow. Basically, the regionals function as supplements to the NYSE through their small order execution systems and supplemental specialist market making. In addition, they provide a forum for executing block transactions. The October market break showed that the regionals need to improve in these areas.

B. Equity Specialist Capital

1. Regulatory Capital Requirements

a. Organization of Specialists

Most of the national securities exchanges have rules that allow and provide for the formation of "specialist units". The composition of each specialist unit varies not

^{120/} As noted in the section discussing the CSE (*see* Appendix F, *infra*), its experience was slightly different, with the designated market makers willing to take on or maintain substantial long positions on the 19th. This, however, appears to be the result of upstairs market making activity rather than active buy and sell activity on CSE or through ITS executed orders.

only from exchange to exchange but also within the exchanges themselves. The components of a specialist unit may include one or more individuals, partnerships, corporations, joint accounts, or combined books. Partnership and corporations take the conventional legal forms. A joint account is basically a joint venture by two or more individuals, partnerships, or corporations. In a joint account, the participants keep separate books for brokerage orders, but maintain a single trading account. The combined book is the converse of the joint account. In a combined book, the participants, who again may be individuals, partnerships, or corporations, maintain separate trading accounts but are partners for the purposes of the brokerage aspects of the business.

The NYSE currently has 440 members registered as specialists. On October 19, 1987, there were fifty-five specialist units at the NYSE. Forty-eight of these units are comprised of individuals registered as specialists who are all representatives of the same broker-dealer firm (*i.e.*, there is only one broker-dealer firm represented in each of those specialist units). The remaining seven units are comprised of combinations of broker-dealer firms.

The Amex has 212 members registered as specialists. These 212 specialists are associated into twenty-one specialist units; each unit is comprised of three to fifteen specialists. "Upstairs" member firms ^{121/} are involved in fourteen of the twenty-one specialist units usually in the form of a joint account between the upstairs firm and one or more individuals or firms. Specialists on the floor of the Amex trade both equity securities and option securities. ^{122/} Most Amex specialist units are comprised of both equity specialists and option specialists, but a few units are comprised only of equity or option specialists. Each specialist within a unit is allocated anywhere from one to forty equity and/or option securities.

The MSE has eighty-seven members registered as equity specialists who are associated into forty specialist units. The BSE has twenty-one specialist firms comprised of thirty-eight equity specialists. The Phlx has twenty-three equity specialist units. The PSE has seventy-two registered equity specialists, thirty-six each at its Los Angeles floor and its San Francisco floor. The specialists at the PSE operate individually. The specialists at the MSE, the BSE, and the PSE make markets in only equity securities. Two of the Phlx's specialist units are also option specialist units.

b. Self Clearing v. Introducing Specialists

Specialist units can be characterized as either "self-clearing" or "introducing." Both self-clearing and introducing specialist units conduct their own trading transactions both as brokers and as dealers on the floor of the exchange. If a specialist unit is self-clearing, it processes the paperwork, makes the comparison and any necessary

^{121/} An "upstairs" member firm for purposes of this portion of the study is a firm that has public customers.

^{122/} Options are traded at the NYSE, but only three of the fifty-five specialist units referred to above are specialists for both equity and option securities. For purposes of this study, any reference to NYSE specialists refers only to equity specialists or the equity market making of the three specialist units which are also option specialists.

settlement of discrepancies between the buyer's and seller's record of the size and price of the trade, and, most importantly, arranges financing for its own positions. If a specialist unit does not clear its own account (*i.e.*, it "introduces" its securities transactions to another broker-dealer), it relies on someone else to process, compare and settle, and finance its securities transactions. Approximately thirty of the NYSE's fifty-five specialist units and ten of the Amex's twenty-one specialist units introduce their security transactions to clearing broker-dealers. Fourteen of the MSE's forty units and eleven of the Phlx's twenty-three specialist units introduce their accounts. Nineteen of the twenty-one specialist units at the BSE clear their accounts through the Boston Stock Exchange Clearing Corporation. All seventy-two specialists at the PSE are self-clearing.

c. Financial Responsibility Rules for Specialists

The Securities Act Amendments of 1975 ("1975 Amendments") amended Section 23(a)(1) of the Exchange Act to authorize the Commission to classify persons for purposes of implementing the provisions of the Exchange Act and to prescribe different requirements for the different classes with respect to minimum financial responsibility requirements for brokers and dealers. The Uniform Net Capital Rule ("net capital rule"), Exchange Act Rule 15c3-1 (17 C.F.R. Sec. 240.15c3-1), is the Commission's rule which sets forth the financial standards for brokers and dealers. The Rule classifies specialists as a separate class of brokers and dealers and exempts certain specialists from its requirements. The separate classification and exemption is granted to specialists who among other things (i) limit their activities to trading with only brokers, dealers, or other members of the exchange on which they act as specialists, and (ii) are subject to the capital requirements of that exchange. ^{123/} Thirty of the NYSE's fifty-five specialist units and a majority of the Amex's specialists are currently exempt from the net capital rule.

Both exempt and non-exempt specialists are subject to their exchange's financial responsibility rules. Each exchange has rules prescribing specific financial requirements for its specialists. NYSE members registered as specialists must be able to assume positions of fifty trading units (5,000 shares) in each common stock for which they act as specialists. ^{124/} NYSE specialists also must be able to establish that they can meet

^{123/} Rule 15c3-1(b)(1) provides: The provisions of this section shall not apply to any specialist who does not transact a business in securities with other than members, brokers or dealers and who is in good standing and subject to the capital requirements of the Amex (if he is not also a clearing member of the Options Clearing Corporation), the BSE, the MSE, the NYSE, the PSE, the Phlx (if he is not also a clearing member of the Options Clearing Corporation) or the Chicago Board Options Exchange ("CBOE") (if he is not also a clearing member of the Options Clearing Corporation) provided that this exclusion as to a particular specialist of any exchange or as to the exchange itself, may be suspended or withdrawn by the Commission at any time, upon ten (10) days written notice to such exchange or specialist, if it appears to the Commission that such action is necessary or appropriate in the public interest or for the protection of investors.

^{124/} NYSE Rule 104.20(1). Furthermore, Rule 104.20(2) requires that a specialist be able to assume a position of 10 trading units in each convertible preferred stock, of 400 shares in each of the 100 share trading unit non-convertible preferred

with their own net liquid assets 125/ as minimum capital the greater of \$100,000 or 25% of their position requirements. 126/ Amex members registered as specialists must maintain the greater of a cash or liquid asset position in the amount of \$100,000 or in an amount sufficient to assume a position of twenty trading units (2,000 shares) in each security for which they act as specialists. 127/ The other stock exchanges (collectively referred to as the "regional exchanges") have rules similar to the NYSE which require their respective specialists to maintain a minimum capital requirement in liquid assets and/or to be able to assume a certain size position. 128/

In addition to their financial requirement rules for specialists, the exchanges also have maintenance margin rules. 129/ These rules set forth the equity level which must be maintained in each margin account which is carried or cleared by a member of that exchange. Basically, the NYSE and Amex rules require that a margin of 25% of the market value of long security positions and 30% of the market value of short security positions must be maintained in the margin account of each customer (including a specialist or another broker-dealer). These rules provide an exemption for specialist accounts whereby a specialist's positions may be carried upon a "good faith" margin basis which is satisfactory to the specialist and the member carrying the account. 130/ These rules also provide a similar exemption in the case of a joint account which is carried by a member and in which the member participates. The carrying member is required by these rules to take a charge to its own net capital for any deficiency between the amount actually deposited with it as margin and the amount specified by

stocks, and of 100 shares in each of the 10 share unit non-convertible preferred stocks.

125/ "Net liquid assets" is defined by NYSE Rule 104.20 as "The excess of cash or readily marketable securities over liabilities for a specialist who neither carries nor services customers' accounts and who does no business with others than members and member organizations" and as to other specialists as the "excess net capital computed in accordance with the provisions of Rule 325 [NYSE capital requirements for members]. . ."

126/ NYSE Rule 104.20(4).

127/ AMEX Rule 171.

128/ MSE Article XI, Rule 3; Phlx Rule 703; BSE Chapter XXII, Sec. 2; and PSE Rule V, Sec. 2(a).

129/ NYSE Rule 431; AMEX Rule 462; PSE Rule XI; and MSE Article X, Rule 3; and PHLX Rule 722.

Regulation T (12 C.F.R. Sec. 220), issued by the Federal Reserve System's Board of Governors to regulate extensions of credit (including initial margin requirements) by and to brokers and dealers, allows a clearing broker-dealer to finance specialists' market making transactions on a "good faith" margin basis. (12 C.F.R. Sec. 220.12)

130/ To qualify for this exemption only transactions in securities in which the specialist is registered can be carried in the account.

the rule. ^{131/} NYSE Rule 431 and Amex Rule 462 provide a similar exemption for option specialist accounts whereby a specialist's positions may be carried on a margin basis which is satisfactory to the option specialist and the member carrying the account. The maintenance margin rules of the various regional exchanges are substantially the same as the NYSE's and Amex's.

The stock exchanges, as self regulatory organizations supervise and monitor their members' operational and financial conditions. Each exchange has its own system of oversight which includes examinations, surveillance, and mandatory reports. Each exchange which is the designated examining authority ^{132/} for one of its members, including a specialist or specialist unit, receives a copy of that member's FOCUS report.^{133/} Furthermore, exchanges have guidelines whereby a member will be given a higher degree of surveillance because of exchange rule violations or capital deficiencies and during certain market conditions.

The NYSE's system for monitoring its specialists during normal market conditions includes requiring each specialist or specialists operating as a joint account to prepare and submit to the NYSE on a quarterly basis the "Financial Report for Specialist". ^{134/}

^{131/} See, e.g., NYSE Rule 431(e)(5)(A).

^{132/} See Chapter Five *infra* at note 52.

^{133/} Exchange Act Rule 17a-5 (17 C.F.R. Sec. 240.17a-5) requires each broker or dealer who clears transactions or carries customer accounts to file Part I of Form X-17A-5 (Form X-17A-5 is the Commission's Financial and Operational Combined Uniform Single Report or FOCUS Report) monthly and Part II quarterly. This includes those specialists who are subject to the net capital rule. Rule 17a-5 requires each broker or dealer who does not clear transactions or carry customer accounts to file Part IIA quarterly. This filing requirement is applicable to specialists who are exempt from the Net Capital Rule.

Rule 17a-5 also provides that the above filing requirements shall not apply to a member of a national security exchange if the information required by Form X-17A-5 is maintained by the exchange and is forwarded to the Commission pursuant to a plan that has been approved by the Commission. Pursuant to its plan, the NYSE receives and transmits to the Commission twice a year the FOCUS Reports of its specialists who do no public business. The Amex receives the FOCUS Reports of its specialists only once a year.

^{134/} The Financial Report for Specialist was developed by the NYSE as a replacement for data once collected in the SEC's Quarterly Survey of Specialists. It contains information such as: (1) assets and liabilities (each broken down into those directly identified with NYSE specialist activities, those directly identified with other activities, and all others); (2) revenues and expenses (each broken down into principal activities in NYSE assigned specialty issues, agency activities in NYSE assigned specialty issues, and other lines of business); (3) supplemental information (such as the monthly average of long and short positions in both specialty and non-specialty securities, volume of transactions both as principal and as agent, and market value of collateral supporting secured demand notes); (4) an NYSE Rule 104.20 capital requirements calculation (see notes 124-126 *supra* and

Each specialist unit also is required to submit to a financial examination of its books and records conducted by NYSE examiners. This examination is conducted annually for all specialists unless the specialist conducts business other than its floor business as a specialist, and then an examination is conducted twice each year. In the event a specialist unit is in violation of or near the minimum capital level the exchange requires, that unit will be placed on a special surveillance list.

In unusual or volatile market situations, the NYSE has established "early warning" signals that trigger a more intense level of surveillance of its specialists. Specifically, on any day the market, as measured by the Dow Jones Industrial Average, gains or declines a certain percentage, at the end of that day's trading the exchange will conduct spot checks of various specialists' capital levels. In addition, if there is an unusually large volume of trading in a security, the exchange will examine the capital situation of the specialist making the market in that security. During the period between October 19 and October 28, the NYSE made daily checks of the capital of each of its specialist units.

The Amex, in its oversight of its specialists, uses different procedures for monitoring the specialist units that introduce their security transactions and the specialist units that clear their own security transactions. In the case of an introducing specialist unit, the Amex receives a daily report of each unit's equity. This report is produced by the firm which clears the account. Some units have more than one clearing account, especially if the unit makes a market in equities and options. In such a situation, each clearing firm which carries an account for the unit will send a daily report to the Amex containing the unit's equity in that account. In the case of a self-clearing unit, the Amex receives a monthly report of the equity of each individual specialist within that unit but does not receive a daily report. If the Amex receives a daily or monthly report which reveals that a specialist or unit is at or below 120% of its minimum financial requirement, as imposed by the Amex, it monitors that specialist or unit until it is above the 120% level.

The Amex also has early warning signals which during volatile market situations trigger a more intense level of surveillance of its specialists. On any day in which there is a three percent gain or decline in the Amex composite index, the Amex staff will conduct a telephone survey of the specialists in order to monitor the specialists' financial conditions.

2. Estimates of Actual Capital Available to Specialists

The tables below, "NYSE Specialists Positions" (Table 4-1) and "Amex Specialists Positions" (Table 4-2), set forth for the fifty-five NYSE specialist units and the twenty-one Amex specialist units, respectively, the aggregate daily totals for September 2 (a normal trading day) and various trading days from October 14 to October 27 for the NYSE and various trading days from October 15 to October 30 for the Amex in each of the following categories: (1) market value of long security positions; (2) market value of short security positions; (3) total market value of long and short security positions; (4)

accompanying text); and (5) an "Excess Net Capital Modification" calculation. This report is sent by the specialist to the NYSE finance division and is used for statistical purposes only. It is not sent to the NYSE division responsible for surveillance and is not used for regulatory purposes.

net liquid assets/equity; (5) margin required; (6) excess equity; and (7) buying power. Except where noted, they are based on data supplied by the NYSE and the Amex.

TABLE 4-1
NYSE Specialists Positions

	Long Market Value	Short Market Value	Total Market Value	Net liquid Assets/Equity	Margin Requirement 136/	Excess Equity 137/	Buying Power 138/
9.2*	586,370,041	99,099,090	685,469,131	746,308,788	171,367,283	574,941,505	2,299,766,020
10.14	680,888,077	74,026,727	754,914,804	770,911,893	188,728,701	582,183,192	2,328,732,768
10.16	859,393,887	65,334,332	924,728,219	808,144,631	231,182,055	576,962,576	2,307,850,304
10.19	1,306,897,149	42,774,770	1,349,671,919	612,392,434	337,417,980	274,974,454	1,099,897,816
10.20	974,080,527	118,658,984	1,092,739,511	585,303,893	273,184,878	312,119,015	1,248,476,060
10.21	652,518,624	186,520,328	839,038,952	643,734,051	209,759,738	433,974,313	1,735,897,252
10.22	557,835,557	139,028,465	696,864,022	690,447,827	174,216,006	516,231,821	2,064,927,284
10.23	554,804,534	155,988,946	710,793,480	724,243,591	177,698,370	546,545,221	2,186,180,884
10.26	594,825,460	105,965,835	700,791,295	673,191,697	175,197,824	497,993,873	1,991,975,492
10.27	525,298,183	97,668,018	622,966,201	657,275,470	155,741,550	501,533,920	2,006,135,680

* For one specialist unit the figures reported were as of 8-31-87. For another specialist unit the figures were as of 9-8-87.

TABLE 4-2
AMEX Specialists Positions*

	Long Market Value	Short Market Value	Total Market Value	Equity 139/ Equity 140/	Margin Requirement 140/ Equity 141/	Excess Equity 141/
10.15	575,996,710	238,409,946	814,406,656	132,281,736	100,248,640	36,948,025
10.19	706,546,527	169,522,538	876,069,065	127,429,856	112,520,261	6,540,607
10.20	552,383,106	175,746,176	728,129,282	148,357,334	123,736,993	18,754,638
10.21	522,085,659	192,056,148	714,141,807	147,237,566	118,186,798	33,915,942
10.22	435,062,000	170,335,000	605,397,000	125,459,000	112,424,000	19,583,000
10.23	414,228,000	181,577,000	595,805,000	124,498,000	111,572,000	46,940,000
10.26	395,758,536	183,740,940	579,499,476	108,882,891	118,483,718	(13,459,608)
10.29	336,971,576	209,411,530	546,383,106	117,032,988	105,595,774	16,794,907
10.30	303,092,055	208,361,467	511,453,522	121,316,197	96,184,745	29,215,844

* These figures are for only twenty of the AMEX's twenty-one specialist units. Since figures for all the above dates were not available for one specialist, all figures for that specialist were omitted from the table for consistency.

FOOTNOTES FOR TABLES 1 & 2 135/ 136/ 137/ 138/ 139/ 140/ 141/

135/ The term "net liquid assets" as defined by NYSE Rule 104.20 (see note 125 supra) is used when referring to a self-clearing specialist unit. The term "equity" refers to the equity of an introducing specialist unit in its account at its clearing firm.

Net liquid assets/equity reflects only the amount that is committed to the specialist units. It does not reflect the total financial resources available to some specialist units.

136/ NYSE Rule 431 sets forth the maintenance margin rule for margin accounts carried by NYSE members. See notes 129-31 supra and accompanying text.

Although specialist units that clear their own accounts are not subject to the 25% or 30% margin requirement (i.e., any margin accounts they have are not carried by other exchange members but are financed by some other means such as bank lending), 25% is used to calculate their margin. This is done because, as a general rule, lenders such as banks will lend only up to 75% of the market value of securities pledged as collateral.

The "margin required" figures in Table 4-1 are calculated using a straight 25% requirement for both the long and short security positions of both clearing and introducing specialist units.

137/ "Excess equity" is net liquid assets/equity minus the margin required.

138/ "Buying power" is calculated as follows: $\text{buying power} = (1/\text{maintenance margin requirement}) \text{ multiplied by the excess equity}$. The buying power figure reflects the approximate dollar value of securities a specialist could purchase using his excess equity while retaining equity sufficient either to meet the maintenance margin requirements on the new positions (if he is an introducing specialist) or for the difference between the market value of the securities purchased and pledged as collateral and the actual loan value (if he is a self-clearing specialist).

For purposes of Table 4-1, buying power will always be four times the excess equity since 25% is the margin requirement used for all security positions and types of specialist units.

139/ Equity reflects only the amount that is committed to the specialist units. It does not reflect the financial resources available to some specialists units.

140/ Amex Rule 462, which is substantially the same as NYSE Rule 431, sets forth the maintenance margin rule for margin accounts carried by Amex members. See notes 129-31 and 136 supra and accompanying text.

The "margin required" figures in Table 4-2 are actual margin calculations supplied by the Amex.

141/ "Excess equity" is equity minus the margin required.

From information received from the NYSE staff and from Table 4-1, it appears that NYSE specialists had increased their aggregated positions by October 19 to at least twice normal size. It also appears from information received from the NYSE staff that some individual specialists at the NYSE increased the size of their positions to four times normal size. This increase in the size of positions caused a reduction of the amount of excess equity, which in turn resulted in a loss of approximately one-half the normal buying power of the specialists by the close of trading on the 19th. ^{142/}

At the end of trading on October 16, only one of the NYSE fifty-five specialist units had no buying power because its margin requirement was in excess of its net liquid assets/equity. By the end of trading on October 19, thirteen units had no buying power. At the end of trading on October 20, five of the thirteen units from the previous day had excess equity and buying power, and one additional unit no longer had buying power; thus a total of nine units had no buying power at the close on October 20. At the close on October 21, 22, and 23, three, two, and two units, respectively, had no buying power. Four units on October 26 and two units on October 27 had no buying power.

At the close of trading on October 19, the majority of the total buying power possessed by the NYSE specialist units was held by a small number of units. Of the total \$1,229 million of buying power held by the fifty-five NYSE units at the close on October 19, over one-half (54%) was held by only eight units (14.5% of all units); each of these eight units had in excess of \$58 million buying power. Twenty-three of the fifty-five units (42%) had less than \$5 million buying power at the close of trading on October 19.

As can be observed from Table 4-2, the increases and decreases in the Amex specialists' short and long positions closely reflect those of the NYSE specialists. From information received from the regional exchanges, it appears that their specialists, for the most part, were able to maintain their usual levels of positions. ^{143/} Even with regular position levels, those specialists with long positions still suffered losses because of the decline in value of the positions held.

The discussion and data above demonstrate that the capital and buying power of many specialist firms can become eroded during a major market break. While specialist capital appears sufficient in normal trading situations, the staff is not confident that it will continue to be sufficient if the markets continue to be substantially more volatile. Moreover, the capital required by NYSE rules is very low relative to even normal demands on specialists. Although additional capital would probably not have retarded to any great degree the market decline of October 16 and 19, the staff believes that additional capital needs to be available to the specialists to ensure that, in any future down market, the specialists avoid reaching the limit of their buying power or becoming in jeopardy of failing.

^{142/} See note 138 *supra*.

^{143/} See discussion *supra* at Section A.3.

The staff has evaluated the likely impact on NYSE specialists if an additional 250 point (14%) drop in the market occurred on October 20. ^{144/} Our calculations assumed that specialists would have had to be net buyers of additional stock on that day of approximately \$224 million (1/2 their net purchases on October 19). Our calculations further assumed specialists' aggregate equity would have been reduced from \$612 million to approximately \$429 million and aggregate excess equity from \$272 million to approximately \$92 million. Based on these calculations, specialists would have experienced a reduction of buying power from \$1,229 million to approximately \$368 million. Moreover, we believe it likely that an additional 15 to 20 specialist units would not have been able to meet the 25% maintenance margin requirement (*i.e.*, their buying power would have been exhausted).

Given the effects on the specialists' capital of October 19 and 20, and the potential need for substantial borrowing, we examined the ability of specialists to obtain additional financing from their clearing firms or banks. The staff's analysis suggests that the major specialist clearing firms had access to substantial capital and were willing or at least likely to increase financing to the specialists units which cleared through them.

The staff contacted the two largest specialist clearing firms, Spear, Leeds & Kellogg ("SLK") and Wagner Stott Clearing Corporation ("WSCC"). SLK clears for ten NYSE specialist units and is involved in clearing twelve Amex specialist units. WSCC clears for seven NYSE specialist units and is involved in clearing eight Amex specialist units. WSCC is also involved in the clearing of several of the regional exchanges' specialists' accounts. SLK personnel informed the staff that, during the week of October 19, it had been ready to extend substantial additional financing to the specialists who clear through it and did in fact increase the level of financing to its introducing specialists by at least three times the normal amount. WSCC stated that it did not have to address the question of how much financing it would have extended to its introducing specialists because none of their specialist accounts fell below the maintenance margin WSCC requires. Although it did not have to extend emergency financing to its introducing specialists, WSCC stated that it had substantial capital available for its introducing units had it been needed. The staff believes that both firms had the financial ability to increase lending to specialists.

Specialists that are self-clearing also finance their positions in securities through their own equity and funds borrowed from banks. Some firms tend to rely most heavily on their own equity and rarely borrow from banks. Few, if any, specialists maintain committed credit lines from banks. ^{145/} Moreover, because specialists tend to have lower capital needs and utilize fewer bank facilities than integrated broker-dealers, they tend to have few lending relationships. Specialists generally concentrate most of their borrowing with a single bank. Since banks do not commonly establish lending relationships on short notice, an adverse credit decision by a specialist's primary lender could have a substantial impact on the specialist's short-term liquidity. Because of the staff's concern over potential specialist liquidity problems, the staff interviewed several

^{144/} For purposes of this analysis, short positions were disregarded because of the small dollar amount they represented in relation to the dollar amount of the long positions.

^{145/} See Section B.5.a. *infra* regarding the establishment of lines of credit.

specialists, and the major banks that lend to specialists, regarding financial arrangements during the market break.

Most of the specialists that borrow from banks do so largely from a handful of the major New York banks. Generally, banks will advance specialists from 75-90% of the market value of their collateral. ^{146/} Because most specialists have less capital than major broker-dealers and are less diversified, they are generally perceived to be greater credit risks by the banks. Thus, with some notable exceptions, specialists generally must borrow on a fully secured basis using securities pledged through the Depository Trust Company.

Specialists' overall inventories grew from the 16th through 20th as they attempted to maintain two sided markets, in contrast to those of many broker-dealers, who appear to have reduced their proprietary positions in order to limit their exposure during the break. Information received from the NYSE reveals, for example, that two self-clearing specialists increased their loan amounts from \$14.1 million and \$5.6 million on October 19 to \$45.5 million and \$16 million, respectively, on October 26. Many banks believed that they faced their greatest credit exposure from specialists, arbitrageurs, and other smaller broker-dealers that were less well capitalized. Thus, during the period when the specialist firms were experiencing their greatest need for financing, banks were acting cautiously regarding their credit exposure to specialists. Some banks reported, however, that they were encouraged by the value of the specialist "franchise" and because banks had always been repaid for credit extended to failed specialists. One bank indicated its awareness on the morning of October 19 that at least one specialist firm to which it loaned funds was out of margin and noted the firm's failure to respond to the Monday morning margin call. Apart from a few firms that were known to be experiencing problems, however, there was no general consensus about which other firms might be in trouble.

Because of the volatility of security prices on October 19 and 20, banks were uncertain about the value of the securities pledged by specialists. Some banks reacted to this concern by making intra-day margin calls against all of their customers based on an assumed decline in market value. At other banks, specialists were among a handful of firms singled out for intra-day margin calls that were used as a means of "testing" the capital of the specialists. Other banks (including the bank with the largest number of lending relationships with specialists) rather than using sweeping intra-day margin calls lowered their advance rates to specialists on the 19th and 20th by 5%. In this manner, the banks sought to obtain further security for their loans by requiring the firms to commit more of their own capital to finance positions, and thus, to provide the banks with an additional "cushion" against further market declines. However, in light of the banks' desire to maintain lending relationships with their customers, some banks indicated to the specialists that if their requests for additional collateral presented difficulty, they would be willing to try to reach an accommodation. Nevertheless, as noted earlier, most specialists would have had few short term alternatives to complying with the banks' requests.

^{146/} As discussed in Chapter Five, Section C, *infra*, there are specific exemptions in Regulation U that permit banks to lend on a good faith basis to finance the positions of specialists. See 12 CFR Sec. 221.5(c)(10). Since the collateral requirement under Regulation U is not specific, banks individually determine the amount of credit they will advance against collateral.

Discussions with banks suggested that most specialists' borrowing did not exceed the banks' internal guidelines during the break. Specialists after October 19 seemed to have simply sought assurances that credit would be available at the time of actual need. Later in the week, when it appeared that specialists had sufficient capital to continue operation, banks appeared willing to relax advance rates somewhat to accommodate their customers. On October 26, the settlement date for October 19 trades, banks reported that no problems were experienced.

Five self-clearing NYSE specialist units were contacted by the staff to ascertain the attitude of the banks with which they dealt regarding the extension of any emergency credit or additional financing for stock settlements they may have required during the October market break. One specialist informed the staff that the unit's bank contacted it during the week of October 19 to obtain information not only about the unit's financial condition and security positions but also to inquire about the partners' personal assets. This specialist stated that its bank between trade date of October 19 and settlement date of October 26 was somewhat apprehensive about extending the unit the additional credit it required for trades occurring during the week of October 19. On Monday, October 26, the bank did lend the unit money at 80% of the market value of the securities pledged as collateral ("loan value") as opposed to the 75% it usually based its loans on.

Another specialist informed the staff that both the banks with which his unit dealt with acted very favorably toward the unit and had expressed no reluctance to extend the unit further credit. The unit, which usually borrowed at a 70% loan value, asked both banks if it could increase its borrowing to 75% or 80%. One bank agreed to 75%, while the other bank advised against the request. The three other specialist units contacted stated that they had encountered no difficulty in obtaining any loans or financing that they had required.

The staff also was informed by NYSE personnel that in response to concern expressed by some of their specialists and upstairs firms, the NYSE staff during the week of October 19 contacted several of the larger banks that finance many broker-dealers. Upon inquiry to these banks about the possibility of firms obtaining any needed additional capital, the NYSE personnel learned of no unusual restraint being placed on specialist financing.

3. Analysis of Specialist Failures Due to Market Making Losses

On Wednesday, October 14, as the market began its decline, the staff began contacting the exchanges and the NASD at least once a day to determine whether specialists or other broker-dealers were experiencing capital or liquidity problems because of the drastic drop in the value of securities and to identify what remedial actions were being contemplated or implemented by either the exchanges and the NASD or the financially troubled broker-dealers themselves. These contacts continued on a daily basis throughout Friday, October 23.

On Tuesday, October 20, inquiry was made by the staff to the appropriate personnel at the NYSE, the Amex, and the regional exchanges to ascertain the financial conditions of their specialists. The NYSE informed the staff that it had placed twelve of its fifty-five specialist units on "closer than normal" surveillance because of its concern about those units' financial conditions. The NYSE was particularly concerned

about the financial difficulties being experienced by two specialist units, one of which was A.B. Tompane & Co. ("Tompane").

At the close of business on Monday, October 19, Tompane held long and short security positions with a total market value of \$43 million and had net liquid assets of only \$4.3 million or 10% of the value of its total long and short positions. Subsequently, Tompane and Merrill Lynch Specialists, Inc. ("Merrill") (a subsidiary of Merrill Lynch, Pierce, Fenner & Smith Incorporated and a specialist firm at the Phlx and PSE) entered into an agreement whereby, beginning on Monday, October 26, Tompane merged its operations into Merrill, and Merrill assumed Tompane's specialist books. Merrill paid all of Tompane's outstanding bank loans during the week of October 19. Merrill accomplished the acquisition of Tompane without the use of any outside financing.

The other specialist firm about which the NYSE was particularly concerned held long and short security positions with a total market value of \$26.5 million and had net liquid assets of only \$1.9 million or 7.5% of its long and short security positions at the close of business on Monday, October 19. By the close of business on Thursday, October 22, it was able to reduce its long and short security positions to \$9.8 million and to increase its net liquid assets to \$5.4 million or 55%.

A third specialist unit that was placed on "closer than normal" surveillance, Beauchamp & Co. ("Beauchamp"), had at the close of business on Monday, October 19, equity of only 4.8% of its security positions. It was able to raise its equity to 14% on Thursday, October 22, but its equity fell to 12% on Friday, October 23. SLK, which clears Beauchamp's account and is currently taking a capital charge for Beauchamp's margin deficiency, is awaiting final approval from the NYSE of its acquisition of the specialist's operation.

According to information received by the NYSE, the other specialist firms which had been placed on special surveillance have since resolved their financial difficulties by either reducing their positions, obtaining additional capital, or through agreements with their clearing broker-dealers. In the last situation, the broker-dealer that carries the introducing specialist's account is taking the appropriate capital charge required by the exchange's net capital rule for any difference between the exchange's maintenance margin requirement and the margin actually deposited by the introducing specialist unit with the clearing broker-dealer. The table below, "NYSE Specialists Placed on Special Surveillance" (Table 4-3), lists the long security positions and equity percentages on October 19, 22, and 23 for the specialist units which were placed on special surveillance.

TABLE 4-3

NYSE Specialists Placed on Special Surveillance

	<u>10-19-87</u>	<u>10-22-87</u>	<u>10-23-87</u>
1. A.B. Tompane & Co.			
	Net Liquid Assets: Long Positions:	10% \$42 million	100% \$17 million
		Merrill Lynch Specialists assumed A.B. Tompane's book beginning 10-26-87; Merrill Lynch Specialist has paid down A.B. Tompane's bank loans; Merrill Lynch Specialist is self-clearing	
2. Beauchamp & Co. (introduces to Spear, Leeds & Kellogg)	Equity: Long Positions:	4.8% \$14 million	14% \$7.5 million
3. Introducing specialist unit			12% \$7.2 million
4. Self-clearing specialist unit	Equity: Long Positions:	25% \$11 million	75% \$4 million
			81% \$4.4 million
5. Self-clearing specialist unit	Net Liquid Assets: Long Positions:	24% \$24 million	59% \$8.7 million
			55% \$7 million
6. Introducing specialist unit	Net Liquid Assets: Long Positions:	17% \$26.3 million	88% \$7.4 million
			84% \$7.1 million
	Equity: Long Positions:	25% capital infusion of \$3.2 million	98% \$9.9 million
			76% \$8.6 million

	<u>10-19-87</u>	<u>10-22-87</u>	<u>10-23-87</u>
7. Self-clearing specialist unit	Net Liquid Assets: 25% capital infusion of \$7.5 million	98%	76%
8. Introducing specialist unit	Equity: 17% Long Positions: \$23 million	25 to 36% \$14.6 million	37% \$13.3 million
9. Introducing specialist unit	Equity: 10% Long Positions: \$25 million capital infusion of \$4.5 million by affiliate	123% \$10 million	51% \$12.9 million
10. Introducing specialist unit	Equity: 16% Long Positions: \$39.8 million capital infusion of \$4 million by affiliate	50% \$21.3 million	28% \$17.7 million
11. Introducing specialist unit	Equity: 12% Long Positions: \$11.4 million clearing firm is taking the capital charge for any equity difference below 25%	18.5% \$9.3 million	21% \$9.3 million
12. Self-clearing specialist unit	Net Liquid Assets: 7.5% Long Positions: \$25 million	55.5% \$7.9 million	47% \$8.4 million

Information recently received from the NYSE reveals that in addition to the 12 specialist units listed on Table 4-3, four additional specialist units were placed on special surveillance. The four units were placed on special surveillance for low percentage of net liquid assets/equity to total market value and/or high percentage of bank borrowings against collateral.

Two additional NYSE specialist units are in the process of selling their specialist operations to, or merging with, an upstairs firm or an affiliate of an upstairs firm. At present, Carl H. Pforzheimer & Co. is awaiting final approval from the NYSE of its proposed merger with an affiliate of Drexel Burnham Lambert, Inc. The other specialist unit, Asiel & Co. ("Asiel"), is selling its specialist operation to Bear, Stearns & Co. Personnel at Asiel informed the staff that the sale was not because of any financial difficulty the specialist operation had encountered but because the specialist operation does not fit into the firm's long term plans and because of impending personnel changes within the firm. The specialist operation is the smallest of five departments that the firm operates.

The Amex informed the staff that two of its twenty-one specialist units, Damm, Frank & Co. ("Damm Frank") and Santangelo & Co. ("Santangelo"), experienced serious financial difficulties. Damm Frank suffered serious losses on Friday, October 16 and Monday, October 19. At the close of business on Monday, October 19, Damm Frank had long and short security positions with a total market value of \$7.4 million. The Amex calculated the required margin to be \$2.1 million, but Damm Frank had equity of only \$.12 million or a margin deficit of approximately \$2.0 million. As a result of the losses suffered and its financial condition, Damm Frank did not believe it had enough capital to continue to operate and to fulfill its function as a specialist. Therefore, Damm Frank entered into an agreement with Bear Stearns & Co., which cleared Damm Frank's account, whereby effective as of the opening of business on Monday, October 19, Bear Stearns & Co. took over Damm Frank's specialist operations.

The staff was further informed by the Amex that its other specialist unit which experienced financial difficulties, Santangelo, had been suffering losses throughout the year. At the close of business Monday, October 19, Santangelo had long and short security positions with a total market value of \$117.8 million. The Amex calculated the required margin to be \$11.6 million, but Santangelo had equity of only \$.84 million or a margin deficit of approximately \$10.8 million. Santangelo entered into an agreement with SLK (SLK cleared for and had provided subordinated loans to Santangelo) whereby beginning at the opening of business on Wednesday, October 21, SLK took over Santangelo's specialist operations. According to the Amex personnel, neither Damm Frank nor Santangelo was ever in violation of the Amex minimum capital requirements.

The regional exchanges informed the staff that although the majority of their specialists had suffered serious losses, the specialists had remained in compliance with applicable minimum capital requirements or were in violation for only a very short period ^{147/}. There were no specialist units at the regional exchanges that failed or were taken over.

^{147/} E.g., the staff was informed that one specialist at the PSE required additional capital and that margin calls were made to a few firms at the BSE, but the calls were met expeditiously.

4. Additional Capital for Specialists

In an effort to increase the amount of capital available to its specialists, both the NYSE and the Amex recently amended their rules 148/ to ease restrictions imposed on approved persons 149/ or member organizations affiliated with specialists to facilitate entry into the specialist business by the larger and more capitalized upstairs firms. Prior to the approval of those amendments, few NYSE or Amex upstairs firms were affiliated with specialist units because any activity that an approved person might have in a security for which its affiliated specialist was acting as a specialist would be subject to the restrictions that these two exchanges impose on their specialists. 150/ The rules, as amended, exempt an approved person from the restrictions imposed on specialists 151/ if the approved person is able to establish and the exchange approves an organizational separation, commonly referred to as a "Chinese Wall," between the approved person and the affiliated specialist unit on the floor.

Although both the NYSE and the Amex took a positive step toward procuring stronger capital foundations for the specialists on the floor of their exchanges, it is unclear whether a substantial number of independent specialist units will be acquired by major upstairs firms in the near future. Accordingly, the staff believes that further analysis of the specialist financial responsibility system must be conducted.

5. Analysis

a. Capital Adequacy

The staff is concerned that the present minimum capital requirements imposed by the NYSE, the Amex, and the regional exchanges does not reflect the actual capital needed to ensure the maintenance of fair and orderly markets in different types of

148/ The Commission approved the proposed amendments to NYSE Rule 98 and Amex Rules 190 and 193 in Release No. 34-23768, 51 Fed. Reg. 41,183 (1986).

149/ In general, the term "approved person" refers to a person who is not a member of the exchange, but who either controls a member organization or is engaged in the securities business and is controlled by or under common control with a member or member organization.

150/ Basically, the NYSE and Amex rules prohibited approved persons affiliated with specialists from trading or promoting specialty securities. The regional exchanges did not place similar restrictions on approved persons affiliated with specialist units.

151/ The NYSE rule amendment approved in Release No. 34-23768 retained the prohibition preventing an approved person from acting as the managing underwriter of an offering of stock, or securities convertible into that stock, of an issuer in whose securities the specialist is registered. The Amex rule amendment contained no such prohibition. In Release No. 34-25055, 52 Fed. Reg. 41520 (1987), the Commission approved another NYSE rule amendment further liberalizing NYSE rules to allow an approved person to act as the managing underwriter of an offering. The NYSE amended this rule, in part, to facilitate the acquisition of Tompane by Merrill Lynch.

securities. For example, \$100,000 of capital is insufficient for a specialist making a market in a high priced, active security. Similarly, many illiquid securities may require specialists to take substantial risk positions requiring a more substantial capital base. This was exemplified by the two Amex specialist units, Damm Frank and Santangelo, which although having positions to equity ratios of substantially less than 10%, never violated the Amex's financial responsibility rules. The staff believes that further analysis of more flexible capital requirements based on the securities for which a particular specialist makes a market is appropriate.

In light of the dependence of self-clearing specialist firms on bank financing, the staff also is concerned that many self-clearing specialists presently have no established lines of credit with banks. We recognize, however, that many banks require lines of credit to be established for a minimum of \$100 million. Accordingly, the cost of establishing and maintaining such a large line of credit may be very difficult for the smaller specialist units. The staff, however, believes that the feasibility of establishing lines of credit should be explored by the exchanges. Where a specialist firm is unable to establish such a line, the exchanges should consider alternatives such as applying a higher per share capital requirement on that firm or even requiring that it clear its security transactions through a firm with an established line of credit.

Another means of ensuring the availability of any additional capital required by specialists would be the development of a private emergency fund to support the specialists' trading function. Such a fund could operate either to provide financing to specialists in emergency situations or to purchase positions directly from the specialists to reduce the specialists' exposure and financing needs. Such a fund would provide a safety net for the specialist system. There are several questions associated with this proposal, however, that must be resolved. First, who should be required to contribute to the fund? Should all members of an exchange, regardless of the amount of their business on the exchange be required to contribute? Should issuers of securities listed on an exchange be required to contribute? Or, should investors contribute in the form of a fee on each transaction? Second, and closely related, what should be the basis on which contributions should be assessed? If all exchange members are required to contribute, would they contribute some flat fee or a variable fee based on a standard such as that used by the Securities Investor Protection Corporation, *i.e.*, a percentage of the year's gross revenues? If the issuers are to contribute, would they contribute based on the number of shares traded, the number of shares outstanding, or a flat fee? If investors are to contribute, would they contribute a "per transaction" fee or a fee based on the percentage of the value of the securities purchased or sold? Third, who would administer and make the decision to commit the assets of the fund? Would each exchange have a "fund administering" body, or would an independent body be established for each exchange, or would there be one administering body for all specialists at all the exchanges? Fourth, if one or more specialists have to draw on the fund, would the purchases of securities be made on behalf of the fund or on behalf of the specialists with the securities purchased held as collateral for the loan from the fund?

b. Capital Rule Exemption and Specialist Monitoring

As previously stated, 152/ the net capital rule exempts certain specialists from its requirements. In a 1975 release, 153/ the Commission solicited the views of interested persons on whether appropriate net capital requirements should be applied to specialists. In that release the Commission stated while unique capital requirements might be appropriate for specialists who do not deal with the public, it did not believe that the exemption should continue indefinitely. Although comment letters were received and the issue was studied, no net capital requirements were imposed at that time.

The Study has revealed limitations in the exchanges' current monitoring of their specialists. Although the Amex receives daily equity reports of its introducing specialists' equity (but not its self-clearing specialists) and the NYSE conducts checks during heavy trading, 154/ neither of these two exchanges receives a daily equity and positions report from all its specialists. Further, while the NYSE has a system of spot checks based on overall volatility or large trading volume in a particular stock, the staff does not believe that either exchange has a satisfactory system of early warning signals.

As a result of the staff's concerns regarding the availability of capital for specialists, today's more volatile market conditions, and the state of the exchanges' specialist surveillance and monitoring system, the staff is currently examining the ramifications of eliminating the specialist exemption and applying the net capital rule to all specialists. 155/ The Division also believes that the Commission and the exchanges should review methods to improve specialist surveillance systems.

152/ See note 123 supra and accompanying text.

153/ Notice of Solicitation of Comments Relating to the Application of Net Capital Requirements to Municipal Securities Brokers and Municipal Securities Dealers and Specialists, Release No. 34-11561, 40 Fed. Reg. 33,747 (1975); See also Extension of Comment Period Relating to the Application of Net Capital Requirements to Municipal Securities Dealers and Specialists, Release No. 34-11656, 40 Fed. Reg. 43,743 (1975).

154/ See discussion supra pages 4-52 and 4-53.

155/ See discussion infra at Chapter Five, Section D concerning application of the net capital rule to options market makers.

QUOTE DEPTH AS A PERCENT OF AVERAGE TRADE SIZE
(50 Sample Stocks)

	1st Decile		3rd Decile		5th Decile		7th Decile		9th Decile	
	Bid	Ask	Bid	Ask	Bid	Ask	Bid	Ask	Bid	Ask
August 10-14	250%	348%	309%	327%	223%	245%	195%	201%	277%	317%
August 17-21	256	308	438	280	215	255	187	165	390	383
September 8-11	241	281	428	250	157	97	217	209	320	233
September 14-18	245	313	443	365	131	158	213	240	385	271
October 12-16	228	233	277	178	142	114	219	157	271	206
October 19-23	110%	128%	189%	120%	106%	93%	109%	126%	183%	122%
October 16	184%	147%	272%	160%	131%	91%	236%	166%	153%	151%
19	85	73	177	119	87	73	94	100	94	123
20	70	80	133	120	87	80	99	60	161	95
21	128	207	252	124	136	112	109	85	142	105
22	141	146	211	132	111	81	103	204	194	96
23	187%	211%	205%	118%	105%	108%	165%	248%	224%	181%

Chart 4-1

PRICE VOLATILITY RELATIVE TO AVERAGE TRADE PRICE (Each Stock and Day Given Equal Weight)					
	1st Decile	3rd Decile	5th Decile	7th Decile	9th Decile
August 10-14	43.7 (0.98)	49.4 (1.09)	41.8 (1.03)	73.1 (1.17)	70.2 (1.12)
August 17-21	44.1 (0.99)	48.1 (1.07)	37.4 (0.92)	76.1 (1.22)	68.2 (1.09)
September 8-11	41.8 (0.94)	48.2 (1.07)	47.3 (1.16)	78.8 (1.26)	57.3 (0.91)
September 14-18	45.0 (1.01)	42.2 (0.93)	44.1 (1.08)	48.8 (0.78)	57.3 (0.91)
October 12-16	89.4 (2.01)	73.8 (1.63)	71.5 (1.75)	54.7 (0.88)	95.6 (1.52)
October 19-23	247.7 (5.56)	254.8 (5.64)	185.2 (4.54)	260.2 (4.17)	266.6 (4.25)
October 16	188.0 (4.22)	120.9 (2.68)	147.3 (3.61)	92.1 (1.47)	165.4 (2.64)
19	422.7 (9.49)	325.2 (7.20)	260.4 (6.39)	421.6 (6.75)	299.1 (4.77)
20	406.3 (9.12)	426.7 (9.45)	265.8 (6.52)	377.6 (6.05)	354.8 (5.65)
21	95.5 (2.14)	176.1 (3.90)	171.7 (4.21)	204.3 (3.27)	305.4 (4.87)
22	207.0 (4.65)	212.6 (4.71)	139.2 (3.42)	189.1 (3.03)	223.2 (3.56)
23	107.0 (2.40)	133.2 (2.95)	88.8 (2.18)	108.7 (1.74)	150.6 (2.40)
Note: Figures in parenthesis represent index values, with "1.00" equal to simple average of values for weeks of August 17-21 and September 14-18.					

Chart 4-2

MODIFIED GARMAN-KLASS PRICE VOLATILITY INDEX (Daily High-Low Price Range Relative to Daily Opening-Closing Price Change)					
	1st Decile	3rd Decile	5th Decile	7th Decile	9th Decile
August 10-14	117.6 (0.95)	145.2 (1.18)	116.6 (0.97)	225.3 (1.32)	193.1 (1.15)
August 17-21	124.9 (1.00)	126.8 (1.03)	108.6 (0.91)	230.0 (1.34)	194.1 (1.16)
September 8-11	138.9 (1.12)	134.3 (1.09)	140.7 (1.17)	225.7 (1.32)	138.6 (0.82)
September 14-18	123.9 (1.00)	119.2 (0.97)	130.9 (1.09)	112.4 (0.66)	141.9 (0.84)
October 12-16	300.8 (2.42)	201.1 (1.63)	213.9 (1.79)	136.7 (0.80)	237.8 (1.42)
October 19-23	836.0 (6.72)	857.0 (6.97)	477.9 (3.99)	783.7 (4.58)	847.0 (5.04)
October 16	534.8 (4.30)	301.1 (2.45)	360.4 (3.01)	189.8 (1.11)	369.0 (2.20)
19	1,340.0 (10.77)	1,011.4 (8.22)	587.6 (4.91)	668.4 (3.90)	844.4 (5.02)
20	1,082.5 (8.70)	1,421.2 (11.55)	638.9 (5.34)	1,339.6 (7.82)	1,140.8 (6.79)
21	324.2 (2.61)	418.6 (3.40)	465.7 (3.89)	608.2 (3.55)	936.9 (5.58)
22	564.2 (4.54)	553.9 (4.50)	323.2 (2.70)	565.8 (3.30)	712.3 (4.24)
23	321.8 (2.59)	384.6 (3.13)	259.4 (2.17)	373.5 (2.18)	433.2 (2.58)
Note: Figures in parenthesis represent index values, with "1.00" equal to simple average of values for weeks of August 17-21 and September 14-18.					

Chart 4-3

AVERAGE BID-ASK SPREAD RELATIVE TO SHARE PRICE (Cents per Dollar of Share Price)					
	1st Decile	3rd Decile	5th Decile	7th Decile	9th Decile
August 10-14	0.237 (0.98)	0.752 (1.05)	1.063 (0.93)	1.385 (0.98)	1.823 (1.09)
August 17-21	0.225 (0.93)	0.666 (0.93)	1.204 (1.06)	1.343 (0.95)	1.809 (1.08)
September 8-11	0.243 (1.01)	0.770 (1.07)	1.266 (1.11)	1.475 (1.05)	1.778 (1.06)
September 14-18	0.258 (1.07)	0.770 (1.07)	1.070 (0.94)	1.473 (1.05)	1.533 (0.92)
October 12-16	0.324 (1.34)	0.821 (1.14)	1.218 (1.07)	1.437 (1.02)	1.975 (1.18)
October 19-23	0.830 (3.48)	1.682 (2.34)	2.235 (1.97)	2.793 (1.98)	3.698 (2.21)
October 16	0.445 (1.84)	0.895 (1.25)	1.531 (1.35)	1.435 (1.02)	2.276 (1.36)
19	0.859 (3.56)	1.596 (2.22)	2.422 (2.13)	1.703 (1.21)	3.450 (2.06)
20	1.090 (4.51)	2.092 (2.91)	2.951 (2.60)	3.338 (2.37)	4.208 (2.52)
21	0.672 (2.78)	1.571 (2.19)	1.881 (1.65)	3.047 (2.16)	3.852 (2.30)
22	0.866 (3.59)	1.560 (2.17)	2.047 (1.80)	2.700 (1.92)	3.597 (2.15)
23	0.676 (2.80)	1.499 (2.09)	1.895 (1.67)	2.500 (1.78)	3.401 (2.04)
Note: Figures in parenthesis represent index values, with "1.00" equal to simple average of values for weeks of August 17-21 and September 14-18.					

Chart 4-4

Chapter Five

ANALYSIS OF CAPITAL ADEQUACY

A. Introduction

All registered broker-dealers, other than sole specialists and sole market makers on an options floor, are subject to the Commission's net capital rule, Rule 15c3-1 under the Securities Exchange Act of 1934 ("Exchange Act") (17 CFR Sec. 240.15c3-1), even if they do not carry customer accounts. 1/ The rule prescribes minimum liquidity standards for broker-dealers. Its purpose is to ensure that broker-dealers maintain sufficient liquid assets to satisfy promptly the claims of customers and broker-dealers, and to provide a cushion of liquid assets in excess of liabilities to cover potential market and credit risks. The rule helps promote the financial viability of, and public confidence in, the securities industry by protecting both customers and other broker-dealers from risks and exposures in the broker-dealer. 2/

There are two methods for determining required net capital, the basic (or aggregate indebtedness) method and the alternative method. A broker-dealer that elects the basic method for computing its net capital must have net capital equal to at least 6 2/3% of its aggregate indebtedness or, stated conversely, the aggregate indebtedness may not exceed 1500% of the broker-dealer's net capital. The rule defines aggregate indebtedness as the total money liabilities of a broker or dealer arising in connection with any transaction. 3/ In addition to this percentage requirement related to liabilities, the broker or dealer must maintain a minimum net capital regardless of its aggregate indebtedness, depending on the nature of its business. Under the basic method, each firm must maintain a minimum net capital of at least \$25,000 unless it carries no customer accounts and holds no funds or securities belonging to customers and otherwise limits its business as described in particular sections of the rule.

The rule prescribes additional capital requirements for a market maker in securities. A market maker is required to have and maintain net capital at least equal to \$2,500 for each security in which it makes a market if the security has a market value of \$5.00 or more and \$500 for each security whose market value is less than \$5.00. The rule provides, however, that a market maker shall have minimum net capital of at least \$25,000, but does not require a market maker to have minimum net capital greater than \$100,000 under these additional market-maker capital requirements. 4/

-
- 1/ Floor brokers on an exchange also are exempt from the net capital rule under certain circumstances. See Rule 15c3-1(b)(2).
- 2/ All registered broker-dealers must also comply with the Commission's Customer Protection Rule, Rule 15c3-3, adopted under the Exchange Act. It requires a precise accountability for customer funds and securities held by the broker-dealer and precludes the broker-dealer from using customer funds or securities to finance its own trading activities or expenses.
- 3/ Rule 15c3-1(c)(1). The rule specifically excludes certain liabilities from aggregate indebtedness, usually because the liability is adequately collateralized by an asset of the broker-dealer.
- 4/ See Rule 15c3-1(a)(4).
-

A broker-dealer that elects the alternative method of computing net capital must maintain net capital equal to at least 2% of its customer related receivables, known as aggregate debit items, computed in accordance with a prescribed formula. 5/ The broker-dealer also must maintain minimum net capital of at least \$100,000.

In addition to the minimum requirements, the net capital rule and the rules of the various self regulatory organizations contain early warning levels below which a firm's net capital cannot fall without adverse consequences. For example, a firm may not withdraw equity capital in any form to pay shareholders or partners if its net capital is less than 5% of aggregate debit items (if it computes net capital under the alternative method) or its aggregate indebtedness exceeds 1000% of its net capital (if it computes net capital under the basic method). 6/

Broker-dealers that do not carry customer accounts or hold customer funds or securities and limit their securities activities as prescribed by the rule are allowed to maintain minimum net capital of \$5,000 (rather than \$25,000) provided they limit their proprietary transactions to ten or fewer per year. Most of these firms are "introducing" brokers, which introduce customers to another broker-dealer (clearing broker-dealer) or sell securities on a best efforts basis.

The term "net capital" is defined in the rule. 7/ Generally, net capital is computed by adding to net worth, as computed under generally accepted accounting principles, certain liabilities subordinated to the claims of customers and deducting from net worth certain assets not readily convertible into cash and certain percentages of the market values of all proprietary positions. These percentage deductions, referred to as "haircuts," are intended to provide for the market and credit risk inherent in the firm's securities positions.

Under the basic method, a broker-dealer must deduct 30% from the market value of its long or short equity positions, whichever is greater. 8/ The lesser of the long or short positions receives a deduction of 15% on that amount in excess of 25% of the greater position's market value. Conversely, under the alternative method, the deduction is 15% of the equity positions held long but 30% of the market value of the short positions in excess of 25% of the market value of the long positions.

The broker-dealer must also deduct from net worth unsecured receivables (except those specified) and certain operational charges related to its inability to process securities transactions efficiently. For example, a broker-dealer must charge its capital

5/ See Rule 15c3-3a.

6/ In addition, NYSE Rule 326 authorizes the NYSE, under certain circumstances, to restrict a member carrying customer accounts from expanding its business or to compel a reduction of business if its net capital falls below the early warning levels. See also NASD Section 38, Rules of Fair Practice.

7/ See Rule 15c3-1(c)(2).

8/ The amount of the haircut for a debt security depends on the issuer of the security, its maturity date and, as to certain debt, the rating of the debt instrument.

for securities transactions that remain open five days after settlement date (aged fails to deliver) and certain unreconciled items in the broker-dealer's records. ^{9/}

B. Upstairs Firms

1. Consequences of the Market Break for Net Capital of Upstairs Firms ^{10/}

a. Large Investment Banking Firms and Wire Houses

In the course of the market break study, the Division examined the financial statements for the month of October 1987 of fifteen of the largest investment banking and integrated retail firms (the latter are often referred to as "wire houses"). During the month of October, thirteen of these fifteen firms reported a cumulative pre-tax loss of almost \$700 million. ^{11/} Two firms reported gains--one of almost \$17 million; the other of less than \$1 million. The losses were not spread evenly among the thirteen firms. The lowest reported loss was approximately \$5 million, while two of the firms reported losses of approximately \$120 million each.

^{9/} A fail to deliver arises when a selling broker or dealer has not delivered to the purchasing broker or dealer securities at the settlement date. Subparagraph (c)(2)(ix) of Rule 15c3-1 imposes certain charges on a broker-dealer for aged fails to deliver.

^{10/} The Commission's Directorate of Economic and Policy Analysis ("DEPA") prepared a study entitled "Financial Condition of Broker-Dealers, October 1987" in which it evaluated the effect of the market break on the securities industry. DEPA compared 58 NYSE member firms' financial conditions on October 31, 1987 with their financial conditions on September 30, 1987. A copy of the study is attached hereto as Appendix G.

^{11/} The losses for the month of October of these 15 firms in descending order of magnitude were as follows:

Losses For October 1987

\$123,269,119
118,605,145
80,409,741
69,682,450
65,203,000
62,199,306
43,869,215
40,702,143
34,852,684
18,522,840
17,795,000
16,891,173
4,820,000
+876,000 (GAIN)
+16,807,660 (GAIN)

A substantial portion of the losses was attributable to realized or unrealized losses from equity positions. Between October 14 and October 30, 1987, the firms reported combined losses of approximately \$796.5 million in their equity positions. Two of the firms lost over \$100 million. Table 5-1 shows the losses in descending order of magnitude for fourteen of these firms. One firm did not report its losses resulting from its equity positions.

TABLE 5-1
Losses in Equity Positions Between
October 14 and October 30

\$133,388,000
128,349,000
88,115,000
83,074,000
72,000,000
62,914,000
57,858,000
50,674,000
50,100,000
44,500,000
17,733,000
5,000,000
2,862,000
(no loss reported)

TOTAL \$796,567,000

In the case of four large investment banking firms, losses in firm proprietary positions in equity securities to some degree were exacerbated by contractual commitments those firms had made in connection with the underwriting of the common stock of British Petroleum ("BP"). The firms were part of a group of underwriters that had agreed to purchase securities of BP from the British Government, as part of its privatization program, at a fixed price several weeks before the securities could be resold to investors in the United States. The October market break, however, occurred after the pricing and prior to the proposed public offering of the securities. As a result, the securities declined substantially in value; the broker-dealers, however, were committed to pre-break prices. Moreover, the firms were faced with the substantial risk of being unable to place the offering at an acceptable price and therefore being forced to absorb extremely large positions of BP into their inventories or sell the securities into the market at the risk of further depressing the price. Because the Bank of England ultimately determined that it would offer to repurchase the securities at a price above the post-break market value, the losses to the four broker-dealers were substantially contained to pre-tax losses of approximately \$325 million.

Many of the firms also reported losses from error accounts and bad debts, totalling approximately \$235.8 million. Presumably, most of these losses arose from losses in cash and margin accounts. Table 5-2 details the losses in descending order of magnitude.

TABLE 5-2
Losses from Error Accounts and Bad Debts

\$73,585,731
43,222,556
31,132,360
21,872,065
20,292,000
15,584,215
8,428,581
7,837,000
5,605,000
5,103,000
2,061,180
783,795
328,020
0
0

TOTAL \$235,835,503

Despite these losses, each of these firms, as well as all other sizeable firms, remained above the early warning levels discussed earlier in this chapter. At month end, after the losses, the fifteen firms showed a total ownership equity of approximately \$16.9 billion, a total net capital of approximately \$9.4 billion and excess net capital above required minimum levels of approximately \$8.3 billion. In large part, the losses were contained because of the diversified nature of the firms' assets. The market value of the equity positions of these firms at the end of September was only a relatively small fraction of their total assets. From the financial reports, the market value of the equity positions in almost every case was less than 20% of the total market value of all securities positions and in most cases less than 5% of the total assets of the firm.

TABLE 5-3
Firm Equity Positions as of September 30, 1987

\$1,481,706,093
1,384,474,605
1,171,319,515
1,016,961,181
971,506,510
852,962,286
641,352,000
432,659,640
399,627,000
393,847,077
274,634,000
271,748,471
174,374,960
162,208,834
91,513,000

During the month of October, several large firms responded to their equity losses and the volatile market conditions by substantially increasing their net capital through infusions of equity capital from parent or affiliated entities or through subordinated borrowings. One firm added \$100 million in equity capital and \$60 million in subordinated borrowings. Another firm added \$100 million in equity capital. A third firm added equity capital of approximately \$600 million. Even without the infusions, however, all of the firms would have remained above the early warning levels at the end of October. ^{12/}

While large firms generally demonstrated substantial resiliency during the market break because they had substantial capital and diversified inventory positions, the problems encountered by certain large firms should be noted.

As publicly reported, Charles Schwab & Co., Inc. ("Schwab"), a brokerage subsidiary of the Charles Schwab Corporation and a member of the New York Stock Exchange, incurred a \$22 million fourth quarter loss because customers failed to meet margin calls in connection with the October market break. The \$22 million charge was mainly attributable to a single customer's inability to meet margin calls in connection with his investments in uncovered Standard and Poor's 100 Index ("OEX") put options. Schwab reportedly reached a court-approved settlement of its claim of \$84 million against the investor arising from his unsecured obligations for \$67 million in cash and notes. Pursuant to terms of the agreement, Schwab received \$25 million in cash and a full recourse, non-interest bearing \$42 million note payable in equal annual installments over a period of 5 years. Schwab also established reserves totalling \$13 million for all other unsecured customer receivables.

L.F. Rothschild & Co., Incorporated ("Rothschild"), a New York Stock Exchange member firm, carried approximately 90,000 customer accounts for itself and as a clearing broker-dealer for introducing firms. As a result of the sharp decline in equity markets during the month of October, Rothschild incurred a loss of approximately \$51.6 million, which eliminated almost all of its net capital in excess of early warning levels. The losses resulted from Rothschild's arbitrage and over-the-counter activities and defaults in the accounts of customers introduced to it on a fully disclosed basis by an introducing firm. Although Rothschild has maintained net capital in excess of the early warning levels, it has taken measures to reduce its risk portfolio in proprietary positions to protect itself in the event of further extreme market volatility. Moreover, as a result of an ongoing review of its business undertaken before the events of October 19, Rothschild has implemented cut-backs in its public finance and municipal bond trading activities, thereby substantially reducing its personnel. Rothschild also has entered into an agreement with Broadcort Capital Corp. to clear its customer securities transactions through Broadcort on a fully-disclosed basis.

b. Medium-Sized Firms

The Division also reviewed the financial reports of eight medium-sized firms, each carrying a substantial amount of customer accounts. These firms had mixed results in October. Four firms had net income for the month as follows:

^{12/} Some of the increases in net capital resulted from reductions in securities positions and thus haircuts.

<u>Net Worth</u>	<u>Net Income</u>
\$82,229,000	\$137,233
10,400,000	40,230
9,140,600	295,850
61,987,264	111,358

On the other hand, four firms had losses for the month as follows:

<u>Net Worth</u>	<u>Net Loss</u>
\$37,987,970	\$1,379,853
95,409,291	6,974,709
28,003,758	3,659,672
109,785,517	20,720,570

Some of the losses were caused by customer defaults in cash and margin accounts; however, most were attributable to realized or unrealized losses in proprietary equity positions. In addition to these firms, other firms suffered losses that were material to the firms' net capital positions. For example, one firm which had tentative net capital^{13/} of about \$1 million lost \$455,000 in October because of unsecured debits ("receivables") and unrealized losses in the firm's trading inventory. A second firm lost almost \$1 million in October 1987, primarily because of investment and trading account losses. This represented some 30% of its October excess net capital at the end of October. A third firm lost \$573,000 in October, or 23% of its October 31 excess net capital. The loss was caused primarily by unrealized declines in its inventory positions. Despite these relatively sharp losses for October, only three firms carrying customer accounts had to cease business because they were in violation of the net capital rule for reasons stemming from the October market break.

Firms characterized as trading or arbitrage firms, with almost no other lines of securities business, suffered extremely large losses due to the market break. The Division reviewed the financial statements of five major arbitrage firms. Those firms lost approximately \$462 million in October. This figure represents a loss of 41% of their combined net worth. Each firm, however, had, at month end, net capital substantially above the required level.

c. Upstairs Firms That Ceased Operations

Approximately 6,700 upstairs firms that do not solely transact business on the floor of an exchange are registered as broker-dealers with the Commission. Slightly less than 1% of that number (fifty-eight firms) were in violation of the net capital rule for reasons related to the October market break and ceased operations at least temporarily. About one-half or thirty of those broker-dealers did not recover from the events of the week of October 19. The great majority of these firms fell below the required levels of net capital because of losses in proprietary accounts or expected losses in customers' cash or margin accounts. (See Table 5-8 at the end of this chapter.)

^{13/} Tentative net capital is the net capital of a broker-dealer before haircuts.

Of these, only one firm that carried customer accounts, H.B. Shaine & Co., Inc., is being liquidated pursuant to provisions of the Securities Investor Protection Act of 1970 ("SIPA") and under supervision of a court appointed trustee.

The nature of these fifty-eight firms' business may be broadly classified into 3 categories: (i) firms that carry customer accounts; (ii) firms whose primary business is trading for their own accounts and which do not carry customer accounts; and (iii) firms that introduce customer accounts to carrying (or clearing) broker-dealers.

i. Self-Clearing Broker-Dealers

Three broker-dealers that carry customers' accounts ceased operations (at least temporarily) because they were in violation of the net capital rule as a result of the October 19 market break. 14/

H.B. Shaine & Co., Inc. ("Shaine"), located in Grand Rapids, Michigan, was a NYSE and NASD member broker-dealer and market maker in thirty-seven NASDAQ securities. The firm had two offices, approximately fifty registered representatives, and carried about four thousand customer accounts. It ceased operations on October 19 because of an inability to meet an intra-day variation margin call from the Options Clearing Corporation ("OCC") stemming from positions in uncovered OEX put options sold by about twenty customers. Although Shaine reported net capital of \$500,000 on September 30, 1987, the customers' accounts on which the customers defaulted liquidated to a total deficit of about \$5 million. During the week of October 19, 1987 a trustee was appointed for Shaine under SIPA.

Two other broker-dealers closed temporarily because of capital deficiencies. Lowell, Listrom & Co., Inc. was forced to close for two business days because of a decline in the market value of proprietary securities related to the October 19 market break. An increase in the market value of its proprietary securities and resolution of aged failed to deliver contracts resulted in its reestablishing capital compliance.

14/ One other clearing firm ceased doing business during the October 1987 time period; however, that firm failed because of financial difficulties generally unrelated to the October market break. K.A. Knapp & Co., Inc. ("Knapp"), a NASD member broker-dealer with headquarters in Grand Rapids, Michigan, had experienced financial problems prior to the market break. Knapp acted as an underwriter for a firm commitment offering of shares in Centrac Associates, Inc. ("Centrac") in September 1987. The stock, issued at \$5.00/share, was selling for approximately \$3.00/share in early November and, after Centrac filed a petition for bankruptcy on November 13, the stock had little or no value. Knapp had approximately 130,000 shares of Centrac long in inventory. Apparently, Knapp had trouble selling its entire obligation in part because it was not able to register ("blue sky") the issue in several states. The decline in value of Knapp's inventory of Centrac stock and other debts Knapp had to Centrac in connection with the offering resulted in an inadequate capital situation for Knapp. Knapp ceased doing business on November 13 and commenced to self-liquidate on November 16 under the general supervision of the NASD. Knapp has negotiated a transfer of its approximately 1,100 customer accounts to other broker-dealers. There is no indication that any customers will suffer any losses.

West Wind Trading Co., which makes markets in four NASDAQ securities, suffered trading losses in connection with the October market break and ceased doing business. The firm, which primarily trades for its own account, had only one customer. It withdrew securities from its proprietary account to satisfy a liability to its customer and was able to obtain sufficient capital to reestablish net capital compliance and re-opened on November 9, 1987.

ii. Trading Firms

Five firms that had no customers and whose primary business was trading for their own accounts ceased their securities operations at least temporarily because of losses from the October market break. The firms were: (a) AIG, Inc.; (b) Comdisco Equities, Inc.; (c) William D. Mayer & Co.; (d) Metropolitan Securities; and (e) Domestic Arbitrage Group.

AIG, Inc. was an options market maker that cleared its transactions through Bear, Stearns & Co. Inc. and also took positions in risk arbitrage securities. As a result of the market break, it lost approximately \$40 million in its arbitrage securities. As of September 30, it reported net capital of \$4 million. After the loss, its net capital was in deficit \$14 million.

Comdisco Equities, Inc. ("Comdisco Equities"), which cleared its securities transactions through Bear, Stearns & Co. Inc., suffered an unrealized loss of approximately \$100 million in equities trading and closed on October 20, 1987. Its parent, Comdisco, infused \$35 million to bring it back into net capital compliance and re-opened on October 22, 1987. Subsequent to the market break, Comdisco Equities reported that it will withdraw from the risk arbitrage business. Comdisco Equities is gradually liquidating its market positions.

William D. Mayer & Co. ("Mayer") was primarily an options market maker in listed options that cleared its transactions through Weiss, Peck & Greer. During the week of October 19, Mayer lost \$13 million in options market making and \$7.8 million in the value of securities held for investment. Its net capital fell to a deficit of \$13.6 million; it had reported net capital of \$3.8 million on September 30.

Metropolitan Securities was an options market maker in listed options, and, in addition traded equity securities for its own account. It lost about \$31 million in options market making in October. Its net capital was in deficit at the end of October by approximately \$41 million; as of September 30, it reported net capital of \$7 million.

Domestic Arbitrage Group ("Domestic") introduced customer transactions on a fully disclosed basis to Financial Clearing and Services Corporation ("FCSC") and was also a market maker in approximately 230 NASDAQ stocks and 100 "pink sheet" stocks. Domestic experienced financial difficulties because of \$4.2 million in unsecured debits resulting from its customers' liabilities to FCSC and a \$1 million decline in the value of its proprietary inventory.

iii. Introducing Broker-Dealers

As noted above, an introducing broker-dealer is one that has a contractual arrangement with another firm, the carrying or clearing firm, in which the carrying firm agrees to perform certain services for the introducing firm. Generally, the introducing

firm submits its customer accounts and customer orders to the carrying firm, which executes the orders and carries the accounts. The carrying firm's duties include the proper disposition of the customer moneys and securities after trade date, the transfer to the customer of the moneys and securities after settlement date, the holding of customer securities and funds, and the handling of the paper work associated with carrying customer accounts.

Approximately fifty-five firms that introduced customer transactions on a fully disclosed basis to clearing broker-dealers ceased operations because of violations of the net capital rule caused by losses directly related to the October market break. Most of the losses resulted from defaults by customers in failing to make payment to the clearing broker-dealers on unsecured monies owing to the clearing firm for which the introducing broker-dealers were contractually liable. The net capital rule requires the introducing broker-dealer to incur a deduction from its net worth equal to the amount of the unsecured deficit.

At least eleven of the fifty-five introducing firms made markets in over-the-counter securities. The losses sustained by these firms were a result of unsecured customer debits for which they were contractually liable and declines in the market value of proprietary inventory. Three of the fifty-five firms also suffered substantial trading losses related to their options market making business.

Approximately 40% of the introducing firms that ceased operations re-opened, usually within a week after their close. A number of firms forced to close because of unsecured customer debits were able to increase their net capital and therefore re-open by entering into subordination agreements with their clearing brokers. ^{15/} The remaining firms were able to acquire additional capital sufficient to bring them into compliance with the Commission's rules.

iv. Over-the-Counter Market Makers

As discussed above, the net capital rule includes certain additional capital requirements for market makers in over-the-counter securities. ^{16/} During the period following the market break, twelve broker-dealers that made markets in over-the-counter securities ceased operations. In some cases, the prices of the securities in which they made markets fell dramatically. The customer obligations, in some cases secured by the securities, became uncollectible. Frequently, the over-the-counter

^{15/} The net capital rule allows broker-dealers, for purposes of computing net capital, to add certain satisfactorily subordinated liabilities back to net worth. Rule 15c3-1d. When a liability is subordinated, the lender has contractually agreed that every other unsubordinated creditor of the broker-dealer has a prior claim to the assets of the broker-dealer. For subordination agreements to be satisfactory for purposes of the net capital rule, they must (i) meet the criteria for acceptability found in Rule 15c3-1d, which, among other things, requires that they may not be repaid within a period of less than one year; (ii) be approved by the broker-dealer's designated examining authority; and (iii) remain in the form found acceptable by the self regulatory organization which acts as the firm's designated examining authority.

^{16/} See discussion *supra* at p. 5-1.

market maker introduces its customer accounts to another broker-dealer. As the customer accounts of the introducing market maker become unsecured, the carrying broker-dealer and its customers become exposed to risk associated with the default of those accounts.

Of the twelve over-the-counter market makers that ceased operations during the market break, ten introduced their accounts to other broker-dealers. All of the broker-dealers that carried the customer accounts of those firms suffered losses from unsecured customer obligations of their introducing market maker firms.

In addition to direct losses from market maker failures, other firms and customers are also exposed to potential market losses when a market maker significant in a particular security fails. Other less significant market makers may withdraw from the system or may restrict their purchases, often resulting in a free-fall in the prices of the securities.

The cases of two firms are particularly noteworthy. Haas Securities Corporation ("Haas"), a market maker in eleven over-the-counter stocks and a member of the New York Stock Exchange, ceased operations on October 28, 1987. Haas, which introduced customer transactions on a fully disclosed basis to Rothschild was forced to close because stocks in its inventory plummeted in market value and the receivables of customers introduced to Rothschild were unsecured, resulting in a reported \$15 to \$20 million net capital deficiency for Haas. Haas made markets in the following securities, which declined precipitously in value from Friday, October 16 to Monday, October 19: (i) Big O Tire, Inc., which declined in value from \$8 1/4 to \$5 1/4; (ii) Fountain Powerboat Industries Inc., which dropped in value from \$11 to \$6; (iii) TS Industries Inc., which dropped from \$27 to \$20 3/4; and (iv) Flores de New Mexico Inc. and Cliff Angle Ltd., for which no quotes were available on the NASDAQ screen on October 19, but which had traded at \$11 1/4 and \$10 1/2 respectively at the close of October 16.

Pace Securities Inc., a New York Stock Exchange member firm which introduces its customer transactions on a fully disclosed basis to Edward A. Viner & Co., Inc. ("Viner"), ceased operations because of difficulties related to customer transactions in securities in which Haas made markets. Many of Pace's customers did not pay for their orders and Pace therefore was left holding severely depressed stocks. The trades in question, which resulted in \$4.6 million in losses, involved Big O Tire, Inc., Fountain Powerboat Industries, Inc. and TS Industries Inc. Pace reestablished capital compliance pursuant to a satisfactory subordination agreement entered into with Viner, and resumed operations on November 12, 1987.

2. Margin Accounts

Broker-dealers extend credit to customers to purchase equity securities or options in margin accounts. Margin is the equity in the account (*i.e.*, the value of the securities in the account, minus any credit extended). When the customer buys securities in a margin account, the securities act as collateral for the extension of credit by the broker-dealer. If the customer sells securities short or sells uncovered options, the margin protects the broker-dealer against loss due to adverse movements in the prices of the securities sold short.

Minimum initial margin requirements are set by the regulations of the Board of Governors of the Federal Reserve System ("FRB"). The various securities exchanges set maintenance margin requirements.

While margin regulations require broker-dealers to maintain certain minimum margins and to liquidate customer collateral if margin is not provided within certain time limits, broker-dealers may also require their customers to provide margin that exceeds the minimums set by margin regulation. Similarly, broker-dealers are free to require their customers to provide margin at any time prior to the expiration of the appropriate time periods set by the applicable self regulatory organizations.

Margin procedures vary among broker-dealers. Most broker-dealers notify the customer that margin is due by telegram or mailgram. If the customer does not respond promptly, the broker-dealer liquidates positions in the customer's account until the customer's obligation to the firm is satisfied. In order to protect the firm against loss, broker-dealers generally, in the margin agreement with the customer, reserve the right to liquidate margin accounts at any time without notice to the customer. ^{17/} Many broker-dealers also restrict the customer's ability to enter into additional transactions while margin calls are outstanding.

Broker-dealers that have fewer, but more creditworthy customers, generally contact the customer directly when margin is due. The margin required by those firms often depends on the credit standing of the individual customer. Likewise, the time required for payment is a function of the credit exposure to the customer.

Immediately after the October market break, the Division collected margin account information from approximately twenty-five broker-dealers. These broker-dealers were selected because of the size of their capital and the volume of their customer business. At the time of the market break, the amount extended by broker-dealers through margin accounts was significant. The firms that were contacted by the Division reported credit extended in securities accounts in excess of thirty-one billion dollars. Margin calls made by the reporting firms increased substantially immediately after the market break. On October 16, the firms reported margin calls of \$295.8 million. On October 19, those firms indicated that they had requested additional margin of \$1.6 billion. On the two days following, the margin calls totalled \$1.5 billion and \$1.1 billion, respectively. Liquidations as the result of the margin calls are described below. Over the two week period following the break, the amount of margin calls gradually declined to the level at which they had existed prior to the break.

There is no federal regulation governing margin on commodities and commodities futures; Regulation T of the FRB applies only to securities transactions. Nevertheless, commodity futures customers are required to provide margin in accordance with the rules of the commodities exchanges.

On October 16, approximately \$944 million in commodity margin calls were issued by the firms that provided data. Those firms issued over \$11.6 billion in commodity

^{17/} Rule 10b-16 under the Exchange Act requires broker-dealers to establish procedures to assure that each customer is given or sent a written statement disclosing the conditions under which additional collateral can be required. Rule 10b-16(a)(1)(vii).

margin requests during the next four trading days. On October 19, approximately \$3.6 billion in margin was requested by the reporting firms. On October 20, 21 and 22, those firms made commodity margin calls of \$2.7 billion, \$2.55 billion and \$2.76 billion, respectively.

Commodity account margin calls met by deposits of funds or securities exceeded the amount of securities margin calls met by deposits by three times over the two week period following the break. On October 16, the broker-dealers reported deposits of additional funds or securities in commodities accounts of \$321 million. On October 19, 20, 21 and 22, those broker-dealers indicated that they had received deposits of funds or securities into commodities accounts of approximately \$1.5 billion, \$842 million, \$906 million, and \$1.3 billion, respectively. Over the same time period, funds or securities deposited in the securities margin accounts of the broker-dealers that provided us information amounted to approximately \$65 million, \$613 million, \$277 million, \$538 million and \$194 million, respectively.

The amount of margin liquidations that occurred in securities accounts exceeded the liquidations of commodities margin accounts by four times. Liquidations reported in securities margin accounts on October 19, 20 and 21 were approximately \$293 million, \$426 million and \$327 million, respectively. Over the same time period, commodity account liquidations were \$66.5 million, \$93.9 million, and \$72.8 million.

A number of reasons may account for the differences between the amount of commodity margin calls satisfied by customers in contrast to the amount of securities margin calls satisfied by customers. First, the creditworthiness of the customers that invest in the instruments generally differs. Institutional, rather than retail, customers are more likely to enter into commodity futures transactions. Furthermore, since those transactions often consist of offsetting securities and futures positions, losses in, for example, futures positions can be balanced by gains in securities positions.

Commodity account customers who held long positions in stock index futures also may have liquidated securities positions or transferred funds or securities into their commodities account in order to prevent liquidations of their index-related futures positions at a substantial discount. Normally, index futures trade at prices close to the composite prices of the related securities. As discussed in Chapter Two, throughout various intervals during the market break, the Standard and Poor's 500 index future was selling at a price significantly lower than the composite price of the securities constituting the index. At times, that discount approximated twenty percent of the price of the securities in the index.

3. Analysis

In general, we believe that the net capital rule adequately measures the actual and contingent risks for securities firms. The capital required by the net capital rule and broker-dealers' substantial excess net capital provided a reasonable safety margin during the October market break, at least for diversified firms. The market break, however, demonstrated that several provisions of the net capital rule should be reviewed. Certain of those areas are discussed in Chapter Four and in a later section of this Chapter relating to options market makers (Chapter 5-D). The remainder are discussed below.

a. Minimum Net Capital Requirements

The \$25,000 minimum requirement under the basic method of calculating net capital under Rule 15c3-1 and the \$100,000 requirement under the alternative method are applicable to broker-dealers conducting a general securities business. This includes broker-dealers that buy and sell stocks, bonds, options or municipal securities and/or engage in firm commitment underwritings as managing underwriters or as members of a syndicate. More importantly, these broker-dealers are permitted to carry the accounts and clear the trades of customers. Thus, customer funds and securities continuously flow through these broker-dealers and consequently customer exposure is potentially high.

These minimum levels of capital required for transacting a securities business were established in the early 1970's and have never been adjusted for inflation. Two developments raise concerns about the adequacy of the minimum capital requirements. First, as discussed in Chapter Three, the increased volatility experienced in October appears to be continuing, albeit to a lesser degree; higher market volatility increases exposure to both customer market defaults and trading defaults. Second, the development of index options and futures has provided new leveraged products that have increased the potential for substantial customer losses and accompanying defaults during a market break. Considering the continuing higher levels of volatility in the equities market ^{18/} and the demonstrated leverage of certain new products, the combination of which caused substantial losses to broker-dealers, the staff will review whether higher minimum capital levels for firms maintaining customer accounts would be appropriate.

Minimum capital levels for introducing broker-dealers also deserve reexamination. To qualify for the reduced minimum net capital requirement, a broker-dealer must restrict its securities business to that permitted by the rule. In addition to being required to introduce all customer transactions to another broker-dealer, the \$5,000 broker-dealer may only participate in "best efforts" or "all or none" underwritings; it must promptly forward all monies and securities of customers that may come into its possession or control; and when acting as principal, it may only engage in "riskless trades" that are cleared through another broker-dealer. These restrictions are designed to minimize the risk of loss associated with broker-dealers that handle customers' monies and securities. If the \$5,000 broker-dealer operates its business beyond the permissible scope of the rule, it is considered to be operating a general securities business, and hence, subject to a \$25,000 minimum net capital requirement.

In general, customers should not be exposed to risk associated with the operations of an introducing firm. There are, however, certain situations in which customers' monies or securities may be at risk. First, these broker-dealers do in fact receive customer funds and securities, some on a routine basis, that are required to be forwarded to carrying firms. Second, if any of these firms fail, their customers are often stranded; the carrying firms will usually not accept orders from customers directly because the carrying firms regard the customers as those of the introducing firms. As a result, the customers may suffer a period of illiquidity until the accounts can be

^{18/} See discussion *supra* at Chapter Two.

transferred to another broker-dealer. Accordingly, the Division also will review a possible increase in minimum capital requirements for introducing broker-dealers. 19/

The Division also believes that a review of the minimum amount of capital necessary for one to qualify as an over-the-counter market maker should be conducted. This review should include an analysis of the amount of capital necessary for each security, as well as the appropriateness of the net capital ceiling of \$100,000 on a market maker's minimum net capital requirement.

In reexamining the minimum capital requirements, the Division, of course, would review the impact of any change on the securities industry. An increased requirement, among other things, might require some broker-dealers to leave the business and might reduce the ability of new firms to enter the business. On the other hand, an increase in minimum capital requirements would provide broker-dealers with a greater capital cushion to withstand unanticipated events and meet their obligations to customers and broker-dealers. For those reasons, it also would provide greater protection for the Securities Investor Protection Corporation's insurance fund. If it is determined that the minimum capital requirements should be increased, the Commission would, of course, provide sufficient lead time to enable existing broker-dealers to meet any new requirements.

b. Commodities

We believe that the haircuts broker-dealers incur with respect to their commodity futures positions should be reviewed. The haircuts under Appendix B of the net capital rule, 20/ which largely conforms with similar provisions in the CFTC's capital rule, are dependent on the margin requirements of the various commodities boards of trade and clearing organizations. For example, the haircut a broker-dealer must incur with respect to an uncovered 21/ proprietary futures position is equal to its margin requirement if it is a member of a clearing organization. The haircuts that futures commission merchants ("FCMs") that carry the accounts of commodities floor traders must take are also based on the board of trade or commodity clearing organization margin requirements.

While those margin requirements may be adequate for the purpose of protecting clearing corporations and FCMs against credit and default risks, we believe that margin requirements set by the self regulatory organizations may be inappropriate for measuring risk for capital adequacy purposes. Capital adequacy rules provide conservative but constant risk measurement of all the transactions in the firm. Futures margin requirements, on the other hand, measure risk for only particular transactions (which may include hedges) and may permit greater risk exposure than is warranted in a capital

19/ A \$5,000 minimum requirement may, however, still be appropriate for those broker-dealers who do business solely in best efforts underwritings where they handle no cash or securities.

20/ Appendix B to the net capital rule sets forth the haircuts for commodities and commodities futures positions.

21/ The term "covered" is defined in 17 CFR Sec. 1.17(j). Currently, the CFTC capital rule and Appendix B do not require deductions for covered futures contracts.

adequacy rule. Because of relatively low margin levels, those requirements must be frequently adjusted in reaction to varying market conditions. As noted earlier, the Chicago Mercantile Exchange's margin requirement for its Standard and Poor's 500 future was changed four times during the two week period following the market break. When margin requirements are used for capital purposes, rapidly adjusted margin requirements, which cause sudden changes in capital requirements, make it difficult for broker-dealers to plan capital employment effectively. During the period following the market break, two broker-dealers were temporarily forced out of compliance with the net capital rule solely because of unanticipated increases in capital requirements resulting from the Chicago Mercantile Exchange's changes in its margin requirements. Both broker-dealers were able to adjust their positions or obtain additional capital sufficient to regain compliance with the rule.

The Division staff intends to review whether Appendix B of the net capital rule should be amended to require broker-dealers to take haircuts for their securities related futures positions that are independent of margin requirements. Those haircuts should, of course, be related to the volatility of the underlying securities. Moreover, consideration should be given to imposing additional deductions for concentrated futures positions.

c. Haircuts on Equity Securities

Since 1975, the net capital rule has provided two separate methods for calculating haircuts related to a broker-dealer's equity securities positions. The method used by a broker-dealer depends on the election the broker-dealer makes with respect to its net capital requirement. As noted above, those broker-dealers calculating their net capital requirement under the basic method incur a haircut equal to 30% of the greater market value of the greater of their long or short equity securities positions. That haircut is increased by 15% of the market value of the lesser of their long or short positions, but only to the extent that those positions exceed 25% of the market value of the greater of the long or short positions.

Broker-dealers electing the alternative method of computing net capital incur a 15% haircut on their long equity securities positions. That haircut is increased by 30% of the broker-dealers' short equity securities positions, but only to the extent those short positions exceed 25% of the long positions. Although a broker-dealer electing the alternative method incurs a 15%, rather than a 30%, haircut on equity securities positions, the alternative method requires maintenance of higher minimum net capital. The absolute minimum net capital is \$100,000 under the alternative method, as opposed to \$25,000 required under the basic method.

Generally, the haircuts prescribed by the rule take into account market risk, credit risk, price volatility and liquidity of particular securities. The haircuts on debt securities include a series of percentage deductions that depend on the specific security and the composition of the positions entered into. The deduction for equity securities haircuts, however, has always consisted of one or two percentages broadly applied to the equity portfolio. The reason for this has been the great variation of risk that exists with respect to different equity securities. Depending on the amount of shares outstanding and the number of market makers willing to quote a particular issue, equity securities vary in degrees of liquidity. The financial condition of issuers is also disparate. In order to make the calculation of the rule as simple as possible, the rule has generally treated different issues of equity securities the same. Thus, the 15% and

30% haircuts in the present rule generally consider the various risks associated with equity securities without distinguishing between the particular positions.

Generally, the Division believes that the haircut levels provided adequate protection even during the period of extraordinary market volatility that occurred in October. Nonetheless, the Division believes that in light of the October market break and the increased volatility in the equity markets, the level and structure of equity haircuts should be reexamined. In particular, because liquidity levels are not the same for different types of stocks, the Division believes that consideration should be given to establishing several levels of haircuts to distinguish among different types of securities. Moreover, the Division believes that the question whether equity haircuts are a sufficient leverage limiting device for firms that do not carry customer accounts should be examined. Virtually all of the failures and episodes of serious financial difficulty that occurred during the market break involved these types of firms, that is, firms that trade for their own accounts, act as market makers or clear through other firms.

d. Activities of Affiliates

The October market break generally demonstrated the resilience of the broker-dealer industry. In particular, the strong capital positions of the major firms and, in many cases, their ability to obtain additional capital from their parents, enabled them to absorb substantial losses in their equity positions. Nevertheless, the Division believes the Commission should evaluate circumstances where there may be potential for a major financial firm failure. In this connection, the Division believes it is appropriate to consider the activities of unregulated entities affiliated with registered broker-dealers.

The large investment banking firms and wire houses generally are owned by holding companies that have other subsidiaries engaging in unregulated securities-related or banking-related activities. These unregulated entities attain a degree of leverage and take credit risks regulated broker-dealers cannot. ^{22/} In some cases, the registered broker-dealer's parent (without the broker-dealer's capital) or sister affiliates have significantly less capital and financial resources than the broker-dealer. Moreover, the Division believes that in many cases the creditors of those entities are indirectly relying on the credit of the broker-dealer and the ability of the holding company to shift capital from the broker-dealer to the unregulated entity.

Bridge financing involving holding companies of investment banking firms is an activity of particular concern. In a bridge financing transaction, the holding company commits its own capital, often for acquisition-related or leveraged buy-out transactions

^{22/} In 1985, several unregulated government securities affiliates of broker-dealers failed due to fraudulent activity and a lack of accountability. In response, the Congress enacted the Government Securities Act of 1986, requiring the registration and financial regulation of government securities dealers. In addition, the Commission amended its financial responsibility rules with respect to its treatment of repurchase and reverse repurchase agreements. In particular, the net capital rule was amended to require registered broker-dealers to take charges with respect to transactions with unregulated affiliates in those instances where the affiliate does not allow regulatory examiners access to the affiliate's books and records.

of certain clients. 23/ In connection with the financing, the affiliated broker-dealer usually underwrites debt instruments of the client. The proceeds of that underwriting are generally used to satisfy the obligation of the broker-dealer's client under the bridge financing. Until the proceeds are collected, the broker-dealer's holding company is exposed to the risk that the broker-dealer's client may default on its bridge financing obligation.

As a result of the market decline, the ability of broker-dealers to market the debt instruments, the proceeds of which were intended to satisfy the bridge loan obligations of the issuers, was temporarily reduced. The events of the market break demonstrate the potential exposure from unregulated financing activity. 24/

In addition to bridge financing, broker-dealer affiliates have expanded their involvement in other non-securities activities. Some broker-dealers have large unregulated affiliates that deal actively in foreign currencies, mortgages, and interest rate swaps. Those affiliates are often highly leveraged and exposed to substantial market risk and credit risk related to their transactions.

The unregulated activities of an affiliate of a broker-dealer theoretically are not directly relevant to the regulated broker-dealer's capital, since the broker-dealer is not responsible for the affiliate's liabilities. Moreover, under the net capital rule, capital cannot be withdrawn from a broker-dealer if the withdrawal would leave its remaining capital below the early warning levels.

A broker-dealer may be indirectly affected, however, by an insolvency of an affiliate or a parent. Broker-dealers often need short-term financing. The failure of a related entity could have substantial effects on the liquidity of the broker-dealer. 25/ In addition, management might seek ways to divert capital from the broker-dealer to the extent permitted by the net capital rule. While this shift of assets would not, by itself, place the firm in net capital violation, it could leave the firm more exposed to failure during volatile market conditions. Further, in cases where the related entity fails because of fraudulent activities, legal challenges to the corporate separateness of the broker-dealer may be made.

23/ The Commission has published two studies on bridge financing. These studies by the Divisions of Market Regulation and Corporation Finance, dated October 28, 1987, are available from the Office of Public Affairs of the United States Securities and Exchange Commission (News Release 87-77).

24/ One bridge loan financing that incurred difficulties because of the market break concerned the Southland Corporation. The firm postponed a \$1.5 billion takeover-related offering of high yield bonds. Affiliates of two broker-dealers had made bridge loans of approximately \$100 million each in connection with the proposed issue. The offering was ultimately completed.

25/ If the holding company itself fails, the creditors of the holding company could force a liquidation of the broker-dealer.

Significant failures in many of the areas noted could affect investors and financial firms. We believe that these system exposures deserve additional study by the Commission. 26/

C. Liquidity of Broker-Dealers

1. Introduction

Large firms have the capacity to obtain substantial leverage by borrowing. As of October 31, 1987, the fifteen largest firms (in capital terms) had total assets of approximately \$377 billion and total equity capital of \$16.9 billion. In most firms, bank loans are not a significant portion of liabilities. Rather, assets are funded in most part (other than through capital) by repurchase agreements, securities lending activity, and intra-company borrowing, generally on an unsecured basis. With isolated exceptions, the Division did not find that the market break had a significant impact on these activities.27/

The financing of customer receivables is largely accomplished through the use of free credit balances, the lending of margin securities to another broker-dealer or unsecured borrowings from affiliates. Again, the Division did not find significant interruptions in the availability of these financing vehicles.

Broker-dealers, however, often need overnight or short term financing from banks to carry or clear securities transactions, to deposit unusual amounts of margin before collections from customers, or to close out stock loan activities before the securities can be turned around. The largest, most well known, investment banks generally have access to unsecured or subordinated loans. Others, however, may have to borrow on a secured basis, and provide collateral through a variety of methods. The need for this short-term financing was increased substantially during the market break because of extremely large futures and options variation margin calls and increased securities settlement obligations. 28/

26/ We recognize that many broker-dealers are now owned by holding companies engaged in a wide range of commercial activities (e.g., Sears Roebuck which controls Dean Witter). We do not believe that substantial oversight of these non-financial activities is necessary or appropriate at this time.

27/ During the period following October 19, 1987, several broker-dealers had difficulty obtaining government securities in the repurchase market. Some counterparties chose not to lend securities to broker-dealers in order to avoid perceived credit risks associated with the market break. The Federal Reserve Bank of New York ("FRBNY") responded to this concern by relaxing restrictions on lending its own securities and letting it be known that it was increasing market monitoring. As actual losses suffered by broker-dealers became known, those market participants who had ceased loaning securities to particular broker-dealers resumed lending.

28/ Two broker-dealers reported substantial delays in receiving payments from a futures clearing corporation on October 20th. One reported receiving in excess of \$900 million after 5:00 p.m. (Eastern time) while another reported receiving over \$500 million after 1:00 p.m. (Eastern time). Normally, funds are made available by the futures clearing corporations at approximately 10:00 a.m. (Eastern time).

In general, it may be said that domestic banks headquartered in New York City or Chicago did not materially change their lending policies for large broker-dealers during the weeks of October 19th and October 26th, although there were reports of isolated problems. There were widespread indications, however, that many regional and foreign banks withdrew credit lines or severely constricted lending arrangements, perhaps because these banks did not have many broker-dealer customers or were unfamiliar with the equities markets.

2. Background 29/

Bank lending policies toward broker-dealers vary widely. At the New York City banks, and some foreign banks, the management of loans to securities firms is usually handled by a bank division that is frequently referred to as the "Wall Street lending group." Although a particular bank may have overall limitations on the credit that may be extended to securities firms as a whole, senior loan officers in the Wall Street lending group are responsible for making individual loan decisions. 30/

Small teams of analysts within the Wall Street lending groups are responsible for cultivating relationships with particular borrowers and, in most cases, monitoring the banks' credit risk. 31/ In connection with their lending operations, the banks regularly review periodic and annual reports, along with financial statements made available by the institutions. In addition, the banks also may ask broker-dealers for copies of the FOCUS reports that they provide to the Commission on a quarterly basis. Banks generally do not offer guaranteed lines of credit to brokerage firms because most of the brokerage firms are unwilling to pay fees for such lines and the banks frequently are unwilling to accept the credit risk. Nevertheless, internal lending guidelines are established by the banks for each borrower. These guidance limits may change as a result of a bank's ongoing assessment of its relationship with a particular broker-dealer. Credit requests by a broker-dealer within a bank's internal guidance limits may be processed by the more junior loan officers. Because a credit request that exceeds the guidance limits requires additional approval by a senior loan officer, most broker-dealers have some idea about the extent of a bank's lending commitment to their firms. A small number of banks indicated that they openly discuss their guidelines as part of their marketing approach with broker-dealers.

Banks provide secured and unsecured loans to broker-dealers to finance firm securities positions and customer margin transactions. The willingness of banks to lend on an unsecured basis varies greatly and is largely determined by the capitalization of the borrower. Several of the major New York City banks, and most of the foreign

29/ In connection with this study, the Division interviewed nineteen banks in New York City and Chicago.

30/ In contrast, the Chicago banks tend to conduct their lending relationships with securities firms out of their general corporate lending departments. Members of the corporate lending department with expertise in securities and commodities firms are assigned to manage lending to these segments.

31/ At one major New York City bank visited by the staff, there were separate credit and marketing teams that reported to the bank's senior management through different channels.

banks, limit their lending on an unsecured basis to a small number of top-tier broker-dealers. The majority of credit extended to broker-dealers, other than the top-tier firms, is provided on a secured basis. Moreover, as discussed earlier, almost all specialists borrow on a secured basis. Some of the major lenders to broker-dealers indicated that they restrict all their lending, even to top-tier brokerage firms, to secured loans.

The form of secured lending differs from bank to bank. Although in some cases banks take physical possession of collateral, the security interest of the bank in the collateral is most frequently perfected by a lien placed on securities in the broker-dealer's account at the Depository Trust Company ("DTC"), or by transfer to the bank's account at DTC. 32/ Within the broad classification of secured loans, some banks also include loans made on an "Agreement to Pledge" ("AP") basis.

An AP loan is a hybrid loan form developed to accommodate the operational difficulties and costs associated with transferring the collateral to the lender's account at DTC, or taking physical possession, for overnight loans. 33/ When a bank makes a loan that is secured on an AP basis, the brokerage firm provides the bank with a list of securities, which it has either segregated on its own books or in vaults, that are intended to collateralize the bank's loan. The securities offered as collateral for a bank's loans change on a daily basis. Accepting collateral on an AP basis requires the lender to rely upon the internal controls of the broker-dealer to assure that proper procedures for segregating securities are followed. Accordingly, banks also must assess the quality of the back office operations of broker-dealers in determining whether to lend on an AP basis. In order to assure that collateral is properly segregated by the broker-dealer, the bank may conduct spot audits.

Article 8 of the Uniform Commercial Code ("UCC") generally requires physical possession of securities, or a registered pledge, to perfect a lien on securities in order to maintain the creditor's secured position in the event of a borrower's bankruptcy. 34/ Nevertheless, many banks believe that the segregation of securities effected in

32/ A few banks also accept securities placed in accounts with the Midwest Clearing Corporation through its pledge program.

33/ In order to pledge collateral through DTC's pledge program, a broker-dealer must be a participant in DTC. The bank providing the loan need not be a DTC participant, but must at least enter into a pledge agreement with DTC. When the broker-dealer and the bank have agreed to the loan and the securities to be used as collateral, the broker-dealer instructs DTC to transfer the securities by a book-entry movement from the broker-dealer's account to the bank's pledge account. The bank then delivers the loan amount to the broker-dealer through channels outside of DTC. When the loan is completed, the bank releases the securities from its account to the broker-dealer's account. DTC assesses program participants a monthly charge and a charge for each pledge. See DTC Rules 1 and 3. One large firm that was required by banks to pledge its securities through DTC stated that the cost of that requirement was \$13,000 a month. This includes interest costs and movement charges. The firm pays \$.22 per movement and averages 700 movements a day.

34/ Collateral pledged through the DTC system clearly satisfies this requirement.

connection with a loan made on an AP basis provides the bank with at least a purchase money mortgage on the securities that is valid for a period of 21 days under the UCC.^{35/} While the banks view AP loans as a form of secured lending, certain factors, such as the reliance on the quality of management and vulnerability to fraud, make AP lending decisions similar to those for unsecured credit. Many banks are willing to lend to broker-dealers on an AP basis only so long as the firms' other creditors lend on an AP basis as well. Their position in this regard reflects a concern that in the event of a default, those lenders requiring DTC pledges may be regarded as bona fide purchasers under the UCC and have a prior claim on the broker-dealers' assets. Thus, a decision by one bank to require DTC pledges for its loans to a broker-dealer could cause the broker-dealer's other lenders to demand similar collateral.

The collateral permitted for secured loans is fairly consistent among banks. At the outset of lending relationships, banks inform broker-dealers of broad classes of equity and debt securities against which they will lend. For example, many banks will not lend on a secured basis against equity stocks valued at less than five or ten dollars, or against high yield bonds. In addition, the New York City banks will not lend against options. In contrast, several of the major Chicago banks indicated that they will lend against long options secured through the Options Clearing Corporation ("OCC") options pledge program. Within the range of acceptable securities, banks also try to avoid receiving a concentration of a particular issuer's securities as collateral.

The collateral value assigned to various securities is determined by the bank's internal lending policy but must be within the limits set by Regulation U of the FRB. Regulation U establishes the maximum amount that banks can lend to purchaser's of securities for certain purposes. For "margin stock," which includes equity securities listed on national securities exchanges as well as national market system ("NMS") securities and other more liquid over-the-counter securities, the maximum loan value is 50%.

Regulation U, however, provides exemptions from the maximum loan limitations that permit banks to make special purpose loans to broker-dealers, with only good faith margin, where the loans are secured by hypothecated customer securities, are used to finance the purchase of securities for prompt delivery with repayment to the bank, or where certain emergency conditions exist. In addition, there are specific exemptions in Regulation U that permit banks to lend on a good faith basis to finance the positions of specialists and over-the-counter market makers. Because the collateral requirement under Regulation U for loans to finance specialists' and market makers' positions is not specific, banks individually determine the maximum amount they will lend against

^{35/} See UCC Sec. 8-321(2), Sec. 8-313(1)(i), (1978), but see also Sec. 9-309 (a creditor may lose protection if the securities come into possession of a bona-fide purchaser). At least one court has indicated that a similar procedure used by broker-dealers in connection with the sale of government securities in repurchase agreements effected on a hold-in-custody basis would constitute a transfer for purposes of Sec. 8-313(1)(d), where the broker-dealer has control of the securities, provides confirmations, and segregates the customers' securities on its books. See In re Beville, Bresler & Schulman Asset Management Corp., 67 B.R. 557, 603-17 (D.N.J. 1986).

particular classes of securities. ^{36/} While there is a range of collateral value provided by the banks, depending upon the creditworthiness of the particular customer, the advance rates (*i.e.*, the amount a bank will lend against collateral) tend to range from 75-90% of the value of the securities.

The banks receive, on a daily basis, lists of collateral pledged against their loans through DTC or on an AP basis. The identity of the securities pledged as collateral may change on a daily basis. Operational personnel monitor the collateral pledged by the broker-dealers to determine whether the collateral falls within the bank's margin limits, whether there are excessive concentrations of a particular issuer's securities, and whether unacceptable collateral is being offered. Fluctuations in the market value of the securities offered as collateral to a bank may cause the bank to request additional margin. Similarly, the bank may be requested to release collateral whose market value has increased. During normal activity, margin calls are made each morning based on the previous day's closing prices. Broker-dealers respond to the margin calls by providing additional collateral during the day, and the adjustments are reflected in the next day's list of collateral.

The loan rates charged broker-dealers by the banks reflect the quality of the borrower and the nature of the loans. Loans are generally quoted at a rate slightly above the Fed Funds rate. In many cases, however, the borrower may be able to negotiate the rate. The rates quoted by banks to brokers also are a function of the banks' competitive positions in the markets. Discussions with major New York City banks reveal that they do not view themselves as sources of "cheap money." Instead, the broker loan business at these banks is viewed as one part of the banks' overall relationship with the securities firms, particularly in the case of major broker-dealers. Thus, a bank may agree to lend to a broker-dealer where it also receives income from compensating balances, day loans, or clearance and settlement of securities transactions. In contrast to the major New York City banks, some regional and foreign banks, which more recently have entered the broker loan market, are reported to loan at very narrow spreads to the Fed Funds rate in order to attract new clients.

Broker-dealers, particularly major firms, tend to have borrowing relationships with a number of banks. Thus, they can allocate their borrowing on a daily basis, based upon a variety of factors. These may include the cost of funds and the desirability of maintaining a credit relationship with a particular lending institution. Through diversification, broker-dealers eliminate some of their exposure to adverse credit decisions by a particular bank. Although the large broker-dealers diversify their lending relationships, smaller firms, including most of the specialists, do not appear to maintain lending relationships with more than one or two banks.

In addition to traditional broker loans, banks also have credit exposure to broker-dealers on an intra-day basis in connection with broker-dealers' foreign exchange trading and clearance and settlement operations for government securities. As part of their foreign exchange operations, banks may be called upon to transfer funds to a broker-dealer or third party, with the expectation that payment will be made shortly thereafter. Settlement of a particular foreign exchange trade may call for a complex series of interrelated transactions, with ultimate payment on the trade coming from a third party unrelated to the original transaction. Convention in the industry calls for

^{36/} See discussion in Chapter Four *supra*.

settlement of a foreign exchange transaction during business hours of the country whose currency is being exchanged. Thus, in a dollar/yen exchange, the yen may have to be delivered during business hours in Japan, while subsequent payment of the dollars would be made the same day during business hours in the United States. During the period between delivery of the yen and receipt of dollars in payment, the bank has in effect advanced credit to its counterparty and is exposed to the risk that it will not receive dollars in return.

Banks encounter similar "pay away" exposure for much briefer periods of time in the course of clearing transactions in government securities. As with foreign exchange transactions, the bank may be called upon to advance funds or securities to be sent over the Fedwire ^{37/} to effect trades in government securities on behalf of its customers. Because simultaneous credits or debits will occur in the account of the customer's bank at a Federal Reserve Bank, as well as the account of the counterparty's bank, the banks are responsible for the transaction regardless of whether or not they receive payment or securities from their customers. Thus, banks are required to monitor their own customers' records closely and must try to determine in advance of effecting a transaction whether a customer's account at the bank is sufficiently funded. Where sufficient funds or securities are not present, the banks will permit "daylight overdrafts," as long as assurances are provided that funding for the transaction is to be supplied by a transfer of funds or securities over the Fedwire from the customer's account at another bank. Between the time the bank effects a trade on behalf of its customer and receives the wire transfer into the customer's account, the bank is exposed to the risk that it will have purchased or sold securities on behalf of its customer, and yet not receive payment or securities in return.

3. Bank Lending During the Market Break

(a) Broker Loans

(i) General

As noted earlier, some broker-dealers experienced problems obtaining credit during the week of October 19th. Our information suggests, however, that banks generally continued to function as lenders to the brokerage community and accommodated the increased demands of their customers for loans.

Bank lending to the brokerage community during the days immediately following the market break appears to have increased significantly. According to FRB data, loans made by banks to broker-dealers and other borrowers to purchase and carry securities positions totaled approximately \$15 billion on Wednesday of the week prior to the

^{37/} The Fedwire is the Federal Reserve System wire transfer facility, which provides a system for transferring funds and U.S. government securities between all 12 Federal Reserve Banks, their 24 branches, the Federal Reserve Board office in Washington, D.C., the U.S. Treasury Department's offices in Washington, D.C. and Chicago and the Commodity Credit Corp.

break. ^{38/} On October 21st, ^{39/} however, the FRB reported that bank loans for purchasing and carrying securities increased to \$22 billion. By November 4th, the loans had receded to \$12.2 billion, below pre-break levels. Of the \$7 billion increase in loans, almost \$5.5 billion came from New York City banks, which increased the amount of their loans to the industry by 82% from the previous reporting period. Chicago banks increased their lending by 21%.

During the week of October 19th, while senior bank executives outside the Wall Street lending groups monitored the market's decline, most banks reported that credit decisions remained the responsibility of the Wall Street lending groups. Although the unusual circumstances dictated added caution, the majority of banks appear to have followed existing lending procedures and continued to provide loans to broker-dealers within the parameters of their banks' internal guidance limits. ^{40/} Bankers faced greatly heightened demands for credit from broker-dealers on the Tuesday and Wednesday following October 19th. On October 16th and October 19th, specialists and OTC market makers accumulated larger than average inventories of securities as the market dropped. At the same time, firms active in the futures markets were receiving extremely large margin calls. In order to finance settlement of their securities positions, meet margin calls on futures, and facilitate securities settlement with customers in the event of counterparty fails, large broker-dealers reportedly began to borrow from banks in substantial amounts on Tuesday and Wednesday, October 20th and 21st, while smaller dealers, including specialists, sought assurances that financing would be available on settlement date for securities they had purchased. At the same time, the collateral value of securities pledged to secure broker loans had declined substantially.

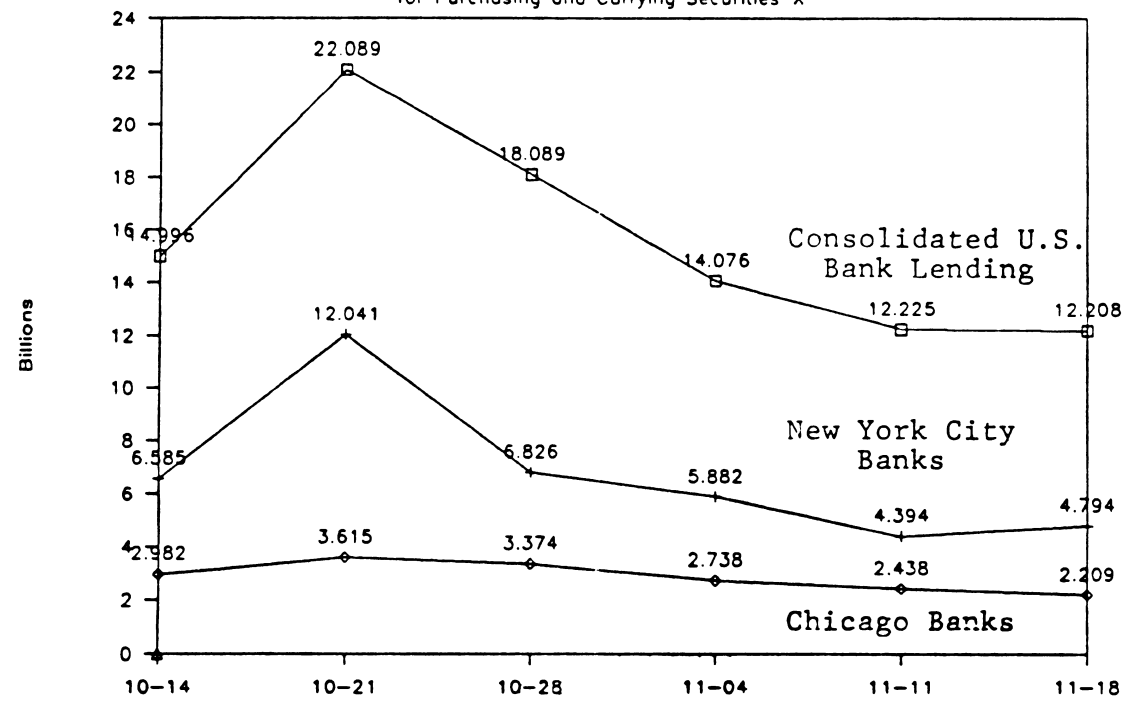
In many cases, senior bank management made decisions to support the brokerage community during the crisis. The actions of the FRB and the FRBNY were widely praised for encouraging banks to continue to lend. On October 19th and 20th, calls were placed by high ranking officials of the FRBNY to senior management of the major New York City banks, indicating that, while banking prudence should be maintained, they should encourage their Wall Street lending groups to use the additional liquidity being supplied by the FRBNY to support the securities community. In addition, the

^{38/} See Table 5-4. These figures are taken from the FRB's statistical releases. Loans for purchasing and carrying securities include all loans to broker-dealers, as well as loans made to any other borrowers, including mutual funds, to finance settlement of securities positions and renew outstanding loans. Borrowing by mutual funds to finance redemptions also may have accounted for a portion of the increased loan demand shown on October 21st.

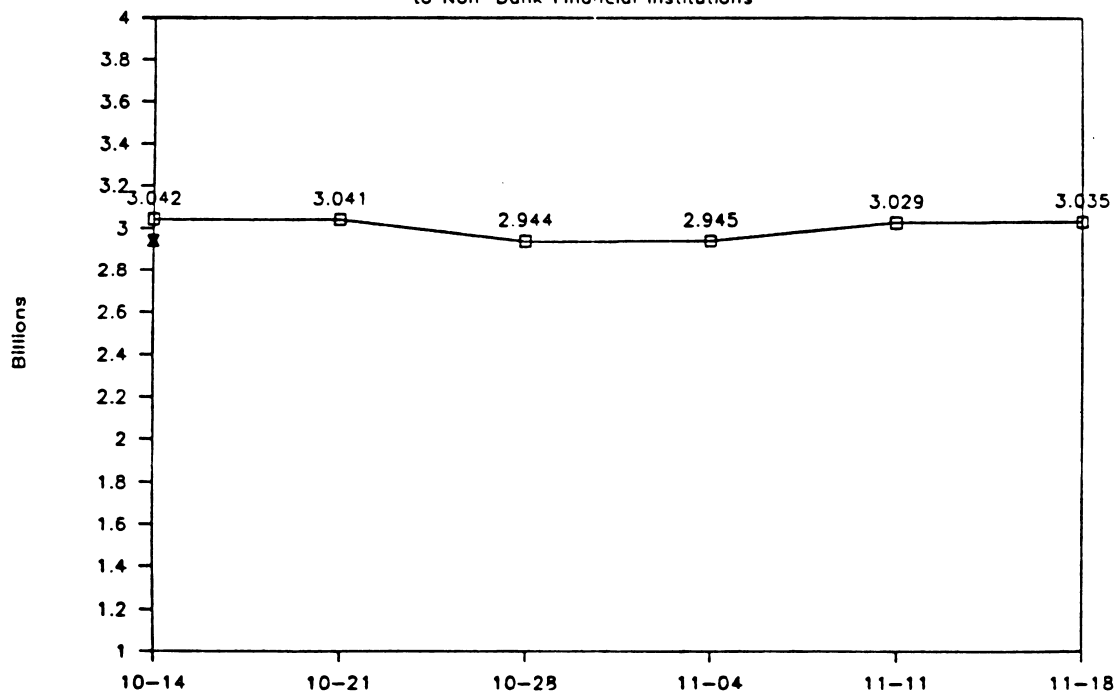
^{39/} Figures available from the FRB are reported by the banks at mid-week. They do not reflect intra-week lending. Consequently, increases in loans to finance variation margin calls, or government and options settlement on the 20th, may not be fully reflected. Similarly, increased lending to finance the settlement of equity trades on October 26th also may not be reflected.

^{40/} Few banks appeared to have specific plans for coping with emergencies such as the market break. Nevertheless, one bank, which seemed to have the largest number of active borrowers in the securities industry, indicated that its analysts had previously rehearsed procedures in the event of a 200 point drop in the DJIA.

TABLE 5-4
Loans by U.S. Banks
for Purchasing and Carrying Securities *



Loans by Foreign Branches
to Non-Bank Financial Institutions *



* Graphs reflect data provided in the FRB's "Weekly Consolidated Condition Report of Large Commercial Banks." Loan activity shown in both graphs includes loans to mutual funds and other non-broker-dealers.

statement issued by the Chairman of the FRB at 8:30 a.m. on Tuesday indicating that the FRB would be ready "to serve as a source of liquidity to support the economic and financial system" was considered significant. While the banks realized that they would be ultimately responsible for any losses attributable to broker loans, the phone calls and public statement were credited with easing the psychological impact of the tremendous drop in the DJIA, reassuring bankers in their efforts to maintain their lending function. ^{41/}

Although the banks closely monitored the decline of the DJIA and sought assurances from some borrowers that were rumored to be in trouble, most stated that routine lending procedures were followed. Margin calls were made to customers on Tuesday and Wednesday mornings in accordance with routine procedures, although closer attention was paid to the collateral pledged by the broker-dealers. Most banks reportedly were sensitive to the difficulties being experienced by their customers and placed no unusual demands regarding the type of collateral to be received or timing of the responses to margin calls. The banks noted that most of their customers responded to the margin calls in regular fashion and without complaint.

In addition to regular morning margin calls, some banks also made intra-day margin calls to their customers. Banks were conscious that the overall drop in the DJIA may not have accurately reflected their own credit exposure, based upon the concentrations of securities pledged as collateral for specific loans. Thus, while two banks made intra-day margin calls on Monday, based upon an assumed 15% and 25% reduction in the value of their customers' collateral, others focused on firms that had concentrations of particular securities and requested that additional collateral be supplied to offset the reduction in their value.

Selective intra-day margin calls also were used in some cases as a means of "testing" particular borrowers. By using intra-day margin calls, some banks expected to detect any problems that their borrowers were experiencing that might have presented a credit risk to the banks. Risk arbitrageurs, in particular, were viewed by the banks as presenting a potential problem because of the concentration of their positions and the high degree of leverage employed by such firms.

A number of banks also lowered the collateral value accorded securities held by certain firms, and required that securities be pledged by selected firms through DTC, rather than on an AP basis. One New York City bank, for example, indicated that it lowered its advance rate on collateral from 80% to 75% to certain borrowers, thus reducing the funds available on a given amount of collateral. The bank's decisions appear to have been made on a case-by-case basis, however, and did not affect the willingness of the bank to increase the amount of its loans to those customers, so long as additional collateral was provided. Moreover, at the same time the bank asked for increased collateral from some of its customers, it expanded its loan commitment to the same firms and its unsecured lines of credit to other clients.

Similar actions were taken by other banks and appear also to have been made on a case-by-case basis or in response to concerns about specific classes of borrowers, such as specialists or arbitrageurs. Another New York City bank lowered its advance

^{41/} Representatives of the FRBNY also were physically present at some of the banks during the period of the market break.

rate to all specialists from 75% to 70% in response to the wide fluctuations in stock values, rather than making intra-day margin calls. Moreover, to maintain lending relationships with their customers, the banks reported that they emphasized to specialists that the banks' requests for more collateral were not inflexible; if the requests presented undue difficulties, the banks indicated a willingness to compromise. In contrast, certain Chicago banks increased their advance rates to options market makers' clearing firms on a case-by-case basis, from 75% to 80% to up to 100% and, in isolated instances, higher.

As noted, many banks that lend on an AP basis will do so only on the understanding that other creditors will not have a senior claim to the broker-dealer's assets. There was considerable concern among banks during the week of the market break that other lenders would require specific broker-dealers to supply collateral through DTC. The concern of many banks during this period was reflected by the actions of one major New York City bank, which informed each of its borrowers that it would continue to lend on an AP basis, but expected to be notified if any of the firm's other creditors required DTC collateral. A decision by one bank to alter the collateral requirements of a firm could have caused other banks to follow suit. In addition, there was an awareness at some banks that, in light of the high volume of trades executed during the break, broker-dealers may not have been following the procedures designed to assure that the banks' collateral was properly segregated. Banks attempted to monitor the collateral pledged on an AP basis and in some cases exercised their right to conduct audits during the week of the 19th.

The reactions of the banks, in terms of modifying acceptable security procedures, generally varied based on each particular bank's perception of the creditworthiness of its customers. In response to rumors in the brokerage community and the banks' own perception of the capitalization of particular firms, banks asked some broker-dealers, on an individual basis, to provide collateral through DTC. Moreover, in a number of instances where broker-dealers were asked to convert to DTC collateral, the banks reported that requests were made on an informal basis. Thus, one bank mentioned that when a broker-dealer responded to its request to convert from AP to DTC collateral by indicating it would take a day to make the conversion, the bank rescinded its request.

One of the major New York City banks reported that it requested certain top-tier brokerage firms to convert previously unsecured lines of credit to loans collateralized by liens on securities at DTC. Faced with the alternative of converting to DTC collateral, which may have adversely affected the brokerage firms' other lending relationships, the firms chose not to continue borrowing from the bank. Notwithstanding these difficulties, it should be noted that the bank significantly increased its overall lending amounts to the industry during the break.

At the same time that banks were calling customers to verify rumors and request additional collateral, broker-dealers were attempting to verify the availability of credit lines. Banks reported that a number of their customers made such inquiries, but did not ultimately draw upon the lines of credit that were offered. One senior loan officer at a major New York City bank indicated that some of his customers had chosen to test the availability of credit from foreign and regional banks initially out of concern that they might be the first to restrict credit.

The staff's interviews with a number of the top-tier broker-dealers are not necessarily inconsistent with the banks' reports, although they provide a different

perspective on the broker-dealers' requests. One major broker-dealer reported that some of its unsecured lines of credit were reduced by \$500 million. Other major broker-dealers also reported that their unsecured lines of credit were temporarily reduced. These broker-dealers indicated that, although some banks reduced their lines of credit, they had sufficient remaining unsecured credit sources.

(ii) Foreign Banks

As noted earlier, there were numerous reports that foreign banks withdrew their support of broker-dealers during the market break. Staff interviews suggest that many foreign banks reduced their lending to the industry; others were willing to increase their loans to securities firms, but not to the same extent as domestic banks. Although no directly equivalent statistics are available, data from the FRB indicate that U.S. branches and agencies of foreign banks maintained existing loan amounts to non-bank financial institutions, including broker-dealers, during the period when U.S. banks increased loans to purchase and carry securities by approximately 50%.

As a rule, foreign banks have entered the U.S. broker-dealer lending market by providing funds at lower rates than U.S. banks. For the most part, the foreign banks interviewed by the staff tend to limit their lending relationships with U.S. broker-dealers to those firms in the top-tier. Moreover, U.S. branches of foreign banks generally rely upon their main offices abroad to set major credit policies. Thus, while the U.S. offices were responsible for day-to-day administration of the loans, senior officials residing abroad set guidance lines for their customers.

The reactions of the foreign banks to the events of the week of October 19th varied greatly. Since the staff interviewed only six foreign banks, three headquartered in Japan and three headquartered in Europe, it is difficult to generalize. Nevertheless, it appears that foreign banks immediately raised rates in an effort to discourage additional lending and to test whether their customers had other sources of funds. One European bank reported that it raised its rate 0.25% on October 20th. When its customers borrowed up to their usual lending limits on that day, despite the higher rates, it raised its rates 0.25% again on October 21st. Only when demand dropped as a result of the additional increase, did the bank feel confident that it was not the sole source of liquidity for its customers. At that point, the bank lowered its interest rates.

A Japanese bank interviewed by the staff, which also increased its interest rates significantly relative to previous levels, indicated that its senior management expressed grave reservations about its lending relationships with top-tier brokerage firms during the week of October 19th. At one point, the bank requested that its customers provide government securities as collateral for their loans. When the firms refused, the bank maintained existing lending levels, but did not accommodate additional loan requests.

In contrast to most of the other foreign banks interviewed, one Japanese bank significantly expanded its loan volume to the securities industry during the same period. The bank stated that it made a commitment early on October 20th to support the securities industry. Consequently, the bank, which had lending relationships with a wide diversity of firms, including top-tier and regional broker-dealers, almost doubled its loans to broker-dealers, accommodating all of its customers within existing guidance limits.

The differences in the reactions among the banks may be attributable to the confidence of the parent bank in the Wall Street lending expertise of its U.S. affiliate or branch, and its understanding of the U.S. securities markets. In some instances, senior officials of the foreign banks located overseas, who were unfamiliar with activities of U.S. broker-dealers, responded to the falling markets by assuming responsibility for key lending decisions, with the result that credit was not increased despite the additional demand of their customers. Officials at one Japanese bank that did not increase its lending during the market break also cited an inability to obtain information about the financial condition of its borrowers as another factor that influenced its decision not to expand credit lines.

In addition to the unfamiliarity of foreign banks with U.S. markets, there was some indication that the lower interest rates traditionally charged by foreign banks may have accounted for some hesitancy on the part of those banks to expand lines of credit. Specifically, bank management may have decided that the smaller returns received by their banks did not justify the additional credit risk that they would have encountered on loans to broker-dealers during the week of the break. This factor alone, however, does not explain why some foreign banks after raising their rates did not expand their loans to meet the increased demand.

While many of the foreign banks may have intentionally increased rates to their customers during the market break in an effort to reduce demand, some banks have indicated that they did so as a result of an increase in the so-called "foreign bank premium" (i.e., the additional premium charged foreign banks by New York City and regional banks in the Fed Funds market). While this premium normally ranges from 1/16% to 1/8%, the foreign banks indicated that it increased to 3/8% and sometimes to 1/2% during the week of the October 19th. Some foreign banks may have raised their rates solely to pass this additional cost on to their customers, and not to restrict credit. ^{42/}

b. Other Sources of Credit Exposure

(i) Foreign Exchange

Banks also faced potential exposure in connection with foreign exchange transactions and the clearance and settlement of options transactions. During the week of the 19th, problems connected with broker-dealer trading and settlement of foreign exchange became particularly acute. Many of the banks that normally trade with broker-dealers through the broker market determined that broker-dealers were no longer acceptable counterparties in that market. Nevertheless, broker-dealers reportedly were able to cover positions by dealing directly with counterparties or effecting transactions in foreign currencies through the facilities of organized futures exchanges.

One major New York City bank refused to settle a foreign exchange transaction with an investment bank in accordance with convention, a reaction that was potentially disruptive to the system. Rather than make payment to the broker-dealer in foreign currency before receiving payment later in the day from the investment bank, as is customary, the bank asked for payment in dollars, which would be followed the next day

^{42/} See letter from John Valentino, Vice President & Manager, Bank of Tokyo, to Joseph F. Morley, Vice President, Securities Industry Association (December 2, 1987).

by its own payment in foreign currency. Other banks eventually stepped forward to advance overnight funds necessary to finance the broker-dealer's position until payment was made the next day.

Although the bank agreed to compensate the broker-dealer for the use of its overnight funds, the bank's actions appeared to have created a negative reaction among other participants in the foreign exchange market. Because the settlement of foreign exchange trades involves interrelated transactions, any significant departure from convention could have frozen the foreign exchange market and precipitated a widespread credit constriction that would have worsened the difficulties experienced by the financial community during the break.

(ii) Lending to Options Clearing Firms

Banks also were forced to make credit decisions as a result of their function as OCC clearing banks. As discussed in more detail in Chapter Ten, numerous problems developed in the OCC morning settlement process. Senior managers in the Wall Street lending groups were charged with the responsibility for determining whether to transfer funds to the OCC in connection with the settlement process. Where sufficient funds were not available in the broker-dealers' accounts, the banks attempted to acquire additional collateral from the firms that would permit them to advance funds on a secured basis to honor the settlement. Thus, at the same time loan officers were reacting to declines in the market and making margin calls against dealers' positions, OCC settlement presented an additional source of exposure.

4. Analysis

During the period following the market break banks continued to provide liquidity to the brokerage community. Banks appear to have made independent credit decisions on a client-by-client basis, taking into account the perceived creditworthiness of their customers and the value of securities pledged as collateral. The Division was unable to identify any generalized liquidity problem following the break caused by the withdrawal or constriction of bank credit. In fact, most banks reported that many of their customers did not request credit exceeding their internal guidance limits. To the extent that broker-dealers, and particularly specialists, experienced difficulty in borrowing, these difficulties appear to have arisen from concerns by the banks about the capitalization of the firms and their ability to repay loans.

Communication played an important part in the response of the banks to the credit needs of their customers. Most banks reported that they had access to senior management within the brokerage firms, through which they were able to check rumors and acquire information necessary to make positive credit evaluations. In addition, banks praised particular brokerage firms, including some specialists perceived as possessing greater degrees of credit risk, that maintained close contact with the banks on October 19th, 20th and 21st. The staff also believes that the actions of the FRB and the FRBNY had a positive, stabilizing effect on bank lending.

Communication problems played a factor in the decision of some foreign banks to constrict lending during the market break. The apparent inability of some foreign banks to acquire information from their borrowers, coupled with slim margins, delays in communication with foreign headquarters and lack of familiarity with lending to U.S. securities firms may have contributed to the problems encountered by broker-dealers

who borrowed from foreign banks. The reactions of foreign banks appears not to have been uniform, however, and those banks that appeared to have the greatest familiarity and commitment to the broker loan market continued to supply liquidity.

A major potential for disruption appeared in the context of bank global exposure to broker-dealers and, in particular, in foreign exchange trading. Banks recognized that they had high exposures to broker-dealers in other than traditional lending capacities, but as a general matter lacked systems to quantify these exposures. Some exposures, such as the foreign exchange trades discussed earlier, involve significant short term risks. The effect of these unquantified exposures is to make banks wary of increasing their lending to broker-dealers in times of crisis. Further attention needs to be given to the extent of global credit exposure of banks to broker-dealers and the impact of this exposure on their lending to broker-dealers.

Finally, in reviewing the lending performance of banks in the wake of the October 19th market break, it must be kept in mind that banks made many of their crucial lending decisions during and after the market rebound on Tuesday, October 20th. The delay of some banks in settling with the OCC on Tuesday morning and the decision by one bank to stop new stock lending on Tuesday morning suggest that the initial reaction of at least certain major banks to Monday's market drop was to tighten credit. Thus, it is not certain that credit would have remained as readily available had the market continued to fall sharply on Tuesday. In order to mitigate the impact of a single lender's decision during difficult times, the Division believes that it may be appropriate for the designated examining authorities to review with broker-dealers the desirability of establishing diverse lending relationships with a number of banks, as well as the feasibility of obtaining more committed lines of credit than now exist.

D. Options Market Makers' Financial Responsibility

1. Regulatory Capital Requirements

Options market makers on the floor of the various options exchanges that do not conduct other securities business and that clear their transactions through other broker-dealers ("clearing firms") are exempt from the Commission's net capital rule. ^{43/} However, the market makers are required to obtain and file with their respective exchanges letters of guarantee from their clearing firms. In the letter of guarantee, the clearing firm accepts financial responsibility for all options transactions made by the guaranteed market maker. ^{44/}

While options market makers are exempt from the Commission's net capital rule, their clearing firms are subject to the rule. A clearing firm may compute its net capital pursuant to the basic or alternative method. ^{45/} In addition to the deductions required of other firms, the net capital rule also requires the clearing firm to reduce its

^{43/} Rule 15c3-1(b)(1).

^{44/} See CBOE Rule 8.5, NYSE Rule 758, AMEX Rule 961, Phlx Rule 703(a)(vii), PSE Rule VI, Section 77.

^{45/} For a basic description of the net capital rule, see Section A of this chapter *supra* at pp. 5-1 - 5-3.

net capital to the extent that the haircuts or deductions required under the rule relating to a particular market maker's account exceed the equity in the market maker's account. 46/ If a market maker's account liquidates to an equity that is in excess of the market maker's haircuts, the clearing firm would not be required to take any deductions for that market maker's account. 47/

If the haircuts for a particular market maker's account exceed the equity in the account, the rule as written provides that the clearing firm may not extend further credit to the market maker unless the clearing firm requires the market maker to add sufficient equity to the account to eliminate the net capital charge. However, the Division, in a no-action letter approved by the Commission, permits the clearing firm to take the charge without requesting margin from the market maker, notwithstanding the literal language of the rule. 48/

If a market maker's account liquidates to a deficit, the market maker must cease doing business until such time as the deficit is eliminated. The clearing firm is required to issue a call for additional equity which must be met by noon of the following business day. If a market maker fails to meet the call for additional equity, the clearing firm must take steps to liquidate the market maker's account promptly and give telegraphic notice of the market maker's failure to meet the call to the Commission and the self regulatory organization responsible for examining the financial condition of the clearing firm and market maker.

Furthermore, the net capital rule limits the volume of market maker business a clearing firm can carry in relation to its net capital. The rule requires that the aggregate gross haircuts with respect to all the market maker accounts carried by the clearing firm (regardless of equity in the accounts) not exceed ten times the clearing firm's net capital for a period exceeding five consecutive business days ("ten to one ratio standard"). 49/ During these five business days, the clearing firm can increase its capital, or call upon its market makers either to reduce their positions, and thus the haircuts or charges associated with the positions, or deposit additional equity to reduce the direct deductions against the clearing firm's net capital.

Some options market makers are not exempt from the net capital rule because they do not limit their securities business to options market making. For these options market makers, the rule provides an optional financial responsibility standard 50/ which subjects them to the net capital rule but does not require them to take haircuts on

46/ The equity in the market maker's account is determined by taking the market value of all long positions in the account less the market value of the short positions adjusted by the amount of money due to or from the clearing firm.

47/ Each market maker account must be computed separately; a deficit in one market maker account cannot be offset with excess equity in another market maker account.

48/ See Division's No-action Letter to Mr. Joseph W. Sullivan of the Chicago Board Options Exchange, dated April 8, 1977.

49/ Rule 15c3-1(c)(2)(x)(B)(1).

50/ Rule 15c3-1(a)(6).

their proprietary options positions. This optional standard is available to an options market maker that (1) only effects transactions with other broker-dealers, (2) carries no customer accounts, (3) effects no transactions in unlisted options, and (4) effects its options market maker transactions through and carries those transactions in a market maker account cleared by a clearing firm. This optional standard is predicated on the maintenance of specific levels of equity in the market maker's account. It also imposes upon the clearing firm control and early warning obligations intended to ensure daily surveillance over the account's financial condition.

The rule also provides an optional financial responsibility standard for self-clearing options specialists or market makers. ^{51/} The rule provides that a self-clearing options specialist or market maker can take the same deductions for its proprietary positions that the clearing firms take for their independent options market makers. This standard is available to a broker-dealer that clears its own options market making and related transactions and those of other independent market makers and generally does no other securities business.

2. Financial Condition of Options Markets

There are nineteen broker-dealers clearing the accounts of substantially all options market makers. Sixteen of the firms are designated to the CBOE for financial examination purposes. ^{52/} The net capital computations and market maker deductions of these firms are monitored daily by the CBOE for compliance with the financial responsibility rules. The remaining three firms (Bears, Stearns & Co. Inc., Wagner Stott Clearing Corp., and Spear, Leeds & Kellogg) are designated to the NYSE.

Because of the record volume on the CBOE on October 19th, the large number of uncompleted trades, and other processing problems, particularly problems in obtaining accurate options pricing information, ^{53/} the sixteen clearing firms designated to the CBOE experienced difficulties providing the CBOE with accurate capital computations for October 19th. Eventually, all of the clearing firms, with the exception of First Options of Chicago, Inc. ("First Options"), submitted to the CBOE completed capital computations. One clearing firm, Fossett Corporation ("Fossett"), operated on October 19th and 20th while in violation of the Commission's net capital rule. The CBOE is unable to confirm at this time that First Options was operating in compliance with the net capital rule on October 19th, even though it had increased its capital by \$102

^{51/} Rule 15c3-1(a)(7).

^{52/} If the broker-dealer is a member of more than one self regulatory organization, the Commission designates one of the SROs as the Examining Authority for the broker-dealer. The Designated Examining Authority ("DEA") is responsible for examining the member for compliance with applicable financial responsibility rules.

^{53/} See *infra* Chapter Eight for a more detailed description of the problems that occurred in pricing options for capital and clearing purposes during the October market break.

million by drawing on its revolving subordinated loan agreements. ^{54/} No other clearing firms were close to violating the net capital rule.

On October 19th, the ratio of aggregate gross haircuts to net capital for three clearing firms exceeded the prescribed ten to one standard. The ratios for each firm were, respectively: 40.5 to 1, 48.7 to 1 and 138 to 1. By the close of business on October 20th, the ratio of aggregate gross deductions to haircuts of two of these firms had been reduced to within the ten to one standard. The other firm's ratio increased to 43.6 to 1 from 40.5 to 1, but its ratio problem was corrected by the close of business on Wednesday, October 21st. One of the clearing firms designated to the NYSE slightly exceeded the prescribed ten to one standard. The ratio of the firm was 10.97 to 1. On the following day, the ratio problem was corrected by the firm.

a. Options Market Makers

The total market maker deficits at all options exchanges for those market makers that clear through any of the sixteen clearing firms designated to the CBOE increased from approximately \$6.2 million on October 14th to approximately \$137 million on October 23rd, a net increase of approximately \$130.8 million (see Table 5-5). The number of market makers' accounts in deficit increased from sixty on October 14th to 130 on October 30th. The bulk of the deficits in the market makers' accounts were isolated to a few accounts, even though the losses of equity in all accounts during the period were substantial.

More individual market makers were in deficit on October 19th and 20th than at any other time during this period. For instance, on October 20th there were 164 market makers whose accounts were in deficit with an aggregate total deficit of approximately \$217 million. Eighty-one market makers whose accounts are carried by First Options, the largest clearing firm, accounted for approximately 86% of the total deficits of October 20th. On October 19th, 15 clearing firms ^{55/} had 114 market makers go into deficit with an aggregate deficit of approximately \$31.4 million.

The three NYSE member firms that engage in options clearing also had market makers go into deficit during this period. The majority of these market maker deficits occurred on October 19th. For example, one clearing firm had eighteen market makers go into deficit with an aggregate deficit of \$90.1 million. ^{56/} The other two firms'

^{54/} See footnote 15, *supra* for a general description of subordination agreements. In 1982, Appendix D was amended to permit the use of "revolving" subordination agreements which allow broker-dealers meeting certain conditions to prepay amounts borrowed under a "revolving" subordination agreement before the expiration of one year from the effective date of the subordination agreement only with the approval of the firm's DEA. A revolving subordinated loan agreement may not be prepaid if the effect of such prepayment would be to endanger the firm's net capital position.

^{55/} The aggregate figure does not include the information for First Options since First Options was unable to provide the CBOE with a completed capital computation for October 19th.

^{56/} This firm absorbed the positions of ten market makers into its inventory.

TABLE 5-5 */

	<u>10/14</u>	<u>10/23</u>	<u>10/30</u>	<u>Increase/ (Decrease)</u>
Market Maker Equity at All Options Exchanges	\$835,885,475	\$584,788,991	\$548,413,808	(\$287,471,667)
Market Maker Deficits at All Options Exchanges	\$ 6,202,967	\$137,832,633	\$132,002,966	\$125,799,999
Market Makers in Deficit	60	127	130	70
Deficit Range	\$663--\$2,381,299	\$641--\$52,534,585	\$13--\$52,374,682	--
Clearing Firm Adjusted Net Capital	\$121,992,273	\$216,861,152	\$300,072,862	\$178,080,589

*/ These data represent a composite of all the options market makers which clear through the sixteen clearing firms designated to the CBOE. The information for those market makers that clear through the integrated firms designated to NYSE is not included. In addition, self-clearing market maker data are not included. Deficits resolved in one business day also are not included.

aggregate market makers deficits were not substantial. One of the firms had eight market makers go into deficit with an aggregate deficit of approximately \$4.8 million, and the other had seven market makers go into deficit with an aggregate deficit of only \$1.8 million.

During the October 14th-30th period, the market maker equity at all options exchanges for market makers carried by the sixteen clearing firms designated to the CBOE decreased by approximately \$287.5 million, from approximately \$835.9 million on October 14th to approximately \$548.4 million on October 30th. Approximately 44 percent (\$125.8 million) of the decrease in total market maker equity was attributable to market maker deficits. The remaining difference resulted from market value declines in the accounts of other market makers and from withdrawal of equity by market makers, apparently troubled by numerous rumors regarding the financial health of their clearing firms. During this period, net market makers' withdrawals totalled approximately \$364.5 million.

b. Clearing Firms

The aggregate net capital of the clearing firms designated to the CBOE increased by approximately \$178 million, from approximately \$121.9 million on October 14th, to approximately \$300 million on October 30th. This increase in net capital was due not only to various capital infusions that occurred during this period, but also to the dramatic reduction in options market maker positions (and therefore in the haircuts required to be taken by the clearing firms).

Although the clearing firms, as a whole, substantially increased their net capital during this period, they still experienced liquidity problems. A number of factors caused the liquidity problems of these firms, including: (1) intra-day margin calls by OCC and the commodity clearing corporations; (2) difficulties in financing stock and options positions through banks; (3) problems with returned stock loans; and (4) market makers' withdrawals of equity from their accounts, as noted above.

The clearing firms had to meet several intra-day variation margin calls made by OCC and the various futures clearinghouses. In addition, the lack of an adequate cross-margining system among futures and options aggravated the liquidity problems encountered by the firms. ^{57/} Consequently, OCC and the futures clearing corporations were requesting intra-day variation margins based solely upon the positions carried by the particular clearing corporation without recognizing the risk reduction posed by offsetting positions carried at other clearing corporations. For example, an intermarket spread consisting of an OEX option traded on the CBOE and an S&P 500 future traded on the Chicago Mercantile Exchange would be independently margined by each of the clearing corporations involved without recognizing the reduced risk of the combined position. Thus, intra-day margin calls by OCC due to a loss on an options position could not be immediately offset by gains on the futures positions and vice-versa.

A second factor contributing to the liquidity crisis experienced by the clearing firms was the difficulty encountered by these firms in securing adequate financing for stock and options positions through banks. During the week of October 19th, clearing

^{57/} The merits of a cross-margining system are discussed in Chapter Ten.

firms were financing a large quantity of stock and options positions for market makers. With the severe decline in the market, the loan value of the positions (other than long puts) pledged as collateral was significantly reduced. Accordingly, many of the bank loans became undermargined which required the clearing firms to deposit additional collateral to secure them. Some banks reduced the loan value percentage those positions would receive. In addition, at least one of the few banks that had accepted long put options in the past refused to accept these positions, requiring what the bank considered "more secure" collateral, to finance clearing firms. Thus, some banks effectively reduced their lines of credit to several clearing firms by reducing the amount clearing firms were able to draw against the collateral the firms provided. Finally, a number of clearing firms' borrowing needs exceeded their existing bank lines of credit, and some banks refused to extend additional credit to accommodate the financing needs of the clearing firms. Nevertheless, several of the banks indicated that once their borrowers reached the advance rate limits generally extended to them, the banks, after some consideration, extended advance rates as much as 100% in some instances in order to ensure that their clearing firm customers were able to meet their settlement obligations. 58/

Another factor contributing to the liquidity concerns of the clearing firms was the return of significant quantities of stock loans 59/ to the clearing firms. The stock loan returns forced the clearing firms to seek financing to settle with the broker-dealers returning the stock. Because of the market decline, however, the loan value of the returned stock was worth much less than the funds required to be remitted to the borrowing broker-dealers. Thus, the clearing firms were forced to search for additional acceptable collateral to pledge to the financing banks.

The last significant factor that contributed to the liquidity problems of the clearing firms was the market makers' withdrawals of excess funds. As noted above, the net market maker cash withdrawal during the October 14th-30th period was approximately \$364.5 million. Many market makers usually leave excess equity beyond the haircuts in their market maker accounts. During this period, however, the market makers requested cash as they liquidated their positions. The clearing firms apparently honored all requests for withdrawal of funds in excess of haircut or house requirements. The effect of these cash drains was to exacerbate an already tight cash flow situation at the clearing firms, further inhibiting their ability to meet their settlement and other financing obligations.

3. Stresses on Firm Resources

The particular exposures and stresses on options clearing firms can be illustrated by the experiences of the following three clearing firms.

58/ The advance rates were also extended to ensure that margin calls could be met.

59/ In a standard stock loan transaction, one broker-dealer lends stock to another broker-dealer which the borrowing broker-dealer needs to cover short sales or to satisfy fails to deliver. Normally, the lending broker-dealer receives collateral in the form of cash or government securities equal to at least 100% of the market value of the loaned securities. Upon the return of the stock loan, the lending broker-dealer must return the collateral to the borrowing broker-dealer.

a. First Options

First Options is the largest clearing firm (in terms of the number of options market makers it clears); it presently clears the accounts of approximately 1,200 options market makers. First Options is a wholly-owned subsidiary of Continental Illinois National Bank and Trust Company of Chicago ("Continental Bank"); it was purchased by the bank for \$125 million from Spear, Leeds & Kellogg in 1986. The acquisition of First Options by Continental Bank was approved by the Office of the Comptroller of the Currency ("Comptroller"), subject to certain restrictions in an "approval letter." The approval letter limited First Options' activities to those in which national banks are allowed to participate. These include taking positions in some options and futures contracts on bank eligible securities (e.g., Treasury and municipal bonds). The approval letter also restricted Continental Bank's capital infusion and extension of credit to First Options to the same legal limitations applied to non-affiliated customers (25% of the bank's capital, of which at least 10% of the capital must be secured).

On Tuesday, October 20th the Division learned that First Options was experiencing liquidity problems. First Options' liquidity problems were attributed to (1) large losses in certain market maker accounts, (2) restrictions imposed by the Comptroller on Continental Bank's ability to infuse additional capital into First Options, (3) extensive market makers' withdrawals of equity from their accounts, (4) intra-day variation margin calls by OCC and the commodity clearinghouses, and (5) difficulties in obtaining bank financing for stock and options positions held by market makers.

i. Market Maker Losses

In October 1987, First Options incurred a one month loss of approximately \$79.5 million. First Options' loss was primarily attributable to the establishment of reserves for bad debts associated with market makers' deficits of approximately \$91.6 million. The majority of First Options' write-offs was attributable to the accounts of nine market makers that went into deficit. As Table 5-6 below indicates, as of October 30th, the deficits in these accounts ranged from \$1.9 million to \$52.3 million.

The majority of the losses in these accounts was related to long securities or short options positions in the Standard & Poor's 100 Index ("OEX"), General Electric ("GE"), International Business Machines ("IBM") and Southland Corporation ("SLC"). Generally, the losses in these accounts resulted from "short straddle" 60/ and "covered call" 61/ positions in the above issues.

60/ A short straddle is a short call/short put combination which profits from the sale of options which may expire worthless or be bought back at lower prices as the time premium erodes. The maximum profit is the sale proceeds (premiums). The maximum loss potential is unlimited on the upside (because of the short call), and on the downside it equals the exercise price on the short put less the premium received. This particular strategy is best suited for a neutral market and can result in severe losses in a rapidly rising or falling market.

61/ A covered call position is defined as a short call position offset by a long stock position. This particular strategy is neutral with respect to a bullish strategy with the short call providing only limited protection in a declining market. The maximum profit of this position is the out of the money amount of the option plus the time value. The maximum loss is the stock price minus the call premium.

Table 5-6
Equity or Deficits of First Options' Market Makers
with Largest Losses 62/

	10/14	10/15	10/16	10/19	10/20
1	5,987,023	2,971,101	(5,656,800)	(45,166,334)	(47,679,685)
2	2,245,262	2,126,825	(5,984,324)	(5,995,632)	(6,052,617)
3	1,338,749	(87,806)	(3,290,194)	(17,671,052)	(16,969,381)
4	3,668,988	3,139,142	501,305	(6,482,906)	(6,282,876)
5	3,533,880	2,862,894	(1,211,816)	(12,624,942)	(12,019,798)
6	1,559,996	1,465,942	1,135,175	(274,280)	(1,758,322)
7	10,568,861	10,644,758	8,004,952	(2,118,922)	(8,068,794)
8	37,132	(136,661)	(66,672)	(1,605,840)	(3,646,107)
9	414,437	506,250	(29,366)	(643,224)	(805,264)
	10/21	10/22	10/23	10/26	10/27
1	(51,468,578)	(52,158,408)	(52,534,585)	(54,410,494)	(52,939,167)
2	(5,986,565)	(5,979,980)	(5,970,930)	(5,986,935)	(6,000,376)
3	(16,440,073)	(16,782,867)	(16,818,269)	(16,983,949)	(16,997,211)
4	(6,383,517)	(6,348,158)	(6,347,180)	(6,376,213)	(6,364,627)
5	(12,049,384)	(12,039,429)	(12,054,904)	(12,063,537)	(12,076,916)
6	(1,600,060)	(1,723,035)	(1,578,747)	(1,483,750)	(1,564,737)
7	(3,149,680)	(4,106,899)	(3,721,467)	(7,722,462)	(4,836,660)
8	(3,209,722)	(3,795,059)	(3,347,067)	(3,485,046)	(3,198,604)
9	(1,781,035)	(2,152,051)	(2,027,847)	(2,146,212)	(2,017,268)
	10/28	10/29	10/30		
1	(52,575,567)	(52,330,034)	(52,374,682)		
2	(6,007,173)	(6,004,709)	(5,998,032)		
3	(17,170,557)	(16,998,022)	(16,693,466)		
4	(6,375,272)	(6,376,742)	(6,376,779)		
5	(12,062,173)	(12,057,622)	(12,057,813)		
6	(1,719,810)	(1,747,890)	(1,899,772)		
7	(5,750,465)	(3,898,157)	(3,500,043)		
8	(2,663,748)	(2,435,735)	(2,160,360)		
9	(2,091,896)	(2,166,255)	(2,225,524)		

62/ Market Makers 1-5 were primarily OEX Options Market Makers. Market Makers 6-9 were primarily Equity Options Market Makers.

a. OEX Market Makers

Five of the nine market maker accounts had significant positions in OEX Options. These accounts sustained tremendous losses as the Standard & Poor's 100 Index fell from 297.06 to 216.12 between October 14th and October 19th. For example, on October 14th, the market maker which incurred the largest deficit had a short straddle position in over 7000 OEX contracts. As the market declined on October 15th and October 16th, losses were incurred as the short puts in the straddle increased in value. On these two days, the account sustained a loss of approximately \$10.2 million and had a deficit of approximately \$5.6 million as of the close of business on Friday, October 16th.

On October 19th, even though the market maker's overall short position had been substantially reduced by the expiration of a number of the contracts on the previous Friday, the market maker still had 4,214 naked short OEX puts in his account. When the market collapsed on October 19th, the put prices increased dramatically and created huge losses in the account. The loss to the market maker on October 19th caused by his OEX position was approximately \$36 million. The market maker lost \$10.7 million in just one series of the OEX because the price of the puts increased from \$17 at the close on October 16th to \$101 at the close on October 19th.

On October 20th, all short puts, except those within a spread, were liquidated generating an additional loss of approximately \$1.3 million. Thus, the aggregate loss during the October 15th to October 20th period in OEXs for this market maker totalled approximately \$46.5 million.

This market maker also had a significant position in IBM stock and options. His IBM position consisted primarily of covered calls, short straddles and naked short calls. From October 14th to October 19th, the market value of IBM stock declined from 145 1/4 to 103 1/4, generating losses in the account of \$2.7 million. On October 20th, when IBM posted a gain of 11 3/4 points, some short puts in the straddles were liquidated, and a profit of approximately \$1.2 million was realized. However, the aggregate losses incurred because of the IBM position during the October 15th to October 20th period, were approximately \$1.5 million. In sum, between October 16th and October 20th, this market maker sustained an aggregate loss of approximately \$53.6 million; approximately \$48 million of the loss was attributable to the OEX and IBM positions.

The other four market makers with substantial OEX positions sustained losses ranging from approximately \$6.9 million to \$15 million. The losses in those accounts also were attributable to short straddles and naked short put positions. Three of these accounts went into deficit on October 16th. The deficits ranged from approximately \$1.2 million to \$5.9 million on that day. The other market maker went into a deficit of approximately \$6.4 million on October 19th.

b. Equity Options Market Makers

Four other market makers experienced substantial losses from equity options positions. For example, two of the market makers' losses were caused by their short put positions in Southland Corporation ("SLC"). From October 14th to October 20th, the market value of SLC stock fell from 72 5/8 to 47. The market value of the short put options increased from 2 1/8 to 29. One market maker that had 1500 naked short puts in SLC sustained a loss of approximately \$4 million because of its SLC position. On October 15th, 19 of these contracts were assigned, and on October 16th, another 46

contracts were assigned. ^{63/} As a result of the declining market and the assignment of the contracts, which meant that the market maker was long the actual securities, equity in the account decreased from \$37,132 on October 14th to a deficit of approximately \$3.6 million on October 20th.

During this period, another market maker sustained losses of approximately \$10 million because of its SLC position. This market maker's position consisted of covered call writings, naked puts, conversions ^{64/} and hedged puts. ^{65/} Its covered calls and naked puts were adversely affected by the steady decline of SLC stock that occurred between October 14th and October 20th. Although the market maker sustained losses in its SLC position of approximately \$10 million, it had a deficit of only approximately \$1.8 million on October 20th.

ii. Comptroller's Restrictions on Continental Bank's Ability to Infuse Capital

On October 20th, the Office of the Comptroller informed the Division that Continental Bank had requested the Comptroller to relax its limit on the amount of capital that Continental Bank could infuse into First Options (*i.e.*, extend the 25% of Bank's capital limitation). Prior to the opening of business on October 19th, First Options had drawn \$42 million pursuant to its revolving subordination loan agreement ("revolver") with Continental. That same day, First Options drew an additional \$60 million from its revolver. The Comptroller, however, determined that the \$60 million draw on the revolver caused Continental to violate its covenant that Continental's investment in and loans to First Options should not exceed 25% of its capital. Despite the above covenant, Continental, on October 20th, lent an additional \$138 million to First Options through the revolver. On October 21st, after being informed by the Comptroller that it would not waive the 25% restriction, First Options entered into a revolver with the holding company of Continental Bank ("Holding Company"). The Holding Company lent First Options \$130 million through a revolver, which enabled First Options to repay \$130 million to Continental Bank. This plus payments of unrelated secured loans from the Bank placed Continental Bank back into compliance with the provisions of the Comptroller's "approval letter."

As a result of the unprecedented high volume of trading and the losses incurred by market makers for which First Options cleared, during the month of October Continental Bank and the Holding Company infused into First Options approximately \$312.5 million of subordinated capital. Most (approximately \$277 million) of the capital infusion was made between October 14th and October 21st. The staff was assured that the Holding Company had substantial liquid assets in excess of \$200 million that could

^{63/} An assignment of a position occurs when the person holding a long option position has exercised his right to buy or sell the underlying security at the exercise price and the obligation to buy or sell becomes the duty of the person who sold the option.

^{64/} A conversion is defined as a long security position hedged by a short call option position and a long put option position for the same number of units of the same underlying security, each option having the same expiration date and exercise price.

^{65/} A hedged put consists of a long security position and a long put position on the same underlying security.

have been made available if needed to keep First Options in business and in compliance with the Commission's net capital rule.

iii. Withdrawal of Equity by Market Makers

First Options' cash flow situation was further exacerbated because market makers whose accounts it carried were withdrawing all excess funds or equity from their accounts. As market makers liquidated their stock and options positions, they requested cash from First Options. Although these withdrawals were a widespread problem for all the clearing firms, First Options was most severely affected. The total net market maker cash withdrawal from First Options during the period from October 14th to October 30th was \$201.1 million, which accounted for approximately 55 percent of all net market makers' cash withdrawals from CBOE designated clearing firms.

TABLE 5-7

FIRST OPTIONS DAILY MARKET DEPOSITS AND WITHDRAWALS

<u>DATE</u>	<u>Market Maker Deposits and (Withdrawals)</u>
10/14/87	\$ 341,312
10/15/87	13,767,989
10/16/87	7,657,400
10/19/87	(51,687,744)
10/20/87	2,628,020
10/21/87	(157,441,171)
10/22/87	2,471,771
10/23/87	(38,791,837)
10/24/87	(8,802,872)
10/27/87	14,843,786
10/28/87	6,287,960
10/29/87	9,821,741
10/30/87	(2,248,315)
<hr/>	
TOTAL	(\$201,151,960)
Total Net Market Maker Cash Withdrawals for the 16 CBOE clearing firms	
	(\$364,495,941)

As the above table indicates, the bulk of the market makers' withdrawals occurred during the week of October 19th. The net cash withdrawals by market makers during the week of October 19th totalled approximately \$242.8 million. Apparently, many market makers withdrew the excess equity in their accounts because they were troubled by rumors regarding the impending collapse of First Options because Continental Bank could not infuse additional capital into the firm.

iv. Intra-day Variation Margin Calls by OCC

On October 19th, OCC called for a total of approximately \$31 million of intra-day variation margin from First Options through four separate calls. Three calls were met by First Options on October 19th. The fourth, a late afternoon call, could not be processed before First Options' bank closed for the day and was met on October 20th. On October 20th, First Options met an intra-day variation margin call of approximately \$1.2 million. On October 21st, OCC issued an intra-day variation margin call of approximately \$50 million. The Division was informed that First Options was unable to meet the call and that OCC relieved First Options from its obligation to meet the call. 66/

v. Bank Financing

First Options had established lines of credit with approximately twelve banks with which it normally maintains bank credit lines in excess of \$650 million. First Options advised the Division that, during the week of October 19th, its lines of credit were not reduced. In fact, several of the banks provided First Options with financing beyond the established lines of credit to accommodate its financing needs. For instance, on October 22nd, the day following net market maker withdrawals of approximately \$157.4 million, First Options had approximately \$1 billion in total bank loans outstanding.

On October 22nd, the staff was informed that one of First Options' lenders had become uncomfortable with accepting long put options as collateral although such positions had been accepted in the past. The lender requested a substitution of collateral in the form of equity securities or \$100 million in cash. First Options had pledged \$250 million in long put options positions along with \$110 million in securities positions to collateralize a \$250 million letter of credit from the bank. First Options had pledged the letter of credit with OCC to meet its margin requirements. The bank's request was prompted by its decision not to accept deep in the money long put options as collateral, despite the protection such a pledge afforded it. Given First Options' liquidity constraints during the week of October 19th, it did not have the additional collateral readily available. First Options was able to satisfy the bank by reducing the pledged letter of credit by \$110 million. The bank released approximately \$200 million in long put options, which First Options pledged with OCC to satisfy its margin requirements.

b. Fossett Corporation

Fossett is a self-clearing options market maker 67/ which clears the accounts of 160 independent options market makers, including that of its subsidiary Fossett Trading Corporation ("FTC"). Fossett experienced financial difficulties on Monday, October 19th, primarily because of an unhedged position in excess of 700,000 shares of Caesar's World stock carried in the accounts of Fossett and FTC. The price of the stock precipitously

66/ See Chapter Ten for a more detailed description of the problems encountered by First Options in meeting its margin and settlement obligations.

67/ Fossett, as a self clearing options market maker, elected to compute its net capital pursuant to Rule 15c3-1(a)(7). See discussion of Rule 15c3-1(a)(7) supra at p. 5-34.

dropped on October 19th. The losses on its Caesar's World holdings caused the firm to incur a net capital deficiency of \$10.9 million as of the close of business on October 19th.

The CBOE, the DEA for Fossett, directed the firm to liquidate all proprietary positions in the Fossett and FTC accounts. Furthermore, the CBOE and Fossett instructed all independent market makers to reduce their options positions in order to reduce the haircuts assessed to Fossett's net capital. The market makers also were instructed to maintain equity in their accounts equal to the haircuts on their options positions. On Tuesday, October 20th, Fossett, by reducing its proprietary and market makers' positions, reduced its net capital deficiency by approximately \$5.7 million and by the close of business October 20th had a net capital deficiency of \$5.2 million.

On Wednesday, October 21st, Fossett sold the remainder of its Caesar's World stock position. The sales brought the firm back into compliance with the net capital rule. As of the close of business on October 21st, Fossett had total net capital of \$1.3 million which exceeded its net capital requirement of \$100,000 by \$1.2 million. The firm still was experiencing some cash flow difficulties, however, and was unable to meet a variation margin call of \$3.1 million. OCC released the firm from this obligation. 68/

Fossett's liquidity problem was further exacerbated on Wednesday, October 21st, by the return of stock loaned by Fossett to another broker-dealer. Initially, Fossett's bank was unwilling to finance Fossett's \$30 million obligation. After negotiations with Fossett and OCC, the bank agreed to finance the \$30 million obligation. As part of the agreement, OCC agreed to pledge long puts of about \$3 million to the bank and utilized its discretionary authority to reduce required margin to 100% from 130%. Fossett, in turn, agreed to liquidate enough securities to pay back the \$30 million by the following Friday. Furthermore, Fossett agreed that it would cure its other under-collateralized obligations to the banks within a month. Lastly, the bank received a personal guarantee to repay all loans from Stephen Fossett, the firm's principal owner.

Once Fossett's financial condition stabilized, the CBOE and OCC imposed upon it a number of restrictions. For instance, OCC, effective October 26th, placed the firm on 150% margin status. The CBOE, effective November 2nd, placed the following restrictions, among others on Fossett: (1) the firm must maintain net capital in excess of \$3 million and must maintain a ratio of gross market maker haircuts to net capital below 5 to 1; (2) no new accounts may be opened by Fossett without the prior approval of the CBOE; (3) no capital withdrawals may be made without the consent of the CBOE; and (4) Fossett and FTC may not maintain any significant unhedged positions in their respective trading accounts. As of January 12, 1988, the CBOE restrictions were still in effect.

c. Self-clearing Market Maker

One self-clearing market maker firm that carried no other market maker accounts experienced unusual liquidity problems as a result of the October market break. The firm was actively involved in both the securities index options and the financial futures markets and had accumulated large options and futures positions in a variety of index

68/ For a discussion of OCC's variation margin call and its decision to relieve Fossett from its margin call, see Chapter Ten.

products. The firm experienced severe liquidity problems when OCC and the futures clearing corporations significantly increased the margin requirements after October 19th.

On October 26th, the firm apparently went into net capital violation because the haircuts on its futures related positions substantially increased as the margin requirements on the futures positions increased. ^{69/} Furthermore, the firm faced a margin deficit of \$10 million at OCC and its subsidiary, the Intermarket Clearing Corporation ("ICC"), which clears the FMCI Index Futures. OCC relieved the firm from its margin obligation and instructed the firm to reduce its positions to attain net capital compliance. ^{70/} The firm achieved net capital compliance by reducing some of its futures related positions.

4. Analysis

The liquidity problems experienced by the options clearing firms during the October market break suggest certain weaknesses in the Commission's net capital rule. Specifically, the staff believes that a number of issues should be explored further.

a. Financing of Market Maker Haircuts by Clearing Firms

Clearing firms are required to reduce their net capital to the extent that the haircuts on an individual market maker's position exceed the equity in its accounts. The Division issued a no-action letter on April 8, 1977 to the CBOE in which the Division acquiesced in allowing clearing firms, in effect, to finance the haircuts of their market makers. It is possible that some market makers would perform more conservatively if they were required to maintain equity equal to the haircuts at all times. It also is clear that the clearing firms would have greater liquidity if trading exposure from market makers was more limited. On the other hand, such a requirement might decrease to some extent the market making liquidity on the floor of the options exchanges. The staff plans to study whether the Division's no action position should be withdrawn. Absent this no-action position, market makers would be required to have minimum equity equal to the perceived risk in their positions.

b. Revision of Haircuts on Short Options Positions

The substantial losses of market makers cleared by First Options demonstrate that the present net capital treatment accorded to short options positions is inadequate to insure against the risks of major market movements. We believe that consideration should be given to whether there should be concentration haircuts for short options positions, either on a market maker by market maker basis or on a total clearing firm basis.

^{69/} The haircuts on futures positions are dependent on margin requirements of the various commodities boards of trade and clearing corporations. In this case, since the firm is a clearing member of Intermarket Clearing Corporation, the haircut the firm must take with respect to its proprietary futures positions is equal to its margin requirement.

^{70/} See *infra* at Chapter Ten for a discussion of OCC's and ICC's cross-margining proposal and their decision to relieve the firm from its margin requirement.

In late 1985, the Division issued a no-action letter ("Minikes Letter") allowing broker-dealers to compute deductions with respect to their options positions based on the market value of the options rather than the value of the underlying security.^{71/} Unlike those provisions of the rule for options market makers on the floor (paragraph (c)(2)(x) and paragraph (a)(6)), that letter includes concentration limitations on the amount that broker-dealers can hold with respect to a particular short options position.

c. Reduction of Five Business Day Period

As explained above, the rule provides that the aggregate gross market maker haircuts with respect to all market maker accounts carried by the clearing firm cannot exceed ten times the clearing firm's net capital for a period exceeding five consecutive business days. We believe that the ratio is an appropriate measurement of how much business a clearing firm should undertake given its net capital. However, we believe that the 5 business day grace period for the clearing firm to reduce positions or increase its capital may be overly generous. Thus, consideration should be given to reducing the five business day grace period.

d. Elimination of Paragraph (a)(6)

Under the current net capital rule, market makers that are not exempt under paragraph (b) may elect to compute net capital pursuant to paragraph (a)(6). Although paragraph (a)(6) applies to market makers in equity securities and options, the Commission adopted it in 1976 with a view toward equalizing disparities between broker-dealers that were solely options market-makers and those firms that combined options market making with other securities activities. Prior to the adoption of paragraph (a)(6), those nonexempt options market makers had to compute deductions for their market maker options positions under Appendix A to the rule. Appendix A prescribes deductions based on the value of the underlying security.

Paragraph (a)(6) allows broker-dealers that conduct both market making activities cleared by another firm and other activities not to incur deductions with respect to those market making positions. Other proprietary positions not carried in a market maker account are haircut under the general rule.

The amount of leverage that can be obtained by broker-dealers computing under paragraph (a)(6) is significant. During the market break, at least three paragraph (a)(6) broker-dealers failed as a result of leverage arising from options positions that they could not have entered into if they did not compute under paragraph (a)(6). This leverage is achieved by the availability of the equity in their market maker accounts for meeting capital requirements. We will consider whether the provisions of the Minikes letter, or provisions closely approximating it, are more appropriate measures of capital adequacy for those broker-dealers currently operating under paragraph (a)(6).

^{71/} See letter from Michael Macchiaroli, Assistant Director, Division of Market Regulation, to Michael Minikes, Chairman, Capital Committee of the Securities Industry Association (October 23, 1985).

e. Self Clearing Options Market Makers Clearing for Independent Market Makers

The staff believes that serious consideration should be given to whether self-clearing options market makers should be permitted to carry the accounts of independent market makers without having the net capital requirements of other firms. As illustrated by the Fossett situation, a clearing firm for market makers may experience financial difficulty because of its own proprietary trading without regard to the risks of carrying market maker accounts. To the extent it engages in proprietary trading, the clearing firm should account for those risks as other broker-dealers do. Hence, consideration should be given to restricting availability of paragraph (a)(7) of the net capital rule to those firms which are sole options market makers and do not *carry independent market maker accounts.

f. Limitation on Withdrawal of Equity

The withdrawal of market maker equity caused liquidity problems for several clearing firms. There is no easy solution to this problem. The staff believes the problem should be explored to seek solutions in the event of further large market declines.

g. Bank Lending Practices

The DEA for an options clearing firm should review carefully the bank financing arrangements which that clearing firm has in place. In particular, the Division is concerned about the unwillingness of many major banks to accept in-the-money options positions as collateral. Such refusals could substantially reduce the ability of an options clearing firm to obtain necessary financing during volatile market conditions. We believe that the DEA, OCC and the options clearing firms should enter into conversations with those banks to encourage them to develop guidelines that would allow them to extend credit on in-the-money options positions. These guidelines could include the ability to monitor and adjust collateral value on an intra-day basis as well as to monitor expiration dates. It also would be necessary to develop reasonable lending ratios in which both parties have confidence. OCC also should consider requiring all options clearing firms to establish their primary financing relationships with banks that have the ability and willingness to provide liquidity based on options positions.

TABLE 5-8

FIRMS THAT CEASED OPERATIONS AS A RESULT OF THE OCTOBER MARKET BREAK

<u>FIRM</u>	<u>TYPE OF FIRM</u>	<u>REASON CLOSED</u>	<u>DATE CLOSED</u>	<u>OTHER COMMENTS</u>
Firm 1	Self-clearing; market maker in 37 NASDAQ stocks	Could not satisfy an approximately \$5 million margin call from OCC related to customer OEX index options transactions	10/19	Liquidation under SIPA
Firm 2	Self-clearing	Underwriting problems not related to market break	11/13	SIPC 5(a) referral 11/13;
Firm 3	Self-clearing	Inventory losses of approximately \$80,000	10/20	Re-opened 10/22
Firm 4	Self-clearing; market maker in 4 NASDAQ stocks; trades primarily for its own account; only one customer	Trading losses	10/28	Re-opened 11/9; B/D satisfied customer's claim from inventory
Firm 5	Introduces options market maker transactions; arbitrage firm; no customers	Suspended by NYSE; \$40.2 million in trading losses	10/21	
Firm 6	Introduces customer transactions	\$2.5 million in unsecured debits due to sale of OEX naked puts	10/22	
Firm 7	Introduces customer transactions	\$500,000 in unsecured debits	10/26	Re-opened 11/2

<u>FIRM</u>	<u>TYPE OF FIRM</u>	<u>REASON CLOSED</u>	<u>DATE CLOSED</u>	<u>OTHER COMMENTS</u>
Firm 8	Introduces customer transactions	\$93,000 in unsecured debits	10/28	
Firm 9	Introduces customer transactions; market maker in 18 NASDAQ stocks	Loss in Value of proprietary securities	10/20	No customer exposure
Firm 10	Introduces customer transactions; arbitrage firm; no customers	Approximately \$100 million in trading losses	10/20	Re-opened 10/22; infusion of \$35 million in capital
Firm 11	Introduces customer transactions	\$60,000 in unsecured debits	11/18	Re-opened 11/21
Firm 12	Introduces customer transactions	Steady losses	11/11	
Firm 13	Introduces customer transactions	\$50,000 in unsecured debits	11/4	
Firm 14	Introduces customer transactions; market maker in approximately 230 NASDAQ stocks and 100 pink sheet stocks; arbitrage firm	\$2.2 million in unsecured debits; lost \$1 million inventory value	10/22	
Firm 15	Introduces customer transactions; market maker in 2 NASDAQ stocks	\$200,000 unsecured debits; \$30,000 in inventory losses	10/30	

<u>FIRM</u>	<u>TYPE OF FIRM</u>	<u>REASON CLOSED</u>	<u>DATE CLOSED</u>	<u>OTHER COMMENTS</u>
Firm 16	Introduces customer transactions	Assets seized by its parent's clearing broker-dealer because its parent, also a broker-dealer, had unsatisfied liabilities to its clearing broker-dealer related to the market break	10/20	
Firm 17	Introduces customer transactions	\$40,000 in unsecured debits	10/28	
Firm 18	Introduces customer transactions	\$50,000 loss on options in trading account	10/21	
Firm 19	Introduces customer transactions	Loss of value in proprietary securities	10/30	Re-opened 11/2
Firm 20	Introduces customer transactions	\$250,000 in unsecured debits	12/2	
Firm 21	Introduces customer transactions	Unsecured debits	10/28	Re-opened 11/5
Firm 22	Introduces customer transactions	\$47,000 in unsecured debits	11/6	Re-opened 11/9
Firm 23	Introduces customer transactions; market maker in 8 NASDAQ stocks	\$146,000 in unsecured debits	10/30	
Firm 24	Introduces customer transactions	Loss in value of proprietary	11/16	Re-opened 11/17
Firm 25	Introduces customer transactions	\$33,000 in unsecured debits	11/5	Re-opened 11/6

<u>FIRM</u>	<u>TYPE OF FIRM</u>	<u>REASON CLOSED</u>	<u>DATE CLOSED</u>	<u>OTHER COMMENTS</u>
Firm 26	Introduces commodity transactions and equity trades; market maker in 5 NASDAQ stocks	Approximately \$3.2 million in unsecured debits; 1.5 million margin call on commodities transactions; \$1.7 million loss on stock transactions	10/23	Originally closed 10/20; re-opened 10/22; closed again 10/23
Firm 27	Introduces customer transactions	\$190,000 in trading losses	10/28	
Firm 28	Introduces customer transactions; market maker in 21 NASDAQ stocks	\$200,000 in unsecured debits and trading losses	11/9	
Firm 29	Introduces customer transactions	\$200,000 in unsecured debits	10/20	One margin account
Firm 30	Introduces customer transactions	\$65,000 in unsecured debits	10/20	Re-opened 10/23
Firm 31	Introduces customer transactions; market maker in 11 NASDAQ stocks	\$15 to \$20 million net capital deficiency due to unsecured debits and trading losses	10/28	
Firm 32	Introduces customer transactions	\$300,000 in unsecured debits	10/29	Re-opened 11/2
Firm 33	Introduces customer transactions	\$400,000 in unsecured debits	10/26	
Firm 34	Introduces customer transactions	\$96,000 in unsecured debits due to 25 customer trades	10/5	

<u>FIRM</u>	<u>TYPE OF FIRM</u>	<u>REASON CLOSED</u>	<u>DATE CLOSED</u>	<u>COMMENTS</u>
Firm 35	Introduces customer transactions; market maker in 33 NASDAQ stocks	Unsecured debits	10/28	
Firm 36	Introduces customer transactions	\$60,000 in unsecured debits; customers sold naked puts	10/23	
Firm 37	Introduces customer transactions	\$800,000 in unsecured debits from 2 customer accounts due to OEX index options transactions	10/26	
Firm 38	Introduces customer transactions; market maker in 57 NASDAQ Stocks	Trading losses	10/20	Re-opened 11/2
Firm 39	Options trading firm that introduces options market maker transactions	Trading losses resulting in a \$38 million net capital deficit	10/21	See also broker-dealer #16
Firm 40	Introduces options transactions; no customers	\$20,000 options trading losses	10/21	
Firm 41	Introduces customer transactions	\$150,000 payment from foreign customer failed to clear	11/4	Re-opened 11/6; funds cleared
Firm 42	Introduces customer transactions	\$1 million in unsecured debits	-	Re-opened 10/28; Subordinated loan from clearing broker-dealer
Firm 43	Introduces customer transactions	\$4.6 million in unsecured debits due to customer transactions in OTC stocks	11/2	Re-opened 11/12; Subordinated loan from clearing broker-dealer

<u>FIRM</u>	<u>TYPE OF FIRM</u>	<u>REASON CLOSED</u>	<u>DATE CLOSED</u>	<u>OTHER COMMENTS</u>
Firm 44	Introduces customer transactions	\$320,000 in trading losses due to index options	11/10	
Firm 45	Introduces customer transactions	Approximately \$500,000 in unsecured debits due to OEX index option transactions	10/27	Re-opened 10/28; infusion of capital
Firm 46	Introduces customer transactions	"Steady losses"; unsecured debits	11/16	
Firm 47	Introduces customer transactions	\$50,000 in unsecured debits	10/28	Re-opened 11/23
Firm 48	Introduces customer transactions	\$2 million in unsecured debits due to OEX index option transactions	10/23	Acquired as branch office of another broker-dealer
Firm 49	Introduces customer transactions	Three (3) customers sold naked put options worth \$650,000; unsecured debits	10/21	Re-opened 10/27; Subordinated loan from clearing broker-dealer
Firm 50	Introduces customer transactions	\$50,000 in unsecured debits	10/28	Re-opened 10/28
Firm 51	Introduces customer transactions; market maker in 43 NASDAQ stocks	\$895,000 in unsecured debits and decline in value of inventory	11/20	
Firm 52	Introduces customer transactions	Unsecured debits	11/7	Re-opened 11/10
Firm 53	Introduces customer transactions	\$300,000 in unsecured debits due to options trading	10/29	

<u>FIRM</u>	<u>TYPE OF FIRM</u>	<u>REASON CLOSED</u>	<u>DATE CLOSED</u>	<u>OTHER COMMENTS</u>
Firm 54	Introduces customer transactions	\$289,000 in unsecured debits due to customer transactions in index options	10/31	Re-opened 11/2
Firm 55	Introduces customer transactions	\$785,000 in unsecured debits due to sales of naked puts	10/28	
Firm 56	Introduces customer transactions	\$180,000 in unsecured debits	10/20	Re-opened 10/22
Firm 57	Introduces customer transactions	\$180,000 in unsecured debits	10/28	Re-opened 10/28
Firm 58	Introduces options market maker transactions; arbitrage firm; no customers	\$13 million in options market making losses; \$7.8 million decline in value of investment securities	10/21	

Chapter Six

ISSUER REPURCHASE ACTIVITY

A. Introduction

In the wake of the October market break, approximately 650 issuers publicly announced plans to make open market purchases of their common stock. Previously, between January 1, 1987 and October 16, 1987, approximately 350 issuers had announced stock repurchase programs. Many of these issuers initiated or continued their repurchase activities during the week of October 19-23. This section discusses the market impact of issuer repurchase activity on the stocks in the S&P 500, and the operation of Rule 10b-18 under the Exchange Act. ^{1/}

B. Rule 10b-18

Many issuers conduct repurchase programs pursuant to Rule 10b-18 ("Rule") under the Exchange Act, which provides that an issuer (and certain related persons) will not incur liability under the anti-manipulation provisions of Sections 9(a)(2) or 10(b) (and Rule 10b-5 thereunder) of the Exchange Act if purchases of the issuer's common stock are effected in compliance with the limitations contained in the Rule.

When the Rule was adopted in 1982, ^{2/} the Commission recognized that issuer repurchase programs are seldom undertaken with improper intent, that they may frequently be of substantial economic benefit to investors, and that undue restriction of such programs is not in the interest of investors, issuers, or the marketplace. The Commission stressed that Rule 10b-18 is not the exclusive means by which issuers can make repurchases without manipulating the market.

The conditions of Rule 10b-18 pertain to four areas: volume, timing, price, and manner of purchases. The volume limitation is designed to prevent an issuer from dominating the market for its securities through substantial purchasing activity. Specifically, the Rule provides that an issuer may effect daily purchases of up to 25 percent of the trading volume in its shares, defined as the average daily trading volume over the preceding four weeks. Purchases of blocks, as defined in the Rule, ^{3/} are excepted from the volume condition although all other conditions apply. Thus, an issuer may comply with the volume condition if it purchases up to 25 percent of the trading volume and, in addition, purchases one or more blocks.

The timing conditions specify those periods during which the issuer may bid for or purchase its own stock. The issuer's purchase may not be the opening purchase reported in the consolidated system; nor may the purchases be made during the last

^{1/} 17 CFR Sec. 240.10b-18.

^{2/} Securities Exchange Act Release No. 19244 (November 17, 1982), 47 FR 53333.

^{3/} A "block" is defined essentially as a quantity of stock that has a purchase price of \$200,000 or more, or is at least 5000 shares and has a purchase price of at least \$50,000. Rule 10b-18(a)(14).

half-hour before the close of trading. Purchases of a reported security ^{4/} or exchange-traded security at the opening or close of a trading day generally are thought to be significant indicia of the current market value of the security since they tend to forecast the direction of trading and to suggest the strength of demand. Thus, the exclusion of opening purchases was designed to prevent the issuer from setting the character of the day's trading through such transactions. Likewise, the exclusion of bids and purchases near the close was designed to prevent the issuer from creating or sustaining a high bid or transaction price at or near the close.

The price conditions specify the highest price an issuer may pay for its common stock. The maximum price will depend on whether the common stock is a reported security, an exchange-traded security, a NASDAQ security, or other security, and on whether the transaction is effected on an exchange or not. The price limitations were designed to prevent an issuer from effecting transactions at prices that lead the market. Instead, an issuer must pay a price determined by independent market forces.

Finally, the manner of purchase conditions require that an issuer make purchases from or through not more than one broker or dealer on any given day. The single broker-dealer limitation was designed to prevent the manipulative practice of creating the appearance of widespread interest and trading activity in the security through the use of several broker-dealers. The Rule permits issuer purchases, however, from any number of broker-dealers in transactions that are not solicited by the issuer.

C. Commission Staff Activity

From October 20 through November 20, the Commission received and responded to over 350 telephone calls from issuers and broker-dealers or their legal counsel concerning repurchase programs. One of the most frequently asked questions was whether the Commission had waived the Rule's restriction on purchases during the last half hour of trading or in other respects, as had been suggested in newspaper reports. Callers were advised that, although none of the provisions of the Rule had been waived or rescinded, issuer repurchases could continue to be made pursuant to the safe harbor provisions of the Rule or outside the Rule so long as the issuer did not engage in manipulative practices. Callers were also advised that the staff recognized that there are many valid reasons for issuer repurchasing activity, and that it was understandable that many issuers wished to actively purchase their stock (including cautiously purchasing outside certain parameters of the Rule) during the week of October 19 because of a belief that the stock was priced at an attractive level. An experienced staff member was designated to respond to questions on repurchase programs, and she counseled a large number of callers on the application of the Rule's provisions in various contexts. The questions presented to the staff reflected a concern about market developments, and an interest in effecting repurchase programs for various legitimate corporate purposes, and providing additional liquidity in the marketplace.

^{4/} I.e., any security for which last sale information is available, including NASDAQ-NMS securities.

D. Analysis of Repurchase Activity**1. Introduction**

The staff undertook to determine the extent of S&P 500 issuer repurchase activity during the week of October 19-23, and whether the repurchase programs affected the market performance of the companies' common stock. During the week, 158 (31.6%) of the S&P 500 companies either had ongoing common stock repurchase programs (101) and/or announced new or accelerated programs (78), as reflected below. Of the 158 companies, 129 made purchases on one or more days during the week. The staff found that issuer repurchase activity was substantial, particularly toward the end of the week. Moreover, the purchases had a positive effect on the overall price performance of the securities of these issuers during that week. Additionally, announcements of repurchase programs appeared to have a short-term positive effect on market price.

2. Repurchase Volume 5/

Table 6-1 shows the market participation of S&P 500 companies during the week. Daily issuer purchases accounted for 2.80% to 9.36% of total S&P 500 trading volume. Table 6-2 reflects the breakdown between new and ongoing repurchase programs.

Table 6-1
S&P 500 COMPANY REPURCHASING ACTIVITY
October 19-23, 1987

<u>DATE</u>	<u># COMPANIES PURCHASING</u>	<u># SHARES PURCHASED (million)</u>	<u>% NYSE S&P 500 VOLUME</u>	<u>% NYSE VOLUME</u>
10-19	56	11.84	2.80	1.95
10-20	91	21.94	5.14	3.57
10-21	87	15.44	4.94	3.41
10-22	109	25.02	8.86	6.33
10-23	103	16.15	9.36	6.52
TOTAL	129*	90.39	5.59	3.90

* Total reflects the number of companies that made purchases on one or more days of the week.

5/ The analysis compared issuer repurchase activity to consolidated volume which is generally higher than the volume of a security on the primary market for its shares.

Table 6-2

S&P 500 ISSUER REPURCHASING ACTIVITY
October 19-23, 1987

DATE	ONGOING PROGRAMS			Program Announcements*	NEW PROGRAMS			CUMULATIVE PROGRAMS (ONGOING & NEW)		
	No. of Ongoing Programs	No. of Companies Buying	Shares Repurch. (million)		No. of New Programs	No. of Companies Buying	Shares Repurch. (million)	Cumulative Programs	No. of Companies Buying	Shares Repurch. (million)
10/19	101	54	10.25	2	2	2	1.59	103	56	11.84
10/20	103	76	18.86	31	21	15	3.08	124	91	21.94
10/21	124	76	12.32	22	18	11	3.12	142	87	15.44
10/22	142	99	23.91	16	11	10	1.11	153	109	25.02
10/23	153	101	15.81	7	5	2	.34	158	103	16.15
10/19-23	—	—	81.15	78	57	—	9.24	158	129**	90.39

* Announcements of new or accelerated ongoing programs. After the date of announcement, a new program is treated as an ongoing program.

** 129 different companies purchased on one or more days.

During the period October 19-20, 93 S&P 500 companies made purchases of their shares, and their purchases ranged from 60.1% to 0.2% of the week's trading volume for the individual company's shares, with a median of 12.5%. Nineteen companies accounted for 25% or more of their volume. During the period October 19-23, 129 S&P 500 companies made purchases of their shares, ranging from 80.5% to 0.4% of their trading volume, with a median of 12.9%. Thirty companies accounted for 25% or more of their volume. The repurchasing activity is even more substantial if the number of shares purchased is compared to the trading volume on and after the day that the company began purchasing. Using this measure, the 129 companies purchased between 82.5% and 0.5% of their trading volume, with a median of 18.7%, and 47 companies accounted for 25% or more of their trading volume. Eleven companies accounted for more than 50% of their trading volume.

3. Price Performance

We also analyzed the price performance of S&P 500 companies with ongoing and new repurchase programs. The analyses are divided into two time periods, October 19-20, and October 19-23. All S&P 500 companies were categorized by whether or not they purchased their common stock during these periods. In order to ascertain the effect of the announcement of a repurchase program, the price performance of the S&P 500 companies that made repurchase program announcements during the period and either purchased or did not purchase their shares was also analyzed.

a. The Effect of Repurchases

Tables 6-3(A) and (B) show that during October 19-20, the market price of companies that repurchased their shares decreased 17.5%, or 2.1% less than companies that did not repurchase their shares; and, in the period October 19-23, the market price of repurchasing companies' common stock decreased 15%, or 1.5% less than the market price of nonpurchasing companies. This suggests that company repurchases ameliorated the price decline of their common stock.

Tables 6-3(A) and (B) also contain the repurchasing companies' market performance adjusted for the beta values ^{6/} of the individual securities, and show

^{6/} Beta values are a measure of the relative price volatility of an individual stock compared with the overall market. By adjusting price movements of the individual S&P 500 stocks for their beta values, the market volatility component of the price movements of the individual stocks is eliminated. The S&P 500 stocks generally moved consistently with their beta values during the week of October 19.

In Tables 6-3(A) and (B) the beta-adjusted price performance of the purchasing and non-purchasing firms is reported as compared to the movement of the S&P 500 index. Note that the average beta adjusted performance of all 500 of the S&P 500 stocks is positive over this period (1.2% in Table 6-3(A) and 1% in Table 6-3(B)). One would expect that the beta-adjusted performance of all 500 firms in the S&P 500 would be zero when compared to the movement of the S&P 500. There are two reasons for this seemingly anomalous result. First, the betas used in these calculations were obtained from Value Line and average 1.0 in comparison to the Value Line index, not necessarily the S&P 500 index. In addition, the S&P 500 index is value weighted while these calculations are equal weighted. Thus,

similar results. Specifically, in the October 19-20 period, the adjusted market price of repurchasing companies' common stock rose 3.2%, or 2.4% more than the market price of nonpurchasing companies. For the October 19-23 period, repurchasing companies' adjusted market price rose 2.7%, or 2.3% more than the market price of nonpurchasing companies.

The 11 companies that purchased more than 50% of their trading volume outperformed all purchasing companies as a group and those companies that purchased less than 50% as follows:

<u>Percentage of Trading Volume Purchased</u>	<u>Average Percentage Price Change 7/</u>	<u>Number of Companies</u>
Over 50%	-13.0	11
Under 50%	-15.2	118
Overall	-15.0	129

larger firms have a greater impact on the S&P 500 index than they have on these samples where each firm's price movement is equally weighted. However, these characteristics of the beta adjustment for market movements do not affect the comparison between the price performance of purchasing and non-purchasing firms.

7/ Difference in means is statistically significant at the 75% level of confidence. In most studies in business and economics, a confidence level of 95% is thought most appropriate. The Division presents some data in this chapter with confidence levels below this level solely to provide the reader with additional information on the effect of purchases and announcements.

Table 6-3(A)

PRICE PERFORMANCE OF
ALL S&P 500 COMPANIES
October 19-20

	Percentage Price Change		Number of Companies
	Mean	Median	
Purchasers	-17.5	-17.7	93
Non-Purchasers	-19.6	-19.1	407
Overall	-19.2	-18.9	500

(Difference in means is statistically significant at
the 99% level of confidence)

BETA ADJUSTED
PRICE PERFORMANCE OF
ALL S&P 500 COMPANIES
October 19-20

	Percentage Price Change		Number of Companies
	Mean	Median	
Purchasers	3.2	3.3	93
Non-Purchasers	0.8	2.2	407
Overall	1.2	2.3	500

(Difference in means is statistically significant at
the 99% level of confidence)

Table 6-3(B)

PRICE PERFORMANCE OF
ALL S&P 500 COMPANIES
October 19-23

	Percentage Price Change		Number of Companies
	Mean	Median	
Purchasers	-15.0	-15.8	129
Non-Purchasers	-16.5	-16.8	371
Overall	-16.1	-16.3	500

(Difference in means is statistically significant at
the 95% level of confidence)

BETA ADJUSTED
PRICE PERFORMANCE OF
ALL S&P 500 COMPANIES
October 19-23

	Percentage Price Change		Number of Companies
	Mean	Median	
Purchasers	2.7	2.8	129
Non-Purchasers	0.4	1.4	371
Overall	1.0	1.7	500

(Difference in means is statistically significant at
the 99.5% level of confidence)

b. The Effect of Announcements ^{8/}

The staff also analyzed whether the announcement of a new or accelerated repurchase program had a separate price impact. We first compared the price performance of companies that made an announcement with companies that did not make an announcement. This comparison, however, did not indicate any clear price impact from the announcement. ^{9/}

We separately compared the average percentage price change of the individual stocks and the S&P 500 index between the price on the hour prior to announcement (T) and the price two hours later (T+2). ^{10/} Table 6-4 shows that the price of companies that made announcements rose by an average of 3.27%, whereas the S&P 500 index rose by an average of 1.82%. Accordingly, the price of announcing companies outperformed the S&P index by 79.7%. If one company that made an announcement but had an abnormally large negative percentage price change is eliminated from the group, the percentage positive price change for announcing companies is even greater, as reflected in Table 6-4. Moreover, it is interesting to note that the index itself moved positively in the hour after corporate repurchase announcements.

^{8/} The only announcements included in this study were those that were reported in the financial press. Companies that purchased during the week but did not make a reported announcement during the week were treated as having ongoing repurchase programs only.

Eight companies made repurchase program announcements between 11 a.m. and 1 p.m. on October 20 (the actual announcement times were between 11:59 a.m. and 12:58 p.m.).

^{9/} See Tables 6-5 to 6-12 at the end of this chapter.

^{10/} Where an announcement was made in the last hour of trading or after the close of trading, the T+2 time was 11:00 a.m. on the next trading day.

Table 6-4
EFFECT OF REPURCHASE PLAN
ANNOUNCEMENTS ON SHARE PRICES
October 19-23, 1987

	Average Percentage Price Change (2 hour period)	Number of Companies
Announcing Companies	3.27 ^{11/} (3.84) ^{12/}	78 (77)
S&P 500 Index	1.82 (1.92)	500 (499)

E. Broker-Dealer Survey

To gain additional perspective on repurchase programs and the operation of Rule 10b-18, the staff surveyed 13 brokerage firms that appeared to be active in the execution of repurchase programs. This section summarizes the responses to the survey.

The brokers stated that they offered their services to issuers announcing new or accelerated repurchase programs, and that new repurchase programs generally did not begin until October 20 or 21.

The brokers reported that the vast majority of repurchases were made within the parameters of Rule 10b-18, and that the Rule had worked satisfactorily during the week. The major exception occurred with respect to the timing restrictions: a number of brokers purchased during the last half-hour of trading, and one broker made two opening purchases. It is also clear that the treatment of blocks under the Rule was very significant and many issuers purchased a large number of blocks. Some issuers bought only 25% of the trading volume, as contemplated by the Rule; other issuers purchased the 25% and blocks; and others purchased only blocks.

F. Summary

Stock repurchases by many S&P 500 companies represented a significant proportion of the trading volume in their shares during October 19-23. The Division found that these purchases appeared to be made for legitimate business purposes based generally on the perception by issuers that their securities had become substantially undervalued. Purchasing activity had a favorable impact on price performance, and the effect of the announcement of a repurchase program appeared to have a short-term

^{11/} Difference in means is statistically significant at the 90% level of confidence.

^{12/} Difference in means is statistically significant at the 97.5% level of confidence. Numbers in parentheses reflect the exclusion of one company that had an abnormal negative percentage change for the 2 hour period.

positive effect. The substantial purchasing level of a number of S&P 500 companies (11 companies purchased over 50% of their trading volume) does, however, raise concerns about market domination.

While most issuers apparently followed all but the time requirements in Rule 10b-18, the treatment of blocks under the Rule may effectively negate the volume restriction for many securities. As a result, a number of issuers were the predominant buy market force in their securities after they commenced their repurchase activity. It is not clear that this was a situation envisioned by the Commission when Rule 10b-18 was adopted. Accordingly, the staff expects to continue its review of the impact of issuer repurchases during the market break, and review the need for amendments to Rule 10b-18.

Table 6-5

PRICE PERFORMANCE OF S&P 500 COMPANIES
THAT DID NOT MAKE ANY PURCHASES
October 19-20

Non-Purchasing Companies	Percentage Price Change		Number of Companies
	Mean	Median	
Announced	-19.5	-18.7	9
Did Not Announce	-19.6	-19.2	398
Overall	-19.6	-19.1	407

(Difference in means is not statistically significant)

Table 6-6

PRICE PERFORMANCE OF S&P 500 COMPANIES
THAT DID NOT MAKE ANY PURCHASES
October 19-23

Non-Purchasing Companies	Percentage Price Change		Number of Companies
	Mean	Median	
Announced	-17.9	-21.3	18
Did Not Announce	-16.4	-16.3	353
Overall	-16.5	-16.8	371

(Difference in means is statistically significant at
the 60% level of confidence)

Table 6-7

PRICE PERFORMANCE OF S&P 500 COMPANIES
THAT MADE PURCHASES OF THEIR SHARES
October 19-20

Purchasing Companies	Percentage Price Change		Number of Companies
	Mean	Median	
Announced	-17.1	-16.9	27
Ongoing Programs	-17.7	-18.4	66
Overall	-17.5	-17.7	93

(Difference in means is statistically significant at
the 60% level of confidence)

Table 6-8

PRICE PERFORMANCE OF S&P 500 COMPANIES
THAT MADE PURCHASES OF THEIR SHARES
October 19-23

Purchasing Companies	Percentage Price Change		Number of Companies
	Mean	Median	
Announced	-16.0	-16.9	60
Ongoing Programs	-14.2	-15.7	69
Overall	-15.0	-15.8	129

(Difference in means is statistically significant at
the 75% level of confidence)

Table 6-9

BETA ADJUSTED
PRICE PERFORMANCE OF S&P 500 COMPANIES
THAT DID NOT MAKE ANY PURCHASES
October 19-20

Non-Purchasing Companies	Percentage Price Change		Number of Companies
	Mean	Median	
Announced	3.1	5.1	9
Did Not Announce	0.7	2.1	398
Overall	0.8	2.2	407

(Difference in means is statistically significant at
the 90% level of confidence)

Table 6-10

BETA ADJUSTED
PRICE PERFORMANCE OF S&P 500 COMPANIES
THAT DID NOT MAKE ANY PURCHASES
October 19-23

Non-Purchasing Companies	Percentage Price Change		Number of Companies
	Mean	Median	
Announced	-1.1	-2.5	18
Did Not Announce	0.5	1.5	353
Overall	0.4	1.4	371

(Difference in means is statistically significant at
the 75% level of confidence)

Table 6-11

BETA ADJUSTED
PRICE PERFORMANCE OF S&P 500 COMPANIES
THAT MADE PURCHASES OF THEIR SHARES
October 19-20

Purchasing Companies	Percentage Price Change		Number of Companies
	Mean	Median	
Announced	4.3	6.1	27
Ongoing Programs	2.7	2.9	66
Overall	3.2	3.3	93

(Difference in means is statistically significant at
the 75% level of confidence)

Table 6-12

BETA ADJUSTED
PRICE PERFORMANCE OF S&P 500 COMPANIES
THAT MADE PURCHASES OF THEIR SHARES
October 19-23

Purchasing Companies	Percentage Price Change		Number of Companies
	Mean	Median	
Announced	2.5	2.5	60
Ongoing Programs	2.8	3.1	69
Overall	2.7	2.8	129

(Difference in means is not statistically significant)

Chapter Seven

EXCHANGE OPERATIONAL PERFORMANCE

During and subsequent to the October market break, concerns have been expressed regarding the adequacy and capability of securities industry systems to process record transaction and share volume. This chapter examines these concerns. The first section discusses the accuracy of last sale and quotation information in providing investors and market professionals with an accurate picture of market developments. The second section describes the handling of customer orders during the market break. The third section reviews the performance of various exchange small order execution systems, including the New York Stock Exchange's Designated Order Turnaround ("DOT") system. Finally, the fourth section describes use of the Intermarket Trading System ("ITS") during the market break.

A. Market Information Systems

Market participants (e.g., regional exchange specialists, derivative product traders, broker-dealer firms, and clearing agents) have suggested that trade and quote information was delayed or inaccurate during the market break. ^{1/} There were frequent complaints that quotes were unreliable. There are several possible explanations for the deterioration of quote information or for the perception that quotes were "bad," which we discuss below.

1. Background

Pursuant to Rules 11Aa3-1 ^{2/} and 11Ac1-1 ^{3/} under the Securities Exchange Act of 1934 ("Act") and joint plans filed thereunder, ^{4/} most national securities exchanges are required to collect transaction and quotation information on a real-time basis for equity securities substantially meeting New York Stock Exchange ("NYSE") or American

^{1/} Customer complaints received by the Commission and self-regulatory organizations allege instances of inaccurate quote information and poor executions. See Chapter Twelve.

^{2/} 17 C.F.R. 240.11Aa3-1 ("Transaction Reporting Rule").

^{3/} 17 C.F.R. 240.11Ac1-1 ("Quote Rule").

^{4/} See Plan Submitted to the Securities and Exchange Commission Pursuant to Rule 17a-15 [11Aa3-1] under the Securities Exchange Act of 1934 ("Consolidated Tape Association Plan"), Securities Exchange Act Release No. 10787 (May 10, 1974) (declaring plan effective); Plan Submitted to the Securities and Exchange Commission for the Purpose of Implementing Rule 11Ac1-1 under the Securities Exchange Act of 1934 ("Consolidated Quotation Plan"), Securities Exchange Act Release No. 16518 (January 22, 1980), 45 FR 6521 (permanent approval of plan).

Stock Exchange ("Amex") listing criteria ("Reported Securities"). 5/ Similarly, options exchanges collect and forward transaction information, pursuant to a Plan filed under Section 11A(a)(3)(B) of the Act. The exchanges have various systems for collecting and disseminating this information. For example, at the NYSE, exchange employees known as reporters record trade information and quote updates on so-called mark-sense cards and feed these cards into optical card readers. The information is then transmitted to the NYSE's Market Data System ("MDS") for processing. The MDS then transmits the data to the Securities Industry Automation Corporation ("SIAC") which is the central processor for last sale and quote information from all exchanges. 6/ Each exchange reports to SIAC all transactions in Reported Securities and the highest bid and lowest offer communicated on their facilities for these securities.

In the over-the-counter ("OTC") market, the National Association of Securities Dealers ("NASD"), through its National Association of Securities Dealers Automated Quotations ("NASDAQ") system, collects from its members transaction and quotation information for those OTC securities that are subject to real-time transaction reporting (*i.e.*, OTC/NMS Securities) and exchange-listed NMS Securities that are also traded OTC. 7/ Small order trades that are executed through the NASD's Small Order Execution System ("SOES") are reported automatically. As discussed in more detail in Chapter Nine, trades that are not executed through SOES are reported by NASDAQ market makers (who are able to transmit trade information through their NASDAQ computer terminals), or, in the rare case that a NASDAQ market maker is not involved in the transaction, by the broker-dealer by telephone or telex.

After processing the information they receive, SIAC and NASDAQ disseminate the information to entities known as securities information vendors. Securities information vendors are firms that provide current and continuous information with respect to transactions in and quotations for securities to broker-dealers, investors and others. 8/ Typically, vendors' subscribers receive this information on computer terminals or on a moving ticker.

5/ The equity securities for which there is last sale transaction reporting, both on exchanges and in the over-the-counter market, are known as National Market System ("NMS") Securities. In addition, regional exchanges voluntarily collect and forward to securities information vendors transaction and quotation information for other solely-listed issues.

6/ SIAC is a jointly-owned subsidiary of the NYSE and Amex.

7/ In addition, the Commission has granted the Midwest Stock Exchange ("MSE") unlisted trading privileges ("UTP") in 25 OTC/NMS Securities. See Securities Exchange Act Release No. 24406 (April 29, 1987), 52 FR 17495. Under the interim UTP reporting plan applicable to this arrangement, the MSE now reports transaction and quotation data to the NASD through NASDAQ terminals. See Securities Exchange Act Release No. 24407 (April 29, 1987), 52 FR 17349.

8/ In addition to providing transaction and quotation information, some vendors also provide their subscribers with so-called "analytic" information, such as comparisons of index futures and equity index options prices to the prices of the underlying component stocks.

SIAC provides a stream of transaction and quotation information to vendors over high speed lines (the "high-speed tape"). ^{9/} NASDAQ's information is disseminated directly to subscribers to the NASDAQ system. In addition, two services, one supplying a best bid and offer for all NASDAQ securities and transaction information for OTC/NMS Securities ("Level 1 Service"), and the other a complete stream of transaction and quotation information ("NQDS Service"), are fed to vendors.

2. Performance During the Market Break

It does not appear that there were many delays in the NYSE's systems used for collecting and routing transaction and quotation information, or in the processing and dissemination of this information by SIAC. NYSE personnel reported that the exchange deployed emergency reporter staff where needed, and that there were no documentable delays in collecting and routing transaction and quotation information through the MDS. As discussed below, securities information vendors also did not report many significant delays in providing transaction and quotation data to their subscribers.

There were, however, some delays at several of the regional exchanges in routing trade information to SIAC. ^{10/} The dissemination of delayed trade information from regional exchanges led to discrepancies between quote and last sale information. If delayed trade information was not identified as being delayed, such discrepancies gave rise to uncertainty as to the accuracy of quotes.

Moreover, even where the technological procedures for collecting and disseminating information were not appreciably delayed, it is possible that the speed with which the dissemination took place, coupled with the extremely fast-moving markets of the week of October 19 and delayed order executions, created the false impression of "inaccurate" quotes. What may have been occurring was that the quotes were no longer a "reliable" predictor of the price at which an order would, in fact, be executed. ^{11/} If market participants were not able to "hit" the quotes they saw displayed for a particular exchange, they may have concluded that the quotes were "bad." The inability to have trades executed at displayed quotes may not have been due to specialists failing to honor or update quotes, but rather to fast-moving markets and problems with some order routing and execution systems.

^{9/} When providing last sale information on a moving ticker, vendors have to slow down the high speed tape so that the information will be readable on the ticker.

^{10/} For example, the Boston Stock Exchange reported that it was not able to transmit trade information on a timely basis during much of the week of October 19. Delays were particularly acute on October 19 and 20, when trade reporting was two to three hours late by the end of trading sessions. On October 19, despite the fact that SIAC agreed to accept trade data until 5:45 p.m, some Boston Stock Exchange trades could not be reported and had to be entered the next day. See discussion of Boston Stock Exchange *infra*.

As discussed in more detail in Chapter Nine, NASDAQ also experienced an unusually high number of transactions reported "out of sequence," *i.e.*, later than 90 seconds after execution.

^{11/} See Chapter Eight, n. 5 *infra*.

During the week of October 19, a number of quotes by NYSE and regional specialists were designated "non-firm." ^{12/} Although this may have contributed to the general dissatisfaction with the quality of quotes, not many stocks were affected. ^{13/}

Delays in ticker displays also may have contributed to a perception that quotes were not current. During times of increased trading volume, the stream of transaction information displayed on moving tickers is necessarily late, so that the data are readable on a ticker. During the market break, ticker display devices were often well behind the market, with delays of as much as two hours toward the end of trading sessions on October 19 and 20. Thus, it is likely that prices shown on tickers on those days were quite different from the more current quotes available by way of the high speed line. ^{14/}

^{12/} Non-firm quotes are an exception to the Quote Rule which, subject to limited exceptions, requires exchange specialists to honor their quotes. Specialists are relieved of this obligation if their exchange has determined and notified appropriate parties that the level of trading activity or the existence of unusual market conditions in a security is such that the exchange is incapable of collecting, processing and making available quotation information.

^{13/} Non-firm quotes by NYSE specialists during the week of October 19 (expressed in absolute numbers and as an approximate percentage of the total number of NYSE quotes for each issue) were, at least, as follows:

October 19 - IBM (527/99%); IC Industries (9/4%); Allegis (2/1%)

October 20 - E.F. Hutton (411/92%); IBM (214/81%); Eastman Kodak (185/83%); National Semiconductor (168/89%); Textron (148/85%); Ford (69/20%); MCA, Inc. (9/2%)

October 21 - Eli Lilly (195/98%); National Semiconductor (149/99%); Lockheed (77/21%); Ford (67/22%); Norfolk Southern (17/11%); JWP, Inc. (14/61%); Par Pharmaceutical (10/13%); Ohio Mattress Co. (3/12%); Nicor, Inc. (2/5%)

October 22 - IBM (780/98%); National Semiconductor (172/68%); Ford (33/8%); PepsiCo (10/4%); Digital Equipment (1/1%)

October 23 - MCA, Inc. (11/5%).

Source: SEC Directorate of Economic and Policy Analysis.

^{14/} While these delays in the ticker may have led to doubts as to the accuracy of quotes, it is important to note that ticker display devices are a secondary source of last sale information.

The Division conducted an informal survey of eight broker-dealer firms and seven of the major securities information vendors 15/ to determine the extent of any difficulties in providing securities information during the market break. The Division staff also spoke with personnel at SIAC, the Options Price Reporting Authority ("OPRA"), 16/ NASDAQ, and the NYSE.

Overall, the vendors reported that they did not experience many significant interruptions or delays in providing service. Where problems did occur, they were sometimes caused by brief outages in SIAC's high-speed tape for transaction information or by vendors' computer programming elements that had been designed to identify and query or reject aberrational information (e.g., unusually large price changes).

All vendors were affected by brief outages on October 19 and 20 in SIAC's high-speed line for reporting last sale data in equity securities. As a result of computer hardware problems, SIAC's line was not operational from 1:57 p.m. to 2:06 p.m. on October 19, and from 11:47 a.m. to 11:51 a.m. on October 20. Vendors would not have been able to provide their subscribers with last sale information during these two periods. In addition, one vendor reported that it experienced a 45 minute delay in disseminating last sale information as a result of SIAC's nine minute outage on October 19. Under normal circumstances, the last sale data that it receives from SIAC is accompanied by consecutive message sequence numbers, thus enabling it to determine when there has been a break in the stream of transaction reports. According to this vendor, when SIAC resumed equity last sale transmission at 2:06 p.m. on October 19,

15/ ADP Financial Information Services, Inc. ("ADP"), Bridge Data, Inc. ("Bridge"), Instinet Corporation ("Instinet"), PC Quote, Inc. ("PC Quote"), Quotron Systems, Inc. ("Quotron"), Reuters Information Services, Inc. ("Reuters") and Teletext of Pricing Information by Computer ("TOPIC").

TOPIC, the real-time market price information service developed by the International Stock Exchange, provides quotations for International Stock Exchange-listed stocks. It currently leases only approximately 160 terminals in the United States. It reported that it did not experience any delays in transmission or any faults in data from the International Stock Exchange.

Instinet also operates a trading system that disseminates market information to subscribers, enabling subscribers to enter buy and sell orders and indications of interest, negotiate with other subscribers in the system, and to execute trades. Instinet stated that generally its trading system (other than the guaranteed execution feature discussed in Chapter Eight) operated normally, except that: (1) the system was unavailable for trading and market information for brief periods on October 16 (between 9:45 a.m. and 10:04 a.m.), on October 19 (between 9:31 a.m. and 9:36 a.m.), and on October 20 (between 9:05 a.m. and 9:07 a.m., 10:13 a.m. and 10:17 a.m., and 3:17 p.m. and 3:38 p.m.) because of system overloads in the amount of message traffic; (2) Instinet curtailed the normal operating hours of its system, pursuant to the Division's request; (3) one subscriber suspended its participation in the system commencing October 19, 1987, because of the subscriber's need to reformulate its trading algorithms.

16/ OPRA is the registered processor for options information; however, the actual processing of this information is done by SIAC, under contract with OPRA.

without notifying the vendor, it assigned message sequence numbers to the data flow that were arbitrary and bore no relation to the last numbers transmitted before the data flow ceased at 1:57 p.m. As a result, the vendor's computer began to reject the entire stream of last sale information.

The NASD reported that there were no interruptions or delays in providing information to NASDAQ subscribers. The NASDAQ system experienced a sharp increase in the number of queries ^{17/} by subscribers and quote updates by NASDAQ market makers on October 19 and 20. For example, the number of queries rose from 1,416,303 on October 13 to 1,994,546 on October 19 (an increase of 41%), and the number of quote updates rose from 69,709 to 221,492 (an increase of 218%). The average response time for queries by NASDAQ subscribers rose from approximately 2.75 seconds on October 13 to approximately 3.25 seconds on October 19.

There were, however, some delays on October 19 and 20 in NASDAQ's provision of transaction and quotation data to some of the other vendors over the NQDS Service due to insufficient line capacity. Bridge and Instinet stated that their services were affected by such delays. Although the NASD has not been able to measure the duration of the delays, Instinet stated that they were at times as long as half an hour or more. The NASD has completed an upgrade in the NQDS line capacity to vendors from 4,800 to 9,600 bits per second ("BPS").

OPRA reported that there were no interruptions or delays in the dissemination of transaction and quotation information for options. There were, however, two areas in which several of the vendors experienced difficulties. First, as the values of underlying securities and indexes changed dramatically, the number of new options series that were created was much greater than normal. ADP, Bridge, Quotron and Reuters explained that the introduction of new options series into their data bases was delayed because this process has to be done manually. One vendor reported that its entire securities information service shut down for about 5 minutes on October 21 and again on October 22 due to a systems overload caused by the addition of 15,000 to 20,000 new options series to the 80,000 items already in its data base. That vendor has indicated that it has undertaken systems modifications to avoid the possibility of another breakdown. Furthermore, during the weeks of October 19 and 26, the addition of thousands of new options series forced at least one of these vendors to delete some existing options series from its computer files to make room for the new series.

The second problem relating to the provision of options information occurred when premiums (*i.e.*, prices) reached three digits (*i.e.*, \$100 or more). The options information message format, which OPRA had specified that SIAC use, only allowed for two digit price information. When premiums reached three digit figures, only the last two digits were disseminated by SIAC. For example, when the premium for a particular option reached \$110, SIAC disseminated to vendors a price of \$10. According to OPRA, most of the complaints that it received regarding this problem came from broker-dealer "back office" personnel who rely on this information for automated margin computations. Generally, traders who monitor market information throughout the day and who know

^{17/} A query occurs whenever a NASDAQ subscriber keys a command for market information into a NASDAQ terminal. The query message is relayed to NASDAQ's central processing site, and the market information is then broadcast back to the subscriber's terminal.

the correct three-digit price even where only the last two digits are displayed, were not as adversely affected. One firm, however, indicated that in some instances registered representatives may not have realized that certain options quotes were defective and accepted customer transactions on the basis of erroneous two-digit quotes. OPRA has corrected the problem and modified the options information message format to accommodate three-digit premiums.

Several of the vendors experienced further temporary difficulties, in addition to those described above. For example, on October 19, Quotron's display of the value for the Dow Jones Industrial Average ("DJIA") was at times incorrect. The inaccuracy was, however, so great as to be obvious (e.g., a decline of several hundred points was shown as an advance of several hundred points). Bridge, which calculates the value of the Value Line Index, ^{18/} was unable to perform those calculations between approximately 10:30 a.m. and 1 p.m. on October 19. ADP reported that it experienced delays in quote query response times, because lines to subscriber terminals are used to transmit both market information and back office (e.g., margin) information to its clients. In addition, ADP's provision of quotation information was impaired for about 30 minutes on the morning of October 19, because its systems were programmed to reject as inaccurate large price fluctuations.

The broker-dealers that were contacted did not, as a whole, experience many major problems with the receipt of accurate and reasonably timely market information. The broker-dealers' responses also did not reveal any particular patterns of inferior or superior performance by individual vendors.

3. Analysis

The foregoing discussion focuses largely on the delays and inaccuracies in market information that occurred. These difficulties, however, were mostly isolated incidents that were quickly remedied. They should not detract from the larger picture, which shows that market information systems generally performed well during the week of October 19. The Division believes that at least some of the disenchantment with the quality of market information may have been due to the difficulties of trading in fast-moving markets, rather than to the performance of information systems. Finally, the staff is encouraged that the securities information processors and many of the vendors have taken corrective measures, such as rewriting computer programs, and updating processing and line capacity, to avoid a repetition of the problems that were encountered.

At the same time, there were problems that warrant further attention. First, there were significant numbers of late trade reports from stock exchanges and the OTC market. Second, the proliferation of options series strained vendor systems and there was no uniform system for determining which series to delete when necessary. Third, the NYSE should review whether it has adequate personnel and facilities to maintain accurate trade and quote reporting capabilities during periods of sustained high volume.

^{18/} The Value Line Index is a composite of prices of approximately 1,700 equity securities. Options on this index are traded on the Philadelphia Stock Exchange. Trading these options had to be suspended during the period when Bridge could not update the index calculation. See discussion of trading halts, Chapter Eight, infra.

B. Order Handling

The process of entering orders to buy and sell securities varies depending on the type of order and brokerage firm. In particular, the level of automation at any firm plays an important role in determining the number of steps necessary to complete an order.

Typically, a retail investor calls or visits his or her broker who, in accordance with the investor's instructions, completes an order ticket. The order ticket is time stamped and the order to buy or sell is conveyed to the firm's order room for processing. 19/ At the firm's order room, the order room clerk directs the ticket to either the listed trading desk, option trading desk or OTC trading desk, depending on the type of security. 20/ As a general matter, if the order is for a listed stock, the order either is transmitted to an exchange small order routing or execution system, such as DOT on the NYSE, or to a floor broker 21/ on an appropriate exchange. 22/ Options orders are entered in a manner similar to that used for orders for listed equity securities.

If the order is for an OTC security, the entry process is different. If the firm is a market maker in the particular security involved, 23/ the order entry process involves routing the order to the OTC trading desk where the firm generally trades with the customer as principal and provides an immediate execution. If the firm does not make a

- 19/ For example, a small firm might rely on telephones whereas a large firm would use an automated delivery system, which might in turn automatically route some orders to a particular market and route other orders to the firm's order desk for special handling.
- 20/ Of course, this function of the order desk may be performed by the firm's internal automated order routing system.
- 21/ Three types of brokers typically can be found on an exchange floor. They are commonly referred to as floor brokers, two-dollar brokers, and bond floor brokers. Floor brokers execute orders sent to the floor by their own firms. Two-dollar brokers transact orders for member firms when the firm's floor broker is unavailable. Bond floor brokers complete bond transactions. The remaining members of an exchange generally consist of competitive traders, who buy and sell for their own account; specialists, who are registered by the exchange to execute orders left with them and to maintain fair and orderly markets in the securities in which they specialize; or competing market makers who, on the options exchange, make markets in a range of securities, but are not obligated to specialize in any one security.
- 22/ This transmission occurs through a message switch established by each exchange which permits the exchange's computerized order delivery system to interface with the varying order routing systems of its member firms. (See discussion *infra*.)
- 23/ A market maker for a NASDAQ security is required to buy or sell 100 shares of that security at the dealer's stated price. The stated price refers to the firm's inside quote consisting of a bid and asked price.

market in the security, however, the trader must query the NASDAQ terminal,^{24/} locate a market maker, and negotiate the order execution by telephone. ^{25/}

The process changes when a firm has automated routing capabilities. Generally, firms with extensive retail business are more highly automated. For example, a registered representative dealing with a retail investor might have available a desk terminal displaying a format screen. This screen enables the representative to type the retail investor's buy or sell order instruction into the computer terminal, which interfaces with the firm's mainframe computer to route the order directly to the exchange floor if a listed transaction, or to the appropriate market maker if an OTC transaction. This automation reduces the need for telephone contact. Moreover, some firms' internal wire systems are directly linked to the NYSE's DOT system or the regional exchanges' various automatic execution systems. Thus, the broker can quickly survey the terminal to determine which system is qualified for the particular order, and transmit it accordingly.

The order entry process for institutional investors differs from that of retail investors. Institutional investors typically have access to current market information through computer terminals in their offices. Thus, unlike most retail investors, they need not contact their broker to obtain price and volume information before deciding whether to place an order. Institutional customers often will contact a broker, however, to obtain additional information regarding the price at which a particularly large transaction may be effected. Further, whereas retail investors must access a branch office of a firm through commercial telephone lines, or visit their broker's offices in person, institutional investors often have direct telephone or computer links with their brokerage firm's trading room, thus enabling them to by-pass a number of the steps associated with the retail order entry process.

In addition to firm proprietary order routing systems, non-proprietary order routing systems are provided to broker-dealers by a number of companies known as service bureaus. The largest service bureau is ADP. Approximately 25% of the order flow to the NYSE's DOT system is delivered via ADP's "order match service." According to ADP, about 100 of its 350 broker-dealer clients ^{26/} subscribe to an ADP order routing service as an alternative to maintaining their own systems or to telephoning orders directly to the floor. In contrast, two other service bureaus, Phase III and Securities Industry Software, currently have one firm and three firms, respectively, using their order routing service on NYSE's DOT system.

^{24/} NASDAQ terminals, used by firms trading OTC issues, centralize quotation information from all market makers.

^{25/} The order also can be transacted automatically by computer assuming the transaction is within the parameters of the small order execution system. The NASD's small order execution system ("SOES") is for order entries of 1,000 shares or fewer of NASDAQ/NMS securities or 500 shares or fewer of all other NASDAQ issues. Orders outside these limits are negotiated by phone. See Chapter Nine.

^{26/} ADP also provides financial accounting and recordkeeping services to its securities industry clients.

By subscribing to the ADP order routing service, broker-dealers are able to transmit buy or sell orders through an ADP terminal line directly to the DOT system at the NYSE, or to the electronic routing and execution systems available on the Amex, the Chicago Board Options Exchange, Midwest Stock Exchange, Pacific Stock Exchange, Philadelphia Stock Exchange and NASDAQ.

1. Performance of Routing Systems During the Market Break

In response to the problems experienced during the week of the market break, the Division sent questionnaires to 25 large broker-dealers, ^{27/} seeking information regarding the order routing systems utilized by these firms, ^{28/} the capacity of these systems, and any operational difficulties encountered during the period October 13-30, 1987. ^{29/} In addition, the Division's staff telephoned several other brokerage firms (those with more than 50 branch offices dispersed throughout the world) to request similar data. ^{30/}

a. Proprietary Systems

Of the firms that responded, most represented that they had some type of in-house automated order routing and matching systems. ^{31/} More than 75% of the firms indicated that their systems functioned well during the week of October 19 in terms of intake but that the external systems used to route and execute orders on exchanges presented problems. One large discount broker, however, indicated that its proprietary system failed several times on October 19 and 20 due to the high level of data traffic

^{27/} See Appendix E.

^{28/} It is important to distinguish between automated order routing systems and automated execution systems. The former routes the order either to one of the various automated execution systems, the floor of an appropriate exchange or the OTC trading desk. The latter executes the order. Some systems perform both functions. Thus, at times, these terms encompass both aspects. Furthermore, there are internal (*i.e.*, proprietary) order routing and execution systems and external order routing and execution systems.

^{29/} Because many of the responding firms did not focus on their own internal order routing systems, but rather the external systems they employ, follow-up phone calls were made regarding the performance of their in-house procedures.

^{30/} For purposes of this portion of the study, the phone calls were limited to questions concerning the firms' internal automated and non-automated order routing systems during the period October 13-30, 1987.

^{31/} For example, one firm has its own internal system for basket trades of approximately 2,000 shares or fewer which feeds the orders directly to DOT on the NYSE; others have their own proprietary systems used to route orders automatically to external systems for execution. Firms that do not have their own automated systems rely on automatic routing systems provided by outside service bureaus such as ADP or Brokerage Transaction Services, Inc. ("BTSI") (a subsidiary of ADP), or use non-automated means to transmit orders to the floor of an exchange or market maker in the case of an OTC issue.

over transmission lines. As a result, many orders that normally would have been routed within seconds were delayed substantially when they had to be routed manually or negotiated by telephone. A few of the firms indicated that their branch offices had more business than they could handle. Nevertheless, few firms indicated that there were problems in delivering orders to the firm's trading desk on a timely basis from regional offices. ^{32/}

The data collected evidenced a wide range in delay time in routing customer orders to exchanges and market makers. While some firms indicated no delay, other firms had delays of up to 2 hours; the average was approximately 20-30 minutes. In the case of firms having to route orders manually due to systems failures, the delay increased substantially as firms with direct access to the exchange floor indicated that certain exchange posts were unable to receive the traffic and firms without direct access were unable to reach other firms to transact their orders.

Most of the firms stated that incoming orders did not exceed system volume intake capacity, but if systems were overloaded, firms resorted to back-up internal systems, which reportedly alleviated any prior internal order routing problems. Moreover, many of these firms represented that they forfeited timely out-bound execution reports to facilitate the mass input of orders. ^{33/} While queues in the systems were noted, most were with execution reports rather than in the order routing process. Because of the external routing and execution systems' breakdowns,^{34/} however, some firms stated that orders entered into their internal interface systems were sometimes not reported as executed until a number of days later, and, in certain instances, were never reported.

Despite the generally positive assessment of the performance of firm's internal order routing systems, almost all the firms either increased the frequency at which orders could be entered ("line speed") or added more lines to feed into the external systems used to access exchanges during the week of October 19. ^{35/} Moreover, storage capacity and processing power were often enhanced, either during the week of

^{32/} We were unable to measure the difficulties that customers encountered in reaching their registered representatives on the phone. As noted in Chapter Twelve, however, the Commission and the SROs did receive a substantial number of customer complaints regarding this problem.

^{33/} Few firms represented that they had lost orders. If orders were lost, firms maintained that external execution systems were responsible and losses were unrelated to the firms' internal order routing procedures. In fact, only one firm assumed part of the responsibility for lost orders and identified voluminous order entry as the cause.

^{34/} For example, system breakdowns occurred in DOT, SCOREX, PACE and other exchange automatic execution systems. See discussion *infra*.

^{35/} There were very few firms that indicated no future plans to upgrade their in-house order routing systems to prepare for a time of even higher volume than during the week of the market break. These few firms represented that no problems had occurred with respect to their internal systems and that they had stayed within their systems' volume capacity.

October 19 or in subsequent weeks. 36/ The firms that were able to respond immediately by increasing line speed, using by-pass emergency modes, and/or other back-up systems, advised that internal problems, particularly with respect to back-up in branch offices, were reduced. 37/

b. Non-Proprietary Systems

Many firms are dependent on outside automated systems to route orders to exchanges. Some firms represented that they had sufficient terminals and wire operators to handle incoming order volume significantly in excess of average volume, but that they encountered problems when their customer orders were dispatched through service bureau systems. 38/ Those firms that use external systems, or service bureaus, cited problems with delays in order routing and severe disruption in reports of order execution.

The largest service bureau, ADP, experienced queuing delays and backlogs caused by the unprecedented order volume during the market break. In addition to its extensive back office processing systems, ADP has two systems that provide order routing services, Data Network Service ("DNS") and the Message and Order Processing System ("MOPS"). On October 19, there were queues intermittently on DNS and on October 20 and 21, DNS continued to have queues that varied in duration. Delays ranging from 15 to 30 minutes occurred on DNS twice on October 20 and 21, when the capacity of the equipment had to be expanded due to full data files. These short shutdowns affected a maximum of 30 broker-dealers at any one time.

There were no queues on MOPS on October 19. On October 20, however, queues built up on MOPS resulting in a two-hour waiting period. As a consequence, ADP notified firms that no new orders should be entered after 2:30 p.m.. This affected 22 firms. MOPS also was closed to new orders between 12:15 p.m. and 1:45 p.m. on October 21 due to queues. On October 22, MOPS had an equipment problem at the market open but was operational as of 9:40 a.m.. On Friday, October 23, there were no order delays in either system.

The bottlenecks ADP encountered were attributed to two factors. First, there were unanticipated surges in order flow by firms that had never before experienced

36/ None of the firms indicated an intention to increase staff or phone lines to the exchanges. While some firms did acknowledge that more phone lines to the floor or more staff would have been helpful in terms of order input, they also recognized the limited space available on the floors of the exchanges. In this respect, firms placed priority on enhancements to their own internal automated systems.

37/ A few responding firms, however, stated that such upgrades were not necessary and that they were implemented as precautionary measures.

38/ Because the intake capacity of these firms is contingent on the total volume received by the outside systems, however, most of the firms surveyed could not accurately determine their own order routing capacity during the market break. Three firms, however, reported that orders arrived at destinations up to 90 minutes after they were sent through ADP.

multiple increases in their order flow. According to ADP, these increases were particularly great for discount firms and regional clearing firms using their systems. Second, the configuration of ADP's DNS system did not allow for immediate flexibility in responding to rapid volume increases by some user firms. Broker-dealers using the DNS order routing service are assigned a certain number of computer lines connected to "ports" on front-end computers, based on their expected demand for order flow. During the week of October 19, some firms experienced three to five times their normal use of the system, which far exceeded the firms' prior business estimates and disrupted access of other firms sharing their group of ports. ADP modified the DNS front-end groupings over the weekend of October 24-25 to accommodate changing patterns of demand by firms using the system. In addition, ADP has expanded overall capacity of both the DNS and MOPS order routing systems by 100% since the market break. 39/

2. Experience of Retail and Institutional Investors

The 25 broker-dealer firms with customer accounts responding to the Division's questionnaire 40/ reported having received a total of 2,768 customer complaints^{41/} concerning the period from October 14 to 30. Of this total, 182 complaints dealt with the inability to contact broker-dealers, 269 with the lack of verbal confirmations, and 1,243 with poor quality of executions. 42/ In large part, the difficulty that retail customers experienced in reaching brokers on the telephone was due to the inability of brokerage personnel and communications systems to handle the large increase in the number of telephone calls received from customers. For example, one large discount broker reported that the volume of telephone calls more than tripled on October 19. In addition, brokerage personnel who would otherwise have been available to respond to customer inquiries and take trade orders were required to perform some order routing and execution functions manually, as automated systems became overloaded. 43/

The Division also sent questionnaires to 23 institutional investors, requesting information concerning the methods which these institutions use to communicate orders to their brokers and whether they experienced delays in entering orders and receiving execution reports on certain days in October. 44/ Of the 20 institutional investors that responded to the questionnaire, only one reported that it relies exclusively on commercial telephone lines to communicate with its brokers; all of the others reported that, in addition to commercial lines, they use direct telephone lines (i.e., "dedicated

39/ ADP added 10 front-end computers, 48 disk drives, 16 tape cartridge drives, 4 laser printers and 1 mainframe computer which increased CPU capacity by 30%.

40/ See Appendix E.

41/ The data from some firms included only written customer complaints.

42/ For a discussion of customer complaints received by the Commission and self-regulatory organizations, see Chapter Twelve.

43/ Several brokerage firms extended the hours of their branches nationwide into the weekend of October 24-25, 1987, to clear back office work and to respond to retail investors' inquiries.

44/ See Appendix E.

lines") and, in some cases, computer links with their brokers. Although several of the institutions stated that they experienced some delays in communicating orders on October 19, 20 and 26, overall the institutions surveyed stated that the delays were not significant in the context of the record volume. ^{45/} Many of the institutions, however, stated that they experienced delays in receiving trade execution reports for transactions on October 19 and 20. These delays ranged from several hours to, in one case, several weeks.

While it appears that institutional investors did not encounter as many delays or other difficulties in entering orders as did retail investors, there is no indication that broker-dealers ignored retail investors in favor of institutional clients during the market break. Rather, institutional investors may have fared better because their relationship and methods of communicating orders to their brokers are quite different from those of most retail investors. Even in normal times, institutional investors maintain direct telephone or computer links with their brokerage firms and tend to trade much more frequently than do retail investors.

3. Analysis

The review of order entry and routing procedures during the market break highlights at least two areas of concern. First, many broker-dealers were nearly overwhelmed by the surge in order flow. Although firms should not be faulted for not having been prepared for 600 million share days, some firms may not be routinely reviewing and assessing their capacities to accept orders from their clients and to route the orders to the appropriate destination. In-house systems, from telephone capacity to computer programs, should be evaluated routinely, so that investor needs, even in abnormally high volume periods, may be more adequately addressed. Firms should develop contingency plans to cope with excessive volume which should include back-up computer systems, cross-training of personnel and better communication with public customers. To ensure that these reviews regularly take place, the self-regulatory organizations and the Division should review operational capacity during broker-dealer examinations.

Second, it is apparent that at least one major service bureau suffered operational problems that resulted in delays in order routing and execution reporting for a large number of firms. Because firms rely on service bureaus to perform external order routing functions and because these systems interlock and are dependent on the operations of the routing and execution systems of the exchanges, the entire network must be examined to determine the causes of inefficient operations during the market break. It is apparent that modifications to remedy the delays and queuing problems throughout the systems are needed. However, the Act does not specifically provide for regulation of service bureaus. Thus, they are not regulated by the Commission or subject to oversight by any of the self-regulatory organizations. The staff, therefore,

^{45/} Only one institution reported that "[t]he chaos on October 19 and 20 made communications and execution extremely difficult."

intends to consider whether some degree of regulatory oversight of service bureaus is desirable, and, if so, whether this would require legislation to amend the Act. 46/

C. Automated Order Routing and Execution Systems

1. Introduction

Automated order routing and execution systems provide the primary means of executing the vast majority of small-sized trades both for listed and OTC stocks. With the exception of program trades, most of these orders are for retail customers. This section describes the performance of these systems in routing and executing orders for listed securities on the NYSE and regional exchanges. 47/ Although the NYSE's DOT system has a very limited automatic execution function, the order routing function accounts for over two-thirds of average daily order volume at the NYSE. 48/

Small order routing and execution systems are designed to receive smaller sized orders electronically from broker-dealers and route them to the appropriate stock exchange floor for automatic execution or for manual handling by the specialist. These systems include the MSE's MAX system, the PSE's SCOREX system, the NYSE's DOT system, the Amex's PER system, and the Phlx's PACE system. 49/

During the market break, these systems were under severe operational strain. The record volume and number of transactions during the week of October 19 caused several failures and problems. The particular operational problems varied among the markets. While some of the markets, such as the MSE, were able to make certain adjustments in their systems to continue operations, two markets, the PSE and the Phlx, asked members to refrain from using their automated systems for several periods of time during the week of October 19 because the systems were overloaded.

To some extent, all of the markets experienced queuing or turnaround problems in their automated systems. Because of the large number of orders, many delays occurred

46/ One of the Commission's rules, Rule 17a-4(i) under the Act, affects service bureaus, but it does not address their order routing operations. Rule 17a-4(i) provides that service bureaus used by broker-dealers for the preparation or maintenance of records must file with the Commission an undertaking acknowledging that these broker-dealer records are subject to examination by the Commission and that the records are the property of the broker-dealer. The rule was adopted to ensure the accessibility of broker-dealer records in situations where, for example, a service bureau refuses to surrender the records due to the nonpayment of its fees. See Securities Exchange Act Release No. 13962 (September 15, 1977), 42 FR 47552.

47/ The discussion of option and OTC automatic routing and execution systems appears in Chapters Eight and Nine, respectively.

48/ For example, in September 1987, the average daily volume on the NYSE reached 175 million shares; 128 million shares (73%) were routed through DOT.

49/ The BSE and CSE do not have automated routing or execution systems.

in delivering the orders to the specialist post, the "front-end" of the system where all orders enter and are queued based on their time of receipt. Front-end problems were particularly troublesome on October 19, 20, and 21, because so many orders entered the systems at the same time causing queues and delays in routing the orders to the specialist post. Because of the extreme price volatility, the queues and routing delays often drastically affected the execution prices that the orders received. Generally, once the orders reached the specialist post at most exchanges (where the systems were operational), there were no significant delays in execution. Even more substantial delays occurred, however, in issuing execution reports back to member firms and ultimately to customers. A description of each system at the NYSE, Amex and regional exchanges and the problems encountered are set forth in detail below. ^{50/}

2. NYSE's DOT System

a. Development of DOT

To understand the systems problems caused by the volume of transactions during the market break, it is helpful to understand the development of order processing technologies on the floor of the NYSE. In the 1960s, orders were received at the NYSE in the following manner. An order received by a broker-dealer's registered representative at a branch office would be telephoned to the firm's order desk; the firm's order desk would in turn telephone the order (or route it by pneumatic tubes) to the firm's booth on the floor of the NYSE (the member firm booths are located around the perimeter of the NYSE trading floor) and a firm representative (the floor broker) would take the order (a physical paper ticket) to the specialist location for the particular stock and execute a trade with either the specialist or other trading interest represented in the crowd. The process of reporting the transaction back to the customer was substantially the same in reverse.

This manually intensive process could not handle the increasing order volume. Accordingly, new methods were developed for order delivery and execution. In large part, these new technologies were designed to minimize the number of times an order had to be handled manually. As a first step, the large broker-dealer firms, wire houses (so named because they used to have "wire" communications from their branch offices to their home offices), developed data communications facilities for automatically routing orders from their branch offices to their order desks. As this process was occurring, the NYSE, in conjunction with Amex, developed the Common Message Switch ("CMS") in 1976. The CMS is a data communications application that accommodates a wide variety of member firm computer and technical connections, enabling a member firm to send orders directly to the appropriate floor booth on either the Amex or NYSE for execution by the firm's floor broker or to the appropriate specialist post. While these two steps -- the enhancement of firm order routing capabilities and the development of the CMS -- greatly increased the efficiency by which orders could be routed from a customer to the floor booth of the firm, the rising volume of transactions continued to

^{50/} See chart at the end of this chapter, which sets forth the volume and number of trades on each automatic routing and execution system for October 16, 19, 20 and 26.

strain the resources of firms and the NYSE. Accordingly, also in 1976, to facilitate the routing of small transactions in particular, the NYSE implemented its DOT System. ^{51/}

Initially, DOT was designed to provide a method of by-passing the member firm floor booth for small customer orders. ^{52/} Instead, DOT provided a mechanism whereby small market orders could be directly routed from the member firm branch office to the applicable specialist post. ^{53/} The specialist would then represent the order within the trading crowd and report back an execution to the member firm. This application of DOT provided several benefits. First, it provided a competitive response to the regional stock exchanges that were developing their own small order execution systems. ^{54/} Second, it provided a facility whereby order traffic could be directed away from the floor broker so that the floor broker could use his time to execute large orders, which usually require more attention. Third, it provided a better system of internal controls to ensure the timely execution and reporting of transactions.

b. Enhancements to DOT

Since the introduction of DOT, its applications have increased. In 1980, the NYSE developed a new application of DOT called the Opening Automated Report Service ("OARS"). OARS facilitates the efficient and accurate processing of eligible orders received by the NYSE through DOT prior to the opening of trading, when an estimated 20% of daily order flow reaches the trading floor. OARS stores individual pre-opening market orders of up to 5,099 shares entered through DOT prior to the opening. Then OARS automatically and continuously pairs buy and sell orders and presents the imbalance to each specialist up to the time the specialist opens the stock for trading,

^{51/} DOT also was a competitive response to the automated small order execution systems already being developed and operated by regional stock exchanges. The Pacific Stock Exchange has operated its SCOREX (originally called COMEX) system since 1969. The Philadelphia Stock Exchange began operation of its PACE system in 1976, and the Midwest Stock Exchange began its MAX system in 1981. These three automatic execution systems are very similar in operation, in large part, as a result of the exchanges' sharp competition with one another for order flow, which caused them to adopt similar pricing parameters for market orders, assure similar response times, and offer similar execution costs.

^{52/} In 1976, the DOT order eligibility size was 199 shares, 36% of the average size of a trade on the NYSE (559 shares). In September 1987, both the average trade size and DOT order eligibility size were 2,099 shares. In October 1987, the average size trade was 2,455 shares, and DOT order eligibility at 2,099 shares represented 85% of this figure.

^{53/} A market order is an order to buy or sell a stated amount of a security at the most advantageous price obtainable after the order is represented in the trading crowd at the post. By contrast, a limit order is an order to buy or sell a stated amount of a security at a specified price -- or a better price, if possible -- after the order is represented in the trading crowd. A marketable limit order is a limit order that is immediately executable because the price of the subject security at the time the order is entered is equal to or better than the limit price on the order.

^{54/} See discussion of regional systems, *infra*.

thereby assisting the specialist in determining the opening price. In addition, after the specialist determines the opening price, OARS automatically distributes within seconds execution reports to member firms for each stored order in that stock. 55/

The DOT limit order system ("LMT") assigns a limit order an identifying number, and routes the order to the specialist's post where it is entered into the limit order book. 56/ When an order is executed by the specialist, he reports the identifying number on a mark sense card and the system sends the execution report to the entering member and to clearing. The LMT system also has begun to handle odd-lot orders that are routed through DOT. 57/

In 1984, the NYSE further implemented certain enhancements to the DOT system, including an automatic execution feature. If the NYSE quote equals the best quote disseminated by any participant in the Intermarket Trading System and the spread between the bid and asked is no more than one eighth of one point (e.g., when the quote is 20 bid to 20 1/8 asked), the DOT system will automatically execute the order and immediately report the trade back to the member firm. 58/

In addition, the NYSE developed the Request Status Reporting feature, which generates an execution at a reference price of an order that has not received an execution report within three minutes. 59/ The reference price currently is the NYSE

55/ The NYSE has proposed to increase the size of order eligibility for OARS from 5,099 to 30,099 shares. See Securities Exchange Act Release No. 24993 (October 5, 1987), 52 FR 37862.

56/ In addition, the LMT system allows broker-dealer firms to choose to have limit orders near the prevailing market routed to their own booths, and the others directly to the specialist.

57/ During October 1987, and until December 1987, standard odd-lot market orders (an odd-lot is an order to purchase or sell a security in an amount less than 100 shares) went through the CMS to be routed to the NYSE's Automated Pricing and Reporting System ("APARS"). APARS automatically priced the orders, based on the next round-lot sale in the stock. APARS, an older computer system, was designed to keep specialists advised of their odd-lot inventories and return execution reports to the member firm offices originating the orders. The NYSE now is changing its procedures for handling odd-lots, and standard market odd-lot orders now are being routed through the LMT system, and receive an execution based on the prevailing NYSE quote, with no odd-lot differential charged on the order. After execution, the odd-lot trades are included in specialist inventory accumulations. The new odd-lot reporting system, APARS II, provides comparison reports and sends a direct input of the trades to the appropriate clearing systems. See Securities Exchange Act Release No. 25177 (December 7, 1987), 52 FR 47472.

58/ Orders of up to 1,099 shares are eligible for the Immediate Reporting Service; currently, the feature is available for only about 50 stocks, none of which is traded in the electronic display book environment (see infra).

59/ The specialist rarely fails to act within the requisite three minutes, so only a very small percentage of orders are executed at the reference price.

quotation at the time the DOT order was received by the system. 60/ However, a specialist must make every effort to execute orders in two minutes or less, and, in its evaluations of specialists to determine allocations of stock, the NYSE takes into account such turnaround performance. 61/

Order-size eligibility for DOT also has increased since its inception. In 1984, DOT capacity for market orders increased from 599 to 1,099 shares and marketable limit orders were handled as market orders for the purposes of DOT. Also in 1984, the order-size eligibility in LMT was increased to 5,099 shares for all LMT orders. 62/ Now, the LMT system accepts both day limit and "good 'til cancelled" orders of up to 99,900 shares.

Currently, member firms may route orders of up to 2,099 shares through DOT in market and marketable limit orders. DOT also may accept order sizes larger than 2,099 shares, up to 30,099 shares in the more liquid stocks, but there are no guarantees as to the timing of the execution of such orders. 63/

As discussed in Chapter One, in response to increased use of derivative products, such as index options and futures, the NYSE developed the List system to facilitate instantaneous transmission of large orders from member firms. The DOT List is an application of DOT that allows member firms to send orders through DOT in, as its name implies, a list of securities. Primarily used for so-called "program" trading strategies such as index arbitrage and portfolio insurance, DOT List processing enables

60/ Originally, in 1984, a DOT market order had been assigned a reference price based on the NYSE's most recent last sale price in the subject stock preceding the order, and, if not executed within the specified time after receipt, the DOT order would be automatically executed at this reference price. See Securities Exchange Act Release No. 21197 (August 2, 1984), 49 FR 31792 ("1984 DOT Release"). In 1985, the Commission approved the NYSE's modification of the reference price assigned to a DOT order from the previous last sale price to the NYSE quotation at the time the DOT order is printed on the floor. See Securities Exchange Act Release No. 22498 (October 2, 1985), 50 FR 41082 ("1985 DOT Release"). The Commission, however, expressed concern regarding the use of the NYSE quote (or, for that matter, the NYSE last sale, see 1984 DOT Release) as the reference price, instead of the best bid and offer of all ITS participants (see 1985 DOT Release).

61/ The NYSE estimated that in 1986, 92% of all DOT orders were executed and reported back to the originating firm within two minutes. For the first quarter of 1987, that figure remained at 92%; for the second quarter of 1987, the figure was 94%. See letter from Santo Famularo, Assistant Vice President, NYSE, to Brandon Becker, Associate Director, Division of Market Regulation, SEC, dated October 6, 1987.

62/ Until 1984, the order eligibility size had been 599 shares for "day" limit orders--those limit orders in effect only for the day on which they are placed -- and 5,099 shares for "good 'til cancelled" limit orders -- those limit orders in effect indefinitely, or until cancelled by the order-entry firm.

63/ Firms must make special arrangements with specialists for these larger orders.

members to enter buy or sell orders quickly in a large number of securities by having previously identified the specific securities to be included as a part of the package. Indeed, member firms, through personal computers located in their offices, can modify their particular package of securities for execution on an intra-day basis.

Parallel to the development of enhanced systems for routing orders to the NYSE, the Exchange also has undertaken to automate the procedures for handling orders received by the specialist. For the majority of stocks listed on the NYSE, each specialist maintains a so-called "limit order book." This book is a physical book for recording limit orders received at particular prices. As such, using this book is manually intensive because a specialist must receive orders on paper and physically record the order tickets received. Moreover, when an order is executed out of the limit order book, the order must be manually reported back to the member firm. The NYSE, however, has been expanding the use of electronic display books, replacing handwritten limit order books. ^{64/} With the use of the electronic display books, orders are electronically received through DOT, ^{65/} displayed on the electronic book, stored or executed (as the case may be), and electronically reported back to firms with limited manual intervention by the specialist other than to enter the execution price. Such electronic systems greatly increase the efficiency of order execution, helping eliminate paperwork and processing errors.

c. How DOT Operates

Before discussing the processing difficulties that occurred during the market break, we detail the specific mechanical procedures used for orders received through DOT. After a DOT order goes through the CMS, it is validated and assigned a unique turnaround number bypassing the member firm's booth. First, if a market order is for a security with an electronic display book, it will be directed to the Post Support System ("PSS"), which will then route the order to the appropriate display book. In contrast, a market order for a stock still traded in the paper environment, and any limit order or ITS commitment to trade (regardless of whether the stock is traded in the display or paper environment) must be routed through a Universal Floor Device Controller ("UFDC") printer on the exchange floor. A card printer at the appropriate specialist post prints an incoming order on a machine readable mark-sense card. The order is handled by a clerk, passed to the specialist who executes the order and returns it to the clerk; the clerk marks on a mark-sense card the turnaround code, price, number of shares, and the name of the broker on the other side of the trade. The card is then placed in a card reader connected to the CMS. Using the turnaround number, the system retrieves the original order data, and generates and transmits an execution report to the member firm.

The card printer can print out only a limited number of messages per second; thus it is a critical stress point in a busy market. At each of the 14 trading posts, there are eight active printers and two emergency printers (the emergency printers generally are used to print queues that may develop or to replace any active printers

^{64/} As of December 1987, approximately 600 of the 2,000 NYSE issues, including 190 to 200 of the most active stocks, were on electronic display books.

^{65/} Currently limit and ITS orders still must be printed and manually delivered to the specialist posts.

that stop functioning, for example, because they temporarily have run out of paper). Each printer, which generally supports two or three specialists, is capable of printing only 10 to 12 messages per minute, depending on the length and type of message. The NYSE indicated that, before October 19, the queuing of orders and messages on the printers only occasionally created short delays at the printers.

d. DOT Operations During the Market Break

The average NYSE daily trading volume in September 1987 was 175 million shares;^{66/} by comparison, on Monday and Tuesday, October 19 and 20, the volume was 608.3 million and 613.7 million shares, respectively. ^{67/} For purposes of analyzing the performance of order routing and execution on the NYSE, it is important to focus on statistics regarding numbers of orders, ^{68/} and, accordingly, the amount of message traffic that DOT was required to handle.

In September 1987, DOT processed an average of 138,600 orders daily; on October 19 and 20, 1987, DOT processed 471,513 orders and 584,992 orders, respectively. Each of the various DOT components could handle only finite numbers of messages generated by these orders, including any related administrative messages: delays occurred when the numbers of messages exceeded the maximum capacity. In general, the UFDC printer message traffic exceeded the limit. The UFDC printers collectively can handle 68 messages per second, but the printer capacity was exceeded during high order

^{66/} In September 1987 the volume of trading through DOT averaged 128,500,000 shares daily, contributing to about 73% of the trading.

^{67/} On October 19 and 20, the volume figures for trading through DOT were 324 million and 419 million shares, respectively, contributing to about 54% and 70% of the trading volume, respectively.

^{68/} Because reported trades may involve the execution of two or more separate orders or transactions, particularly at the opening, and because of the "active stock" feature of DOT that groups small market orders and prints out a "bunched" order, reported trade statistics are a significant factor in an evaluation of how the NYSE handled post-trade activity.

periods, 69/ therefore delaying market orders in paper environment stocks, 70/ and all limit and ITS orders. 71/

Market orders, particularly in the stocks still traded in the paper environment, were delayed due to the message traffic at the printers. 72/ The average number of messages fluctuated more broadly on October 19; accordingly, there were more peaks at certain times to cause queuing at the printers. By noon on October 19, close to one of these peak periods, the NYSE reported that the printers created delays of 45 to 75 minutes in both market and limit orders. Even during the periods of heaviest trading, according to the NYSE, on average, 80% of incoming orders were executed in three minutes or less, and 95% were executed in ten minutes or less. 73/

The NYSE reported that the only market orders not executed were those to sell short. 74/ Specialists were unable to fill orders to sell stock short because the prices

69/ It has been difficult for the NYSE and the Division to ascertain the times or lengths of delays in the routing of market or limit orders that resulted from excess traffic at the printers. The printers in different areas of the trading floor were affected at different times, and no specific records set forth information about the times or lengths of delays.

70/ Although the printing queues created the most significant problems, the voluminous order flow also caused other related difficulties. For example, disk space for the storing of information was exhausted. In addition, the heavy volume demonstrated the shortcomings of certain software, which had to be corrected. Therefore, there were some delays in order execution even in market orders in display stocks.

71/ As discussed *infra*, ITS orders also had an impact on DOT activity because all ITS orders must be printed. The printing queues at the UFDC paper switch were frequently so large that the majority of incoming ITS commitments to trade expired before they were routed to the appropriate specialist. Because of the fast market conditions, ITS orders continued to pour into the NYSE. Because the commitments already had expired by the time they reached the appropriate specialist's post, these commitments and any other accompanying messages such as queries or error messages were a further burden on the UFDC.

72/ The NYSE has indicated that there were no problems with OARS (the component of DOT that handles orders received prior to the opening). Any difficulties in opening individual stocks resulted from order imbalances.

73/ The NYSE indicated that once market orders were printed, there was no excess message traffic to create any further delays in order execution.

74/ The NYSE has stated that it cannot substantiate any "rumors" of missing orders.

were falling consistently throughout most of October 19 and 20 and short sales are not permitted while the price, or last "tick," is falling. 75/

With limit orders there were delays that lasted for over an hour, in both paper and display book stocks, 76/ again due to message traffic at the printers. In general, the delays in limit orders were more extensive than those in market orders, because the specific software mechanism enabling firms to cancel limit orders or to cancel and replace limit orders did not function properly. 77/ Although normally there is more market order traffic than limit order traffic, on October 19 and 20, DOT handled twice as many limit orders as market orders. Because all limit orders must go through the UFDC, all of this extensive limit order traffic was subject to delays. The LMT system stopped receiving orders one half hour before the market closed on October 20, because the system's memory capability had been exceeded.

e. Execution Reports

Although there were few system difficulties, interviews with member firms clearly indicate that the heavy trading volume contributed to problems in specialists' disseminating execution reports on a timely basis. 78/ On October 19, trade reports in certain electronic display book stocks, such as General Electric Corporation, American Telephone and Telegraph Company, and Union Carbide Corporation, were either delayed

75/ Rule 10a-1 under the Act generally provides that a person may sell a stock short only at: (1) a price above the price of the last sale (at a "plus tick") or (2) the same price, if such price is above the next preceding different price (at a "zero-plus tick").

76/ In particular, specialist posts 8 through 11 were delayed on the limit side, because a number of active issues, (such as American Express Company, Ford Motor Company, General Electric Company, International Business Machines Corporation, and Johnson & Johnson) traded at those four posts.

77/ The NYSE was in the process of converting the handling of odd-lot orders from the older APARS to the new APARS II before the market break. See supra. The APARS system for odd-lots was not able to handle the more than 13 messages a minute that it received; the frequent excess capacity created significant queues. The APARS feature that was designed to keep specialists advised of the extent to which they had bought or sold stock did not work adequately. For example, specialists did not receive reports of their positions as of the close of the day on October 19 until 2:00 p.m. on the next day. Thus, specialists who had been required to buy the many odd-lots of stock that investors offered to sell because of the declining market, lacked important information about their inventory accumulations, and, specifically, they had to make determinations as to how to open their stocks on October 20 without knowing how much stock they owned. In addition, the odd-lot system failed to execute and report many orders on October 20.

78/ NYSE member firms responding to the Division survey indicated that the firms had experienced numerous and sometimes severe delays in receiving execution reports from DOT, regardless of the kind of order -- market, limit, or odd-lot.

or not sent out at first; approximately 5,000 to 9,000 reports of executions were lost and had to be recreated on paper and dispatched to the member firms.

f. Proscriptions on Members' Program Trading

Starting on October 20, in an attempt to alleviate order execution problems, the NYSE requested that its members not use the DOT List processing feature for any program trades. This request was a response to the fact that List orders on October 19 accounted for approximately 25% of total DOT orders. While DOT orders actually increased on October 20, the staff believes that without the NYSE's action, queuing of DOT public orders would have been much greater.

As of November 3, the NYSE permitted members to execute program trades over DOT prior to the opening, whether for their own accounts or for customers. On November 9, members were allowed to use DOT to execute orders for program trades throughout the day.

3. Amex's PER System

The Amex's Post Execution Reporting ("PER") System uses the same computer hardware and is generally similar to DOT. PER electronically routes market and marketable limit orders of up to 1,000 shares 79/ from participating member firms^{80/} to the post on the floor where the security is traded. Once executed by the specialist, a transaction report is automatically routed back to the initiating member firm. Unlike some exchanges' automated systems, Amex's PER does not have the ability to execute trades automatically. The Amex has instituted "AUTOPER," however, to facilitate execution upon the order's arrival at the post. AUTOPER enables specialists to enter execution data into PER by using touch screen terminals, 81/ rather than executing by manual reporting on mark cards.

Normally, PER delivers orders and execution reports for 10,000 trades a day. Although PER averaged approximately 25,000 trades on October 19 and 20, 82/ it

79/ In July 1987, the Commission approved a proposal by the Amex to increase the size of eligible market and marketable limit orders from 1,000 to 2,000 shares. See Securities Exchange Act Release No. 24668, 52 FR 25677. As of December 1987, however, the Amex had not implemented these increased trading parameters.

80/ Approximately 80 Amex member firms utilize PER. All specialists on the Amex floor are included on the PER system and all issues are eligible for PER routing unless quotes become lower than 1/16th.

81/ "Touch screen" terminals display the incoming PER orders and, as the name implies, permit each order to be executed by the specialist touching the screen where the order is displayed.

82/ On October 19, PER facilitated the execution of 23,583 orders representing 8,599,907 shares of the day's volume. On October 20, PER facilitated the execution of 26,002 orders representing 8,994,440 shares. In comparison, the September 1987 daily average of executed orders facilitated by PER was 8,329 and volume reached 2,760,133 shares.

experienced relatively few problems. On the front-end, orders entered the PER system from the participating member firms with no reported problems. Once in the system there was no queuing of orders, with one exception. On October 19, at 3:49 p.m., the PER system was shut down for the remainder of the trading day while the computer disk was changed. Orders queued in the system were returned unexecuted to the member firms initiating the orders.

Volume-related problems that may have caused delays in turnaround time, *i.e.*, the time from which the order is entered into PER to the time when the order is executed, arose at the point of execution with AUTOPER. The problems involved the priority of orders on the system and the temporary elimination of the use of AUTOPER touch screens to execute orders by some specialists. The specialist's AUTOPER screen displays up to six orders entered through PER at a time. When the screen is full because orders are entering the system faster than they can be executed, orders begin printing out on paper tickets in the order they are received by the PER system. After an order is executed on the screen, the next order not already printed in hard copy is displayed on the screen. Thus, the specialist must rely not only on the screen but on the paper tickets to ensure that orders are executed in proper priority and sequence. Many specialists turned off their screens during the week of October 19 so that all orders were printed in hard copy, creating less chance of error. ^{83/}

Although switching off AUTOPER so that all orders were printed on hard copy alleviated potential errors, it resulted in execution delays because all orders then had to be manually executed without the use of the touch screen. During this time, the specialist was required to mark transaction cards manually to execute orders, that were then inputted into the PER system by a clerk, rather than executing orders by simply touching the screens. Although the Amex does not have statistics on the delays this may have caused in execution, it is clear that the time for execution of PER orders increased. This delay is reflected in a comparison of turnaround times between normal days and the days of extremely heavy volume, such as October 19 and 20. ^{84/} For the month of September, 88% of the orders entered through PER were turned around within three minutes. On October 16, the turnaround percentage was 88.1%. On the 19th, 20th and 26th, the three minute turnaround percentages were 68.7%, 64.7%, and 72.1%, respectively. In comparison, the turnaround percentage from the time the order entered the system and a report was received by the member firm, measured by a fifteen minute interval, was 71%, 67%, and 72% for the 19th, 20th, and 26th, respectively. The switch from AUTOPER touch screens to manually marked cards for execution entailed the use of clerks and resulted in the elimination of automatic transmission of execution data, and probably resulted in an increase in uncompleted trades. ^{85/} Amex has indicated it has no plans to deal with the problems caused by switching to a manual system without AUTOPER and believes that PER generally worked well during the weeks of October 19 and 26.

^{83/} The Amex has no statistics on how many specialists chose to execute trades manually during the week of October 19.

^{84/} The standard by which turnaround time is rated is three minutes from the time the order enters the PER system.

^{85/} See analysis on uncompleted trades in Chapter Ten.

4. Analysis of DOT and PER Performance

The Division believes that although the NYSE's automated systems generally work well to ensure prompt and effective order routing and execution services under normal market conditions, they were not adequate to respond to the increased message traffic in October. Although this conclusion is obvious in hindsight, the important point for the future is for the NYSE to redouble its efforts to improve the processing of message traffic. Specifically, the NYSE must undertake further efforts to upgrade its order-handling equipment to prevent the problems described above from recurring during periods of high volume. ^{86/} The Division is aware that the NYSE has appointed an Operations Advisory Committee to examine whether new systems and technological upgrades are appropriate, and we encourage the activities of this committee and any other efforts to advance the efficiency of the NYSE order-routing systems.

In particular, the Division encourages the increased movement of stocks to electronic display books. We note that 190 to 200 of the NYSE's most active stocks are now traded in the display environment and that, by mid 1988, there will be 350 display books, covering 1,000 stocks. In addition, by that time the NYSE anticipates that it will have completed a connection between the electronic display books and the LMT system, so that limit orders no longer will have to be printed at the UFDC. We also stress that, to improve the flow of order traffic for stocks in the paper environment, the Exchange needs more printers that can operate at higher speeds. The Division believes that the DOT system as a whole should be able to process high volume efficiently and effectively as more stocks are electronically displayed. Other modifications, such as default executions of ITS orders in fast market conditions, discussed *infra*, should improve DOT operations overall.

Amex's PER system, which only routes orders, generally worked well, although the system did evidence the problem discussed above. As noted, the switch off AUTOPER caused execution delays. We believe Amex should examine the systems problems that caused the specialists to shut off AUTOPER and the resulting delays. Amex should address these problems so that it can deal effectively with future volume surges.

The Division is also considering expanding its oversight program to include periodic review of NYSE and Amex order-routing, execution, and support systems in general, to ensure that these critical exchange operations may perform more efficiently and effectively in the future.

5. MSE's MAX System

The MSE's Midwest Automatic Execution ("MAX") System routes market and limit orders of up to 1,099 shares to specialist posts, and guarantees execution of orders up

^{86/} In early 1987, the NYSE had decided to accelerate its technological developments, and anticipated that its automated equipment would be prepared to handle trading days of 500 million by the end of 1988, 600 million by the end of 1989, 700 million by the end of 1990, and 750 million by the end of 1991.

to 1,099 shares at the ITS best bid and offer. 87/ In general, under the MAX system, an order is entered electronically into the system from the office of an MSE member firm. 88/ After entry, the MAX system automatically determines a price at which a MAX market order would be executed based on the ITS best bid and offer available at the time the order was received by the system, and then routes the order to the trading post of the MSE specialist responsible for handling trading in the particular security. The order, together with its projected MAX execution price, is then displayed on a video terminal at the specialist post for 15 seconds to permit the specialist to improve upon the execution price. 89/ If the specialist does not intervene within this 15 second period, the order will be automatically executed against the specialist at the previously determined MAX system price. 90/

During the week of October 19, the MSE handled nearly triple the number of transactions of an average week. 91/ The MSE experienced a similar dramatic increase in the number of transactions executed on the MAX system, 92/ with preliminary MSE

87/ The MAX system allows individual specialists to increase the maximum size limit for orders that will be eligible for routing and automatic execution under the MAX system. All MSE specialists are on the MAX system. In addition, currently 1,225 issues are MAX eligible.

88/ Currently, 60 MSE member firms are directly connected into the MAX system. In addition to orders entered on the MAX system from the offices of member firms, 15 floor brokers, employed by member firms that use the MAX system, have terminals on the MSE floor that permit them to enter orders directly into the MAX system. These terminals also may be used to enter orders from any other MSE member firm.

89/ If a MAX order is a market order and the ITS best quotation spread between the bid and the offer is 1/8 of a point and the stock is quoted with a minimum variation of 1/8 of a point, the order will be immediately executed without first being displayed at the specialist's post because the market price cannot be bettered.

90/ Limit orders entered on the MAX system are executed automatically for their full amount when the limit order price is penetrated in the primary market for the particular security. Where such primary market trades occur at the limit price MSE specialists are only required to execute 300 shares of the limit order at the limit price for every 500 shares traded on the primary market. This function is not automatic on MAX and must be done manually by the specialist. See Securities Exchange Act Release No. 22073, (May 23, 1985), 50 FR 23216.

91/ See note 96, infra. See also Chapter Four and Appendix F which discusses trading on the regional stock exchanges.

92/ MSE specialists and floor brokers stated that they believe one reason for the increased order flow on the exchange during this period was that their regular customers, who normally route only a fraction of their order flow to the MSE, sent MSE up to 100% of their orders because of the difficulty and delays encountered in executing orders on the NYSE. These specialists also stated that the type of orders that were executed on the exchange during this period were mostly smaller retail orders rather than the larger block trades that generally

data showing 25,653 trades being executed on MAX on October 19, 30,203 on October 20, and 31,056 on October 21, compared to 8,982 as the daily average trades for September. MSE officials also stated that, because of perceived slowness in updating quotes at the primary market ^{93/} and the inability of specialists to obtain access the primary market at many times on October 19, they decided to reduce the MAX automatic execution limits for all stocks to a maximum of 1,099 shares irrespective of whether a specialist had a previous agreement to guarantee larger size orders. When this condition worsened as the day progressed, the MSE dropped the MAX automatic execution limit again, this time to 599 shares. MSE officials stated that they felt these steps were necessary in order to reduce the risk to specialists. This level was kept in place until October 26 when the MAX automatic execution limit was raised back to its normal levels of 1,099 shares for all specialists. ^{94/}

MSE officials estimated that their computer system can handle a total capacity of 30,000 to 40,000 transactions a day. ^{95/} That capacity was exceeded on October 19, 20, and 21. ^{96/} As a result of the increased order flow, and the increases in the number of last sale transactions and quote changes received on the system, the MAX system experienced system delays on October 19, 20 and 21 for as long as 41 minutes during peak periods, with average delays ranging from 15 to 20 minutes. ^{97/} The delays were experienced in the time it took for orders to be transmitted from the front-end portion

account for the majority of the volume on the MSE. While some block trades were executed on the MSE during this period, the specialists stated that these trades tended to be from regular customers and were not routed away from the NYSE.

^{93/} See Section A of this chapter discussing Market Information Systems.

^{94/} From October 20 through October 30, no MAX specialist went higher than 1,099 shares. In addition, as of November 6 only 132 issues were above the 1,099 minimum limit as compared to 604 issues with limits higher than 1,099 on October 16.

^{95/} Because the MSE's front-end computers receive both MAX and non-MAX orders, the capacity figure noted above represents total order capacity, not just MAX order capacity.

^{96/} MSE handled a total of 37,424 trades, 46,722 trades and 48,771 trades on October 19, 20, and 21, respectively. MAX executions represented more than half of these trades. See the chart at the end of this chapter which sets forth the number of MAX trades executed on the 16, 19, 20 and 26.

^{97/} MSE also had similar system delays on October 26. No further delays were encountered in the system after Wednesday, October 28. In addition to delays encountered with MAX, MSE officials stated that some MSE member firms using ADP service lines for entering orders into the MAX system encountered queuing delays of several hours over the ADP lines before their orders reached MAX on October 19, 20 and 21. Those member firms were also unable to receive reports of orders executed on the MAX system and transmitted over ADP on these same dates. See discussion of ADP related problems in the section on order entry systems, supra.

of the system, where orders are received from member firms, 98/ to the back-end part of the system where orders are executed based on the ITS best bid and offer. Once an order reached the back-end portion of the system, however, it was priced within two to three seconds and then was subject to automatic execution within 15 seconds if it fell within the reduced automatic execution limits for MAX. If the size of the order was higher than the reduced MAX limits, it was delayed approximately four to five minutes to be manually executed by the specialist.

Because orders are not priced until they reach the back-end part of the system, the front-end delay can result in an execution price significantly different from what would have been received if there had been no delay. For example, an order to sell 100 shares of IBM entered at 3:00 p.m. on October 19, would have received an execution price of approximately 116 if priced immediately, but a price of 107 if executed at 3:40 p.m.

In an effort to reduce delays, the MSE took a number of steps during the week of October 19 to speed up the system by removing some normal checks and backups from the front-end system. These steps included eliminating the normal logging for ITS transactions, CQS quotes, and CTS last sale reports, 99/ and shutting down the Backup Order Delivery System ("BODS") which would have been used to provide a backup record of orders in the system in case of a hardware failure in the main front-end system. 100/ MSE operations officials stated that all these systems were restored to service on October 28. In addition to the temporary elimination of some checks and backups, in order to increase the front-end system's capacity, by October 26 the MSE was able to add a third computer to the two already in use for the system. 101/ MSE

98/ The front-end system functions basically as a communications processor. It has three main functions: (1) it receives MAX orders and sends the orders to the back-end system for pricing and execution; (2) it receives last sale reports from SIAC, logs them in, and sends them to MAX; and (3) it receives quotes from SIAC, logs them in, and then sends them to MAX where they are used to calculate the ITS best bid and offer on a continuous basis. In addition, once a MAX order has been executed, the front-end system transmits a report of the completed order to the MSE member firm that entered the order.

99/ The MSE stated, however, that they did not eliminate logging of MAX orders from the front-end system.

100/ MSE officials stated that if a hardware failure had occurred on the main front-end system during the period when BODS was shut down, approximately four minutes of orders would have been lost. They pointed out, however, that if such a loss had occurred it would have been possible (in about one day) to reconstruct the lost orders from logged order entry records from the front-end system.

101/ In addition to the delays encountered on the MAX system, beginning on October 19 the MSE also exceeded the capacity of the computerized files that maintain the records of executed trades. As a result of this, the MSE was forced to add additional trade file storage capacity to their system, increasing its capacity from 40,000 records on October 19 to 50,000 records by October 26, and 55,000 records by October 28. MSE officials stated that they are in the process of adding additional capacity to this computerized file system.

operations officials stated that as a result of the improvements made to the MAX system since October 19, the system now has the capacity to handle approximately 50,000 MAX and non-MAX transactions daily. 102/

According to the MSE, on October 19 five large MAX users were contacted by MSE staff and informed of the reduction in MAX automatic execution limits. The firms were advised that the MSE's computerized order file was approaching capacity and that, if its capacity were exceeded, they would be required to input trades manually and that the MAX system would not be able to send execution reports automatically. Firms were told that if they were unwilling to accept that risk, they should route their orders to another market. In response to this notification, one firm chose to reroute orders for a short period. The other firms continued to route to the MSE. Due to MSE's efforts to expand its computerized files during this period no firm was required to input manually during this period.

The MSE also stated that when it received quotes from a stock's primary market that had been designated as "non-firm" or "fast market quotes" by that exchange, and thus were not binding on the quoting market and could not be used in the calculation of best bid and offer for the MAX system, it dropped the automatic execution limit for such stocks to zero. 103/

Further, because of their concern with the accuracy of quote information received during the weeks of October 19 and 26, MSE officials deleted suspect quotes from the MAX system. According to MSE officials, when they received administrative messages from SIAC or an ITS participant indicating quotation system delays or ITS delays from a particular exchange, they purged all quotes from that exchange for the period indicated in the administrative message. 104/ Purged quotes, however, continued to be displayed

102/ The major capacity increases did not occur until the week of October 26, when the third computer was added to the front-end system. Although there were some slight improvements in MAX's capacity on October 20 and 21 due to the enhancements on October 19, these did not have a significant effect on queuing and delay problems because of continued increased order flow. The MSE did indicate, however, that it could have handled the order flow of October 19, 20, and 21 without significant delays with the capacity enhancements they had installed over the weekend on October 24 and 25.

103/ MSE data indicate that MAX automatic execution limits were reduced to zero for 2 stocks on the 19th, 9 stocks on the 20th, 7 stocks on the 21st and the 22nd, no stocks on the 23rd and 26th and 9 stocks on the 27th.

104/ MSE officials stated that quotes from a stock's primary market are never purged from the MAX system for best bid and offer calculation; only regional market quotes are purged under such circumstances. Where quotes from a primary market were suspect, or were the subject of such administrative messages, the MSE would simply drop the MAX automatic execution limit for the effected stocks to 0 and allow MSE specialists to manually price MAX trades in some stocks. MSE officials stated that quotes suspected to be inaccurate from other regional exchanges or NASDAQ were purged nine times during the weeks of October 19 and 26. Specifically: on October 19 quotes were purged four times, once from BSE and Phlx and twice from NASDAQ; on October 20 NASDAQ quotes were

on the MSE's other floor display systems and thus were available to specialists and members on the floor.

Suspect quotes also can be purged under a second method in which a specialist complains to MSE floor officials that quotes on a particular stock continue to be bad. Under such circumstances, if MSE floor officials can confirm that a quote from a regional exchange in a particular stock is substantially out of line with the primary market quote and that MAX automatic executions have occurred based on such a quote, MSE officials can purge the quote. 105/ After a quote has been purged under this method, MSE will contact the regional exchange and request an updated quote.

Since the market break, MSE officials stated that they have continued their efforts to increase the capacity of the MAX system, including the ability to increase peak capacity with existing hardware, and to improve the communications capacity with firms from which MAX orders are transmitted. In 1988, the MSE intends to add additional disk drives for data and communications backup and faster computer processors. By year end 1988, MSE hopes to be able to handle a maximum of 50 million shares per day and 60,000-70,000 transactions per day. In addition, the MSE has developed a better system for measuring the capacity of its equipment, allowing it to predict more accurately the capacity of its computer and data network.

6. Phlx's PACE System

Phlx's Philadelphia Stock Exchange Automated Communication and Execution ("PACE") System 106/ automatically executes orders of up to 599 shares at the ITS best bid and offer and routes up to 1,099 shares or higher by agreement between specialists or member firms. 107/ According to exchange officials, the unusually heavy volume of

purged twice; on October 21 PSE quotes were purged twice; and on October 26 NASDAQ quotes were purged once for over a three hour period.

105/ MSE officials stated that although quotes for some stocks were purged under these circumstances during the week of October 19, they had no written records of what quotes were purged, the affected stocks, or the date and time of such purges.

106/ There are 27 member firms that participate in the PACE system. Twenty four specialists participate on PACE and 950 stocks are eligible for PACE executions.

107/ The PACE system is a non-order exposure system; that is, an order transmitted to the Phlx trading floor via PACE is not displayed to a specialist before execution. Thus, the specialist cannot intervene to improve the price at which the order is executed in the system, even if a superior price is available on the Phlx trading floor at the time the order is received by the system. After an order is executed, the system automatically generates an execution report which is then sent to the entering firm. We note that the Commission has expressed concern over the PACE system's lack of order exposure to specialists prior to automatic execution and has encouraged the Phlx to modify the system to permit an exposure period similar to those of SCOREX and MAX that would allow for the price of orders to be bettered for some minimum period of time. See Securities Exchange Act Release No. 19858 (June 9, 1983), 48 FR 27872, n. 13 and accompanying text.

orders routed to specialists through PACE disrupted the system's automatic execution and execution reporting features, resulting in delayed order executions and delayed execution reports. In addition, Phlx specialists and officials complained that PACE orders were being executed at incorrect prices due to what they believed to be stale quotes from the NYSE. ^{108/} This resulted in Phlx moving to manual execution. As discussed in more detail below, queuing problems in the PACE system, which prices orders before the specialists see the order, also caused specialists to be concerned about their exposure and risk and to request a switch to manual execution.

On October 19, the system encountered substantial delays in the execution of orders. Exchange officials attributed the execution delays to queuing, which developed as a result of a rapid increase in the volume of orders entering the system. ^{109/} Normally, market orders routed to PACE are executed within 30 seconds. Shortly after execution, under normal conditions, the order and the price at which it is executed is "shown" to the specialist on a terminal screen through a system called PACE View. Due to the increase in the number of orders entering the system on the 19th, however, queues and delays occurred in two places. First, orders being routed by member firms for automatic execution into the system were delayed in being priced and executed due to queues. In some instances, orders were queued for up to 75 minutes before actually entering PACE and being priced. Second, there were significant queuing delays in moving the executed order and its price through PACE View to the specialist post. These delays ran up to one hour. As a result the specialist would not know what orders he had executed at a given price for a substantial period of time, by which time the market may have moved down drastically. In addition, the Phlx specialists believed that they were required to take larger principal positions than they normally would, because of the high volume of orders. ^{110/} The risk resulting from these positions was exacerbated, in the opinion of Phlx specialists, by their uncertainty regarding NYSE quotes. Therefore, they believe that the execution prices called for under the PACE algorithm often did not reflect current market conditions. Finally, as discussed in the section on ITS, the ability of Phlx specialists to lay off principal positions on the NYSE was made more difficult by delays on ITS. ^{111/} Despite these problems on October 19, PACE remained fully engaged on automatic execution throughout the day.

At approximately 3:00 p.m. on October 19, however, Phlx officials requested all firms to reroute orders to other exchanges in an effort to relieve traffic that had accumulated in PACE. According to Phlx, this request was based on concern that the system's file space would be exhausted prior to the 4:00 p.m. close, which would have resulted in system failure and the loss of orders. All PACE users complied immediately,

^{108/} See section on Market Information Systems, *supra*, which discusses quotes.

^{109/} Exchange officials noted that queuing was a major problem throughout the week of October 19. See chart at the end of this chapter showing volume on PACE and other systems.

^{110/} But see Section A(3) in Chapter Four on regional specialist performance which discusses specialist positions.

^{111/} As discussed above, the ability to lay off their positions, to the extent possible over ITS, was also reduced by the fact that the specialists may not have known what positions they had taken due to the delays in PACE View.

except for one local affiliate which remained on PACE somewhat longer than the other users because it had no ability to route orders to an alternate market. Because order flow into the PACE system was substantially reduced due to this request, Phlx believes it avoided a potential system failure.

The heavy system traffic also resulted in firms receiving late execution reports. As a consequence, firms using PACE on October 19 could not provide their retail customers with the status of their orders. One Phlx official noted that execution report delays varied from 10 minutes up to two hours on October 19.

On Tuesday, October 20, the traffic encountered by PACE was heavier than during the prior trading session. In addition, queuing problems persisted. At approximately 10:00 a.m. on October 20, Phlx officials decided to disengage PACE and convert to manual order executions. The conversion to manual execution was done essentially for two reasons. First, Phlx officials and specialists continued to question NYSE quotes and believed that automatic executions were occurring at different prices than the actual markets on the NYSE. Second, and perhaps most important, the conversion to manual execution was done to ease specialists' concerns and fears about their exposure and risk which were exacerbated both by ITS and PACE system delays. Because of the increased orders entering the PACE system, which, as noted above, automatically executes orders and then subsequently "shows" the execution and price to the specialist, the specialists believed they were required to take larger and larger positions and increase their risk. ^{112/} Nevertheless, specialists believed they would have difficulty in laying off these larger positions through ITS. Moreover, even if the specialists had been able to lay off some of their long positions, the queuing delays between the PACE system and PACE View made it difficult for them to accurately ascertain what their increasingly larger positions were on a timely basis.

Under manual mode, orders still were guaranteed execution at the ITS best bid or offer. ^{113/} Orders were priced, however, at the time the order was received by the specialist. Accordingly, manual execution allowed specialists to see the orders they were receiving and at what price they would be executed. The disengagement increased the workload for Phlx specialists and discussions with Phlx indicated that queuing delays for pricing and executing orders of up to an hour continued throughout the period PACE was on manual mode. Moreover, switching to manual mode disengaged the automatic reporting feature that sends execution reports to member firms. As a result, Phlx decided to dispense with reporting executions to PACE users until the close of business on the days the system was disengaged. ^{114/} Phlx believes this was necessary because manually issuing the execution reports during the trading day would have been

^{112/} We note that although our data indicates that some specialists bought and sold large amounts of stock on October 19 and 20, particularly in the blue chip issues we examined, closing positions were not particularly long on these days. See Chapter Four and Appendix F.

^{113/} Phlx noted, however, that in some cases orders did not receive executions at the best displayed markets in those instances where Phlx specialists believed quotes were questionable.

^{114/} The Phlx stated that specialists continued to report to CTA on a timely basis while the system was on manual.

work intensive and required additional personnel. The Division notes that, although other markets had delays in issuing execution reports, no other market refrained from making an effort to issue the reports during the day.

Despite the disengagement on October 20, Phlx officials indicated that the system continued to experience strains in handling the heavy order flow. Accordingly, at 11:30 a.m., Phlx requested the PACE users that send order flow through ADP to reroute. ^{115/} Because queues still remained after ADP rerouted their orders, by 12:30 p.m. Phlx had requested that all other users reroute their orders from PACE. Because PACE users rerouted their orders to other markets, Phlx noted that queues were somewhat reduced but still continued throughout the rest of the day on October 20.

Phlx officials continued to operate in the manual mode until Friday, October 23, at which time they switched back to the automatic execution mode. Because the reporting feature also was disengaged, the member firm execution reporting process began after 4:00 p.m. on the 21st and 22nd and continued until 12:00 midnight and 11:00 p.m., respectively, on those days. As noted above, on October 23, Phlx reverted back to its automatic mode even though there continued to be sporadic increased activity that caused queuing from 5 to 8 minutes. Finally, although on October 26 PACE experienced heavier than usual pre-opening order flow, the system was able to handle the strain and operate normally throughout the day and the rest of the week.

In response to problems during the market break, Phlx has developed a method that will enable the exchange to disengage the automatic order execution feature of PACE without disengaging the automatic execution reporting feature. Accordingly, in the future, if the volume of orders entered into PACE overloads the system resulting in a backlog of orders, stale quotes and delayed executions, Phlx officials can convert to the manual mode without disengaging the automatic reporting feature of PACE. This should ensure that PACE will provide an uninterrupted flow of execution reports to member firms and retail customers.

During the week of October 19, Phlx was unable to increase its systems capacity to reduce the queuing problems and delays that were occurring. The switch from automatic to manual execution did not cause significantly more orders to be executed faster, but simply allowed the specialist to see the order before it was priced and executed. Currently, the PACE system can handle only up to 10,000 orders per day. Phlx officials indicated that PACE had not experienced queuing problems prior to October 19. Nevertheless, at the time of the market break, Phlx was in the process of changing its computer systems to increase their maximum capacity. Phlx claims that, if the enhancements had been in place, it would have been able to increase the system's capacity when needed and could easily have handled the increased order flow during the week of October 19. Since the week of October 19, Phlx has accelerated its schedule for enhancing the PACE system and hopes to increase its capacity to 30,000 orders per day by the end of 1988.

^{115/} Phlx first requested ADP not to send orders through PACE because ADP represents about 17 firms and sends a substantial amount of order flow through the system. It was thought that removing ADP from the system would reduce order flow sufficiently to reduce queues. As noted above, however, this did not prove sufficient.

7. PSE's SCOREX System

PSE's Securities Communication Order Routing and Execution ("SCOREX") System routes orders from member firms to the PSE floor, and automatically executes customer agency orders of up to 1,099 shares at the ITS best bid or offer. 116/ The maximum order size for routing purposes is determined pursuant to agreements between specialists and member firms. 117/

During the week of October 19, SCOREX experienced severe operational problems due to increased equity volume. For example, on October 19, 22,410 trades were executed on SCOREX compared to an average of fewer than 6,000 per day in September 1987. The overloading was particularly acute at the opening because of the huge amount of information, including quotations, entering the PSE computer systems relating to the 1,000 SCOREX stocks and many other stocks not even traded on the PSE. 118/ PSE officials claimed that the heavy order flow was exacerbated because many firms started sending order flow to PSE once the NYSE's DOT system and other exchange routing and execution systems encountered delays. 119/ As a result, SCOREX was

116/ SCOREX orders are fed from member firm lines into one of the PSE's two CC-80 computers. The CC-80 is a communication processor that takes messages and routes orders into the SCOREX computer. Once in SCOREX the order is routed to the specialist post where it is assigned a price and "displayed" to the specialist for 15 seconds so that he has an opportunity to better the price. If no message is received back from the specialist to SCOREX in two minutes the order is executed at the assigned price. The executed order is then routed through SCOREX back to the CC-80, which sends execution reports back to firms via the firm's incoming lines and a hard copy of the executed order back through SCOREX to the specialist so he can confirm how many shares were executed and at what price.

117/ Approximately 32 firms are wired directly into the SCOREX system. Additional member firms use SCOREX through their floor brokers. Of the 1,300 stocks traded on the PSE, 1,000 are eligible to be traded through SCOREX. Any order entering SCOREX, other than for a "local" stock (*i.e.*, those stocks not listed on the NYSE or Amex), is directed to the San Francisco or the Los Angeles trading floors on an alternating basis. SCOREX is only used for routing purposes for local issues, and because there is only one PSE market maker in a local issue, the order is sent directly to the applicable floor.

118/ PSE's system receives information on stocks not traded on the exchange which then is filtered out. According to PSE, this non-usable information further clogged its computer systems.

119/ For example, as noted above, at 3:00 on the afternoon of October 19, Phlx asked member firms not to use its PACE system. According to officials at various exchanges, this resulted in order flow being transferred to other regional markets, such as the PSE. From our sample of firms, however, we have been unable to verify that as one system got overloaded, the firm switched its order flow to another regional system. The firms we contacted about this issue stated that they sent order flow to the NYSE's DOT system rather than another regional exchange when regional systems malfunctioned.

handling 250 orders per minute at some points on October 19, compared to an average for September 1987 of fewer than 25 per minute. The overload of orders in the "front-end" of SCOREX prevented orders from arriving at the "back-end" for execution by the specialists in a timely manner. PSE officials were unable to quantify those delays. They believe, however, that the delays varied considerably depending on the time of day and to which floor, Los Angeles or San Francisco, the order was being routed. PSE noted that orders routed to San Francisco were delayed more than orders routed to Los Angeles.

At the opening on October 19, 7,000 trades, the number often received in a full day, were queued. Due to systems overload, orders were lost at various times during the October 19 trading session because queues built up and orders started to "wrap" over other orders. Wrapping is much like recording over what already has been recorded on a cassette because the available tape has run out. Information lost due to wrapping either can be order information, that is, orders newly arriving in the system and not yet "logged in," or trade confirmation information ("retrieval information") on its way back out of the system to be processed. In addition, at one point during the day, the order retrieval portion of SCOREX was closed and had to be restarted, causing some retrieval information to be lost until later in the day. In addition, some orders were sent to San Francisco specialists even after they had been executed in Los Angeles. Although PSE has been unable to quantify the delays in receiving executions, we believe that for those orders that got through the system and were not lost due to wrapping, queuing problems significantly delayed their execution. PSE has indicated that, once an order was executed, delays in the receipt of execution reports by member firms ran up to one hour.

On Monday night, the Exchange relieved some of the strain on the PSE computer systems by eliminating the ticker that disseminates PSE trades to its floor. In addition, SCOREX was reprogrammed not to perform limit order alerts. These alerts are designed to warn specialists that the primary market quotes for a stock are approaching the bid or offer of a limit order on the specialist's book. It later was discovered that, due to a programming oversight, only half of the limit order alerts had been eliminated.

During the first three hours of trading on October 20, queues again built up, wrapping occurred, and order and retrieval information was lost. ^{120/} During the day, PSE officials began calling some of the larger users of SCOREX and asked them to refrain from using the system. The firms' general reaction was that they would not remove themselves from the system unless everyone did. They argued that they needed to use SCOREX because DOT was backed up and because their floor brokers were swamped with orders.

By October 21, the Exchange had eliminated all limit order alerts from SCOREX. During the morning, the same queuing problems started to develop. PSE officials, in an

^{120/} PSE noted that there were delays on the incoming lines bringing in orders from the member firms to the CC-80 communication processor. For example, during the first 3 hours of trading on October 20, delays, depending on the firm, ranged from 10 to 90 minutes. According to PSE, the delays varied depending on how much order flow the firm was sending to SCOREX.

effort to avoid any wrapping, called all firms that use SCOREX between 10:30 and 12:00 EST and told them not to use the system for order routing and execution or they would risk having their lines into SCOREX disconnected completely. Member firms complied with this "request," and due to a reduction in volume, 121/ the Exchange permitted firms to come back onto the system late in the trading day or the next morning. 122/

Due to a unique systems problem, SCOREX went down for about 14 minutes before the opening on October 22. At 9:01 a.m. EST, a large number of pre-opening orders entered the system at the same time, causing primary and back-up systems to fail. The Exchange officials who operate SCOREX had thought SCOREX had been programmed not to allow such a sudden rush of incoming orders. The system was brought back up at 9:15 a.m. Because the orders already had been "logged in," they were retrieved and later executed at the opening price.

By October 23, most firms still were not using SCOREX. 123/ The firms that earlier had been asked not to use SCOREX had decided to stay with other exchanges' systems and still were experiencing back office problems arising from their use of SCOREX earlier in the week (i.e., missing trade reports). Most of these firms had rerouted orders to DOT. Over the weekend and during the week of October 26, the PSE worked with firms to reconstruct orders lost because of wrapping and to research and report unreported trades. Using the firms' computer tapes indicating what trades had been sent to SCOREX, the PSE was able to execute the vast majority of orders lost due to wrapping at the price at which the trades would have been executed had the system not wrapped. In addition, using a combination of National Securities Clearing Corporation, firm, and PSE records, trades executed but not reported due to wrapping were reported. 124/ Many of the major firms were back on SCOREX by the last week in October or the first week in November, but average daily SCOREX order executions for the first and second weeks of November remained relatively low at 2,358 and 3,142 trades, respectively.

121/ SCOREX executed 8,700 trades, representing 2,257,100 shares. This is significantly less than the trades and volume for October 19 and 20, but still higher than the September daily average. See chart at the end of this chapter.

122/ After October 21, the PSE also established the so-called "five minute rule." This rule allowed PSE to "disable" broker lines if their San Francisco trade reporting printers backed up more than 5 minutes. Broker lines would be reactivated once processing returned to acceptable levels. PSE has indicated that this rule is no longer in effect and all lines are now active.

123/ On October 22 and 23, SCOREX only executed 965 trades representing 245,500 shares and 763 trades representing 282,500 shares, respectively.

124/ According to the PSE, some firms, rather than working with the PSE, simply filled outstanding customer orders themselves and took any loss. In addition, some firms were able on their own to reconstruct fills through a clearing report or clearing ledger entry. PSE claims that because they did not hear back from some firms it is impossible for them to estimate how many orders never were filled. PSE assumes that most orders were filled eventually, either from them or the firm directly.

In light of the problems experienced during the heavy volume periods, PSE officials have begun to upgrade and replace outmoded system components in order to enhance the capacity of SCOREX and PSE systems in general. PSE had estimated SCOREX's maximum capacity at approximately 25,000 trades. PSE officials noted that SCOREX had handled 25,000 transactions without problems on one day in the past and they were unsure if the system could handle a higher number of trades. PSE is currently in the early stages of a two year program to phase-in updated equipment that will increase capacity. PSE projects that by the end of the two year period SCOREX should be able to handle 50,000 trades under normal volume levels and up to 100,000 transactions on peak days. Further, until recently, there were two lines connecting the Los Angeles and San Francisco trading floors. In anticipation of increased volume and as part of an overall effort to upgrade PSE systems, a third line that was being added at the time of the October market break is now in place. A fourth line was installed in December 1987. In addition, systems officials have begun efforts to cope better with future volume surges by making it easier and less disruptive to exclude certain non-essential incoming data (e.g., information on stocks not traded on the PSE), to eliminate limit order alerts and to restart system components more quickly after they are closed unexpectedly. Finally, PSE officials claimed that they could have reduced significantly the strain on SCOREX by stopping it from calculating the best bids and offers. This would have required specialists receiving SCOREX orders to execute the orders manually using the best bids and offers displayed on their Quotron screens. 125/

8. Other Systems - BSE and CSE

a. BSE - Manual System

The BSE is unique among the regional stock exchanges because the majority of its systems are still manual and the exchange lacks an automated order routing and execution system. 126/ Without an automated system, the exchange attempts to draw order flow by requiring its specialists to guarantee trades up to 1,299 shares (or 2,500 if the issue is among the 100 most active or has been designated by its Market Performance Committee) at the ITS best bid and offer. 127/ Orders are routed to the BSE floor by BSE members, to a floor broker or the BSE "front desk." The front desk serves as an official floor broker, where employees of the exchange receive orders from BSE members and deliver them to the appropriate specialist for execution. There is also a small number of floor brokers, both affiliated and independent, that can receive orders from BSE members. Orders are routed to the floor either electronically or by

125/ This procedure would have been similar to the manual execution procedures adopted at the Phlx. See discussion of Phlx's PACE system, supra, in this chapter.

126/ The BSE is in the initial phases of introducing an automated system, BEACON (Boston Exchange Automated Communication and Order-routing Network), which will provide routing, execution and trade reporting functions. The proposal has been noticed for comment by the Commission but has yet to be approved. BEACON, however, currently receives, processes and distributes quotes and last sales to the BSE floor. See Securities Exchange Act Release No. 24187 (March 6, 1987), 52 FR 26612.

127/ See BSE Rules Chapter 2, Section 33.

telephone. 128/ Executed trade reports are delivered manually to the BSE Clearing Corporation for settlement, and to SIAC terminals on the floor for manual entry onto the Consolidated Transaction Reporting System.

Because it has a manual system, the BSE did not experience many of the problems suffered by other exchanges in order routing. When volume surged, the exchange was able to increase its staffing on the floor to accommodate the order flow. It was much easier to increase staffing quickly than to upgrade an automatic execution system on short notice.

The exchange and its specialists, however, did experience some problems due to the record volume received on October 19-23. 129/ First, as discussed in more detail in the ITS and specialist performance sections, the BSE specialists believed there were difficulties in laying off positions due to delays in the execution of ITS orders. Accordingly, BSE Floor Officials determined on October 19 at about 1:00 p.m. EST to suspend the 1299/2500 execution guarantee. From the 19th through the 22nd, specialists operated on a "best efforts" basis; that is they were not held to any execution guarantee limit. 130/ The BSE indicated that this policy was not officially communicated to member firms.

Second, the BSE experienced significant problems in reporting trades to the Consolidated Tape Reporting System and in issuing trade execution reports. As discussed above under Market Information Systems, because trade data from BSE must be entered manually on one of three terminals and accepted by SIAC before another trade can be entered, the large volume of trades caused the system to back up. According to BSE officials, these problems caused BSE entries to the Consolidated Transaction Reporting System to be 2 to 3 hours late on October 19 and 20.

The BSE also experienced significant delays in reporting executions to the upstairs firms. Even though the BSE was continually trying to key in the necessary information so that reports could be sent to the upstairs firms, input operators, entering trade report information, were backed up throughout the week of October 19 because of the extremely heavy volume. Accordingly, the BSE stated that execution reports to some member firms did not reach the firms until the end of the trading day or after. BSE further indicated that it tried to confirm executions for those firms that inquired during the trading day and some firms were able to get quicker confirmations through their floor brokers.

128/ Currently, six firms direct order flow to the trading floor through electronic transmission. The systems used to provide this service are not owned by BSE but are owned by the member firm or their vendors.

129/ For example, trading volume approximately doubled on October 19, (5,189,105) when compared to the average daily volume for September 87 (3,030,406). The same dramatic increases were also seen in the number of trades on the BSE. For the week of October 19 the average number of trades more than tripled (10,023) as compared to average daily trades for September 1987 (3,107).

130/ The BSE claimed that many specialists still guaranteed execution within the limit of 1299 shares even though they were permitted to operate on a best efforts basis.

b. CSE's - NSTS

The CSE executes orders automatically through its National Securities Trading System ("NSTS"). The NSTS is a system of users linked electronically. All CSE proprietary members have access to NSTS, as do access participants, who may utilize the system through the facilities of a member. Designated dealers are assigned one or more issues and every issue traded through NSTS has at least one designated dealer. The designated dealer is responsible for the automatic execution of public agency market orders and marketable limit orders, up to 2,099 shares, at the ITS best bid and offer. The designated dealer also is responsible for the limit order guarantee in his issues, which means that he must guarantee an execution of public agency limit orders when the limit order price is penetrated by a transaction on another (usually the primary) market. ^{131/} If an issue has two or more designated dealers, they rotate the responsibility for the small order execution guarantee on a daily basis.

CSE experienced substantially increased order flow during the week of October 19. According to the CSE, with two exceptions, the volume increase did not prevent the public from obtaining immediate executions at the ITS best bid and offer throughout the weeks of October 19 and October 26. CSE's small order execution system was non-operational for two hours on October 28 and three hours on October 29 due to a communications hardware problem. ^{132/} According to CSE, at all other times during the weeks of October 19 and 26 the public received immediate automated execution of orders. CSE, however, did encounter some pricing problems on October 19 and 20. According to CSE, for reasons it has not yet determined, NSTS executed orders at prices that did not appear to reflect the current NYSE market as reported over the consolidated tape. As a result, CSE designated dealers manually adjusted the prices of some agency executions.

9. Analysis of Regional Systems' Performance

The week of October 19 highlighted some significant flaws in the small order routing and execution systems of the regional stock exchanges. Obviously, these flaws have to be examined in the context of a level of trade volume on the regional exchanges that few could have anticipated. In addition, the volatile conditions in the primary market added a degree of uncertainty to the problems the regional exchanges were faced with during the week. Nevertheless, even considering these circumstances, most of the systems did not perform particularly well. The level of performance, however, varied across systems, and some exchanges responded more quickly to system problems that arose than others.

Although MAX had some queues and delays throughout most of the week of October 19, the MAX system appears to have performed the best of the regional small order systems. This may be due, in part, to the fact that MAX had the highest capacity going into the week of October 19 when compared to the other regional

^{131/} Away from the market limit orders are not executed automatically, but are executed manually upon the occurrence of a penetrating price transaction.

^{132/} CSE noted that the problem has since been corrected.

systems. 133/ In addition, the MSE proved most adept at quickly increasing the capacity of its system.

The SCOREX system performed particularly poorly, losing both orders and trade reports. In addition, the PSE asked members not to use its system on October 21. Essentially SCOREX was not a reliable or functioning system for most of the week of October 19.

The Phlx's PACE system also had significant problems. Phlx's decision to move to manual execution may have been unavoidable given the queues existing between the time of execution and the time the specialist became aware of the trade. Nevertheless, the decision to dispense with all execution reporting to member firms until after hours raises troubling questions. Although the manual mode disengaged the automatic reporting feature, Phlx was the only market to dispense totally with issuing trade reports to member firms until after trading hours. Even BSE, with an entirely manual system, continued to issue execution reports throughout the day, although its system was backed-up and had significant delays.

The MSE, PSE and PHLX have made or are in the process of making capacity enhancements to their systems so they can better handle the volume experienced the week of October 19 in the future. Quick implementation of these enhancements is critical, particularly for the PSE and Phlx. The week of October 19 demonstrated that those enhancements need to be implemented as soon as possible to accommodate unexpected volume surges. Indeed, the Division believes that, in light of the serious problems both these exchanges experienced, the Commission should consider whether to request both exchanges to refrain from adding any new firms to their systems until they have made progress in increasing system capacity. In addition, before adding new firms, regional exchanges should develop plans to ensure that firms using their systems or sending order flow to the floor are adequately informed in a timely manner of any problems, including reductions in guarantee limits and delays encountered on the exchange for executing orders and issuing trade reports. 134/

D. Intermarket Trading System

1. ITS Operations

The Intermarket Trading System ("ITS") is a communication system designed to facilitate trading among competing markets by providing each market with order routing capabilities based on current quotation information. Specifically, ITS links the

133/ During the week of October 19, MAX maximum capacity was 30,000 to 40,000 transactions a day for both MAX and non-MAX orders. SCOREX maximum capacity was estimated to be about 25,000 transactions per day and PACE's maximum capacity was about 10,000 orders per day.

134/ In addition, all of the exchanges should work on improving coordination among markets when their small order systems are down. Although difficult to confirm, many markets believed their problems were exacerbated when other markets told system users to use another market. Accordingly, we believe the exchanges should develop means of informing other markets when they decide to send their users elsewhere.

participant markets ^{135/} and provides facilities and procedures for: (1) display of composite quotation information at each of the participant markets so that brokers are able to determine readily the best bid and offer available from any participant for a multiply-traded security; (2) efficient routing of orders and administrative messages between market participants; and (3) participation, under certain conditions, by members of all participating markets in opening transactions in those markets.

Authorized in 1978, the ITS was a step in the creation of the national market system ("NMS") because it increased the opportunities for brokers to secure the best execution of their customers' orders. ^{136/} In addition, it enhanced market making competition by permitting regional specialists to attract orders from other markets by providing superior quotations and to more efficiently, and at a lower cost, lay off risk positions by selling stocks on primary markets. All major exchanges and the NASD are participating members. By the end of 1984, there were 1,169 stocks traded through the system; by the end of November 1987, the number reached 1,523. ^{137/}

2. ITS Transactions

As a general matter, when a floor broker receives an order to buy or sell stock that is traded on several exchanges, he will attempt to execute that order in the marketplace where the order is received, but he will compare the quoted market for the stock at his market location with the ITS quotation display that is continuously updated. If the ITS display indicates that a competing market is disseminating a superior bid or offer, the broker may send the order through ITS. Orders sent through ITS are referred to as "commitments to trade" ^{138/} and contain information such as the destination market, the name of the clearing corporation through which the trade shall be settled, specifications as to whether the commitment is to buy or sell, the number of shares, the price of execution and the time period during which the commitment is irrevocable. The commitment to trade is firm only for a fixed period of time. When most market participants receive a commitment, the specialist or market maker may either accept the commitment, which would result in an execution, or reject that

^{135/} The parties to the plan, or participants, are the Amex, BSE, CSE, MSE, NYSE, PSE, Phlx and the NASD.

^{136/} The ITS Plan ("Plan"), which governs the ITS operations, was first authorized by the SEC on a provisional basis on April 14, 1978, (Securities Exchange Act Release No. 14661 (April 14, 1978), 43 FR 17419) and permanently approved on May 6, 1982 (Securities Exchange Act Release No. 18713 (May 6, 1982), 47 FR 20413).

^{137/} The average daily volume of executed trades increased from 5,404 in 1984 to 8,612 in 1987, with 4,692,200 and 8,781,600 shares traded, respectively.

^{138/} Commitments sent to another market are referred to as "outgoing commitments" by the sending market and referred to as "incoming commitments" by the market that receives the commitment.

commitment. 139/ If the specialist or market maker does not act on the commitment, it will expire automatically within one or two minutes, depending on which market originated the order. 140/ Generally, commitments sent by regional exchanges are irrevocable for two minutes, whereas those sent by the NYSE expire after only one minute. NYSE typically receives 33% of the ITS commitments to trade from the regional exchanges and is responsible for sending out approximately 50% of the commitments. 141/

3. Pre-opening Procedures

In contrast to the routine procedures regarding ITS commitments sent or received during the trading day, special procedures apply at the opening. A pre-opening application must be sent through ITS whenever a market maker anticipates that the opening transaction will be at a price that represents a change from the stock's "previous day's consolidated closing price" 142/ of more than the "applicable price change." 143/ For example, if a stock's consolidated closing price was 34 and the market maker anticipates the opening price to be $34 \frac{3}{8}$, that market maker will have to send a pre-opening notification because the price change of $\frac{3}{8}$ is more than the applicable price change of $\frac{1}{4}$ for a stock of such value, as provided in the Plan.

139/ Rule 11Ac1-1 under the Act generally requires that quotations must be firm for the price and size disseminated. Thus, unless a market maker had just effected a transaction at his quote or was in the process of revising that quotation, he is required to accept the commitment. When the market is moving rapidly, however, specialists may indicate that their quotes are not firm and thus will not be held to their quotes.

140/ This expiration procedure applies to most participants except for the CSE and Bernard L. Madoff, Investment Securities ("Madoff") who have automated execution systems that will guarantee order execution. Madoff is the only third market maker and member of the NASD that uses ITS, and thus is the only representative of the NASD. Madoff trades for its own account; it does not deal with retail customers but services institutional clients. Madoff's access to ITS is through the NASD's Computer Assisted Execution System ("CAES"), an NASD order routing system. As for the CSE, when a commitment to trade is sent through ITS, the order will be routed through CSE's National Securities Trading System ("NSTS") switch, which will generate an acceptance (or rejection) on behalf of the designated dealer (the primary market maker on the CSE as defined in CSE Rule 11.9) for the ITS security being traded.

141/ In September 1987, for instance, out of a total of 216,819 commitments to trades sent through ITS, NYSE sent out 106,684 and received 77,666 from the other participants.

142/ The "previous day's consolidated closing price" is the last price at which a transaction in the stock was reported by SIAC on the last previous day on which transactions in the stock were reported by SIAC.

143/ "Applicable price changes" vary between $\frac{1}{8}$ and $\frac{1}{4}$ point depending upon the price of the stock.

Thus, to offset a pre-opening imbalance in a stock, a market maker will notify other participant markets of the situation by sending a "pre-opening notification" through ITS, and cannot open the particular stock until three minutes have elapsed. The pre-opening notification must include the following information: (1) a designation that the message is a pre-opening notification; (2) the identity of the exchange, the exchange specialist and the security; and (3) the applicable price range of the anticipated opening, which is not to exceed 1/2 to 1 point, depending on the price of the security.

Market makers from other participant markets will send "pre-opening responses," containing obligations to trade, including the number of shares and price that they are willing to trade. Based on the pre-opening responses, the market maker will allocate stock to the regional exchanges at the opening and set the opening quotations. 144/

4. Trade-through Rule

Since each participant may see the current bid and offer from every other member on the ITS terminal, it is also possible to see when a trade has been executed at a better price. The ITS trade-through rule states that, absent reasonable justification or excuse, a market maker should not purchase (sell) any security at a price that is higher (lower) than the price at which that security, at the time of such purchase (sale), is offered (bid) in one or more other participant's markets. The rule requires anyone who "trades through" another market's quotation to either break the trade or satisfy the other market's quotation. The rule does not apply under certain conditions, such as (1) when the size of the offer or bid traded through is posted at 100 shares, (2) when the trade-through is caused by a systems/equipment malfunction, (3) when the trade-through occurs during "unusual" market conditions, 145/ and (4) when a complaint is not received within 5 or 10 minutes (depending on whether the trade-through was an exchange or third market trade-through) after the trade-through transaction appeared on the tape. 146/

144/ The pre-opening rule also applies whenever a security that was subject to a "regulatory halt" resumes trading. "Regulatory halts," as defined in Part X of the CTA Plan, occur whenever the primary market halts or suspends trading for a security in the exercise of its regulatory functions. The primary market will halt or suspend trading if it determines that: (1) certain matters relating to the security or the issuer thereof have not been disclosed to the public, or (2) certain regulatory problems relating to the security should be clarified before trading is permitted to continue. The primary market shall notify other participant markets of such halts or suspensions. ITS Plan, Pre-Opening Application Rule, Section (b)(ii).

145/ Unusual market conditions are defined in Rules 11Ac1-1(b)(3) and 11Ac1-1(c)(3).

146/ See ITS Plan, Trade-Through Rule, Section (b)(3). In addition, the trade-through rule block application policy requires a person executing a block trade to send each participant that displays a better bid or offer a commitment to trade at the execution price and for the number of shares displayed, before the remainder of the block is executed.

5. Specific Problems and Members' Responses

During the October market break, the ITS experienced severe problems, most of which resulted from operational difficulties. ^{147/} ITS participants were concerned with the substantial number of expired commitments due to queuing problems, as well as with the lack of compliance with the pre-opening requirements of the Plan.

One of the major consequences of the unusually high volume of trades was the inordinate number of expirations of commitments. ^{148/} Because of the queuing problems (e.g., printer delays), ^{149/} the routing of ITS commitments from the regional exchanges through the UFDC ^{150/} to NYSE specialists often was delayed beyond the two minute expiration period during which ITS commitments may be executed. Therefore, during the high volume periods on October 19 and 20, some NYSE specialists never had the opportunity to accept regional commitments to trade because the orders had expired before they arrived at the post. Some regional exchange specialists, as a reaction to continuous expirations of commitments, turned to alternative methods to offset their exposure. ^{151/}

^{147/} During the October market break, however, ITS participants generally did not complain about trade-through and block trade policy violations. Based upon statistical information received from the various participants, it appears that the increased number of trade-through and block trade complaints during the market break was approximately proportionate to the increased volume of trades, unlike the unusually high number of opening and expiration complaints. While the number of complaints dealing with openings increased from a total of 27 for the entire month of September to 106 and 116 on October 19 and 20, respectively, the number of complaints dealing with block trades increased only from an average of about 6 per day in September to 8 and 11 on October 19 and 20, respectively. With respect to trade-throughs, the number of complaints increased from an average of 2 to 3 per day in September to 13 and 24 on October 19 and 20, respectively.

^{148/} Tables 7-1 and 7-2 demonstrate that the regional exchanges substantially increased the number of commitments sent to the NYSE (from a September daily average of 5,080 to a daily average of 12,616 on October 16, 19 and 20), while the number of commitments sent by the NYSE actually declined. Furthermore, as a percentage matter, the number of expired commitments increased substantially on both the NYSE and regional exchanges. But from a market making perspective, however, the NYSE expirations were far more significant to the regional specialists than the regional expirations were to the NYSE specialists.

^{149/} See discussion of DOT, *supra*.

^{150/} ITS orders sent to the NYSE are generally routed through a UFDC switch where they are printed out by a card printer and routed to the specialist.

^{151/} PSE specialists, for example, used floor brokers on the NYSE and executed trades manually. During the month of September, the average daily number of shares executed on the PSE through ITS was about 1,374,600. From October 19 through October 26, however, the average daily number was under 1,000,000, which indicates a higher number of unexecuted commitments, as well as a reluctance to use the system as a whole. At Madoff, trades were also executed through brokers on the NYSE floor. BSE specialists indicated their reluctance to use ITS (because they believed that the commitments sent to the NYSE would expire) and disregarded ITS for the week of October 19.

TABLE 7-1 NUMBER OF OUTGOING COMMITMENTS TO TRADE

	BSE		CSE		MSE		PSE		PHLX		NYSE *	AMEX *	NASD **	
	TOTAL	TO NYSE	TOTAL	TO NYSE	TOTAL	TO NYSE	TOTAL	TO NYSE	TOTAL	TO NYSE			TOTAL	TO NYSE
SEPT DAILY														
AVG	895	647	90	66	1,940	1,566	2,510	1,964	1,022	831	3,698	160	9	6
OCT. DAILY														
AVG	1,142	883	107	80	2,873	2,455	3,120	2,567	1,366	1,164	3,214	160	11	9
10/16	1,707	1,324	151	119	4,364	3,768	5,658	4,725	2,413	2,155	4,394	242	21	17
10/19	1,747	1,472	114	99	5,447	4,832	5,357	4,682	2,050	1,803	1,735	148	9	9
10/20	1,710	1,457	126	107	5,693	5,133	5,282	4,700	1,661	1,440	1,688	128	6	6
10/21	993	765	93	73	3,120	2,620	2,591	2,095	1,459	1,197	1,884	152	7	6

* NO ITS TRANSACTIONS TAKE PLACE BETWEEN AMEX AND NYSE
** THE FLUCTUATIONS IN THE NUMBER OF COMMITMENTS FROM THE NASD DO NOT ACCURATELY REFLECT THE FLUCTUATIONS IN THE MARKET

Source: NYSE

TABLE 7-2 PERCENTAGES OF EXPIRED COMMITMENTS TO TRADE

	BSE		CSE		MSE		PSE		PHLX		NYSE *	AMEX *	NASD **	
	TOTAL	FROM NY	TOTAL	FROM NY	TOTAL	FROM NY	TOTAL	FROM NY	TOTAL	FROM NY			TOTAL	FROM NY
SEPT														
AVG	4.5	5.7	2.6	3.3	5.8	6.6	5.5	6.2	5.4	6.2	1.3	1.2	0.5	0.7
OCT.														
AVG	14.0	17.3	7.6	9.6	16.4	18.8	14.3	16.6	14.0	16.0	3.0	2.3	3.3	4.2
10/16	8.4	10.4	5.5	5.9	9.4	10.5	10.2	11.5	10.3	10.8	4.0	4.5	4.7	5.9
10/19	54.0	63.0	33.0	38.0	58.0	65.0	55.0	62.0	56.0	62.9	14.0	8.8	0.0	0.0
10/20	34.0	39.0	26.0	29.0	35.0	38.0	32.0	35.6	32.0	36.5	8.7	2.3	33.0	33.0
10/21	24.0	29.0	15.0	15.0	21.5	25.0	22.0	25.0	23.0	27.0	16.6	7.2	0.0	0.0

* NO ITS TRANSACTIONS TAKE PLACE BETWEEN AMEX AND NYSE
** FLUCTUATIONS OF NASD FIGURES DO NOT CONFORM TO THOSE OF THE OTHER PARTICIPANTS

Source: NYSE

Furthermore, the NYSE partially shut down ITS on the NYSE floor (ITS was shut down on posts 1 through 7 which service, among others, American Telephone and Telegraph, International Business Machines, General Motors, Eastman Kodak, Chrysler, U.S. Steel, and Union Carbide) on October 19, 1987, between 2:13 p.m. and 3:27 p.m., and, on October 21, 1987, ITS was shut down on the entire floor of the NYSE from 10:33 a.m. to 12:36 p.m. 152/ The NYSE's decision reflected the fact that system delays caused ITS commitments not to reach the specialists in time for them to respond, and that the incoming ITS traffic at the UFDC switch and the printers on the floor was slowing down other order processing systems, such as DOT. 153/

The regional exchanges also experienced delays in their ITS support systems. The MSE, for instance, experienced delays of approximately 15-45 seconds within its own Regional Computer Interface, 154/ which only left 15-45 seconds for the specialists to act on the commitments prior to their expiration. Therefore, specialists found it difficult to respond to the NYSE's outgoing commitments to trade that expired within one minute.

Several participants complained to the staff about the failure of other ITS members to comply with the pre-opening requirements as defined in the ITS Plan. 155/ For example, on October 19 and 20, the NYSE ITS Service Center 156/ indicated that it received 106 and 116 complaints, respectively, dealing with openings, as opposed to 27 received during the entire month of September. Regional exchanges also indicated concern over the absence of any requirement in the ITS Plan that NYSE specialists issue pre-opening notifications prior to resuming trading after an order imbalance halt. As discussed above, the present provisions of the ITS Plan only require notifications after a "regulatory" halt.

Furthermore, PSE specialists stated that, on October 19 and 20, they did not receive any indication as to whether their pre-opening responses had been accepted until one and one-half days later, as opposed to one and one-half hours during "normal" busy days. Similarly, the CSE indicated that, on those same dates, no reports were received on pre-opening responses until late during the day, in spite of the continuous requests for such reports. On the other hand, the Phlx indicated that it intentionally ignored pre-opening notifications because of the delays already experienced throughout the system.

152/ During this period, other participants could not access the NYSE through ITS, but still could communicate among one another through the system.

153/ See discussion, supra.

154/ See discussion of regional exchanges order routing systems, supra.

155/ ITS Plan, Pre-Opening Application Rule, Section (b)(i).

156/ ITS complaints are handled at three different levels at the NYSE. Complaints are first sent through the system from specialist to specialist. If the specialists cannot resolve the matter, the complaint is sent through a "hot line," to the post supervisor. If no resolution is reached, then it is sent to the ITS Service Center.

6. Analysis

The staff is concerned that the present configuration of ITS is not designed to perform efficiently in high volume periods. During the market break, the lack of flexibility of ITS fragmented further the markets, reduced substantially market making capability on the regional exchanges, and caused upstairs firms to place even more pressure on NYSE order processing systems. The unavailability of ITS greatly increased financial risks to regional specialists because it reduced their ability to lay off their inventory positions acquired from market making activities. This unavailability contributed to decisions by certain regional exchanges to reduce their volume guarantees in regional automatic execution systems, which, in turn caused firms to reroute more orders to the NYSE, placing even more pressure on its order handling systems. ^{157/} In short, for periods of time, ITS essentially ceased to function when additional order handling and market making capacity were critical. The staff believes that steps must be explored to develop a faster and more efficient intermarket linkage. At the same time, however, it should be recognized that while on October 19 and 20, 32% and 55%, respectively, of NYSE commitments to trade were executed on the regional exchanges, 75% and 80% of the regional exchanges commitments to trade sent to NYSE were executed on those same dates.

First, considering the large number of expired commitments during the week of October 19, the Division believes that the NYSE, along with the other ITS participants, should examine the operational problems encountered in order to plan possible modifications in the system during peak volume times. For example, the NYSE should consider separating its ITS terminals from the printing functions of other NYSE systems, such as DOT, in order to facilitate the printing of ITS commitments before the two minute expiration period. ^{158/}

In addition, the staff believes that it may be appropriate for all participants to consider adopting default procedures to provide that, when a commitment to trade is not accepted or rejected within the applicable two minute time frame, an execution report will be automatically generated by the system based on the commitment price or the then current quotation for the security (whichever is better) in the receiving market.

The staff is also concerned with the apparent failure of the NYSE to investigate and resolve many ITS complaints received during the market break. Some regional exchanges (notably MSE and BSE) alleged that the NYSE refused to investigate any complaints lodged pursuant to the ITS procedures during the week of October 19. The NYSE indicated to the staff, however, that, except for complaints with respect to expirations, all other complaints had been investigated. The NYSE explained that from October 19 until mid-day on October 21 expiration complaints had not been investigated

^{157/} During the month of October, the NYSE received approximately 60% (157,462 out of 263,854) of the commitments sent through ITS as opposed to 50% during normal days, but sent out only about 25% of the total (or 70,709 commitments to trade), as opposed to 33%, to the other participants. See Table 7-1.

^{158/} It appears that UFDC queuing problems had been discussed at previous meeting of ITS User Committee members. The NYSE subsequently had added electronic display books and anticipates adding more by the first quarter of 1988, in order to decrease the use of the UFDC switch, and reduce the queues on ITS.

because of fast market conditions and the queuing problems with respect to the UFDC switch and the printers on the floor. Nevertheless, queuing problems were not floor-wide through most of these time periods, and many specialists were responding to ITS commitments in a timely manner. While the Division certainly appreciates the intense pressure on NYSE resources during the market break, the Division does not believe the wholesale refusal to investigate expired commitment problems is appropriate.

The Division also believes that ITS participants should consider the regional exchanges' concerns with the lack of pre-opening messages sent after order imbalance halts on the NYSE floor. Although the ITS rules do not require specialists to send pre-opening notifications when trading resumes, it appears that such practice should be encouraged in order to facilitate orderly resumption of trading and allow specialists to attempt to balance their positions after order imbalance halts. Indeed, the Division understands that, in large part, NYSE specialists did, in practice, seek to provide pre-opening notifications following order imbalance halts.

Finally, the Division intends to review with the ITS participants the need for clearly defined procedures for communications among themselves. The Division found that during the week of October 19, there generally were satisfactory communications among the stock exchanges. Nevertheless, some exchange officials have suggested to the Division that they had difficulty reaching responsible officials at the NYSE to discuss trading halts and ITS problems. This is in large part understandable, because of the need for senior NYSE officials to respond to the operational and trading difficulties in their market. Thus, the Division believes that steps should be taken to identify contact persons at each exchange who will be available during market emergencies.

Volume & Trades on Automatic Execution Systems 1/

	Trades 10-16	Volume 10-16	Trades 10-19	Volume 10-19	Trades 10-20	Volume 10-20
DOT	241,616	226,921,387	471,513	324,109,693	584,992	419,248,012
PER	11,616	4,086,860	23,583	8,599,907	26,002	8,994,440
MAX	18,211	4,530,923	25,653	6,691,603	30,203	7,146,280
PACE	7,735	1,878,862	14,927	3,563,404	12,519	2,927,105
SCOREX	9,109	2,517,000	22,410	6,228,800	21,196	5,599,600
NSTS <u>2/</u>	118	28,360	256	84,239	592	134,632

	Trades 10-26	Volume 10-26	September daily Average Trades	September daily Average Volume
DOT	270,699	210,167,412	138,600	128,500,000
PER	14,007	5,031,105	8,329	2,760,133
MAX	19,130	4,871,774	8,982	2,094,693
PACE	5,898	1,397,257	4,024	920,515
SCOREX	2,631	809,800	5,258	1,425,581
NSTS	148	37,506	82	17,900

1/ On DOT, the "trade" figure actually represents the number of orders entered in the system. The other systems data represent the number of trades automatically executed in their systems.

2/ Although the figures provided by CSE contain some trades over 2,099 shares, the majority, over 99%, represent trades of 2,099 shares or less executed pursuant to the guarantee.

Chapter Eight

PERFORMANCE OF THE OPTIONS MARKETS

A. Introduction

Five securities exchanges currently trade options in the United States: the American ("Amex"), New York ("NYSE"), Philadelphia ("Phlx"), and Pacific ("PSE") Stock Exchanges, and the Chicago Board Options Exchange ("CBOE"). Each of these exchanges trades options on individual equity securities and on stock indexes. 1/ The NYSE and PSE each trade one stock index option, the New York Composite ("NYA") and the Financial News Composite ("FNCI") indexes, respectively. The Amex, CBOE and Phlx each trade several stock index options: the Major Market ("XMI"), Institutional ("XII"), Computer Technology ("XOC") and Oil ("XOI") indexes on the Amex; the Standard & Poor's 100 ("OEX") and 500 ("SPX") indexes on the CBOE; and the Value Line ("XVL"), Gold and Silver ("XAU"), Utility ("UTY") and Over-the-Counter ("XOC") indexes on the Phlx. 2/ In addition, the Amex and CBOE list several interest rate options, and the Phlx trades options on eight foreign currencies.

The total combined volume of the options exchanges exceeded 287 million contracts in 1986. The CBOE, by volume the largest options exchange, accounted for approximately 62% of the total combined volume. The largest index option contract by volume, the OEX, traded more than 113 million contracts in 1986. In comparison, the XMI, NYA, and XVL indexes had volumes of 17.6, 2.7, and 1.2 million contracts, respectively.

The Amex, NYSE, and Phlx employ modified specialist systems for options trading. Each option is assigned to a specialist, who is responsible for maintaining a fair and orderly market and for handling orders placed in the limit order book. Additional market making is provided by registered options traders ("ROTs"), who trade on the floor for their own accounts. 3/ In contrast, the CBOE and PSE do not use specialists.

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- 1/ The ability to trade options on an individual eligible exchange-listed stock is assigned to a particular options exchange pursuant to an allocation plan adopted by the options exchanges in 1980. With a limited number of exceptions, standardized options on exchange-listed stocks are traded on one exchange only.
 - 2/ Stock indexes on which options are traded are subject to classification by the Commission as either "broad" or "narrow" based. In 1982, when the Commission originally approved exchange proposals to trade options on groups of securities, it distinguished between securities groups composed of a relatively large number of well-capitalized stocks representing diverse industry sectors, and smaller indexes composed of stocks representing a particular industry group. Options on these latter indexes, referred to as narrow-based or "industry" stock index options, are subject to lower position limits and higher margin levels than are broad-based index options.
 - 3/ ROTs generally are assigned by an exchange to make markets in one or more particular classes of options. Exchange rules require ROTs to engage in a course of dealings reasonably calculated to contribute to the maintenance of a fair and orderly market. See, e.g., Amex Rule 958. Throughout this Chapter use of the word "market maker" includes ROTs except where the context indicates otherwise.

Instead, each option has a crowd of market makers trading for their own accounts, with an exchange official, called an Order Book Official ("OBO"), handling the limit order book. The size of the crowd varies depending upon the activity in the option, with more actively traded options attracting a greater number of market makers. In both systems, floor brokers represent public customer orders on the options floor. Regardless of whether an options exchange employs a specialist or market-making system, all exchanges seek to provide continuous two-sided markets in their listed options.

During the week of October 19, 1987, the turbulence experienced in the markets for the underlying securities had a substantial negative effect on the order execution facilities of the options exchanges, the exchanges' ability to provide continuous markets, and the performance of market makers. Problems experienced at the options exchanges, however, were not related primarily to increased volume during the week. Options volume on October 19, while heavy, did not approach the record volume experienced on October 16, when a number of stock index and equity option contracts expired. In fact, during the week of October 19, options volume declined, especially in the stock index options. ^{4/} Rather, problems experienced at the options exchanges stemmed from a variety of factors, including price volatility in the equity marketplace, the inability of options market makers to obtain reliable information concerning the prices of underlying stocks, ^{5/} their inability to hedge options positions in the futures and equity markets,

^{4/} Contract volume on the options exchanges on October 16 and 19-23 was as follows:

<u>DATE</u>	<u>CBOE OEX</u>	<u>CBOE Other Products</u>	<u>CBOE Total</u>			
10/16	1,162,410	771,994	1,934,404			
10/19	405,128	640,665	1,045,793			
10/20	284,640	523,905	808,545			
10/21	335,758	593,749	929,507			
10/22	196,171	352,148	548,319			
10/23	153,701	273,649	427,350			
	<u>Amex XMI</u>	<u>Amex Total</u>	<u>Phlx Total</u>	<u>PSE Total</u>	<u>NYSE Total</u>	
10/16	144,336	653,132	184,896	202,257	19,500	
10/19	63,576	518,826	142,816	140,138	15,239	
10/20	27,147	426,192	149,543	118,589	14,871	
10/21	30,154	417,993	130,853	128,548	16,111	
10/22	13,401	261,489	85,157	88,370	11,700	
10/23	11,553	190,890	56,832	67,805	9,255	

^{5/} The question of the reliability of NYSE quotations during the market break is discussed in Chapter Seven of this report. The importance of these quotations to market makers trading in a derivative product is twofold: the quotes must be technically reliable (i.e., they should be rapidly disseminated from the primary underlying market to securities information vendors), and they must be useful in predicting whether an offsetting stock order to balance an options position

and the proliferation of strike prices as the market value of all equity securities declined.

Between October 19-23, the options exchanges responded to conditions in the underlying primary markets with a number of actions that affected the ability of public customers to transact business in the options markets and influenced options pricing. These actions included adding a substantial number of new options series, allowing protracted opening rotations in some stock index options, and restricting the availability of exchange automatic execution systems. Each of these conditions is discussed in detail below. These discussions are followed by a review of market maker performance.

B. Exchange Operations

1. Trading Halts

Options floor officials on each of the options exchanges have discretion to halt trading in any option contract in the interest of maintaining a fair and orderly market.^{6/} On the CBOE, for example, in deciding whether to halt trading, floor officials may consider whether (1) trading in the underlying security has been halted or suspended; (2) the opening of the underlying security has been delayed; or (3) other unusual conditions or circumstances are present. During the week of October 19, the options exchanges called trading halts in nearly 100 different options at various times as a result of volatility, order imbalances, and trading halts in the primary markets for the underlying securities.

On October 19, CBOE officials called short trading halts in three equity options and halts lasting several hours in three other classes following trading halts in the primary markets for these securities. Similarly, the Amex, PSE, and Phlx each halted trading in one exchange-listed equity option. In addition, the Phlx called several trading halts in its XVL index option because the exchange was unable to obtain accurate index prices from the vendor that calculates and disseminates the index value. Because of the volatility in the prices of the stocks that comprise the XVL, the vendor was unable to calculate the index for 2 1/2 hours on October 19, from approximately 10:30 a.m. ^{7/} to 1:00 p.m., and then for short periods from 2:15-2:22 p.m. and from 3:22-

reasonably can be expected to be executed at the quoted prices when a stock order arrives at the NYSE floor. For example, assume that the NYSE quote for XYZ is 110 bid to 111 ask at 10:00 a.m. Even if that quote is an accurate representation of the NYSE market in XYZ as of 10:00 a.m., if an options market maker, when seeking to effect an offsetting stock transaction, is concerned either that (1) there will be delays in sending a stock order to the NYSE or, even absent abnormal delays, (2) the quote may change drastically (e.g., 103 bid to 104 ask) before the stock transaction is executed, the market maker may conclude that the quotes are "useless" for his purposes. As discussed at length infra, on October 19 and 20 index options traders also faced problems in pricing stocks in which trading was halted.

^{6/} See CBOE Rule 6.3; PSE Rule VI, Section 37(a); Amex Rule 918(b); Phlx Rule 1047(b); and NYSE Rule 717.

^{7/} All times are Eastern Standard Time ("EST").

3:25 p.m. Because of the unavailability of the index value, XVL trading halted at 11:04 a.m. after opening at 10:09 a.m., re-opened at 1:45 p.m., and halted again at 2:30 p.m. for a 15 minute period. ^{8/} Although no trading halts were called in the Phlx's XAU index option on October 19, the option did not open until 11:50 a.m. because Newmont Mining, which alone accounts for more than 10% of the index's weighted value, did not open on the NYSE until 11:22 a.m. ^{9/}

Trading halts on all exchanges increased dramatically on October 20. At the CBOE, trading was halted in 22 equity options and in the OEX and SPX index options for periods ranging from 1/2 hour to approximately 3 hours. Equity option trading halts generally were called in response to indications from the primary market that trading had halted in the underlying security or was otherwise impaired due to order imbalances. ^{10/} In the case of OEX and SPX, trading on the CBOE was halted at approximately 11:54 a.m. because it appeared that trading in more than 20% of the indexes' underlying stocks had halted, ^{11/} and that the NYSE might call a floor-wide trading halt. The OEX and SPX halts lasted until approximately 1:00 p.m., at which time both indexes went through re-opening rotations. ^{12/} Similarly, the Amex and NYSE halted trading in their broad-based index options on the morning of October 20. Trading in the XMI and NYA index options halted at 11:33 a.m. and 12:29 p.m., respectively, because of trading halts in more than 20% of the underlying equity issues. ^{13/} A re-opening rotation in XMI began at approximately 1:15 p.m., lasted ten minutes, and free trading resumed at approximately 1:25 p.m. Trading in the NYA resumed at 1:16 p.m. The Amex also halted trading at 11:46 a.m. in its XII and XOI index options. Both options re-opened at 1:15 p.m. In addition, the Amex delayed the opening of one equity option and called trading halts in 22 others.

The other options exchanges experienced the same difficulties on October 20. On the PSE, trading halted in the FNCI index option from 12:11 p.m. to 3:50 p.m. because stocks that accounted for more than 20% of the FNCI's index value were not trading.

^{8/} The vendor that calculates the XVL index value for the Phlx also provides an index calculation to the Kansas City Board of Trade ("KCBT"), which trades a futures contract on the XVL. The KCBT, however, did not stop trading in the XVL contract on October 19, apparently using the last disseminated value from the vendor during these time periods to price its futures contract. See KCBT spread-premium discount chart in Appendix D.

^{9/} As a narrow-based industry index, the XAU is prohibited from trading if stocks accounting for more than 10% of the index's current value are not trading. See Phlx Rule 1047A.

^{10/} Although in almost all instances trading halts were called on the CBOE for these reasons, in one case a halt was called because the market quote disseminated in the primary market was questionable in the opinion of CBOE officials.

^{11/} CBOE Rule 24.7 requires the exchange to halt or suspend trading in a broad-based market index under these circumstances.

^{12/} See discussion of trading rotations at 8-5, infra.

^{13/} See Amex Rule 918C.

The PSE also halted trading in 23 equity options because of halts or other problems in the markets for the underlying securities. ^{14/} Trading in the XVL index option on the Phlx did not begin until 10:30 a.m. because of delayed openings in the stocks that comprise the index. XVL trading then was halted for the rest of the day at 12:01 p.m. because trading in more than 20% of the index's underlying stocks by weighted value was halted or suspended ^{15/} and, even after the underlying securities had commenced trading again, the vendor of the index value was unable to calculate the index value accurately. The Phlx also halted trading in Newmont Mining from 12:00 p.m. to 2:30 p.m., and delayed the opening of Honda until 11:30 a.m., because of delayed openings and pricing problems on the NYSE. ^{16/} Trading in Phlx's XAU index did not begin until 3:30 p.m. because Newmont Mining stock did not open for trading until late afternoon.

After October 20, the number and length of trading halts declined. By Friday all exchange-listed index options were open for trading the entire day following the completion of opening rotations.

2. Trading Rotations

As stated previously, an equity option may not open for trading until there has been an opening transaction in the underlying security on the principal exchange where it is traded. ^{17/} Opening rotations in index options, however, may commence as soon as practicable after 9:30 a.m., regardless of conditions in the underlying markets. ^{18/} Equity and index options are opened by means of trading rotations held at the opening of trading each business day in order to achieve a uniform opening price in each series

^{14/} Of these 23 trading halts, three lasted less than 40 minutes, two between 40 minutes and one hour, eight between 1-2 hours, five between 2-3 hours, two between 3-4 hours and three longer than four hours.

^{15/} As a broad-based market index, the XVL is prohibited from trading under these circumstances. See Phlx Rule 1047A. The KCBT halted trading in its XVL futures contract from 12:35 p.m. to 1:15 p.m. on October 20 when the CME halted trading in its SPZ futures contract.

^{16/} On October 20 Honda's opening on the NYSE was delayed until 10:27 a.m. and then opened four points down. Pricing problems on the NYSE in Newmont Mining were related to a proposed takeover of the corporation pending at the time of the market break.

^{17/} Exchange officials may elect to proceed with an opening rotation despite conditions in the primary market if they determine it is in the best interest of a fair and orderly market to do so. See, e.g., CBOE Rule 6.2: Trading Rotations.

^{18/} Exchange rules provide for 9:30 a.m. openings of index options in order to coincide with index trading in the futures markets. Options exchanges may continue trading in index options for a one and one-half hour period after opening rotations before exchange rules requiring trading halts become applicable. See CBOE Rule 24.13; Amex Rule 918C(a); PSE Rule XXI, Section 10; NYSE Rule 717(b)(iii)(A); and Phlx Rule 1047A(b).

of an option class. 19/ During a trading rotation, bids, offers, and transactions may occur only in one or a few specified option series at a time, and trading may not occur in any series until it has been reached in the rotation. All exchanges attempt to complete opening rotations as quickly as possible in order that free trading may commence shortly after the opening of an exchange. As discussed later in this chapter, free trading may be viewed as critical to the effectuation of certain options strategies, including hedging.

Trading rotations at the CBOE were delayed and in some instances significantly lengthened on October 19 and 20. Because of delayed stock openings, opening rotations were delayed in 15 equity options classes on October 19 and in one option, IBM, on October 20. In contrast, opening rotations began on time in OEX and SPX, even though a number of the indexes' component securities were not yet open on the NYSE. Rotations in OEX and SPX took substantially longer to complete, however, owing in part to the proliferation of new strike prices. On the morning of October 20, the CBOE made an additional 112 OEX series eligible for trading (bringing the total number of OEX series to 272), in order to accommodate trading interest at prices which mirrored the decline in the cash value of the index. The CBOE also modified its trading rotation procedures in OEX and SPX beginning on October 19, so that calls and puts in each series could be opened separately, thereby concentrating market maker participation in one options series at a time. 20/ On October 19 and 20, opening rotations in OEX took approximately one hour and 32 minutes and two hours and 24 minutes to complete, respectively, as compared to the average completion time of 12-15 minutes. CBOE officials have stated that OEX rotations were unusually long because of the number of orders in each series that had to be executed, the difficulty market makers had in pricing certain option series, and the number of series which had to be called for opening. In addition, on October 20 it appears that the lack of market maker participation in the opening rotation in OEX made it more difficult to attract bids and offers. 21/

A number of "second" rotations were called in the CBOE's stock index options and in several of its individual equity options on October 19 and 20 because of extreme volatility in the prices of the underlying securities. 22/ As a result, periods of free

19/ Rotations may be used at other times as well, but usually are employed only at the opening of trading, and at the close in expiring option contracts.

20/ At the CBOE under normal market conditions, put and call contracts in near-term OEX contracts are opened simultaneously with the far-term contracts, thereby allowing market makers to hedge the risk they assume in establishing near-term positions with offsetting transactions in further-out series and shortening the time necessary to complete the rotation.

21/ See discussion of market maker participation infra at 8-17.

22/ On October 19 second rotations occurred in four equity options, OEX, and SPX. On October 20 second rotations were called in OEX, SPX and thirteen of the 40 most active CBOE-listed equity options. Many of these second rotations were actually "re-opening" rotations necessitated by trading halts on the primary markets and the need in the derivative market to conduct additional opening rotations as trading halts in the underlying securities were lifted.

trading were reduced significantly in some options classes, most notably OEX and SPX. For example, on October 19, after completing the initial opening rotation at approximately 11:00 a.m., a second OEX rotation was held which did not conclude until 12:36 p.m., approximately three hours after the opening of the exchange. On October 20, the OEX opening rotation was completed shortly before 12:00 p.m., but trading in the option was then halted as a result of trading halts in the underlying securities on the NYSE. At 1:22 p.m. OEX entered a "re-opening" rotation which was not completed until 3:23 p.m. As a consequence, free trading in OEX on October 20 was limited to 40 minutes at the end of the day. 23/ Similarly, SPX went through two consecutive rotations on the morning of October 19, and one on the morning of October 20, that were comparable in length to those occurring in OEX.

The problems the CBOE encountered in opening options for free trading were not unique but appear to have been more severe than those experienced by other exchanges. Throughout the week of October 19 opening rotations in XMI were longer than usual, but, with the exception of the rotation occurring on October 22, no opening rotation took more than one hour to complete. 24/ The re-opening rotation of XMI after the trading halt on October 20 took only 10 minutes, compared to two hours for OEX. At the Phlx, opening rotations in its index options took only slightly longer to complete throughout the week of October 19. At the PSE, the FNCI opening rotation on October 19 took approximately one hour to complete. For the remainder of the week, however, the FNCI opening rotation was completed in 15-30 minutes. 25/

3. Vendor Capacity Problems

Pricing information for all options series is supplied to market makers and broker-dealers by independent purveyors or "vendors" of market information. 26/ Prior to October 19, an individual vendor may have had the data base capacity to store and disseminate pricing information for approximately 30,000 series of option contracts. This capacity was outstripped during the week of October 19 as security prices on the primary markets declined and the exchanges elected to make thousands of new strike prices eligible for trading. 27/ One vendor contacted by the Division stated that between October 19-23 it added a total of 10,244 new series to its service. In order to

23/ OEX opening rotations for the remainder of the week also were unusually long. On October 21 and 23 opening rotations took one hour to complete; on October 22 the rotation lasted more than two hours.

24/ On October 22 the XMI rotation was not completed until 11:48 a.m.

25/ The disparity between the length of opening index option rotations on the CBOE and those of the other options exchanges is attributable in part to the higher volume in OEX than in the other index options. Opening rotations in SPX, however, which has much less volume than either OEX or XMI, still were substantially longer than normal despite only moderate order flow.

26/ See Chapter Seven for a description of the operations and services provided by options vendors.

27/ Between October 19-23, the CBOE, Amex, PSE and Phlx made 4,390, 4,444, 1,500 and 952 new series eligible for trading, respectively.

accommodate these new listings, at least one vendor elected to delete May, June, and September series options, foreign currency options, and dually traded options from its service. 28/ Some series were relisted as early as October 30, but not all series were relisted until mid-November. The vendor that provides pricing information for CBOE and Amex market makers stated that it was able to list all new OEX and XMI series prior to the introduction of these series for trading. CBOE officials, however, reported to the Division that they believe that not all new CBOE series were listed on a timely basis. 29/

4. Order Execution Systems

Both the CBOE and the Amex employ automatic order execution systems to aid in the execution of small customer orders in a selected group of option classes. 30/ The CBOE's Retail Automatic Execution System ("RAES") currently is available during periods of free trading in OEX and SPX, and in a limited number of active equity options, including IBM, Eastman Kodak and General Motors. The Amex's AUTO-EX system is operational in XMI and one competitively traded equity option. Both systems afford public customers the opportunity to obtain a guaranteed execution at the market quote for orders up to ten contracts. Customer orders routed through RAES are executed against market makers who elect voluntarily to participate as contra-brokers to system orders, while orders sent through AUTO-EX are executed at the displayed quotations against either the specialist in the option or a registered options trader ("ROT") in the crowd. 31/

28/ In all, this vendor deleted a total of 3,717 series between October 19-23. Where multiply traded options were involved, the vendor continued to list each option as trading on one exchange only, and deleted listings for the other markets where it was traded. Efforts were made by the vendor to quickly relist those foreign currency options which had been deleted, because of substantial trading activity and interest in these options.

29/ During this period securities information processors also were unable to report accurately prices in those option series that had three digit premiums. This problem affected OEX, SPX, XMI and a small number of equity options. As the cash value of these indexes and the underlying stock prices of these options declined swiftly, some series became very deep-in-the-money, and some had huge time value premium increases. Although market professionals have indicated that the problem did not cause confusion for them, it did cause difficulties for options market maker clearing firms attempting to calculate margins.

30/ Neither the PSE nor Phlx has an automated order execution system for options trades. The PSE's SCOREX and Phlx's PACE systems provide automatic routing and execution services for equity orders only. Both exchanges, however, by rule require their market makers to fill public customer orders in certain option series to a minimum depth of 10 contracts. See PSE Rule VI, Secs. 48 and 79; Phlx Rule 1033(A).

31/ Limit orders on the book which are at the same price as incoming system orders are guaranteed executions at the same price as system orders in all options in which AUTO-EX is available, and in all equity options (excluding IBM) in which RAES operates. RAES does not protect public customer limit orders on the OEX

Both the CBOE and the Amex impose certain obligations on participating market makers in order to ensure executions on a continuous basis. The CBOE requires that market makers who sign onto RAES in groups participate in the system on a continuous basis for the duration of the week in which they sign on, and throughout the following expiration week. The Amex imposes somewhat less stringent obligations, requiring ROTs to remain in the trading crowd for the majority of any business day in which they sign onto the system and on the following expiration if the ROT has participated in AUTO-EX on any day that week.

During the week of October 19, neither AUTO-EX nor RAES was operated to its fullest capacity, and both systems experienced a downturn in the number of market makers who were willing to participate in system trades. Prior to October 19, RAES and AUTO-EX execution facilities were available in near term, at-the-money series, which generally are the most actively traded options series. Orders executed through these systems accounted for a significant percentage of total customer volume in the selected classes. For example, from January through September 1987, OEX customer orders executed through RAES constituted an average of 26.6% of all public customer OEX orders, and XMI orders executed through AUTO-EX were 5.6% of total customer XMI volume. Throughout the week of October 19, however, the number of contracts executed through these systems declined dramatically as volume on the options exchanges dropped and the CBOE and Amex elected not to make at-the-money or in-the-money series available for automatic execution. ^{32/} On the CBOE, no OEX or OEZ puts ^{33/} were available on RAES from October 19-21, and the only series which were eligible for automatic execution at any time during that week were far out-of-the-money. Both exchanges deleted from their systems contracts with large premiums, ^{34/} and thereby declined to require their market makers to assume large risk positions by buying or selling deep-in-the-money contracts. For the period October 1-16, approximately 20% of all customer OEX orders were executed through RAES, as compared to 6.6% during the week of October 19.

In addition, both exchanges had difficulty in attracting market makers to participate in these systems. Before the opening of the options market on October 19,

book, however.

^{32/} Contracts executed through AUTO-EX during the week of October 19 were as follows: October 19- 3,760; October 20- 693; October 21- 1,145; October 22- 111; and October 23- 37. In comparison, during September 1987 AUTO-EX executed an average of 5,881 contracts per day. RAES OEX volume figures for the week show a similar decline: between October 19 and 23, 5,692, 1,148, 8,061, 2,566, and 2,430 contracts were executed, respectively. In comparison, the average daily number of OEX contracts executed through RAES from October 1 through October 16, 1987, was 34,114.

^{33/} The CBOE designated all new series added to OEX during the week of October 19 "OEZ" in order to facilitate their listing in the Options Price Reporting Authority ("OPRA"), an independent vendor of options pricing information.

^{34/} At the CBOE, series having premiums greater than \$10.00 were in almost all instances removed from the system.

CBOE officials were informed that their market makers would not voluntarily participate in RAES unless they were released from their obligation to remain on RAES for the duration of the week and throughout the next expiration week. Based on this information, the CBOE decided to waive the customary participation requirements. Despite this relaxation, the level of market maker participation in RAES for OEX dropped by 75% between October 19-23. ^{35/} Market maker participation in RAES in the fifteen equity options using RAES also declined, from an average of 57 market makers participating per day from October 1-16, to 14 market makers per day from October 19-23. The Amex experienced a similar decline in ROT participation. During the week of October 19, between two to four ROTS, in addition to the specialist, participated in AUTO-EX each day. By comparison, six ROTS were on AUTO-EX each day in addition to the specialist during the week of October 12.

Finally, because neither system can be used while the option is in a trading rotation, small customer orders could not be routed automatically to the exchanges and executed through RAES and AUTO-EX for extended periods of time during the week of October 19. Rather, they had to be delivered to the exchanges via the order routing systems of retail brokers and handled by these firms' floor brokers. In sum, during most, if not all, of October 19 and 20, the options small order execution systems were functionally closed because of trading rotations and because those series with the greatest public customer interest were removed from these systems. In addition, many market makers and ROTs ceased to participate in system trades.

C. Market Maker Performance

1. Introduction

Market maker performance on the options exchanges can be measured by a number of factors, such as the price or "premium" charged for any given option contract, the spread between the bid and the ask, the number of market makers trading in a particular options class and their willingness to assume positions of size. Options market making performance, in turn, is influenced by an equally wide range of factors, including the volatility and price of the underlying security, the availability of accurate, timely information concerning prices and conditions in the primary market, volume and order flow, institutional and customer participation, and the availability of efficiently priced hedging vehicles. Under normal market conditions, *i.e.*, when there is relatively little or no price instability in the underlying market and reliable information is disseminated quickly across markets, market maker performance in the options markets generally is characterized by low premiums, narrow spreads and a high level of market maker participation at least in the more active options.

^{35/} The CBOE estimates that prior to October 19, over 400 market makers participated in RAES in OEX on any given day. During the week of October 19 market maker participation in RAES steadily declined. On October 19, 178 market makers were signed onto RAES at the opening of the exchange. This number fell to 154 by the close of trading. On October 20, 21, 22 and 23, approximately 114, 95, 92 and 46 market makers were participating in RAES at the close of trading, respectively. In comparison, on January 23, 1987, a day in which the stock market also experienced extreme price volatility, 422 market makers were signed onto RAES. This number declined on January 26 (the following Monday), dropping to 183.

During the week of October 19, market making performance on the options exchanges was reduced considerably in reaction to volatility in the underlying markets and conditions in the futures markets. The quality of executions, particularly on October 20, varied dramatically and was substantially inferior to pre-market break performance.

2. Premiums

Options premiums, or the price that the buyer of an option pays and the writer of an option receives for the rights conveyed by the option contract, are established by competitive buying and selling pressure on the trading floor of each exchange. Premiums are based on a number of factors, including the value of the underlying stock or index, time to expiration, interest rates, anticipated dividends, supply and demand for the option, and the volatility of the underlying stock or index. The Division's review of options pricing for October 19 and 20 indicates that the time value premiums of certain options, particularly stock index options, increased significantly above historical levels. ^{36/} Commission staff have reviewed the premiums charged in four stock index options (OEX, XMI, FNCI and XVL) and also have compared average premiums for a random sample of equity options. Attention was focused on actual premiums charged for certain index options because of the relatively large public customer participation in these contracts, their function as barometers of the stock market as a whole or of a particular market sector, and their unique exercise feature, whereby the exercise of an option is settled by the payment of cash, not by the delivery of securities. These options also were selected because of the increased number of customer complaints concerning pricing in certain of these indexes during the market break.

a. The OEX Option ^{37/}

During the week of October 19, premiums charged for OEX options increased substantially in response to price volatility in the markets for the underlying securities, with the most significant increases occurring in put options. Although put option premium increases can reasonably be attributed in part to the increasing intrinsic value of these options as the market declined, the huge increases in premiums cannot be explained entirely by this factor. Commission staff calculated time value premiums for October 19

^{36/} The value of an option consists of two components, intrinsic value and time value. Intrinsic value reflects the amount, if any, by which the value of the underlying security or index exceeds, in the case of a call, or is less than, in the case of a put, the strike price of the option. An option which has intrinsic value is said to be "in-the-money." For example, a call with a strike price of 100 and an underlying value of 120 has an intrinsic value of 20. Conversely, an option is said to be "out-of-the-money" to the extent that the strike price is greater than the underlying value, in the case of a call, or less than the underlying value, in the case of a put. An "at-the-money" option is one where the strike price equals the underlying value. The time value premium refers to the amount by which the option's premium exceeds the intrinsic value of the option.

^{37/} Some data cited in this subsection and subsections b, c, and d was generated by the Commission's Directorate of Economic and Policy Analysis ("DEPA").

and 20 and compared these values with a September average, 38/ in order to determine the degree to which premium increases could be attributable to factors other than intrinsic value. The average OEX put time value premium for September 1987 was \$8.46. On October 19 this rose to \$20.65, and on October 20 to \$46.62. Commission staff analysis of OEX premiums charged on October 20 reveals that time value premiums on that day varied substantially depending upon the time of execution of particular orders and the series involved.

On the morning of October 20, the opening rotation in OEX began at 9:30 a.m. and markets were called for in 272 series. As stated previously, the number of series eligible for trading had increased dramatically overnight, rising from a total of 160 series listed the previous day. The opening rotation took approximately 2 hours and 20 minutes to complete, concluding shortly before 12:00 p.m., and was immediately followed by a trading halt. Premiums charged during this rotation in OEX series that were made eligible for trading for the first time that morning ("OEZ" series options), as well as in several OEX series, appear to have been unusually high. The chart below shows the opening price of certain OEX and OEZ puts on October 20.

<u>SERIES</u>	<u>TIME</u>	<u>PRICE</u>	<u>INDEX</u> <u>VALUE 39/</u>	<u>TIME</u> <u>PREMIUM 40/</u>
DEC 255	9:32	55	216	16
DEC 310	9:55	89	229	8
DEC 190	10:26	30	236	30
NOV 240	11:35	80	220	60
NOV 225	11:42	73	219	67
NOV 195	11:53	85	218	85

As illustrated in the table above, the time value premiums of series which were opened late in the rotation are noticeably higher than those for series opened one hour earlier, when the value of the index was approximately 12-15 points higher. 41/

38/ Data for September 21, 22, and 28, 1987, were used for this calculation. These days were selected because they represent a time period comparable to the market break days, i.e., September 21 was the Monday following an expiration. For both the September and October figures, the staff averaged the time value premiums in the November at-the-money series at the opening and at the close of trading. In the case of the October 19 figure, an in-the-money series was used for the close of trading calculation because no at-the-money series had been listed and made available for trading at that time.

39/ This value was provided by the CBOE and incorporates last sale data for those stocks which either opened late or had halted trading some time during the rotation. Accordingly, the index value available to market makers may not have reflected the actual value of all component securities.

40/ Each point of premium equals \$100, making a 16 point premium worth \$1,600.

41/ Data supplied by the NYSE shows that as of 10:00 a.m. on October 20, 24 of the component securities of the S&P 100 index had halted trading, representing 48% of the market value of the index. This figure decreased to 10% by 11:00 a.m., but by

Expressed in dollar terms, an investor who entered an order to buy a November 195 put at the opening price paid \$8,500 for an option that was 11% out-of-the-money. In comparison, if the same order had been executed one hour earlier, it would have been out-of-the-money by 18% and may as a consequence have been executed at a lower price. More importantly, in order for the investor who purchased the November 195 put to break even, the market would have had to drop an additional 50% (bringing the DJIA to 880) by November 20, when the contract expired. While some of the contracts in the put series above involved customers on both sides of the transaction, a majority of the contracts were market makers selling to public customers. In addition, some of the large premiums may have been charged to market makers who were forced to buy puts to close out positions due to margin calls. 42/

b. The XMI Option

XMI time value premiums also rose significantly during the week of October 19. On October 19, the average time value premium for near term, at-the-money puts rose to \$20.08, compared to an average of \$13.68 for September 1987. 43/ On October 20, the average put premium was \$83.92. The table below provides data on trades effected in certain series executed during the morning of October 20. 44/

12:00 p.m. had climbed again, to slightly over 30%. Although the index had reported cash values of 230.57, 231.72, and 216.01, at 10, 11, and 12 o'clock, respectively, Commission staff estimate that the value of the index would have been 244.38, 230.27, and 214.80 at these times if those stocks which had halted moved by the same percentage as non-halted stocks, and would have equaled 241.99, 230.11, and 214.13 if adjusted to include the price at which trading halt stocks first traded upon the lifting of the halt.

42/ In interviews with Commission staff, OEX market makers and CBOE officials identified a number of factors, some of which are discussed below, which they believe were unique to trading on October 20 and influenced the pricing of OEX/OEZ contracts. These factors include the unprecedented volatility in the cash values of the major market indexes and in the stock index futures markets; the extreme discounts in the S&P 500 future during the 2 hour and 20 minute period of the first OEX/OEZ rotation; the significant increase in the total number of OEX series that were eligible for trading for the first time on October 20 and the fact that there was no prior pricing history in the OEZ series; order flow which was substantially one-sided on the buy side; and widely-believed rumors that trading had halted in numerous stocks and might be halted altogether on the CME and NYSE. For a discussion of discounts in the S&P 500 future, see generally Chapter Two. See also "Factors Affecting Market Maker Performance", infra, at 8-18.

43/ Values from selected trading days in September 1987 were used for this computation. See note 38, supra.

44/ With the exception of the third transaction listed in the table, all transactions involved customer purchases with the XMI specialist as the contra party to the trade. In the third transaction, the XMI specialist purchased 15 contracts from a customer closing out a position. The second transaction involved a customer purchasing 100 contracts, of which the XMI specialist sold 90.

<u>SERIES 45/</u>	<u>TIME 46/</u>	<u>PRICE</u>	<u>XMI INDEX</u> <u>VALUE 47/</u>	<u>TIME</u> <u>PREMIUM</u>
XMY NOV 340	10:26	45	382.84	45
XMY NOV 340	10:54	70	369.38	70
XMY NOV 340	11:17	110	362.59	110
XMZ NOV 430	11:32	200	351.49	121.49
XMY NOV 350	11:41	200	349.85	199.85

Expressed in dollar terms, an investor purchasing one at-the-money November 350 put at 11:41 a.m. on October 20 paid \$20,000. 48/ In order for the investor to break even, the DJIA would have had to drop to 760 (approximately 1,000 points) by November 20.

In addition to the extremely high and variable premiums charged, XMI quote spreads were particularly wide. For example, in the November 350 put series, the following quotations were posted between 11:07 a.m. and 11:34 a.m.

<u>TIME</u>	<u>BID</u>	<u>ASK</u>	<u>XMI INDEX</u> <u>VALUE</u>
11:07	100	150	367.87
11:18	100	180	361.66
11:21	100	200	360.42
11:26	100	150	355.34
11:31	100	190	351.57
11:33	100	200	351.37
11:34	100	190	350.84

45/ XMY and XMZ denote series which became eligible for trading for the first time during the week of October 19.

46/ The XMI opening rotation ended at 10:05 a.m. on October 20. Accordingly, the transactions listed above occurred during a period of free trading.

47/ As of 10:00 a.m. on October 20, 13 of the 20 stocks comprising the XMI index had halted trading on the NYSE, representing 69% of the value of the index. By 11:00 a.m. only 2 XMI stocks were still halted, but they accounted for 21% of the index value. By noon, 8 component stocks were halted, representing almost 57% of the index value. At these hours the reported XMI value ranged from 368.74 (10:00 a.m.), to 369.79 (11:00 a.m.), to 346.29 (12:00 p.m.). Commission staff estimate that these index values would have been 413.85, 359.76, and 334.31, respectively, if those stocks which had halted moved by the same percentage as non-halted stocks, and would have equaled 384.80, 361.62, and 339.77 if adjusted to include the price at which trading halt stocks first traded upon the lifting of the halt.

48/ In this transaction a customer bought five November 350 puts from the XMI specialist.

c. FNCI and XVL Options

The table below shows the premiums charged for various FNCI and XVL series on the morning of October 20. Although premiums in FNCI and XVL index options were higher than historical values, they did not approach the levels charged for OEX and XMI contracts. 49/

<u>SERIES</u>	<u>TIME</u>	<u>PRICE</u>	<u>INDEX VALUE</u>	<u>TIME PREMIUM</u>
XVL Nov 245	10:44	46	214	15
XVL Nov 270	11:39	86	204	20
XVL Dec 260	11:28	67	206	13
FNCI Nov 205	10:31	48	170	13
FNCI Nov 160	11:42	23	160	23
FNCI Dec 225	3:08	85	172	32 <u>50/</u>

d. Equity Options

To date, Commission staff have reviewed the average premiums charged in 11 moderately to heavily traded equity options: Coleco, Dayton Hudson, Eastman Kodak, Exxon, General Electric, General Motors, GTE, IBM, Merck, Philip Morris and Shell. For the period September 21-23, 1987, the average price of the stocks underlying these options was \$90.87 (based on the average of the daily high and low for each stock). The average call and put premiums (all series) for this period were \$6.51 and \$5.62, respectively. On October 19 the average stock price declined by 21.16%, to \$71.64, and the average call premium decreased approximately 68%, to \$2.10. The average put price increased dramatically, however, by 277%, to \$21.18, or 26.9% of the average stock price. 51/ On October 20 the average stock price declined an additional 9.24%, to \$65.02. Despite this additional decline, the average call premium on October 20 increased 130% to \$4.83. The average put premium increased 1.98%, from \$21.18 on the 19th to \$21.60. Call and put premiums expressed as a percentage of the average stock price increased

49/ This may be attributable to limited trading interest in these contracts. At the Phlx, trading volume in its four index options for the week of October 19 was relatively light. A total of 1,656 XVL contracts were traded between October 19-23, compared to 4,864 contracts traded the previous week. Similarly, contract volume declined in the PSE's FNCI index during the week of October 19, dropping to a total of 3,144 contracts from 7,668 contracts traded the previous week.

50/ According to information provided by the PSE, these contracts could have been executed at either 10:18 or between 3:08 p.m. and 3:12 p.m. (EST). In either event, the FNCI value at both these times was approximately 172. Thus, the time value premium would be the same regardless of the execution time.

51/ This change reflects the significant downward price movement of the stocks during this period, when many put options that were out-of-the-money in September became deep-in-the-money during the market break. Similarly, call options that were at-the-money or in-the-money in September became deep out-of-the-money.

from 2.9% of the stock value on October 19 to 7.4% on October 20 (calls) and from 26.9% to 33.2% (puts).

The average stock price increased slightly by October 26, rising to \$65.44 from \$65.02 on October 20. The average call premium, however, decreased 24% from \$4.83 on the 20th to \$3.66 on October 26. The average put premium decreased 15% from \$21.60 to \$18.36. Just as both the call and put premiums increased in value as a percentage of the stock's value for the period October 19-20, the call and put premiums decreased as a percentage of the stock's value on October 26. The average call premium percentage for October 26 was 5.6%, a decrease from 7.4% on October 20, and the average put premium percentage was 28.1%, a decrease from 33.2% of the stock's value on October 20.

3. Quotations

Events in the underlying markets during the week of October 19 also affected the size of quotation spreads in the options markets. Under normal market conditions, the maximum spread size is limited by exchange rules as a means of ensuring tight markets. 52/ On October 19, as quote spreads widened in the markets for equity securities, the option exchanges suspended the quotation spread maximums. The suspension permitted market makers to quote bid-ask differentials as wide as the quotation in the underlying security. The options exchanges have stated that they felt compelled to allow options market makers to widen spreads beyond what is customarily permissible because of generally chaotic conditions in the markets for the underlying securities.

Commission staff examined average bid-ask spreads for eleven equity options for the period October 19 through October 26, and compared these figures to the average spreads for the period September 21 through 23, 1987. 53/ For the September period, the average bid-ask spread of these options was \$.428. For these same options on October 19, the average spread increased 145% to \$1.05, while the average percentage spread increased slightly from 18.4% to 22.9%. 54/ On October 20 the average spread increased an additional 46.66% to \$1.54, while the average percentage spread increased again, rising from 22.9% to 24.4%. By October 26 the average spread had decreased 48.7%, to \$.79, and the average percentage spread also had declined, from 24.4% on October 20 to 21% on October 26.

52/ For example, where the underlying security's bid is between \$10 and \$20, option market makers must bid and/or offer so as to create differences of no more than 3/4 of \$1 in the overlying option. However, bid-ask differentials in option series which are ten or more points in-the-money may be as wide as the quote on the primary market of the underlying security. See CBOE Rule 8.7; Amex Rule 958(c); PSE Rule VI, Sec. 79(b); and Phlx Rule 1014.

53/ The analysis of quotation spreads contained in this section was generated by DEPA. DEPA examined bid-ask spreads in the same options for which a premium analysis was done. See "Equity Options" at 8-16.

54/ The average percentage spread is the average bid-ask spread expressed as a percentage of the mean of the bid and ask.

4. Market Maker Participation

Market maker participation data indicates that the market drop on October 19 affected the willingness of some index option market makers to participate in trading. On October 20, approximately 466 market makers participated in at least one trade in OEX sometime during the day, but, during the first rotation, 174, or 38%, of these market makers did not effect a trade. An additional 210 (45%) effected less than 10 transactions during this rotation. A very small number of market makers accounted for the majority of the 2,749 transactions in which a market maker participated during the rotation; less than 10% of the market makers accounted for almost 55% of the transactions.

Market maker participation in OEX, as measured by the number of contracts that market makers bought from or sold to public customers either directly or through floor brokers, declined sharply on October 20. On October 19, OEX market makers participated in 51% of total OEX volume. On October 20, however, market maker participation fell to 39%. In comparison, on October 16, an expiration Friday when total volume on the CBOE exceeded 1.9 million contracts and over 1.16 million OEX contracts were executed, market maker participation in OEX was approximately 66%.

In Amex's XMI options, specialist participation was high in percentage terms on October 16 and 19 but dropped sharply on October 20. Specifically, of the 164,312 XMI contracts traded on October 16, the XMI specialist purchased and sold 30,803 and 39,124 contracts respectively, for a 21% participation rate. ^{55/} On October 19, when total XMI volume equalled 69,797 contracts, the specialist's percentage rate was 33%, with purchases of 19,542 contracts and sales of 26,041 contracts. ^{56/} On October 20, when 30,580 XMI contracts were traded, the XMI specialist purchased 5,835 and sold 4,614 contracts for a 17% participation rate. By October 26 specialist participation had climbed to 20%, the average XMI specialist participation rate for September 1987, but volume remained low. ^{57/}

D. Factors Affecting Market Maker Performance

Commission staff interviewed numerous floor brokers, market makers, and officials at each of the options exchanges. During the course of these interviews, various market conditions were identified as having adversely affected market liquidity, depth and quote spreads in the options markets. These conditions included one-sided order flow and difficulties in hedging.

^{55/} Participation is measured as a percentage of twice the total volume because a specialist cannot be both a buyer and seller on any one particular trade. The highest participation rate possible is 50%.

^{56/} The imbalance in selling by the specialist apparently reflects the heavy concentration of buy orders and puts being sent to the exchange on those days.

^{57/} The XMI specialist reported that the number of ROTS and floor brokers in the XMI trading crowd began to decrease on October 19 and was smaller than usual on October 20. Phlx and PSE officials reported that their exchanges generally did not experience smaller crowds in their index options.

1. Order Flow

CBOE market makers stated that order flow in the stock index options was heavily concentrated in put options on October 19-20 and on October 23, and was predominantly one-sided on the buy side. As a result, market makers as a group were forced to facilitate the execution of these orders by trading for their own accounts to a greater degree than under normal market conditions. In the normal case, a market maker's potential risk exposure is limited to some degree by the existence of customer order flow that can be executed without the participation of a market maker, and by the availability to the market maker of both buying and selling interest. On October 19 and 20 CBOE market makers had to participate in a greater number of transactions on the same side of the market. In their opinion the increased risk exposure they assumed on these days contributed to wider quote spreads and higher premiums. ^{58/} In contrast, equity options floor traders at the CBOE stated that order flow was normal on the morning of October 19 but increased in the afternoon and on Tuesday morning as a large number of institutional market orders to buy puts entered the market. Floor traders also speculated that the number of orders to buy puts related to margin liquidations increased on October 20 and 21. ^{59/}

2. Hedging

In order to hedge the risk of their options positions, market makers usually execute offsetting orders either in the underlying equity markets or in the futures markets. CBOE market makers who are active in OEX and SPX customarily hedge their options positions by establishing offsetting positions in the futures markets, notably in the SPZ future. For example, a short OEX or SPX options position (long put or short call) may be hedged by buying the SPZ. ^{60/}

On October 19 and 20, OEX and SPX market makers experienced a number of difficulties hedging with the SPZ future. First, market makers were attempting to establish hedge positions at times when a severe and persistent discount existed in the SPZ in relation to the cash value of the index. Market makers stated that as a result of the deep discount they were extremely uncertain as to the price at which their futures orders would be executed, and whether they would be executed at all.

^{58/} Commission staff has not had an opportunity to date to conduct an analysis of actual increases in options market maker positions as was done for NYSE specialists. See Chapter Four.

^{59/} See discussion of position liquidations by First Options and Fossett Corporation at Chapter Five. Because timely execution of liquidation orders is of primary importance, rather than price, market makers who were forced to close out their positions in order to raise capital to meet margin calls may have been willing to pay unusually high premiums.

^{60/} The degree to which an options position is in- or out-of-the-money and its historical and implied volatility dictate the number of futures necessary to fully hedge the options position.

Second, the lack of effective inter-exchange communication left market makers uncertain whether trading halts had been called either formally or informally in the underlying securities or in the futures markets. This uncertainty was particularly notable on the morning of October 20.

Third, hedging in the futures markets became significantly more expensive on October 20 when the margin requirements on the CME increased by more than 100%. During the week of October 19 margin on S&P 500 futures contracts tripled, going from \$5,000 to \$15,000 per contract for a hedged position; additionally, rumors circulated on the options trading floor that the requirements would go even higher, to \$30,000 per contract. CBOE market makers stated that this increase significantly reduced their ability to assume large options positions that under normal conditions would be hedged through the futures market. In addition, they indicated that the margin increases reduced their willingness to quote tight markets and forced some traders out of the market entirely. They stated that the lack of cross-margining between the options and futures markets, *i.e.*, the failure to recognize hedged positions across markets, resulted in cash flow squeezes even in instances where a market maker was fully hedged across markets.

CBOE market makers interviewed by Commission staff also reported that the duration of the OEX opening rotation on October 20 had a significant effect on their hedging capabilities. Because no free trading is permitted during a rotation, market makers were unable for an extended time period to engage in hedging strategies that require positions to be taken in different series in the same class. In addition, OEX market makers were affected by their lack of information while in rotation regarding order imbalances in series not yet open.

XMI traders reported having difficulties similar to those experienced by CBOE market makers. These traders, including the XMI specialist, normally hedge their XMI positions with Major Market Index stock index futures contracts ("MMI") traded on the Chicago Board of Trade ("CBT"). They indicated that liquidity in the CBT's MMI futures contract was particularly thin on October 19 and 20 and that this factor, coupled with substantial discounts in the value of the futures contract, made it difficult to hedge short put and long call positions.

Equity option traders on all the exchanges also experienced difficulty in hedging their options positions with stock. Traders who hedge their positions with securities listed on the NYSE generally were able to buy and sell underlying securities, but experienced problems on October 19 and 20 determining the price at which their stock orders would be executed. During some periods options traders were forced to enter stock orders on the basis of quote information that they deemed non-informative because the quoted spreads were abnormally wide. Traders also reported experiencing delays in stock order routing systems, or, even if no unusual delays were encountered, the market often had moved away from the last quote by the time of the stock order's execution.

Market makers in options overlying OTC options experienced severe problems in effecting trades in their underlying securities on October 19 and 20. ^{61/} OTC equity options market makers indicated that in many instances they could not reach OTC market makers by telephone and, because of locked and crossed markets, did not know where the underlying stock was trading. Some OTC market makers also reported to the Division that the inability to buy or sell stock to hedge their risk from writing options forced them to set their options prices significantly higher.

E. Analysis

The impact of derivative financial instruments on the market as a whole is discussed at length elsewhere in this report. Accordingly, this analysis focuses on the performance of the options exchanges and the ability of market makers and specialists to maintain fair, orderly and continuous markets during the week of October 19. While certain of the options exchanges experienced greater stresses than others during the market break, the Division believes that the following analysis is applicable to all of the exchanges.

Prior to the market break, all of the options exchanges had in place rules and policies designed to accommodate trading during periods of unusual market conditions, such as heavy order flow in a particular options class brought on, for example, by news of a tender offer or a stock re-purchase plan. In such a case a "fast" market could be declared by exchange officials in order to accommodate increased trading interest. The exchanges' contingency rules had never been tested under conditions as extreme as those experienced on October 19 and throughout that week, when unprecedented price volatility went hand in hand with operations system failures and inefficiencies.

Options trading during the week of October 19 highlighted a number of inadequacies in key areas. In particular, the most actively traded index options classes did not provide an effective, continuous market at certain times on October 19 and for virtually all of October 20. Moreover, pricing anomalies on October 20 raise questions as to the fundamental fairness of those markets. Accordingly, the Division believes there are a number of areas that require review by the Commission and the options exchanges.

First, index option opening rotations were excessively long, particularly on October 20. The length of opening OEX trading rotations limited the ability of OEX options customers to receive timely executions and may in some instances have resulted in higher premiums being charged in certain series. Because trading is permitted only in one series of an options class at a time during a rotation, customer orders received by the CBOE after the opening of the series involved could not be executed until free trading commenced or, if a second rotation was called, until the series was called again in the rotation cycle. As a result, an order in a series that opened near the end of a lengthy rotation may have been executed long after the order was entered. The operation of this system and its protracted nature throughout the week of October 19 resulted in some customer orders being executed at prices substantially different from

^{61/} For example, an OTC equity options specialist on the Amex who ordinarily accounts for approximately 20% of the daily volume, reported to Commission staff that he was unable to effect any stock transactions on October 19 and 20.

quotes disseminated at the time of an order's delivery to the CBOE, or in OEX orders in different series being executed when the underlying index was at vastly different prices, solely depending upon the particular series' place in the opening rotation. For example, if orders to buy December 255 puts and November 255 puts were entered before the opening on October 20, the December puts would have been executed at 9:32 a.m. when the OEX index was at 216, while the November puts would have been executed at 10:30 a.m. when the index was at 235.

The CBOE has commenced a study to identify possible means to speed opening rotations, particularly on volatile days. The Division applauds this initiative and will monitor carefully the conclusions of that study. There are, however, two areas relating to rotations that deserve the immediate attention of all the options exchanges.

a. The Division believes that the length of OEX rotations on October 20 is attributable at least in part to the number of additional series made eligible for trading for the first time that morning, and to the five point strike price intervals the CBOE elected to utilize in listing new series. In unusual market conditions, options exchanges are empowered by exchange rule to add as many as four new strike prices above and below the current index price. This provision allows the exchange to make series available in response to significant intra-day volatility. An exchange is not required to list the maximum allowable number of series but has discretion to do so. The exchange may utilize strike price intervals of \$5.00 or greater in listing these additional series. In approving \$5.00 strike price intervals as the minimum allowed, regardless of the value of the index, the Commission stated that its approval was based upon the belief that index values generally tend to be less volatile than the prices of individual stocks. ^{62/} The Commission noted, however, that in the event of an increase in the volatility of an index, strike price intervals greater than \$5.00 might become desirable; thus it gave the exchanges the authority necessary to widen price intervals in response to volatility increases. ^{63/} While Commission staff continue to believe that narrow strike price intervals are useful in providing optimum flexibility for hedgers and traders, recent events have demonstrated the problems generated by the proliferation of options series. As was illustrated by the CBOE experience, strike prices set at the absolute minimum during a period of increasing index volatility can contribute to an excessive dispersion of trading interest and dilution of liquidity in all open series.

b. There is a need for the options exchanges to review carefully the manner in which public orders participate in the opening. At present public orders may be routed to the OBO (on CBOE and PSE) or specialist (on Amex, NYSE, and Phlx), or represented by a floor broker in the crowd. Moreover, professional orders on the CBOE and PSE must be represented in the crowd. The Division believes consideration should be given to requiring, at a minimum, all public orders to be represented by the OBO or specialist at the opening. This step would appear to facilitate the identification of the actual order imbalance in a particular series and permit a quicker, more efficient opening of that series. The Division recognizes that such a limitation may reduce the flexibility in how a customer order is handled and raises questions regarding the appropriate

^{62/} Strike price intervals for stock options are set by exchange rules at \$5.00 if the price per share of the underlying stock is less than \$100.00 and \$10.00 if the stock price per share is \$100.00 or more.

^{63/} See Securities Exchange Act Release No. 21362 (September 28, 1984), 49 FR 39135.

preferencing of those orders. Nevertheless, the Division believes that all means to achieve faster and coordinated index option openings must be explored.

Second, it is clear that exchange rules regarding opening rotations contributed to the pricing aberrations experienced during the market break and, accordingly, should be reviewed. These rules permit index options to commence opening rotations at the same time as the opening of the stock exchanges. While the rules may have minimal or no adverse impact when all the component securities of an index open quickly (*i.e.*, by 10:00 a.m. at the latest), they appear to have an adverse impact on market maker performance when a substantial percentage of an index's underlying securities fail to trade during the course of the opening rotation. This problem is aggravated by exchange rules that make it permissible to continue trading in the index option for one and one-half hours after the opening rotation even when more than 20% of the index's underlying stocks by index value are not trading. Commission staff believes that the operation of these rules on October 19 and 20 strongly influenced market maker performance by forcing market professionals to estimate, and in some instances guess, the opening price of individual component securities and the cash value of the index. It is questionable whether fair markets can be maintained in derivative index products when many of the index's component securities are not trading. This is particularly true for index options, in which there is more retail customer interest than in index futures. The Division suggests that the Commission and the options exchanges reexamine these rules.

Third, the experience of the options exchanges during the market break in their efforts to have new series promptly listed by vendors highlights the need for advanced planning by all vendors and the exchanges concerning what series, if any, should be delisted when vendor data base capacity is outstripped. While the Division encourages the vendors to work on expanding their capacity, the exchanges and vendors should coordinate the introduction of new series that may exceed vendor capacity, and vendors should adopt policies providing for the fairest deletion possible in the event capacity is outstripped again.

Fourth, the Division believes that the performance of small order execution systems during the week of October 19 evidences the need for the CBOE and the Amex to revisit their rules governing market maker and ROT participation in these systems. The decision of the CBOE to release its market makers from their customary participation obligations, and the CBOE and Amex decisions to limit the availability of their execution systems to out-of-the-money call series, call into question the usefulness of these systems during volatile markets and the commitment of each exchange to provide public customers with enhanced liquidity and trading efficiencies on a continuous basis. While the NASD experienced similar problems with market maker defections from its Small Order Execution System ("SOES") during the week of October 19, the NASD has taken quick action to prevent future defections by proposing to place SOES participation obligations on market makers. The CBOE and Amex should consider similar action.

Fifth, emergency communication procedures between the options exchanges and the NYSE need to be upgraded. On October 19 and 20 inter-exchange communication appears to have become increasingly difficult as conditions in the stock market became more chaotic. As a result, the options exchanges were not completely aware of conditions in the primary market, especially late in the morning of October 20 when trading halts were in effect in 215 NYSE issues. The Division believes the Intermarket Surveillance Group should develop an inter-exchange plan for emergency circumstances.

Finally, market maker performance, especially in index options, was markedly inferior during the market break. As stated previously, market makers and specialists are required by statute and by exchange rules to trade for their own accounts in a manner that ensures the maintenance of fair and orderly markets. In return for the risks these market participants assume, they are accorded preferential margin treatment and are able to trade for their own accounts on the floor of the exchange. While the Division is cognizant of the many problems faced by these individuals in attempting to price derivative products at a time when the underlying markets were experiencing extreme volatility, nonetheless the performance of index options market makers on the CBOE and Amex is disturbing for two reasons. First, the level of market maker participation declined precipitously, primarily due to increased volatility. If market makers do not want to trade during volatile times, then it is questionable whether they should be accorded market maker status. Indeed, the Division questions whether the market makers that failed to participate during the opening rotations on October 20 should have received preferential margin treatment for any trades they did that day. Second, premiums charged for index options were extremely high and variable, often without regard to changes in stock prices. While the Division believes it is premature to judge the fairness of particular trades until the CBOE and Amex have completed their investigations of those trades, the levels of the premiums raise serious investor protection concerns. The Division intends to monitor the exchanges' handling of the situation very closely.

In conclusion, the Division believes the option exchanges need to address several questions in the near future, including: (1) how should opening rotations be handled in volatile markets; (2) how can communication between primary and derivative markets be improved; (3) how should the proliferation of series be handled; (4) how can high levels of market maker participation be ensured in a very volatile market; and (5) how can pricing continuity and fairness be maintained.

Chapter Nine

THE OVER-THE-COUNTER MARKET

A. Introduction

The over-the-counter ("OTC") market is the third largest securities market in the world. 1/ This market relies on at least three critical elements for its success. First, timely and accurate displayed quotations (supplemented by real-time transaction reporting) have been the keystone of the efficient pricing and execution of transactions in OTC securities. Second, competing market makers willing to place their capital at risk have provided liquidity in the OTC market. Third, and most recently, automated execution systems, based on displayed quotations, have been an essential factor in the ability of the OTC market to process rising transaction and share volume without significant operational difficulties. Moreover, each of these elements is critical to the other. If one element breaks down, the viability of the other elements is also reduced. Ultimately, a certain level of gridlock develops and the mechanisms for order execution and pricing efficiency cease to function effectively.

During the October market break, the quotation system became inoperative due to the large number of locked and crossed markets (discussed and defined below). Market makers no longer could rely on quotations as the basis for executing customer orders, either manually or via their automated execution systems. In turn, once broker-dealers no longer could rely on quotations (and last sale reports also appear to have been delayed), an increasing number of telephone calls were made to the leading market makers in an attempt to execute agency orders and to verify actual quotations for purposes of ensuring that dealer prices provided to effect principal transactions were reasonably related to the prevailing market. In response to a rising number of telephone inquiries, market makers were increasingly unable, or unwilling, to answer the telephone and provide market prices. Indeed, even when market makers were reached, they only were willing to provide prices for a nominal amount of shares (*i.e.*, one round lot) 2/ due to volatile market conditions and uncertainty as to those market makers' ability to obtain access to other market makers to adjust their positions.3/ Accordingly, a perception of a reduced level of market making participation may have led other market makers, in turn, to reduce their level of market making participation

1/ The term "OTC market" encompasses all non-exchange traded securities. As described below, however, this Chapter focuses primarily on trading of securities on the National Association of Securities Dealers Automated Quotations ("NASDAQ") System. Both the New York Stock Exchange (\$1,388.8 billion) and the Tokyo Stock Exchange (\$1,000.5 billion) exceeded the dollar trading volume of NASDAQ (\$378.2 billion) in 1986.

2/ The standard round lot unit of trading for equity securities is 100 shares. Round lots for debt instruments, however, vary and are expressed in terms of dollar value.

3/ Such problems were compounded when leading market makers withdrew from the National Association of Securities Dealers, Inc.'s ("NASD") automated small order execution system, leaving a greatly reduced number of market makers to absorb the rising order flow and volume emanating from that system.

or withdraw from the market entirely. These problems -- unreliable quotations, delayed transaction reports, reduced market maker participation, and increased manual handling of orders coupled with greater telephonic inquiries -- all combined to reduce dramatically the liquidity and orderliness of the OTC market during the October market break.

During the market break, each of the key elements of the OTC system experienced severe strain. Thus, although the OTC market executed a record amount of transactions and volume during this period, its performance was not satisfactory. Indeed, of all the major markets, the OTC market was singled out for the most severe criticism by the respondents to the Brady Task Force's questionnaire. ^{4/} For purposes of the Study, we will discuss separately the adequacy of the quotation and last sale reporting systems, small order execution, and market maker performance. It is worth repeating, however, that these are artificial separations for purposes of discussion. In actuality, failures of each component part played an important role in affecting the performance of the other parts.

B. Overview of NASDAQ Trading In October

The OTC market is composed of at least two distinct sub-groups of securities, those traded on NASDAQ and those quoted in the Pink sheets. The first group, NASDAQ securities, is further divided into two separate subgroups. First, certain NASDAQ securities are designated as National Market System ("NMS") Securities ("OTC/NMS Securities"). ^{5/} OTC/NMS Securities are securities that are quoted on the NASDAQ System and are subject to real-time trade reporting. ^{6/} Quotations for such

^{4/} Most respondents who commented believed the markets performed well below normal quality levels, with the OTC market being the poorest performer. Of those responding to the questionnaire, 76% rated the OTC market's performance in dissemination of price and market information for October 19 and 20 as very poor (less than 50% of normal quality); 65% rated the OTC market's performance in executing and clearing trades as very poor. See Report of the Presidential Task Force on Market Mechanisms; Surveys of Market Participants And Other Interested Parties, Study V, p. V-12, January 1988.

^{5/} See Rule 11Aa2-1 under the Act. Rule 11Aa2-1 recently was amended to designate as NMS Securities all OTC or exchange listed securities for which transactions are reported pursuant to an effective transaction reporting plan approved by the Commission pursuant to Rule 11Aa3-1 under the Act. This would include all securities listed on the NYSE and the Amex and sole regional exchange listings that substantially meet Amex or NYSE listing criteria as well as OTC securities that meet NMS eligibility criteria in the NASD's Transaction Reporting Plan. See Securities Exchange Act Release Nos. 24633 and 24635 (June 23, 1987); 52 FR 24234 and 24149.

^{6/} NASDAQ displays bid and offer quotations of competing market makers registered with the NASD. NASDAQ was developed by the NASD in the 1960s and early 1970s to facilitate trading of equity securities in the OTC market. It began operation in 1971.

securities must be firm 7/ and the price and number of shares involved in the transaction must be reported within 90 seconds of execution. 8/ As a general matter, OTC/NMS Securities represent the most highly capitalized, most actively traded OTC securities. 9/

The second group of NASDAQ securities consists of securities which, although quoted on NASDAQ, are either ineligible for designation as OTC/NMS Securities or have elected not to be so designated. These securities, while sometimes actively traded, generally are less highly capitalized than OTC/NMS Securities and less actively traded. 10/

Finally, there are the so-called "Pink sheet" stocks. These stocks are not quoted on NASDAQ and, generally, quotations only are available through daily reports compiled by the National Quotation Bureau, Inc. or similar quotation services operating on a regional basis. Pink sheet stocks are the least actively traded securities. 11/

The focus of this chapter is on the market for OTC/NMS Securities and, to a lesser extent, NASDAQ stocks in general.

During the week of October 19, 1987, the OTC market experienced unusual volatility: the NASDAQ Composite Index ("Index") 12/ declined by 19.4%, falling a total of 78 points in those 5 days (see Chart 9-1). The decline differed from that of the NYSE in that the dramatic drop occurred over a two-day period. The worst losses were sustained on Monday the 19th and Tuesday the 20th, when the Index declined,

7/ See Rule 11Ac1-1 under the Act.

8/ See Rule 11Aa3-1 under the Act.

9/ As of December 31, 1986, the average value of the total assets of companies issuing OTC/NMS Securities was \$576.7 million as compared to \$180.3 million for companies issuing non-NMS NASDAQ securities. Similarly, for that same date, the average shareholders' equity for companies issuing OTC/NMS Securities was \$80.1 million as compared to \$49.5 million for companies issuing non-NMS NASDAQ securities. Trading in OTC/NMS Securities accounted for 69% of the total share volume of all transactions in NASDAQ securities in 1986. Dollar volume of trading in 1986 in OTC/NMS Securities was \$337.1 billion, 89% of total NASDAQ dollar volume.

10/ Throughout this Chapter the term "NASDAQ securities" will be used to refer to both OTC/NMS Securities and non-NMS securities unless otherwise specifically indicated.

11/ See Burns, Over-the-Counter Market Quotations: Pink, Yellow, Green, and White Sheets -- A Gray Area in the Law of Evidence, 52 Cornell L.Q. 262, 265 (1967). On December 31, 1987, the NASD submitted a proposed rule change that would establish an electronic system of mandatory price and volume reporting for Pink sheet securities. See SR-NASD-87-55.

12/ The Index is a market capitalization weighted index of all OTC/NMS Securities, except warrants, and all other NASDAQ domestic common stocks.

respectively, 11% and 9%. The Index rose on Wednesday the 21st, gaining 7.34% of its value, although it declined again on Thursday the 22nd and Friday the 23rd by 4.47% and 2.29%, respectively. After a steep decline of 9% on Monday the 26th, the Index again declined, though not as sharply, by .86% and 1.51% on Tuesday and Wednesday, respectively. On Thursday and Friday it rose 5.2% and 5.3%, respectively, losing, on balance, only 1% of its value for the week of October 26th. An index representing the top 100 NASDAQ industrial securities -- the NASDAQ 100 -- lost 20.66% of its value during the week of October 19, then rallied during the following week, regaining 3.2% of its value.

While the OTC market was experiencing extreme volatility, reported share volume in NASDAQ securities also was extraordinarily high. For example, during 1986, NASDAQ daily share volume averaged 113.6 million shares; for the week of October 5 - 9, 1987, daily share volume averaged 151.8 million shares. ^{13/} In contrast, during the week of the market break, daily share volume averaged 244.3 million shares -- 113% higher than the daily average for 1986 and 61% higher than the daily average for the week of October 5.

Further, during the week of October 5, the high/low volume range was relatively small. The highest volume figure for any day during the week was 158.5 million shares on Tuesday; that figure exceeded the lowest daily volume for the week (145.3 million shares) by only 13.2 million shares. By contrast, high/low range during the week of the market break was dramatic. The range between the highest and lowest daily volume during that week was 111.1 million shares, over eight times the high/low range during the week of October 5. Volume climbed from 222.9 million shares on Monday the 19th to 288 million on Wednesday the 21st. It then dropped to 176.9 million shares on Friday (when the NASD initiated a 2:00 p.m. closing time), and stabilized throughout the following week at levels ranging from 190.5 million on Monday the 26th to 208.1 million on Friday the 30th (see Chart 9-2), still 83% greater than the 1986 average.

Daily dollar volume showed similar growth, rising from \$2.97 billion on Monday to \$3.52 billion on Wednesday (136% greater than the 1986 average). It then fell to \$1.83 billion on Friday and did not exceed \$2.09 billion the following week. ^{14/}

^{13/} Reported NASDAQ figures do not include the data from the NASD's Form T reports. Form T reports contain information on transactions executed outside the trading hours of the Transaction Reporting System and last sale reports of transactions that are not required to be reported within 90 seconds after execution. The NASD extracts from the Form T data, trades of 10,000 shares or more and adds this information to the volume data for each NASDAQ security. This information is kept in the NASD's files for historical purposes on a year-to-date basis.

^{14/} Share volume for OTC/NMS Securities, which represented from 75% to 80% of the total volume for NASDAQ securities during the market break week, followed a similar pattern. It climbed from 171.1 million on Monday to 234.7 million on Wednesday; it then decreased to 134.8 on Friday, and stabilized during the following week, at levels ranging from 153.7 million Monday the 26th to 168.5 million on Tuesday the 27th. (By comparison, in 1986 average daily share volume in OTC/NMS Securities was 77.9 million, less than one-third the level reached on Wednesday the 21st.) Similarly, the number of trades in OTC/NMS Securities

C. OTC Market Information Systems

Information regarding trading activity in OTC/NMS Securities is available from two sources: (1) last sale reports of completed transactions, and (2) bid/ask quotations. (Last sale reports do not exist for non-NMS securities.) During the week of October 19, both systems showed tremendous strain in the OTC market.

1. Trade Reporting

Perhaps as a result of the extraordinarily high volume experienced on Monday through Wednesday of market break week, there was an unusually high percentage of transactions reported to the NASDAQ System "out of sequence," that is, later than 90 seconds after the transaction was executed. On Monday and Tuesday, 20.6% and 20.2%, respectively, of all trades in OTC/NMS Securities were designated out-of-sequence. From Wednesday to Friday, these percentages declined somewhat, ranging from 18.7% on Wednesday to 15.1% on Friday. By way of comparison, the average daily percentage of OTC/NMS trades reported out-of-sequence during the month of September 1987 was 6.2%, less than one-third the proportion experienced on Monday and Tuesday of market break week. ^{15/}

increased from 135,686 on Monday the 19th to 162,309 on Wednesday; it then declined to 85,094 on Friday and remained within a range of 88,825 to 109,102 during the following week. (By comparison, the average daily number of trades in OTC/NMS Securities in 1986 was 48,397, less than one-third the number of trades executed in OTC/NMS Securities on Wednesday the 21st.)

- ^{15/} In this connection, the Division notes that in general the Commission has encouraged OTC market makers and the NASD to enhance the quality of trade reporting. *See, e.g.,* Securities Exchange Act Release No. 20902 (April 30, 1984), 49 FR 19314 (proposed rule amendments to expand NMS qualification standards). Further, in its comment on the 1984 proposed rule amendments, adopted in January 1985, which increased the number of securities for which trade reporting was required, the NASD stated that to aid in trade reporting it had developed a computer-to-computer interface to permit firms to meet NMS trade reporting obligations by entering trade details through in-house computer systems to be transmitted to the NASDAQ System. The NASD also stated that the use of SOES could significantly reduce a firm's trade reporting burden. Letter from Gordon S. Macklin, President, NASD, to George A. Fitzsimmons, Secretary, SEC, dated June 14, 1984. The Division believes, however, that the high number of late trade reports indicates that the NASD must take further steps. Several years ago the Division specifically suggested that the NASD require members to adopt appropriate internal control systems to ensure timely and accurate trade reporting, and the NASD responded that "[o]ur initial reaction to that suggestion was quite favorable and we anticipate that such would be another element in enhancing the overall quality of trade reporting." *See* letter from John T. Wall, Executive Vice President, NASD, to Brandon Becker, Assistant Director, Division of Market Regulation, dated February 10, 1984. Nevertheless, the extraordinarily large number of out-of-sequence reports demonstrates that further attention by the firms on those internal controls is necessary.

2. Quotations - Locked and Crossed Markets

The NASDAQ market depends to an even greater extent than other securities markets, on the availability of accurate and timely quotations for securities to ensure that trade executions fairly reflect the prevailing market price for those securities. Market makers in NASDAQ securities, therefore, are required to enter and maintain two-sided quotations for a security in which they are registered as a market maker in the NASDAQ System (unless they have obtained an excused withdrawal from the NASD)^{16/} and to stand ready to buy and sell at those specific prices on a regular or continuous basis.^{17/} Usually, bid prices submitted by different NASDAQ market makers in the same security approximate each other, as do asked prices quoted by those market makers. For example, if three market makers, A, B, and C were providing quotes for XYZ security, it would not be uncommon for A to quote a bid/ask spread of 10 (bid) to 10 1/4 (ask), while B and C might quote a spread of 10 1/8 to 10 3/8 and 9 7/8 to 10 1/8, respectively.

In response to a bid or an offer from another NASD member to purchase or sell, a market maker must execute a transaction for at least a "normal unit" of trading (100 shares) at its displayed quotations. Further, if the market maker provides a quotation for a particular number of shares in excess of 100, it must execute orders for that particular amount at its quoted prices in response to offers to buy or sell.^{18/}

A locked market in a security exists when the bid price quoted by one market maker in a security equals the ask price quoted by another market maker in the same security. For example, A bids 10 3/8 for XYZ while B is asking 10 3/8 to sell. A crossed market exists when the bid price quoted by one market maker in a security is greater than the ask price quoted by another market maker in the same security. For example, A bids 10 1/2 to buy XYZ and B is asking 10 3/8. In normal market conditions, "locked" and "crossed" markets occur only for short periods of time because if A is willing to buy at 10 3/8 and B is willing to sell at 10 3/8 (or in the case of a crossed market, a lower price), a trade should occur and new quotes should be entered. Because "locked" and "crossed" markets should be eliminated immediately, their continued existence indicates that the quotations for a security are suspect and may not provide an accurate reflection of the market for a security.^{19/}

^{16/} Schedule D, Part VI, Section 2(a), NASD Manual, paragraph 1754, at 1571.

^{17/} Section 3(a)(38) of the Act defines the term "market maker" as any dealer who "holds himself out . . . as being willing to buy and sell [a] security for his own account on a regular or continuous basis." Quotations may be entered into the NASDAQ System only by NASD members registered as NASDAQ market makers or otherwise approved by the NASD to function in a market-making capacity. See Schedule D to the NASD By-Laws, Part VI, Section 1(b), NASD Manual, paragraph 1754, at 1571.

^{18/} Schedule D, Part VI, Section 2(b), NASD Manual, paragraph 1754, at 1571. As a general matter, NASDAQ market makers only enter quotations for 100 shares.

^{19/} A market maker cannot lock or cross his own quotations; the NASDAQ System is programmed to reject such entries.

Because quotations submitted by NASDAQ market makers are required to be reasonably related to the prevailing market, 20/ and locked and crossed quotes lack that reasonable relationship to the prevailing market, NASD rules prohibit a market maker from entering or maintaining a quote that locks or crosses a market in a particular security, except under "extraordinary circumstances." 21/ Prior to entering a quote that would lock or cross another quote, a market maker is required to execute transactions with the market maker whose quote would be locked or crossed, in order to induce that market maker to adjust its quotes to the market. 22/

As a result of this regulatory framework, locked or crossed markets generally remain only for a short period of time. For example, on July 13, 1987, there were only 65 intra-day locked or crossed markets, 53 of which (82%) were resolved within five minutes. Nevertheless, during the market break there was an extraordinarily high number of locked and crossed markets and the duration of these locked and crossed markets was unusually long.

According to market participants, there were at least two reasons for the high number of locked and crossed markets. When a security is rapidly changing in price (either rising or falling) a market maker may not be able to take effective steps to avoid locking or crossing another market maker's quotation. Similarly, other market makers may not be able to respond to changed quotations in a timely manner. Market makers reported that during the market break the number of transactions was so high that they simply did not have the time to update all of their quotations. 23/ In addition, it was suggested that because market makers had difficulty reaching other market makers by telephone, 24/ they had no choice but to lock or cross another market maker's quote intentionally because they were simply incapable of executing a trade with the market maker whose quote they locked or crossed. Because the market maker had a customer who wanted to sell to the market maker with the highest bid and could not contact that market maker by telephone, the market maker locked the market until it effected the trade.

The significance of locked and crossed markets during the market break can be measured by comparing the number of such occurrences during the break with a prior "normal" period. According to an NASD study, for the two-week period between July 13 and July 24, 1987, there were 925 instances of locked or crossed markets in NASDAQ securities, an average of 92.5 instances per day. Of these 925 instances of locked or crossed markets, 249 (27%) existed at the opening; 56% were resolved within one minute and 82% in less than 5 minutes. In contrast, from Monday October 12 to Friday

20/ Schedule D, Part VI, Section 2(c), NASD Manual, paragraph 1754, at 1571.

21/ Schedule D, Part VI, Section 2(e), NASD Manual, paragraph 1754, at 1571-2.

22/ Id.

23/ The average number of OTC/NMS common stocks and ADRs in which NASDAQ market makers took positions was 50.4 securities per market making firm as of September 30, 1987. According to the NASD, the average trader is responsible for 43 securities (this average figure includes Pink sheet securities).

24/ See Section E, Access to Market Makers During Market Break Week.

October 16, the daily number of locked and crossed markets in OTC/NMS Securities increased from 97 to 268 (a 176% increase). 25/ (In the 50 most actively traded OTC/NMS Securities, the daily number of locked and crossed markets increased from 28 to 83, a 196% increase.)

On October 19, the number of locked and crossed markets in NASDAQ securities rose to 5,074 (4,708 in OTC/NMS Securities), an incredible 54-fold increase from the daily average in July. (For the 50 most actively traded OTC/NMS Securities, the number rose to 967, approximately 34 times the daily average of 28.4 that prevailed during the week of September 28, 1987.) During the week of October 19, there were 15,300 intra-day locked or crossed markets in OTC/NMS Securities, 2,621 of which involved the 50 most actively traded OTC/NMS Securities. Moreover, of those 2,621 instances of locked or crossed markets in the 50 most active securities, only 62% (1,614) were resolved within 5 minutes; 93% (2,444) were resolved within 30 minutes; 2% (56) required over an hour to resolve. In all, there were 8 instances in which locked or crossed markets lasted for over 6 hours. 26/

Examination of figures for the 50 most actively traded OTC/NMS Securities reveals that the frequency and duration of locked and crossed markets were much higher on October 19th and 20th than for the rest of the week. On Wednesday, these figures dropped precipitously, then leveled off somewhat until Friday the 23rd. On Friday, they dropped again, and stayed at relatively low levels throughout the following week. For example, instances of locked and crossed markets for the 50 most active OTC/NMS Securities stood at 967 and 868 on Monday the 19th and Tuesday the 20th, respectively; on Wednesday, the figure dropped to 389 and remained close to that level (338) on Thursday. On Friday, the figure fell to 59; it did not rise above 142 for any day during the entire next week. 27/ The number of locked or crossed markets not resolved within one hour followed a similar pattern. During the week of October 19,

25/ For all NASDAQ securities, from Monday to Wednesday of the market break week, there were an average of 1,991 NASDAQ securities per day in which markets were locked or crossed either prior to or after the opening. Of these, an average of 700 securities per day had locked or crossed quotes prior to the opening; an average of 1,291 securities per day had locked or crossed quotes during normal trading hours. During the market break week, quotations for an average NASDAQ security became locked or crossed 3.24 times a day.

26/ The number of instances per day of locked and crossed markets exceeds the number of securities in which markets are locked and crossed during the day because a market for a security can be locked or crossed many different times during the trading day.

27/ All OTC/NMS Securities reflected this same pattern of declines on Wednesday and Friday in both the number and duration of locked and crossed markets. The number of locked and crossed markets in OTC/NMS Securities reached a high of 5,509 on Tuesday the 20th. On Wednesday it fell to 3,262 and continued falling through Thursday (1,502) until it reached 319 on Friday. During the succeeding week, the figure stayed relatively low, never exceeding 639 for any one day. The number of locked and crossed markets in OTC/NMS Securities not resolved within one hour followed a similar pattern.

there were 56 instances in which locked or crossed markets in the 50 most active OTC/NMS Securities were not resolved within one hour; during the following week, there were no such cases.

On October 19, 20, and 21, the 20 market makers with the highest absolute number of locked or crossed markets constituted, with two exceptions, the same 20 firms with the highest number of market making positions ^{28/} in OTC/NMS Securities. ^{29/} All of the 20 are among the top 50 NASDAQ market makers. ^{30/} These 20 firms held 41% of the total number of market making positions in all NASDAQ securities, as averaged for the end-of-month trading positions for September and October 1987.

These 20 firms head both the list of those market makers who actively initiated locked or crossed markets and the list of those market makers whose quotes were passively locked or crossed by other market makers. ^{31/} The 20 firms represent, on average for the 3 days, 58% of the total number of instances of actively locking or crossing and 67% of the number of instances of passively locking or crossing. In general, of the 20 firms, those that could be classified as large wire houses had a higher number of locked or crossed markets than wholesale firms, small firms or block houses. ^{32/}

^{28/} "Market making positions" represents the total number of positions made by each market maker in the NASDAQ System.

^{29/} Only 5 of the top 20 OTC/NMS market makers are among the top 20 market makers in non-NMS securities.

^{30/} The NASD determined the top 50 market makers by assigning to each market maker a number reflecting a combination of its trading volume, number of positions taken, and total capital.

^{31/} A market maker can be involved in a locked or crossed market in two ways: first, the market maker could be the firm that enters the quote that locks the market ("the locker"); second, the market maker could be the firm whose market is locked or crossed by another market maker ("the lockee"). Generally the firm entering the quote that locks or crosses the market is attempting to update its market. The firm whose market becomes locked or crossed generally has not updated its quotes.

^{32/} If the 20 firms are ranked according to the correlation between the number of locked or crossed markets per firm and the number of market making positions held by the firm, a different picture emerges: the firms with the highest numbers of market making positions in all NASDAQ securities had the lowest number of locked or crossed markets, among the 20 firms, relative to their total number of market making positions. For the three days, the lowest daily number of locked and crossed markets in which any one of these 20 firms was involved, either as a locker or as a lockee, was 101. This number exceeds the system-wide daily average of 92.5 for the two-week period in July of 1987. These are firms that tend to make markets in a large number of non-NMS securities relative to their OTC/NMS market making positions. Of the 20 firms, those with fewer market making positions for all NASDAQ securities had the highest number of instances

The NASD took steps during the week of October 19 to address the occurrence of locked and crossed markets. On Monday and Tuesday, the NASD monitored the number of securities in which markets were either (1) locked or crossed prior to the opening of trading, or (2) became locked or crossed during the trading day. It also attempted to contact firms with locked or crossed markets by telephone to ascertain why the locked or crossed market existed, and urge the firm to update its quote. In addition, the NASD attempted to contact market makers to advise them that other broker-dealers were trying to contact them by telephone. Because of the difficulty it experienced in reaching the trading rooms of OTC market makers, the NASD on Tuesday established direct telephone lines to the OTC trading desks of approximately eight major market makers. On Wednesday the 21st, it disseminated through the NASDAQ System an administrative message advising subscribers that the NASD intended to take action against all market makers who failed to honor their quotes or correct locked and crossed markets. On Thursday the 22nd, a similar message reported that the NASD would refer to the Market Surveillance Committee instances of market makers' failure to answer telephones, failure to maintain firm quotes, and locking and crossing markets. After the close of trading Thursday, the NASD determined to establish a dedicated telephone "hotline" to all NASDAQ market makers, to be used to advise market makers that their quotes were locking or crossing a market in a particular security, and to urge them to update their quotes and to execute transactions at the quoted prices. The "hotline" also could be used by NASD members themselves, to advise the NASD of instances of locked or crossed markets. On Friday the 23rd, the NASD disseminated a notice regarding the establishment of the hotline.

The declines both in frequency and duration of locked and crossed markets from Wednesday the 21st through Friday the 23rd correlate with the NASD's actions to correct the problem of locked and crossed markets. The NASD's announcement on Wednesday of its intention to take action against market makers for failure to honor quotes preceded Wednesday's steep decline in the number and duration of locked and crossed markets. Its establishment on Friday the 23rd of a hotline to assist in the elimination of locked and crossed quotes preceded another decline. ^{33/}

of locked or crossed markets relative to their total number of market making positions. (The three firms of the top 20 with the lower number of locked and crossed markets relative to the number of market making positions were wholesale firms and the four with the highest relative number of locked and crossed markets were investment banks. The other 13 firms fall between the two extremes, with the large wire houses approximately in the middle of the group of 20.)

^{33/} The frequency and duration of locked and crossed markets do not correlate well with NASDAQ volume figures or with figures representing gain or loss in the value of the Index (see Chart 9-3). Unlike the locked and crossed markets, volume on NASDAQ did not fall on Wednesday the 21st, but actually reached a two-week high of 288 million shares. Neither did the value of the Index correlate well with figures for locked and crossed markets. After losses in value of 11% and 9% on Monday the 19th and Tuesday the 20th, the Index rallied, then fell again by 9% on Monday the 26th. Locked and crossed markets remained at relatively low levels on the 26th, and throughout the week; the drop in the market on the 26th was not accompanied by a corresponding increase in locked and crossed markets.

The presence of this abnormal number of locked and crossed markets severely hampered the ability of OTC market makers to execute customer orders. As discussed more fully below, the existence of a large number of locked and crossed markets had a particularly debilitating effect on the NASD's Small Order Execution System ("SOES") and firms' proprietary execution systems. Such automatic execution systems do not function when the market for a security is locked or crossed.

Moreover, NASDAQ quotation problems also affected the firms' non-automated execution capability. A survey of the top 50 NASDAQ market makers ^{34/} (see discussion, *infra*) shows that, because of the high number and duration of locked and crossed markets during market break week and the resulting need to execute orders by telephone, customer orders for securities whose quotes were locked or crossed were often executed in an untimely way or not executed at all. Executions, if and when effected, were often made at prices that represented only the broker's best estimate as to the prevailing market, or at whatever price was "available" (*i.e.*, offered by a market maker who could be contacted and was willing to execute at that price).

Specifically, the NASD asked the top 50 NASDAQ market makers how they handled retail customer orders for securities whose markets were locked or crossed during market break week. Their answers reflect that most attempted to contact, by telephone, the market maker displaying the best price ("the locked or crossed quote") in a security whose markets were locked or crossed. If the broker could execute a trade at the locked or crossed quote, it did so. If not, the broker typically canvassed several market makers, telephoning them to ascertain which was offering the best available price, or executed the trade at the next available bid or offer quotation displayed on the terminal. Brokers found that, whether they dealt with the market maker displaying the locked or crossed quote or sought another market maker, market makers were often unwilling to trade at their quoted prices.

Faced with this unwillingness, most of the brokers said that they typically negotiated with the market maker to agree on an adjusted price that, though not as favorable as the quoted price, reasonably approximated the prevailing market. The responses of both brokers and market makers reflect this bargaining process. One broker responded, "[a]gency orders, if [the] dealer could be reached, [were] offered at the bid. In most cases, the high bid was not honored but done at a price reflecting the real market" (emphasis added). Another firm admitted pricing based on the "[t]raders' discretion on stocks we make a market in. On stocks we did not make a market in-- at the best possible price we would negotiate."

Poor quotation information also affected the ability of firms to execute properly their customers' orders as principal. Firms often provide their customers with executions at the inside market, irrespective of what their proprietary quote is. Unable to identify an accurate best bid or offer, firms attempted to estimate an appropriate price. One firm responded that, in making this estimate, it took three factors into account: (1) number of market makers; (2) size of order; and (3) market conditions. Another stated that it simply chose a bid price 1/8 - 3/8 below the locked price, and

^{34/} The NASD performed a survey of the top 50 NASDAQ market makers in response to the data request sent to it by the Division. See letter from Richard G. Ketchum, Director, SEC, to Joseph R. Hardiman, President, NASD, dated November 12, 1987. Forty-nine out of 50 market makers responded to the questionnaire.

an ask price $1/8 - 1/4$ above the locked price. Finally, the responses of some firms implied that they simply did not consider locked and crossed markets in executing customer orders. One firm said that it "ignored crossed" markets; another stated that "[Obtaining an execution] was not always possible because we were unable to get through to the market makers in some securities."

D. Small Order Handling

1. SOES

SOES, the NASD's small order execution system ^{35/} was established to permit small orders in NASDAQ securities to be automatically executed at the best bid or ask price (the so-called "inside" market) ^{36/} depending on whether the order is to buy or sell. SOES is restricted to agency orders (customer orders) of 1,000 shares or fewer in over 3,000 OTC/NMS Securities and 500 shares or fewer in approximately 2,700 non-NMS securities. ^{37/}

Participation in SOES is voluntary. ^{38/} Any NASDAQ market maker in a particular security may be a SOES market maker in that security. ^{39/} A SOES market

^{35/} The initial phase of SOES became operational in January 1985; the second phase became operational in August 1986. At the System's inception, executions were limited to orders in OTC/NMS Securities of 500 shares or fewer.

^{36/} The "inside" market is the best bid and ask price for a security. For example, if A, B and C are market makers in XYZ and A is quoting a bid-ask spread of 10 to $10 \frac{1}{4}$, B is quoting $9 \frac{7}{8}$ to $10 \frac{3}{8}$ and C is quoting $10 \frac{1}{8}$ to $10 \frac{3}{8}$, then the "inside" quote is $10 \frac{1}{8}$ to $10 \frac{1}{4}$ (i.e., C's bid of $10 \frac{1}{8}$ and A's ask of $10 \frac{1}{4}$).

^{37/} Agency orders also include orders entered into SOES on a riskless principal basis by a SOES Order Entry Firm (see *infra* note 38) that is not a market maker in the SOES security. See also Rules of Practice and Procedures for SOES, Section (a) 8, NASD Manual, paragraph 2451, at 2303.

^{38/} There are two types of participants in SOES: (1) SOES Market Makers and (2) SOES Order Entry Firms. SOES Market Makers must be members of the NASD registered as NASDAQ market makers in a security. SOES Order Entry Firms are NASD members registered as SOES order entry firms. As such, they may enter orders for execution against SOES market makers. See Rules of Practice and Procedures for SOES, Section (a)5 & 6, NASD Manual, paragraph 2451, at 2303.

^{39/} Level 2 and 3 NASDAQ terminals have indicators next to the symbols of the market makers who participate in SOES. The NASD must manually remove SOES indicators from the NASDAQ System. Because of the number of market makers withdrawing from SOES during the week of October 19, SOES indicators were not always removed at the time the market maker withdrew, making it difficult for firms to determine if a particular security had a SOES market maker. Frequently, although the SOES indicators were on the NASDAQ screens, the market makers

maker may withdraw from and reenter SOES at any time, without limitation during the operating hours of SOES. 40/ A SOES market maker is subject to automatic executions on a rotating basis if its quote is equal to the inside market. 41/

Orders entered into SOES generally are automatically routed to a SOES market maker for execution. The automatic execution feature of SOES eliminates the need for telephone contact with various market makers. In addition, SOES automatically reports the trade data to the clearing corporations, in contrast to non-SOES transactions where the trader must transmit the information directly to the clearing corporation. 42/ Accordingly, SOES has played a significant role in processing high volume because it not only reduces paperwork but also curtails the need for telephone contact with market makers.

During the week of October 19, a record number of transactions were executed through SOES, representing record share volume. On Monday, October 19, for example, 21,555 SOES transactions (2.7 times greater than average) accounted for a total of 8

had withdrawn. If a firm enters an order into SOES and there is no SOES market maker for the security, the order will be rejected and must be handled manually.

40/ If, however, the firm has withdrawn from NASDAQ as a market maker on an unexcused basis, then, pursuant to Schedule D, the firm may not reenter as a NASDAQ market maker for a two-day period. Consequently, the firm would be unable to be a SOES market maker for two days. See Schedule D, Part VI, Section 7 & 8.

41/ For example, if the inside market for XYZ is 10 1/8 to 10 1/4, only market makers who were quoting either 10 1/8 bid or 10 1/4 ask would be eligible to receive orders through SOES. A dealer's quote refers to the stated price at which that dealer is willing to buy or sell 100 shares of that security. Currently, SOES orders are executed on a rotational basis against all market makers offering the "inside," or best, quotation. In addition, orders may be entered into SOES and designated for routing to a particular market maker. This type of order-entry is referred to as "preferencing." If this is done, the order is executed at the best price for that market maker's account even if its quote is not the best. Approximately 40% of the orders executed through SOES are preferenced orders. Some of the specifications outlined above will be subject to change if the NASD adopts the proposals outlined in the NASD's Notice to Members 87-77. See Section F, Analysis.

42/ Participation in SOES can be accomplished through one of two means. First, a Computer-to-Computer Interface ("CTCI"), between a firm's in-house computer system and SOES, can be elected if the firm has sufficient automation capabilities. Alternatively, SOES orders may be entered through a firm's standard NASDAQ terminal or a personal computer interface. Execution reports can be received on either the NASDAQ terminal or through a CTCI.

million shares (4 times greater than average). ^{43/} Despite the record volume, however, many market makers withdrew from SOES, reducing the liquidity of the SOES market. For example, the number of NASDAQ securities with at least one SOES market maker (the so-called coverage rate) ^{44/} declined significantly during the market break. The coverage rate on October 16, was 4,611. It dropped 16% to 3,849 on Monday, October 19, 17% to 3,196 on Tuesday, 13% to 2,771 on Wednesday; for the 3-day period, 1,840 securities (40%) were eliminated from SOES because there was no active SOES market maker prepared to execute transactions through SOES in those securities. By Friday, October 23, 831 securities had regained at least one SOES market maker. Another indication of limited liquidity in SOES is the number of SOES market making positions,^{45/} which stood at almost 20,000 on Friday, October 16, and declined 83% to 3,400 by Tuesday, October 20. ^{46/} Similarly, from October 5 to October 16, the average number of market makers per security on SOES was 4. This figure dropped 75% to as low as 1 on October 20, and stood at 3 from November 3 through the 30th. In sum, between Friday, October 16 and Wednesday October 21, the SOES coverage rate declined 40%, the number of SOES market making positions declined 83%, and the average number of SOES market makers per security declined 75%.

Thus, while volume and volatility were soaring, a significant number of SOES market makers withdrew from the SOES system each day (see Chart 9-4). Indeed, among the top 50 market makers, a significant number withdrew from market making in SOES during the week of October 19 while continuing to route orders to SOES for execution. For example, 13 of the top 50 market makers withdrew completely from SOES ^{47/} while continuing to route two to three times their average daily volume to SOES as order entry firms. Such action appears to be a direct violation of NASD rules. ^{48/} In contrast, six firms substantially increased their support of the SOES system and represented a significant portion of SOES volume. During the week of the market

^{43/} On average, volume in SOES is about 2,000,000 shares representing 8,000 trades per day. During 1986, SOES accounted for 13% of all OTC/NMS transactions and 1.3% of total NASDAQ volume. (Transaction information is only available for OTC/NMS Securities.)

^{44/} According to the NASD, the average coverage rate for SOES is between 4,000 and 4,500.

^{45/} SOES market making positions refer to the total number of market makers making markets in the covered securities.

^{46/} Two days later, the number of market makers per security on SOES had increased almost 50% to 6,600 but was still less than 1/3 of the rate for Friday, October 16.

^{47/} Twelve of the top 50 market makers either do not participate in SOES or do not use SOES for order entry.

^{48/} SOES rules prohibit a NASDAQ market maker in a particular security that is not a SOES market maker in that security, from entering orders into SOES for that security. For example, if A is a NASDAQ market maker in XYZ security but not also a SOES market maker for XYZ security, A is not allowed to enter orders into SOES on behalf of customers for XYZ security. See Securities Exchange Act Release No. 25005 (October 8, 1987), 53 FR 462.

break, these firms executed at least 4 times their average daily volume for OTC/NMS Securities.

With a record number of SOES market makers withdrawing from some or all of their stocks, trades that normally would have been executed automatically through SOES had to be executed by contacting NASDAQ market makers by telephone. 49/ This added to the already large number of telephone calls, increasing the workload of firms. 50/

In addition to the withdrawal of market makers from SOES, the large number of locked and crossed markets discussed above contributed to problems in using SOES. 51/ Under current SOES procedures, automatic executions cease if quotations become locked or crossed, requiring orders to be handled manually. Such manual processing contributed to further pressures on market makers and order entry firms as they sought to handle the increased volume of small orders.

In order to address the high level of SOES market maker withdrawals and the unprecedented market volatility, the NASD submitted a proposed rule change providing its President with the authority from October 23, 1987, to December 31, 1987, to define the term "limited size" for SOES to mean any number of shares between 300 and 1,000. 52/ Pursuant to this amendment, from October 26, 1987, to November 6, 1987, the size limit for OTC/NMS Securities was reduced from 1,000 shares to 500 shares, while non-NMS securities order limits remained at 500. 53/ The NASD believed that limiting the exposure of SOES market makers might encourage a number of market makers who had withdrawn from SOES to return to the system. After the 26th, the coverage rate and the number of market making positions rose steadily.

2. Proprietary Systems

Apart from SOES, several large brokerage firms operate their own systems that provide retail customers automatic executions of small orders for NASDAQ securities in

49/ The withdrawal of market makers from SOES prompted the NASD to lower the maximum size of orders that could be entered and executed through SOES. See infra notes 52 and 53.

50/ See Section E, Access to Market Makers During Market Break Week.

51/ See Section C (2), Quotations - Locked and Crossed Markets.

52/ "Limited size" refers to the maximum share size of an order that may be entered and executed through SOES. See Securities Exchange Act Release No. 25064 (October 30, 1987), 52 FR 42050. See also Rules of Practice and Procedures for SOES, Section (a)7, NASD Manual, paragraph 2451, at 2303.

53/ In a subsequent rule filing by the NASD, the size limit for OTC/NMS Securities entered and executed through SOES was raised to its previous 1,000 share limit because of the diminished market volatility and trading volume. See Securities Exchange Act Release No. 25132 (November 10, 1987), 52 FR 44952.

which the firm makes a market. ^{54/} These systems function in much the same manner as SOES; the systems have size limits and provide automatic execution at the inside market. Generally, there are two types of in-house systems. First, a large retail wire house (e.g., Merrill Lynch, Pierce, Fenner & Smith, Inc.) may operate its own system for its own customers. Second, a wholesale OTC market maker (e.g., Troster Singer) may operate a routing and execution system for other firms who route their retail orders to the firm. As with SOES, these systems eliminate many of the manual steps involved in executing an order and provide confirmations of the trade very quickly. Similarly, these systems generally do not automatically execute trades if the market for the security is locked or crossed; therefore, the firm would have to execute the order manually.

Three of the proprietary systems, Instinet, TRAN, and INside, offer their services to a wide range of broker-dealers. ^{55/} These systems act as intermediaries between participating market makers and firms entering orders that are not market makers in the particular security. Each of these systems permits subscribers to enter principal and agency orders of up to 1,000 shares ^{56/} for automatic execution against participating market makers. In the Instinet and TRAN systems, orders are executed on either a preferenced or a rotating basis against the various broker-dealers participating as market makers in the systems. The INside system does not have such competing market makers; instead, Troster Singer and one other market maker guarantee automatic executions in different stocks. The operators of all three of these systems indicated that the great increase in trading volume had a direct impact on system operations. ^{57/}

Instinet discontinued its automatic execution feature prior to the opening of the markets on Tuesday, October 20, 1987. Instinet undertook this action at the request of

^{54/} E.g., Drexel Burnham, L.F. Rothschild, Dean Witter, Paine Webber, and Salomon Brothers.

^{55/} While this chapter addresses solely the OTC market, it should be noted that the Instinet system permits trading in exchange-listed as well as OTC securities, whereas the other two systems only permit trading in OTC securities.

^{56/} The TRAN system permits orders of up to 2,000 shares for stock selling for less than one dollar. On INside, the maximum size for automatic execution is set at a level deemed appropriate in accordance with the liquidity of a particular stock; the maximum size is 3,000 shares, while the vast majority of stocks have a maximum of 1,000 shares.

^{57/} During periods in which the market in a particular security is locked or crossed, the Instinet and INside systems store orders that have been entered, but cannot be executed because of the locked or crossed condition of the market. The stored orders are automatically executed by those systems later when the market has returned to normal. Unlike Instinet and INside, the TRAN system has no capacity to store orders during periods in which markets are locked or crossed. Rather, the system rejects the order and refers it to a trading desk, to be manually executed by telephone. Thus, unlike the other two systems, TRAN permits trading to occur in a security whose market is locked or crossed, subject, however, to the uncertainty of contacting by telephone the market maker offering the best bid or ask price.

the market makers on the system, because of the volatility of the markets and the large number of locked and crossed markets.

Similarly, the TRAN system also discontinued its operations, starting on Tuesday, October 20. Until that date the system operated normally, even with the increased volume. Transaction Services, Inc., the operator of the system, indicated that all of its market makers asked to be removed from the system because of the extremely volatile market conditions. The system did not function again until Monday, November 2, 1987. At first, on that day, the size limit for guaranteed execution was reduced to 500 shares, but because there appeared to be no trading problems, the limits again were increased to the 1,000 and 2,000 share levels.

Troster Singer indicated that the INside system operated normally, without significant malfunctions, except that during the high-volume days the high levels of data traffic over transmission lines slowed response times. ^{58/} INside never discontinued the operation of the guaranteed execution feature. Beginning at noon on Monday, October 19, however, Troster Singer reduced by 50% the maximum size of orders for which the system guaranteed execution. By about 2:00 p.m. on the same day, Troster Singer again reduced the maximum sizes, for a total reduction of 80%. ^{59/} The maximum sizes were adjusted back up to 50% of normal on October 20 and 21, and on October 22, the sizes again were increased to 100%.

3. Timely Executions ^{60/}

Data submitted to the NASD by the top 50 NASDAQ market makers indicating the number of transactions in OTC/NMS Securities during normal trading hours show that, during the week of the market break, transactions with retail customers constituted a somewhat greater percentage of all transactions executed by those market makers than during a more representative week. ^{61/} Retail transactions, which during the week of September 28, 1987, accounted for 73% of all transactions executed by those market makers, increased to 76% of the total transactions during the week of the market break.^{62/} Institutional block transactions accounted for 4% of the total OTC/NMS transactions during the week of September 28, and 3% during the market break week.

^{58/} Troster Singer indicated that on October 19 and 20, the INside system handled two to three times the normal number of transactions.

^{59/} Troster Singer attempted to contact all order-entry firms by telephone to advise them of the adjustments in the maximum sizes. Troster Singer is unaware of any resulting problems.

^{60/} See Chapter Seven, Section C, Automated Order Routing and Execution Systems.

^{61/} These transaction figures are exclusive of transactions executed through the NASD's SOES System. See Section D(1), SOES.

^{62/} For purposes of this Chapter, trades of 1,000 shares or less are considered retail transactions; trades of 10,000 shares or more are considered institutional block transactions.

In addition, due to the extraordinary trading volume during the week of the market break, many NASDAQ market makers were unable to execute customer orders in a timely fashion during the trading day. Accordingly, these customers received executions substantially after the 4:00 p.m. closing of the NASDAQ System. Specifically, an analysis conducted by the NASD identified 11 firms from its sample that executed substantial numbers of trades after normal trading hours. ^{63/} The analysis reveals that 94% of the total trades in OTC/NMS Securities executed after normal trading hours were of retail size, whereas retail trades comprised only 76% of transactions in OTC/NMS Securities executed during the trading day. Moreover, two of the 11 firms accounted for 82% of all the after-hours trades executed by the 11 firms. The survey also reveals that a significant number of trades, especially trades of retail size, were executed at prices that cannot be readily identified as being reasonably related to the market. A total of 96 after hours trades of less than 1,000 shares and 19 trades of between 1,000 and 10,000 shares were executed above the highest price or below the lowest price reached by that security on the day of the trade.

After-hours trading poses particularly serious risks for customers because during those hours, market makers have access, through their computer screens, to only a limited range of price information on which to draw in setting an appropriate price for the security traded. During normal trading hours, a market maker generally has computer access to the inside market for each NASDAQ security (see Section D(1), SOES) and to the current bid and ask quotations submitted by NASDAQ market makers in each NASDAQ security. ^{64/} After normal trading hours, however, a market maker has computer access only to the closing price of each NASDAQ security in which it trades; ^{65/} it does not have ready access to the prices at which other market makers are purchasing and selling the security at that time. The market maker has no "live" quotation information on which to make an estimate of the prevailing market in a security. Accordingly, the prices at which customers receive executions after normal trading hours may vary widely, depending upon their market makers' different, and often

^{63/} The NASD compiled this information by reviewing data submitted to it on Form T by 25 market makers, covering trades executed by those market makers from Monday, October 19 to Wednesday, October 21 (see discussion, supra note 13). From that Form T data, the NASD extracted and submitted to the staff only the after-hours trades, eliminating the trades reported later than 90 seconds after execution. Of the 25 market makers submitting information on Form T, 14 reported they did not execute late trades during the three days covered by the survey. Thus, our analysis considers only the 11 market makers that reported late trades.

^{64/} This information is provided through NASDAQ Level 2 and Level 3 service. (Level 3 service, in addition to providing the inside quotation and the quotations of individual NASDAQ market makers, also allows NASDAQ market makers to adjust their quotations and report trades and daily volume to the NASDAQ System.) Level 1 service provides a more limited range of data and services than Levels 2 and 3. It supplies only the inside quotation for all NASDAQ securities, but does not provide individual market makers' quotations or the ability to update quotations.

^{65/} Moreover, the NASDAQ System disseminates this closing price information only until 6:30 p.m.

divergent, perceptions of the condition of the market. ^{66/} In such an environment, it is difficult for a customer to ascertain whether his order is executed at a price that is reasonably related to the prevailing market.

E. Access to Market Makers During Market Break Week

The shutdown of SOES and the proprietary systems for securities in which markets were locked or crossed, combined with the unwillingness of market makers to purchase a normal volume of NASDAQ securities, resulted in an unusually high number of telephone calls to market makers during market break week. A large number of the broker-dealers interviewed by the Division staff indicated that, during the week of October 19, they found it unusually difficult to contact market makers by telephone. Further, when those firms reached a market maker, that market maker often agreed to purchase only a relatively small number of shares, in order to limit its potential exposure. ^{67/} Thus, it was necessary for a broker to make several calls to execute a single order of 1,000 shares, further adding to the volume of telephone calls.

The Division has sought to determine the reason for the market makers' failure to answer telephones, by personally interviewing representatives of the OTC trading departments of seven NASD member firms that make markets in OTC stocks and execute trades as agent for retail and institutional customers. All five firms expressing a view informed the staff that they believe the market makers' failure to answer their telephones was due to a lack of sufficient staff to respond to the high volume of calls during the week, and not to any deliberate failure to answer telephones in order to avoid trading. OTC market makers had, on average, 14.3 traders per firm involved in OTC market making during the week of October 19 and 132 direct wires into their OTC trading desks during that time, of which 71 were dedicated to communication with dealers, 27 to communication with institutions, 14 to internal communication and 19 to other purposes. In normal times, the volume of calls can be handled because most of the direct lines are not in use simultaneously. During the week of October 19th, however, firms indicated that the volume of calls increased substantially.

Access appeared generally to be a greater problem for market makers than institutional customers. Money managers surveyed by the Division experienced some delays and generally indicated a mixed ability to get through to OTC market makers. On the other hand, market makers interviewed consistently indicated problems in reaching other market makers. The trade data also appear to bear out this difficulty. The proportion of interdealer trades declined from 53.4% to 43.2% during the week of

^{66/} For example, the staff found that, at 6:03 p.m. on October 19, one NASDAQ market maker executed a trade in Apple Computer Inc. at a price of 41 1/4 dollars per share. On the same day at 6:00 p.m., another market maker executed a trade in Apple Computer Inc. at a price of 34 dollars per share, or 18% less than the first market maker's price and below the lowest price at which that security was sold during normal trading hours that day (35 1/2 dollars per share).

^{67/} During the week of the market break, the average size of trades executed through the NASDAQ System decreased significantly from the level reached in August and September, 1987. See Section E(3), Quote Spreads.

October 19, while daily share volume rose dramatically. ^{68/} The impact on OTC market makers of not being able to reach other market makers was substantial. Without recourse to other dealers, firms lacked the ability to lay off excessive risk positions. This inevitably reduced the willingness of market makers to provide liquid markets.

1. Market Maker Formal Withdrawal

One important element of access to market makers is the number of market makers in the NASDAQ System. While a market maker is required to enter and maintain two-sided quotes in all securities in which it makes markets, it can withdraw from NASDAQ on an excused or unexcused basis, from any or all of its market making positions. If a market maker withdraws from NASDAQ, on an excused basis, ^{69/} it may return to the system whenever it is able. A market maker that withdraws on an unexcused basis, however, may not re-enter quotes for the security for two business days.

As discussed above, each firm that is a market maker must commit a certain amount of capital to its market making function. The amount of capital committed by the firm is based on a number of factors and varies by firm. Among the factors related to the size of capital commitments are the size of the firm and the number and the type of securities involving market making by the firm. Market makers are free to reallocate the amount of capital committed to a particular security and might do so by committing additional amounts of capital or eliminating certain securities. This, of course, will affect the liquidity of the market for the security that the firm decides to eliminate from its market making list.

As of September 30, 1987, there were 536 firms making markets in NASDAQ, representing 45,897 market making positions (an average of 86 market making positions per firm) with an average of 7.8 market makers per security. ^{70/} During the week of October 19, however, the number of market making positions fell. ^{71/} On October 19 alone, market makers withdrew from 1,117 market making positions. On October 20, market makers withdrew from 3,234 positions (53% OTC/NMS, 47% non-NMS). On October 21, the withdrawals totaled 906 (50% OTC/NMS, 50% non-NMS). The number of positions from which market makers withdrew, compared to the number for October 5,

^{68/} As discussed, daily share volume for the week of October 19, was 113% higher than the daily average for 1986.

^{69/} Among the reasons for which the NASD will grant an excused withdrawal are: illness, vacations, and circumstances beyond the market maker's control. In addition, a market maker may obtain an excused withdrawal based on investment banking activity or the advice of legal counsel.

^{70/} As of October 30, 1987, there were 515 market makers (a 4% reduction from September) in NASDAQ representing 38,964 market making positions (a 15% reduction) (an average of 76 market making positions per firm) (a 12% reduction), with an average of 7.1 market makers per security (a 9% reduction).

^{71/} Sixty-four percent of the withdrawals were from OTC/NMS Securities; 36% were from non-NMS securities. NMS Securities account for 53% of the approximately 5,700 NASDAQ securities.

was five times greater on October 19, 15 times greater on October 20, and 4 times greater on October 21. 72/

The system-wide total of market makers that withdrew from securities does not tell the entire story, however. As noted, a market maker that withdraws on an unexcused basis may not reenter quotes in the security for two business days and must re-register with the NASD as a market maker. 73/ This means that, if a market maker withdrew from a security on an unexcused basis on October 19, he would have to stay out as a market maker for that security until Wednesday, October 21. Therefore, the number of positions from which market makers withdrew on an unexcused basis on Monday should be added to the number of positions from which market makers withdrew on Tuesday to obtain a more realistic assessment of the number of market making positions lost on Tuesday. The adjusted figure for Tuesday would be 4,171; the figure for Wednesday would be at least 3,500.

In addition, we have reviewed the withdrawal patterns for the top 21 market makers 74/ for October 5, 19, 20 and 21. 75/ The number of the top 21 market makers that withdrew from OTC/NMS market making positions increased substantially, compared to October 5. The percentage of the total withdrawals represented by the top 21 market makers also rose. For the period from October 19 through October 21, the top 21 market makers withdrew from 1,567 OTC/NMS market making positions. Five firms, however, were responsible for 83% of these withdrawals. On October 5, the top 21 market makers represented 31% of the system-wide withdrawals from OTC/NMS Securities; this percentage rose to 42% of the system-wide withdrawals on October 19; 37% on October 20, and 48% on October 21.

With respect to non-NMS securities, the top 21 market makers represented 23% of the system-wide withdrawals on October 5. Again, the percentage of withdrawals represented by the top 21 market makers rose to 32% on October 19, 36% on October 20 and 51% on October 21.

72/ On October 5, the total number of withdrawals was 219; 56% were from OTC/NMS Securities, 44% from non-NMS securities.

73/ Of course, the market maker may decide not to make a market in the security for as long as he chooses.

74/ These are the top 21 of the top 50 NASDAQ market makers identified by the NASD. See note 30.

75/ The top 50 market makers represented 26,582 market making positions as of September 30 (an average of 532 positions per firm). For October 30, the number was 23,281 (an average of 466 positions per firm). This is a 12% drop in the number of market making positions.

2. Market Maker Positions 76/

In a further effort to gauge the activity of OTC market makers, the Division asked the NASD to provide information regarding the amount of capital that the top 50 market makers commit to OTC market making, the position limits observed by the firms and the extent to which the firms exceeded their position limits in October. In reply, the NASD stated that the top 50 OTC firms "normally committed an aggregate of approximately \$925 million to OTC market making activity, [although] [t]he amount varied considerably by firm and type of business," and that 41 of 50 firms reported having dollar position limits. During the market break, the NASD reported that 20 of the 41 firms with dollar position limits exceeded those limits and in aggregate, the top "50 firms exceeded normal capital commitments by about \$155 million [17%]." The data did not, however, indicate the performance of individual firms for individual stocks.

Accordingly, the Division sent its own inquiry directly to the 21 largest OTC market makers (as defined by number of market making positions). 77/ Specifically, the Commission requested the firms to provide their opening and closing positions in the 50 leading NASDAQ securities (by volume) for October 1987. Because review and analysis of the firms' responses to this inquiry was time-consuming and manually intensive, the discussion here is limited to the firms' responses regarding their positions in 14 of the most active stocks, specifically the 14 stocks that, cumulatively, were among the top 10 dollar volume NASDAQ stocks for either 1986 or 1987. 78/

The data on trading positions indicates that on October 19 the broker-dealers were net buyers in these 14 securities, while on October 20 they generally reduced their positions. On October 19, in the 14 sample stocks, trading positions generally increased with firms purchasing, in aggregate, a net 1,693,522 shares. Conversely, on October 20, as the implications of the market break reached the OTC market, there were significantly more decreases than increases in trading positions with firms, in aggregate, selling a net 345,698 shares.

Each of the firms generally conformed to this trend. Specifically, on October 19, the firms increased their positions (*i.e.*, they were net buyers) 67% of the time. 79/ On October 20, the firms increased their positions only 45% of the time. 80/

76/ Market maker formal withdrawals from NASDAQ are readily measurable, but constructive withdrawals (*i.e.*, refusal to answer the telephone, intentional widening of spreads, refusal to trade in size), are more difficult to identify. Accordingly, the Division sought to obtain information on actual trading positions.

77/ See letter of December 15, 1987, in Appendix E.

78/ The Division received 18 responses to this second request for information. Three firms did not respond to the letter, and because one firm's response covered both its principal and agency trading positions, the staff's review was limited to the responses of 17 of the firms.

79/ The firms were net buyers of the stocks 140 times and net sellers 68 times.

80/ The firms were net buyers of the stocks 91 times and net sellers 111 times.

On October 21, as the Index moved upwards 7.3%, in each of the 14 stocks the firms were net sellers, selling 2,511,861 shares. There were nearly twice as many decreases as increases in trading positions. (The firms increased their positions only 34% of the time. 81/)

In sum, although more capital may have been contributed to NASDAQ market making in general, the more specific figures regarding market making activity reflect that the firms engaged in net buying of the leading OTC stocks only on October 19 (when the Index fell 11%) while they were net sellers on October 20 and 21 (when the Index fell 9% and then rose 7.3%, respectively).

3. Quote Spreads

Another indicium of market liquidity is the size of bid-ask spreads. The Commission's Directorate of Economic and Policy Analysis ("DEPA") examined the inside bid-ask spreads that prevailed in each NASDAQ security during a two-week period in September 1987, during the week of October 12 - 16, 1987, and on Monday through Wednesday of the week of the market break. 82/ The data show that, from September 1987 through October 21, there was an appreciable widening of inside bid-ask spreads in NASDAQ securities. 83/ During the two-week period from September 8 to 18, 1987, the

81/ The firms were net buyers of the stocks 67 times and net sellers 132 times.

82/ DEPA then selected a sample of 50 NASDAQ securities, chosen based on capitalization, average size of trades, and trading activity. These 50 securities were then divided into 5 groups of 10 securities each. The first 10 securities are the highest capitalized, most actively traded NASDAQ securities; the last 10 are among the lowest capitalized, least actively traded NASDAQ securities. The second, third, and fourth groups of 10 securities fall between those two extremes. For each group of 10 securities, DEPA averaged the inside bid-ask spreads of all 10 securities to arrive at a daily average, in cents per share, for Monday through Wednesday of the week of the market break. It also averaged the inside bid-ask spreads of all NASDAQ securities for Monday through Wednesday of the market break week. For example, on Wednesday the 21st, the average inside bid-ask spread in the top 10 NASDAQ securities was \$1.82. The average inside bid-ask spread for all NASDAQ securities for the same day was \$.71. DEPA also computed for each of the five groups and for all NASDAQ securities, daily averages for the week of October 12 - 16, and weekly averages for the two weeks in September (September 8 - 11 and 14 - 18). As discussed previously, the existence of a locked or crossed market in a particular security casts doubt upon the accuracy of all price information pertaining to that security. Accordingly, in computing the bid-ask spreads that prevailed in particular securities at any point during the day, DEPA did not consider periods during which markets in those securities were locked or crossed.

83/ Data drawn from the DEPA study also reveal that, though transaction volume in NASDAQ securities was unusually high during the market break week, the average trade size in shares was dramatically below normal. Specifically, on Monday and Tuesday, the average size of trades in NASDAQ securities was 22% and 10% below the August-September norm, respectively; only on Wednesday did the average trade size equal its August-September norm. These data are not surprising,

average inside bid-ask spread in NASDAQ securities approximated 50 cents per share (51.5 cents during the week of September 8 - 11, and 49.2 cents during the week of September 14 - 18). During the week immediately preceding the market break (October 12 - 16), that average increased 20.2% to 60.1 cents per share. Finally, from Monday to Wednesday of the market break week, that average increased an additional 13.5%, to 68.2 cents per share. Thus, in total the average inside spread in NASDAQ securities increased by 36.4% from September to October.

From October 19 to October 21, bid-ask spreads for the top 10 NASDAQ securities were appreciably wider than those for NASDAQ securities in general. Bid-ask spreads for the top 10 ranged from an average of 107.4 cents on October 19 to 182.2 cents on October 21; spreads in all NASDAQ securities ranged from an average of 65.5 cents on October 19 to 71.3 cents on October 21 -- 39% and 61% narrower, respectively, than those for the top 10 NASDAQ securities.

F. Analysis

The NASDAQ market performance during the October market break reflects mixed results. On the one hand, the system itself performed quite well and there were no reported outages or delays. On the other hand, key elements of the system failed to provide an efficient method of pricing securities and executing transactions.

As a threshold matter, the system simply ceased to provide an effective pricing mechanism for many leading NASDAQ securities, due to the inordinate number of locked and crossed markets coupled with the large number of delayed last sale reports. Moreover, the collapse of the pricing system either led to, or was part of, the problem associated with some market makers' unwillingness to provide reliable liquidity in reasonable size. From this standpoint, we think it is irrelevant whether market makers were unreachable due to inadequate staff to cover increasing demands or consciously avoiding their market maker responsibility. The point is that not only were machine-generated quotes unreliable, it was often impossible to verify quotations by telephone, or to effect inter-dealer trades. Finally, the abandonment of small order execution systems (both the NASD's SOES and firm proprietary systems) led to increased strains on market maker capacity and order execution facilities.

In light of these concerns and the dissatisfaction expressed by market participants regarding the operation of the NASDAQ market during the October market break, the NASD concluded that NASDAQ/NMS market improvements were essential. It has proposed specific enhancements for the NASDAQ System, focusing on the role and responsibilities of NASDAQ market makers, as well as on SOES.

Specifically, in Notice to Members 87-77 (November 20, 1987), the NASD proposed amendments to its Rules of Practice and Procedures for SOES ^{84/} and to the requirements applicable to NASDAQ market makers encompassed in Schedule D to its

because relatively high bid-ask spreads traditionally accompany small transaction size.

^{84/} NASD Manual, paragraph 2455, at 2303; see Section D (1), SOES.

By-Laws. 85/ The amendments are aimed at ensuring that investors' orders are executed in a timely manner even in a falling market with high volume, and that NASDAQ market makers fulfill their obligation to trade for their own accounts on a continuous basis, notwithstanding extraordinary market conditions.

The NASD proposed the following changes:

(1) to provide that, if a NASDAQ market maker withdraws quotes for any NASDAQ security without obtaining an excused withdrawal, it would not be permitted to re-enter as a market maker in that security for 30 days instead of the current two days; 86/

(2) to make participation in SOES mandatory for all market makers in OTC/NMS Securities; 87/

(3) to limit the conditions under which an excused withdrawal is permitted;

(4) to adjust the maximum number of shares that may comprise an order eligible to be traded through SOES, which number would vary depending on the type of security;

(5) to provide that, in any OTC/NMS Security in which quotes are locked or crossed, orders will continue to be executed through SOES against the firm causing the locked or crossed market, if its price is the best for the customer. 88/ Orders would continue to be executed against that market maker up to a certain exposure limit, at which point the NASD would contact the market maker and advise it to update and re-enter its quotes. If the market maker does not do so within a certain period of time, it would be forced to withdraw from the system on an unexcused basis, and would not

85/ NASD Manual, paragraph 1754, at 1571.

86/ See note 40 supra. In January, the NASD approved the proposal with minor modifications, one of which reduced the 30 calendar day penalty to 20 business days.

87/ Participation for non-NMS securities would remain voluntary. Currently, out of the NASD's 540 market makers, only 210 are SOES participants.

88/ As mentioned previously, SOES does not execute orders for securities in which markets are locked or crossed, which occurred frequently during October's rapid trading.

be permitted re-entry for 30 days. ^{89/} The proposal would establish minimum exposure limits for all NASDAQ market makers; and

(6) to eliminate "preferencing" of certain market makers during periods in which markets in a particular security are locked or crossed, so that market makers that do not cause the locked or crossed condition are not exposed to executions at quotations that are locked or crossed.

In addition, the NASD submitted a proposed rule change to establish an Order Confirmation Transaction service ("OCT"), which is analogous to an electronic mail system. OCT will enable NASD members to communicate and confirm the execution terms of individual transactions. ^{90/} In addition, OCT will enable a broker-dealer to transmit an order ^{91/} through its NASDAQ terminal to a specific market maker that will have two minutes to respond to the order. ^{92/} If the market maker accepts the order in its entirety, the transaction will be consummated. If not, the rejecting market maker may make a counter-proposal.

We view the NASD's initiatives as important first steps designed to restore accurate pricing, liquidity and the ability to assess risk to the OTC market. We encourage the NASD to continue analyzing the weaknesses that were highlighted by the market break.

It would be premature for the Division to comment on the adequacy of those steps because they are still in the proposal stage before the NASD, and the Commission ultimately will be called upon to review whether the specific initiatives proposed are consistent with the Act. The Division believes, however, that the speed with which action was taken and the comprehensiveness of that action is praiseworthy.

The Division suggests two items for further NASD and Commission consideration. First, the actions of individual firms during the market break raise serious questions

^{89/} At present, SOES market makers can determine the number of shares of any security that the system will execute against the firm's account each day of trading. This amount is referred to as the firm's "exposure limit." The proposal requiring all market makers in OTC/NMS Securities to be SOES participants would require a minimum limit capability in those securities. An additional grace period would be offered for NMS market makers that were removed due to their exposure limit. The NASD is also considering establishing minimum exposure limits. See proposal (4) referred to above. See also NASD Notice to Members 87-77, (November 20, 1987) at 4.

^{90/} See SR-NASD-87-54, approved for ninety days in Securities Exchange Act Release No. 25263 (January 11, 1988), 53 FR 1430. See also Chapter Ten, Clearance and Settlement Systems.

^{91/} Orders transmitted through OCT must include price and size of the order. Order executions negotiated through OCT automatically will generate transaction reports for OTC/NMS Securities and locked-in trades for both NASDAQ and OTC/NMS Securities for clearance purposes.

^{92/} After two minutes, the order is automatically cancelled.

regarding those firms' compliance with present NASD rules regarding market maker performance. The Division believes that the NASD should inquire into the performance of its market makers in October. ^{93/} Second, we believe there are a number of areas, in addition to the existing NASD proposals, which require review.

In considering future reforms, it should be recognized that the uniform practice among NASDAQ market makers is not to disseminate publicly quotations of more than 100 shares. This ongoing refusal by NASDAQ firms to provide firm quotations with size is in marked contrast to the willingness of many of those same firms to provide substantial sized quotations in London. ^{94/} Currently, NASDAQ market makers are required to purchase or sell only 100 shares of any security in which they make a market, in response to each offer to purchase or sell. The rules of the International Stock Exchange of the United Kingdom and the Republic of Ireland, Limited ("ISE") in London, however, specify that the minimum order size market makers may post is 1,000 shares. ^{95/} Thus, the Commission and the NASD should review whether OTC market makers should be required to provide U.S. investors with quotations that are at least comparable in size to those that they are apparently prepared to disseminate abroad.

In addition, the NASD'S "electronic mail" proposal, OCT, may not satisfactorily address the serious occurrences of locked and crossed markets, or concerns over access. While the NASD proposal will permit a market maker to notify electronically another market maker of its desire to trade, it does not enable the first market maker to execute automatically against the second market maker's quote. We believe the NASD and the Commission should review whether, if a firm does not respond to a message in a set amount of time, an execution should occur automatically. Such a system capability

^{93/} For example, the staff believes the high number of after-hours trades, discussed supra, warrants further investigation by the NASD regarding the reasons for the high proportion of after-hours trades executed by two firms. The NASD also should investigate the possibility that the trades cited above may have violated an interpretation of the NASD rules that requires NASD members to use reasonable diligence to obtain the best execution for their customers, and the Commission and the NASD rules and relevant guidelines against excessive mark-ups, mark-downs, and commissions. An interpretation of the NASD Rules of Fair Practice deems it inconsistent with just and equitable principles of trade for a member to enter into any transaction with a customer at a price not reasonably related to the current market price of the security. See Interpretation of the Board of Governors on the NASD Mark-Up-Policy, NASD Manual, paragraph 2154, at 2055, and Interpretation of the Board of Governors regarding Execution of Retail Transactions in the OTC Market, NASD Rules of Fair Practice, Article III, Section 1, paragraph 2151.03, at 2036-37.

^{94/} See Chapter Eleven, The International Capital Markets.

^{95/} Stocks listed on the ISE are divided into several categories, primarily based on liquidity. For the most active stocks, or "alpha" stocks, and the next most actively traded, the beta stocks, a 1,000 share minimum applies. For gamma stocks, which are much less liquid stocks, market makers may input quotes for fewer than 1,000 shares. If a market maker's gamma stock quote is for 1,000 or more shares, however, it is presumed to be a firm quote, if it is for less than 1,000 shares, it is presumed to be "indicative," or only representative.

would appear to increase substantially the incentives on market makers to update their quotes in a timely manner.

Moreover, we believe that the NASD should continue to use its hotline to apprise market makers involved in locked and crossed markets that they must take remedial action. As discussed earlier, the prevalence of locked and crossed markets caused the NASD to establish, on Friday October 23, a "hotline" to the trading desks of NASDAQ market makers. ^{96/} Through the hotline, the NASD advised market makers in appropriate instances to update quotes, answer telephones, contact other broker-dealers that could not get through, and execute transactions in securities with locked and crossed markets. While the administrative messages disseminated by the NASD over NASDAQ, advising market makers to take action, were helpful as a warning to prospective violators, once a market for a particular security was in fact locked or crossed, the hotline was the only tool that successfully restored pricing accuracy to the system. Accordingly, we believe that the hotline should be retained as a permanent component of the NASD's regulatory tools; its interactive aspect is important and not present with electronic mail.

^{96/} In this connection, we note that the NASD on-line surveillance alert for locked and crossed markets was originally designed to identify pre-opening locked and crossed positions. As such, it is programmed to shut off at 9:30 a.m. During the market break, the NASD was unable to obtain intra-day locked and crossed market positions for at least one day. Because, however, locked and crossed markets are not a common intra-day occurrence during normal markets, adjusting the system to require the on-line locked and crossed surveillance report function to remain in effect throughout the day may not be necessary. The staff suggests, therefore, that the NASD consider an enhancement that would, at a minimum, provide the NASD with the ability to resume the on-line function alert at any time during the day.

CHARTS

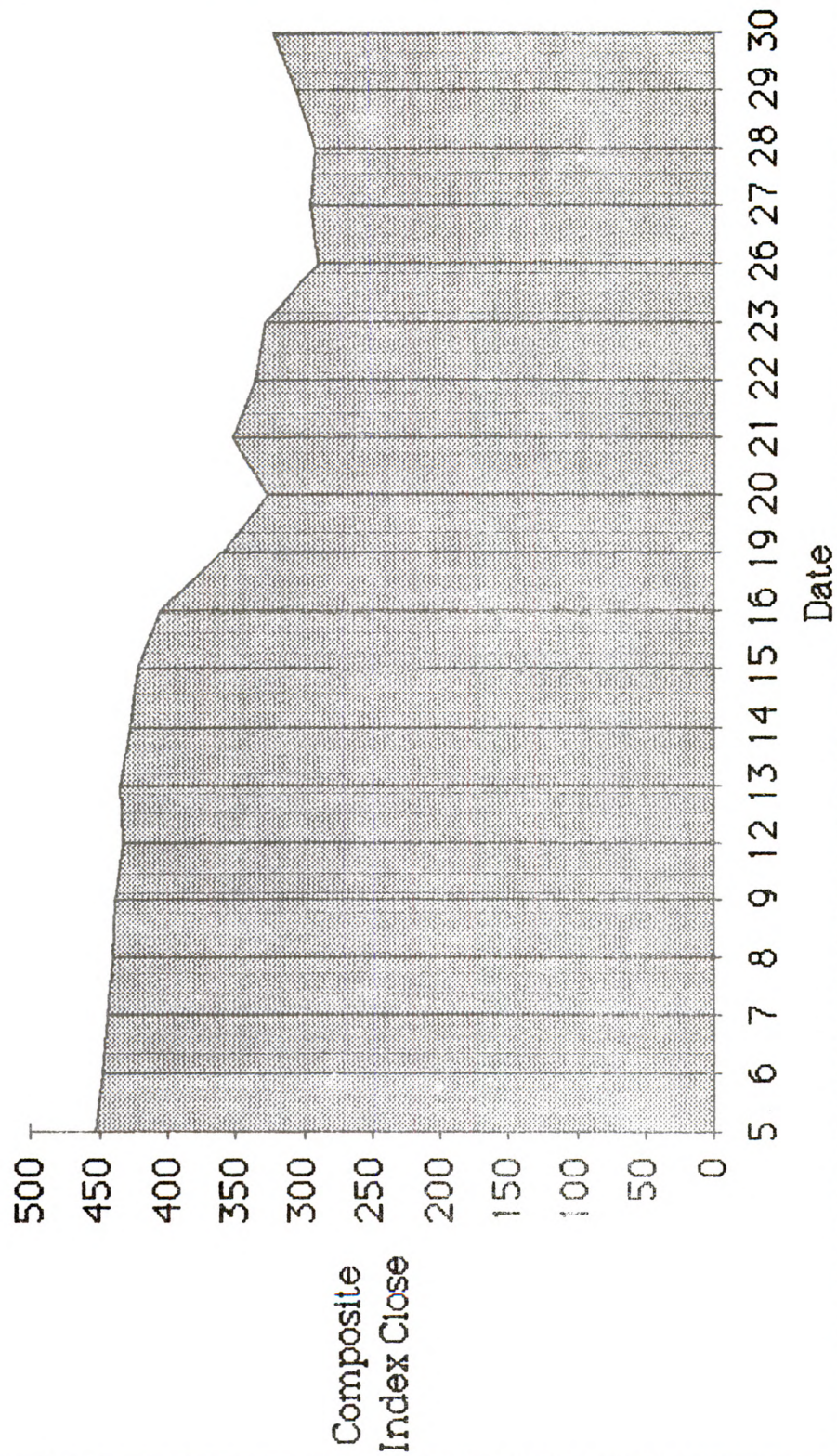
OTC COMPOSITE INDEX FOR OCTOBER

Chart 9-1. OTC Composite Index for October

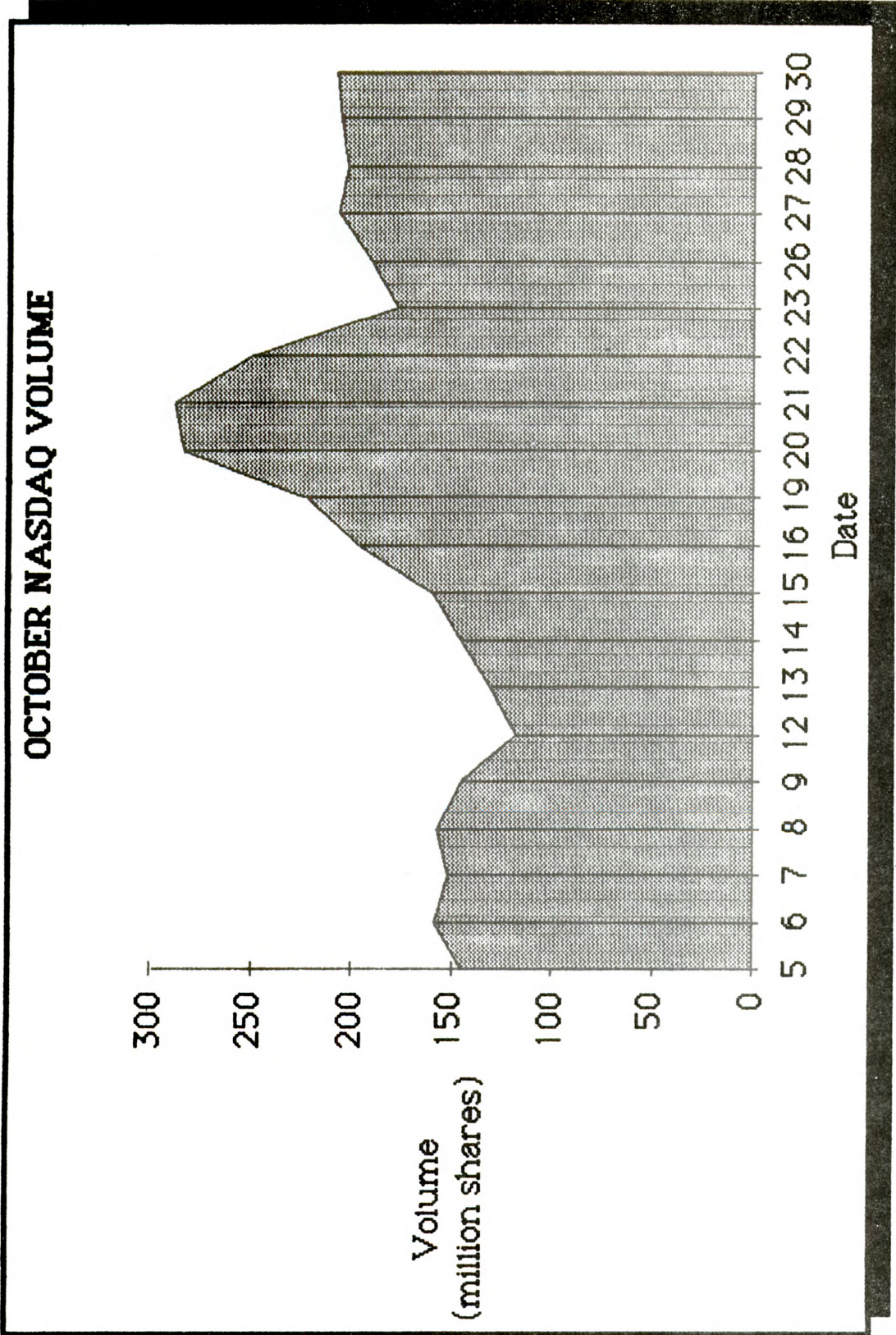


Chart 9-2. NASDAQ Volume for October

NASDAQ Daily Volume v. Intra-Day Locked and Crossed Markets

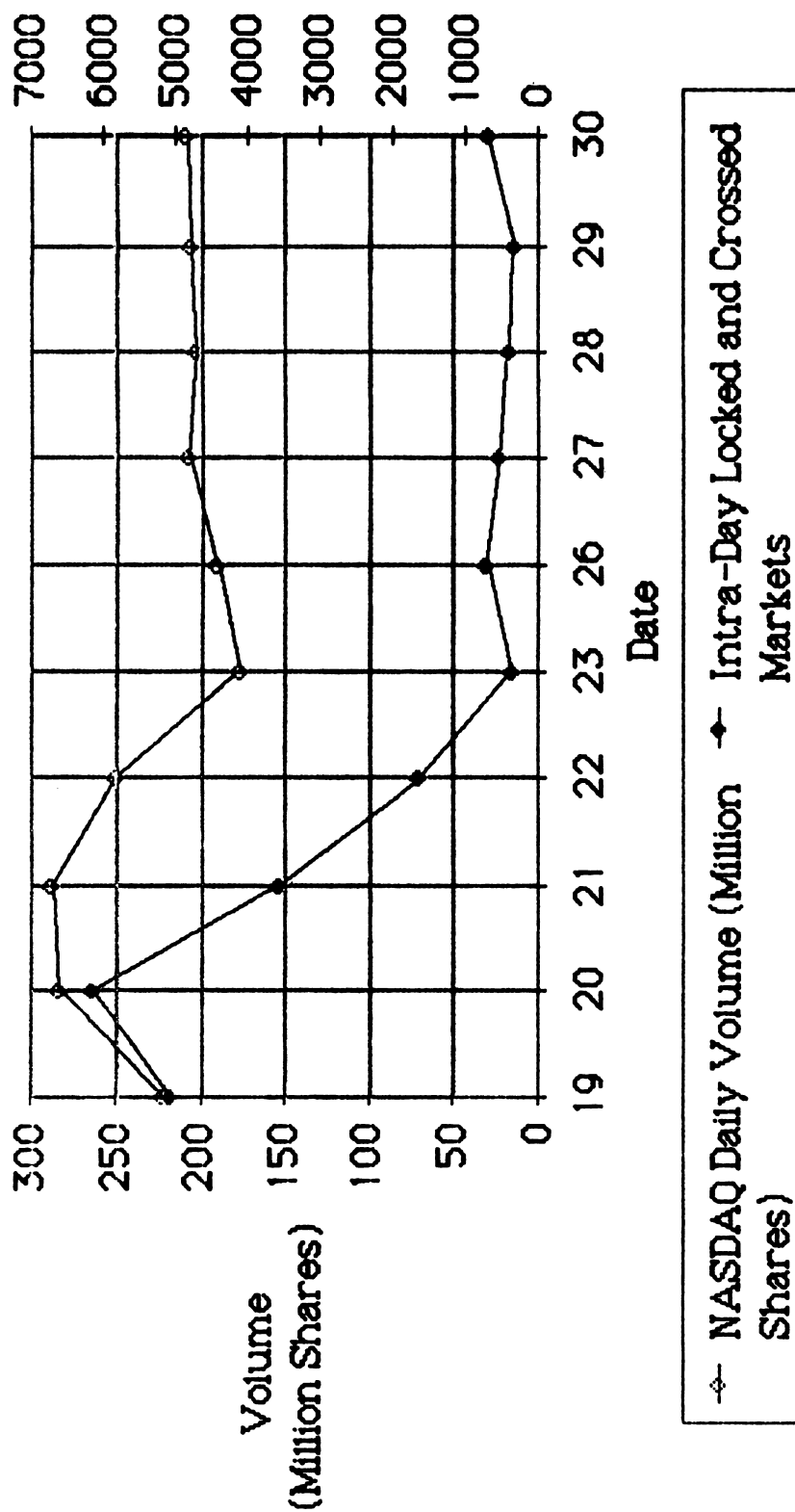


Chart 9-3. NASDAQ Daily Volume v. Intra-Day Locked and Crossed Markets

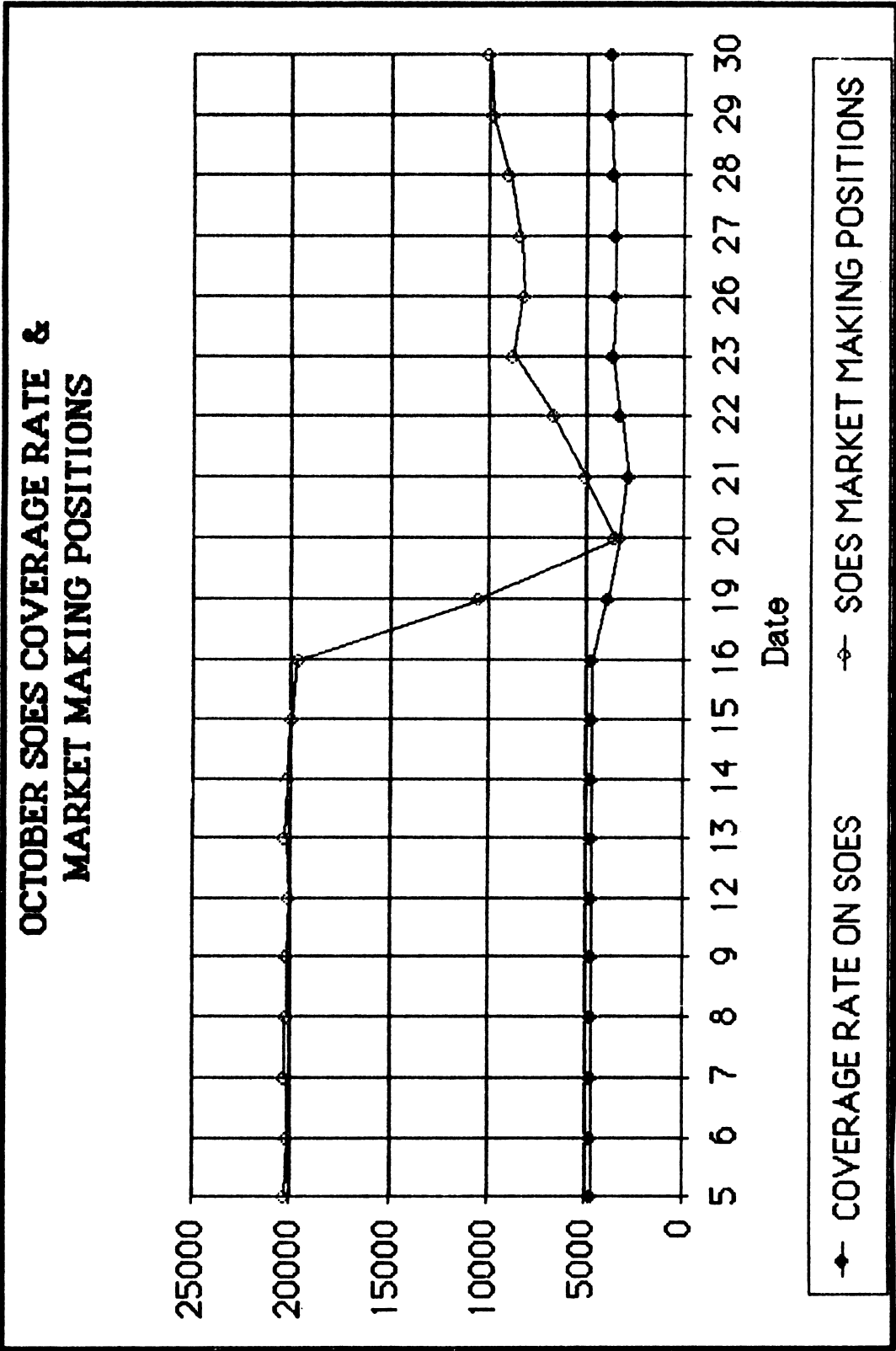


Chart 9-4. SOES Coverage Rate and Market Making Positions for October

Chapter Ten

CLEARANCE AND SETTLEMENT

A. Introduction

During October 1987, trading volume and market volatility reached historic levels. Within a two-week period, New York Stock Exchange ("NYSE") share volume reached peak levels at twice previous records, and volume each day during the period remained at previous record levels. All entities involved in equity trade comparison, clearance and settlement cooperated and succeeded in handling that volume promptly and reasonably efficiently. Trade processing at clearing agencies ran smoothly, although three relatively small clearing members defaulted on settlement obligations. Broker-dealers were under considerable pressure, but settled the majority of their trades with other dealers and customers within the routine five-business-day settlement cycle. During the week of October 26, clearing corporations processed over \$100 billion of deliveries among broker-dealers in settlement of exchange and OTC trades. Transfer agents processed record volumes without significant delays, even though certificate withdrawals from depositories reached record levels.

From October 23 through October 30, the exchanges and the National Association of Securities Dealers ("NASD") shortened the trading day by two hours and gradually resumed normal trading hours by November 6. That allowed member firms more time to complete the various tasks associated with settling the record volume of trades. The additional two hours, in particular, allowed member firms more time to input their trades to clearing agencies, review their trade data, resolve uncompleted trades and otherwise process hundreds of trades that for a variety of reasons could not be processed in an automatic or automated fashion through central clearing agencies. Moreover, the additional two hours allowed data processors, such as the Securities Industry Automation Corporation ("SIAC"), more time to disseminate closing prices and trade execution reports to members and clearing agencies.

Market volatility also reached historic levels. Volatility had its greatest effect on securities options, particularly options on stock indexes. The Options Clearing Corporation ("OCC"), which collects margin to protect against adverse price movements on short positions, generally was able to protect itself through variation margin calls. Those margin calls were made to OCC clearing members who hold accounts for public customers and for professional traders, market makers and specialists. The concentration of such accounts within a few clearing firms, coupled with the shorter time frame for settling options transactions (next-day) and margin calls (same-day or next-day), caused liquidity problems for clearing members and market makers.

Experience during the recent record market volume and volatility indicates that the principal components of the National Clearance and Settlement System ("National System") -- clearing corporations, depositories, and transfer agents -- performed exceptionally well. Nevertheless, some lessons can be learned. This chapter reviews the performance of the clearance and settlement system during the market break and identifies areas that require further review.

B. Equity Securities - Clearance and Settlement

Clearance and settlement of corporate equity securities trades entail coordinated effort among broker-dealers, exchanges, clearing corporations, depositories, banks and

transfer agents. This section will explore how they functioned in October, including trade comparison and settlement; dealer-customer settlements; clearing agency monitoring of member financial condition; and transfer agent, depository and broker-dealer certificate handling.

1. Trade Comparison, Clearance and Settlement

Overall, the vast majority of equity trades were cleared and settled within the routine five-business-day settlement cycle, and clearing agencies handled potential member defaults well. High volume, however, strained trade comparison and error-trade resolution systems. As discussed below, the October market break highlighted the need for further automation in the trade comparison and resolution process and improved capacity and flexibility in existing systems.

a. Background: The Process of Clearing and Settling Inter-Dealer Trades

Settlement of a stock transaction (*i.e.*, the exchange of money for securities) generally occurs five business days after the date on which the transaction occurred ("trade date"). For example, trading from Monday, October 19, 1987, settled on Monday, October 26, 1987. As a general matter, each customer transaction results in three contracts -- one between brokers and two between the brokers and their customers. The settlement of contracts among brokers often is termed "street-side," and "customer-side" refers to brokers' settlement with customers.

1. Trade Comparison Methods

Trade comparison is the process by which broker-dealers agree on trade terms (*e.g.*, security, number of shares, and price) and confirm existence of a contract that is then scheduled for settlement at clearing agencies. Trade comparison generally is the responsibility of the marketplace where trading occurs, and is performed at the exchange, 1/ through NASD facilities, at a clearing agency on behalf of that marketplace, 2/ or through a combination of those procedures. NYSE, Amex, and OTC

1/ The Midwest Stock Exchange ("MSE"), Pacific Stock Exchange ("PSE"), Philadelphia Stock Exchange ("Phlx") and Boston Stock Exchange ("BSE") match trades on the floor of the exchange. Generally, upon execution of the trade, the party initiating the trade writes a ticket (a buy ticket or sell ticket) denoting, among other things, the firm's name, the issue, the quantity of shares, the price, and the market and signs the ticket. The contra-party to the trade reviews the trade data on the ticket and, if accurate, denotes the firm's name as buyer or seller and signs the ticket. The trade information on the ticket is entered into the exchange's data system. Trades are then reported to the appropriate clearing corporation by the exchange.

2/ The National Securities Clearing Corporation ("NSCC") performs centralized comparison for OTC trades as facilities manager for the national OTC comparison system. Other clearing corporations (*i.e.*, Boston Stock Exchange Clearing Corporation ("BSECC"), Midwest Clearing Corporation ("MCC") and Stock Clearing Corporation of Philadelphia ("SCCP") provide access to NSCC for their members. NSCC was created through a merger of independent clearing

trades are compared through a combination of the two-sided trade comparison process and the automated locked-in comparison process. 3/

Traditionally, nearly all NYSE, Amex and OTC trade comparison was based on two-sided trade input from buying and selling brokers to the clearing agencies. 4/ Comparison starts at the end of the trading day with firms processing and submitting trade data to NSCC by 1:00 p.m. on the day after trade date ("T+1"). Brokers submit trade data using paper blotters, cards, magnetic tapes, diskettes and computer-to-computer transmission to the clearing agency. NSCC processes that data and, on the morning of T+2, issues to each clearing member reports known as contract sheets. Those reports list: (1) compared trades, which have been successfully matched as binding contracts; (2) uncomparing trades, i.e., transactions submitted by the member that were not matched; and (3) advisory trades, i.e., transactions submitted by the contra-side against the member that were not matched.

After contract sheets have been distributed, members have until 6:00 p.m. on T+2 to resolve uncomparing trades and accept or reject advisory trades through NSCC. 5/ On the morning of T+3 NSCC returns the remaining uncomparing trades to members and the marketplace (NYSE, Amex or NASD) for resolution.

Each market has established mechanisms for resolving unmatched trades. Exchange members meet on T+3 at exchange facilities to resolve their differences and submit the necessary additions and deletions to the appropriate exchange and NSCC. Uncomparing OTC trades can be resolved through the NASD's Trade Accounting and

corporations that served NYSE, Amex, and OTC markets. See Securities Exchange Act Release No. 13163 (January 13, 1977), 42 FR 3916. In 1986, NSCC had nearly 400 full settling members, and each day processed nearly 400,000 transactions valued at over \$12 billion, which resulted in approximately 77,000 net deliveries.

- 3/ With two-sided trade comparison, there generally are two "sides" to a transaction or trade. With automated locked-in comparison, there are typically four sides to a transaction. Under the locked-in comparison method, the system or the exchange that operates the system becomes the contra-side to each half of the trade.
 - 4/ The NYSE, Amex and OTC markets continue to process the majority of their trades (by share volume) using the two-sided comparison method. Before 1977, the NYSE, Amex and NASD operated separate comparison systems through wholly-owned subsidiary clearing corporations. With the formation of NSCC, the NYSE, Amex and NASD contracted with NSCC to perform centralized comparison for all three markets.
 - 5/ In the event the member receiving the advisory agrees that the trade is accurate as reported by the other member, the advisory notice can be "stamped" to accept the trade. Depending on the specific comparison system, other mechanisms can be used, at different stages in the processing cycle, to add, revise or delete transactions as necessary.
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Reconciliation System ("TARS") 6/ or through clearing agency supplemental trade resolution systems. 7/ Trades matched by the third day after trade date settle automatically on T+5, on a net basis, at the clearing corporation. Trades compared after T+3 generally settle two days after comparison.

As discussed in Chapter Seven, in the past several years an increasing number of transactions in the U.S. securities markets have been executed through automated order routing and trade execution systems. Currently, the NYSE, Amex, NASD, MSE, Phlx and PSE have one or more automated trading systems. 8/ Because these systems capture all of the information necessary to establish a valid contract at the time the trade is executed and in a machine-readable fashion, these systems are considered to "lock-in" the trade and to generate compared trades. Throughout the day, the markets report trade executions to members. Subject to specific limitations, members can correct or delete trades previously reported. 9/ At a specified hour each day, the markets forward to the member's designated clearing agency a report of all trades executed through its automated system. The clearing agency reports those trades to members on the following day (T+1) as trade-date contracts. Members review this report against trading records (frequently this process is automated, because the clearing agency's reports can be received in machine-readable format). If the clearing agency's report is correct with respect to a particular trade, that trade will enter the accounting system in accordance with the clearing member's instructions (many clearing members leave standing instructions for all types of trades).

6/ TARS enables members to resolve uncomparing trades through an on-line system that reports compared trades to the clearing agency. TARS allows subscribers electronically to: (1) enter original trade data; (2) review compared, uncomparing and advisory trades; (3) enter supplementary trade data to resolve uncomparing trades; and (4) review on-line notification of any action taken to resolve unmatched trades. TARS has over 99 participants that account for over 85% of OTC trading. TARS is open to any NASD member that is also a participant in a registered clearing corporation.

7/ For example, if an OTC trade remains unresolved after T+2, a member can submit a "Demand As of," which generates a Demand advisory notice to the contra-side of the trade. If the contra-side does not respond to the Demand advisory notice within three business days, the system will automatically generate a contractual commitment for settlement. Settlement occurs two days after the parties agree to the terms of the trade or after the system generates a contractual commitment. Unresolved uncomparing trades thereafter are subject to negotiation and possible arbitration.

8/ Those systems include: NYSE'S DOT; Amex's PER; NASD's CAES and SOES; MSE's Max, PSE's SCOREX; and Phlx's PACE. For a more detailed discussion of automated trade execution systems, see Chapter Seven.

9/ See, e.g., NYSE Rule 123.47. See generally, Chapter Seven.

ii. Clearance and Settlement of Compared Trades

Most equity trades clear and settle through the continuous net settlement ("CNS") accounting systems operated by clearing corporations. In those systems, the clearing corporation nets each broker-dealer's settling purchases and sales in each security to arrive at daily net settlement obligations for each broker. Broker-dealers then settle those net obligations with the clearing corporation. The clearing corporation guarantees the settlement obligations of each broker-dealer's counter trading party. Brokers can either settle each day or carry open commitments forward to net against the next day's settlement (hence the continuous nature of CNS). Securities deliveries generally are made automatically between NSCC and its members through credits and debits to their accounts at the Depository Trust Company ("DTC"). Money settlement generally is effected by the exchange of certified checks between NSCC and its members. If brokers elect to carry open commitments forward to the next business day, they must pay or collect the daily change in value, the so-called mark-to-the-market. ^{10/}

b. The October Experience

Because of record volume and volatility during October 1987, trade comparison became a major stress point in the clearance and settlement process. The large volume of trades broker-dealers were required to process, particularly trades that required individual and special attention ("exception processing"), created a major crunch for the securities processing industry. The record market volatility threatened to penalize those firms that could not resolve their errors quickly and before settlement with their customers on T+5. This section reviews that experience, steps taken to resolve uncomparated and error trades, and the effectiveness of those efforts.

The NYSE, Amex and OTC markets experienced increased error rates during the market break. ^{11/} For October 19, the NYSE's normal uncomparated rate of 1.6% rose to 3.4%. On October 20, Amex's normal uncomparated rate of 2.4% rose to 5.5%, and the normal OTC uncomparated rate of 5.7% rose to 12.8%. The uncomparated rates for two-sided comparison for the month of October were approximately 9.3% for NYSE trades, 10.8% for Amex trades, and 12% for OTC trades. Further statistical data on each market appears in Tables 10-1 to 10-3.

The following may help to put these numbers in perspective. Assuming the average uncomparated trade represented 100 shares at \$40 per share, the dollar value of uncomparated NYSE trades during the week of October 19 would have been approximately

^{10/} Because members with a delivery obligation generally determine the supply of securities in the CNS system and thus, in broad terms, control how many members will receive delivery allocations, clearing agencies also provide mechanisms for members due to receive securities to force delivery from other members ("buy-in" procedures).

^{11/} Of the total U.S. share volume during the week of October 19, approximately 58.7% occurred on the NYSE, 4.1% on the Amex, and 31.2% in the OTC market. Automated, locked-in systems accounted for 44% of NYSE, 23% of Amex and 1.7% of OTC share volume during the week of October 19. The remaining share volume in each market was compared through two-sided comparison.

\$740 million. NYSE member losses could be substantial if a majority of those trades represented customer trades, uncomparated trades could not be resolved (requiring the NYSE member to re-enter the market and purchase or sell securities), and the market prices changed significantly during the interim. Assuming a 10% decline in the value of NYSE listed shares, the aggregate dollar value of uncomparated trades would decline to approximately \$666 million. Without accounting for each member's netting of purchases and sales in the same issue, losses could approach \$74 million. Assuming a 40% clearing netting factor, 12/ those losses could approach \$44 million.

The record volume during the week of October 19 prevented many firms from transmitting trade input to NSCC by its 1:00 p.m. T+1 cutoff time. Under normal circumstances, firms begin to enter trade data into their systems after the exchange closes. Because of the high number of transactions, some firms reportedly had problems entering all their data in a timely fashion. Other firms reportedly experienced temporary system overloads that prevented timely transmissions by NSCC's deadline. NSCC extended its trade data input cutoff time from 1:00 p.m. to 2:35 p.m. on October 20, to 2:45 p.m. on October 21, 2:30 p.m. on October 22, and 3:00 p.m. on October 23. 13/

Transaction volume and the extension of input deadlines caused late distribution of NSCC contract sheets at 9:30 a.m. on October 21 and at 10:00 a.m. on October 22. 14/ Processing and input delays shortened an already limited time period for uncomparated trade resolution. Nevertheless, because extended deadlines permitted more trade sides to be submitted on T+1 rather than on T+2 or T+3, the resulting delays in distributing contract sheets appear to have been appropriate under the circumstances.

i. NYSE October Experience

As set forth in Table 10-1, over 2.3 billion shares were traded on the NYSE during the week of October 19. The average daily share volume (459.9 million) was over 2 1/2 times normal average daily share volume (180.5 million). On October 19, NYSE transaction volume peaked at over 500,000 transactions and on October 20 and 21, NYSE transaction volume was just below 500,000.

12/ The clearing netting factor is designed to account for uncomparated purchase orders that can be netted or offset against uncomparated sell orders in the same issue. For example, an uncomparated purchase of 100 shares of XYZ at \$30/share might offset, partially, market exposure on an uncomparated sale of XYZ at \$40/share.

13/ Even with the extended cutoff time some firms missed the deadline and submitted the additional data the following day (T+2) as corrections (additional trade sides) to data submitted on T+1.

14/ Although contract sheets are scheduled for distribution at 8:00 a.m. on T+2, NSCC usually makes them available to firms between 3:00 a.m. and 4:00 a.m. on T+2. It normally takes NSCC approximately six hours to complete the trade comparison process, but on October 21 NSCC required 11 hours and on October 22 NSCC required almost nine hours to complete the trade comparison process.

NYSE's automated execution systems facilitated processing of NYSE trades. During the week of October 19, the NYSE automated execution system ("DOT") processed 44% of the NYSE share volume and 55.5% of NYSE transactions. On October 19, NYSE's DOT processed 305.6 million shares and 307,750 transactions, representing 50.6% of NYSE share volume and approximately 57.7% of transaction volume. ^{15/}

The record number of transactions processed through the DOT system on October 19 put that system under severe operational strain. On October 19, DOT experienced capacity problems in reporting trades to NSCC. Although the trades were executed, the DOT system did not report some executed trade data to NSCC in time to appear on trade date contract sheets. A special program was written to add the trades automatically to the next day's clearance cycle without further effect on timely settlement.

NYSE's odd lot system, the Automated Pricing and Reporting Service ("APARS") suffered reporting delays on October 20 and 21, and system problems on October 20. ^{16/} On October 20, no member odd-lot trades were reported to NSCC (those trades were reported the next day and were entered into NSCC's clearance systems without further effect on timely settlements). APARS also experienced capacity overload problems on October 20, which caused a computer failure and, in switching over to a backup computer, loss of approximately 8,000 to 9,000 orders. The lost trades were re-established through the NYSE's trade correction process.

During the week of October 19, broker-dealers submitted more than 1.91 million trade sides for initial two-sided comparison representing approximately 56% of share volume and 44.5% of transaction volume. On October 19, however, slightly less than half the NYSE share volume (49.4%) and 42.3% of NYSE transactions were processed by two-sided comparison. ^{17/} The uncomparing rate for the week, as a percentage of trade sides processed by the two-sided comparison system, was 9.7%. For October 19, over

^{15/} Including DOT-processed orders, 6.67 million trade sides were processed during the week of October 19. (Each DOT-processed order generates four trade sides.) Of those trade sides, 6.486 million were compared on the first attempt and, thus, were eligible for automatic settlement during the week of October 26. On October 19, the NYSE processed 1,681,740 trade sides; 1,625,114 sides were compared and 56,626 uncomparing as of T+2.

^{16/} APARS handles a number of functions, such as receiving customer orders and pricing data, issuing execution reports to customers and notifying specialists of their positions (when the system reaches certain designated positions set by each specialist the system notifies the specialist). In addition, APARS allows customers to cancel executed orders and those cancellations have priority in the system. See Chapter Seven.

^{17/} On October 20, the percentage of shares processed through DOT dropped to 40.65% from 50.6% on October 19. As discussed above, processing problems and delays in executing trades through DOT and a reduction in program trading may have contributed to the drop in share volume. For the week of October 12, DOT processed approximately 48.5% of the NYSE share volume.

56,600 trade sides were reported uncomparred (12.6%), more than twice the normal rate. For the week of October 19, approximately 184,500 trade sides were reported to NYSE members on T+2 as uncomparred. The number of uncomparred trade sides, in absolute and relative terms, represented significant increases in potential exposure to NYSE member firms.

ii. OTC October Experience

During the week of October 19, a daily average of 244.4 million shares, and a daily average of 100,000 transactions were executed in the OTC market. OTC share volume exceeded 280 million shares on October 20 and 21, and peaked on October 21 at over 288.1 million shares. Daily OTC transaction volume exceeded 100,000 from October 19-22 and peaked at over 118,250 transactions on October 21. For the week, 1.08 million trade sides were processed, 966,000 were compared and 114,200 (10.6%) were uncomparred as of T+2. On October 19 and 20, the OTC market processed a combined total of 458,600 trade sides and of those trades 54,700 were uncomparred. The uncomparred rates for October 19 and 20 were 12.3% and 11.5%, respectively, more than twice the average OTC uncomparred rate of 5.6%.

As noted above, a limited number of OTC transactions are processed through automated execution systems. Approximately 98.3% of OTC share volume and 93.4% of OTC transactions were compared through two-sided comparison systems during the week of October 19.

iii. The October Experience at Other Exchanges

During the week of October 19, over 72.6 million shares a day were traded on the Amex, MSE, PSE, Phlx and BSE. Automated execution systems accounted for approximately 23% of Amex share volume, 29.5% of MSE share volume, 27% of PSE share volume, and 48% of Phlx share volume. With the exception of Amex, these exchanges compare executed trades on the exchange floor. Each of these exchanges experienced an increase in error trades, primarily because of delays in processing orders. ^{18/} Difficulties appear to have been greatest on the PSE.

During the week of October 19, PSE handled nearly 21,000 transactions and approximately 11 million shares each day: SCOREX volume increased ten-fold. ^{19/} As discussed in Chapter Seven, the increased order flow caused back-logs, resulting in loss of both order information coming into the system and trade confirmation data coming out of the system. The loss of trade confirmation data resulted in locked-in trades executed though SCOREX not being reported to clearing agencies for clearance and settlement. Using a combination of NSCC, firm and PSE records, PSE staff and PSE member firms worked extended hours over the weekend and during the week of October 26 to reconstruct the lost order and lost trade reports.

^{18/} For a more complete description of the operational problems with exchange automated systems, see Chapter Seven.

^{19/} For September 1987, SCOREX's order flow averaged fewer than 25 orders per minute. During peak times on October 19, SCOREX handled 250 orders per minute and executed approximately 47,000 orders that day.

iv. Steps Taken During The Break To Resolve Uncompared Trades

The exchanges, NASD and NSCC took a number of steps during the week of October 19 to resolve unmatched trades. The NYSE required its member firms and specialists to meet after trading and on the weekend, in addition to early morning meetings, to resolve uncompared trades. The NASD operated TARS on Saturday, October 24 from 10:00 a.m. to 6:00 p.m. to resolve unmatched trades. NSCC extended its time periods for members to report the resolution of unmatched trade sides. ^{20/} Those extensions did not result in significant delays, and indeed, aided the clearing process, because the delays permitted broker-dealers to correct more error trades within the routine settlement cycle. NSCC also was open on Saturday, October 24 to receive reports of compared trades for processing on Monday, October 26.

All of the exchanges and NASDAQ closed trading two hours early from October 23-30 to allow firms to catch up on their back office work and gradually resumed normal trading hours by November 6. ^{21/} The extra two hours allowed firms to begin processing each day's trade data earlier, to resolve uncompared and error trades, and to accomplish other clearance and settlement tasks (both street-side and customer-side). Extended cutoff times and early market closings particularly helped alleviate the crunch in submitting trade data. For example, by October 26, firms were inputting trade data to NSCC by the normal cutoff time, the first time in over a week.

With the combined efforts of the exchanges, NASD, NSCC and the firms, the uncompared trade problem was brought under control. The exchanges, NASD, NSCC and the firms worked extended and weekend hours in order to resolve uncompared and error trades. For example, this effort resulted in the resolution by NYSE members of approximately 146,500 uncompared and error trades during the week of October 19 and another 27,000 on Monday, October 26. ^{22/}

In the OTC market, the extended TARS hours and the extra evening and weekend hours helped to resolve uncompared trades. For example, a survey of 17 broker-dealers (who accounted for 89% of uncompared trades on October 19 and 93% of uncompared trades on October 20) indicated that as of T+3, those firms resolved, respectively, 81%

^{20/} Normally, members have until 6:00 p.m. to submit resolved error-trades to NSCC. NSCC extended that deadline on October 19 to 6:30 p.m., on October 20 to 9:00 p.m., on October 21 to 9:30 p.m., on October 22 to 1:00 a.m., on October 23 to 9:15 p.m., and on October 26 to 9:45 p.m.

^{21/} On October 22, the NYSE announced that the exchange would close two hours early on Friday, October 23, 1987. The other exchanges and NASDAQ also decided to close early.

^{22/} NYSE members resolved approximately 6,800 trades on October 19, 10,200 on October 20, 17,800 on October 21, 46,200 on October 22 and 41,500 on October 23. Another 24,000 trades were resolved on the following Saturday and Sunday.

and 93% of their October 19 and 20 uncomparad trades, which could then be processed on the relevant settlement date. 23/

As a result of successful efforts to clear up uncomparad trades, fails to deliver and receive remained close to normal levels. Table 10-7 shows the number and value of CNS fails to deliver and receive at NSCC from October 14 through November 6. The number of fails to deliver (long) and receive (short) did not rise dramatically for trades executed during the week of October 19. As compared to the previous week, fails rose by about 10% to 20%. The total value and average value per item for fails rose by about 40% to 50% in contrast with near triple volume increases. Data from broker-dealers indicates that although the number of fails to receive and deliver increased during October, the firms in general were able to resolve fails with the same or greater success than they did in previous months. Month-end fails to deliver aggregated for 17 firms (from FOCUS Reports) for October 1987 decreased 15.5% in value from September, from \$9.5 billion to \$8.0 billion. Fails to receive similarly decreased 5.86% from \$7.2 billion in September, to \$6.8 billion in October. 24/ Similarly, securities loan receivables and securities loan payables for those firms at month-end declined significantly from September to October, indicating that stock borrowing was not increased to meet settlement fails.

c. Customer-Side Settlement

Broker-dealers also settle with their institutional customers on the fifth day after trade date, typically on a delivery versus payment ("DVP" or "COD") basis. 25/ Today, the majority of these customer settlements are processed through the National Institutional Delivery System ("NIDS") at one of three registered securities depositories

23/ A separate survey of 12 firms conducting a public business confirms the information from the exchanges, NASD and clearing agencies that the vast majority of transactions during the October market break were settled within the normal settlement cycle. According to that survey, those broker-dealers executed 2,070,000 trade sides during the week of October 19 and approximately 1,069,633 of those trade sides were processed through two-sided comparison methods. Those firms had a total of 68,140 uncomparad trade sides during the week for an uncomparad rate of 6.37%. Those firms worked extended and weekend hours to resolve over 65,268 trade sides by T+5 settlement dates. For October 19-23 trades, only 0.82% of the trade sides remained uncomparad by T+5 settlement dates. See Tables 10-4 to 10-6.

24/ See Table 10-8.

25/ COD privileges commonly are extended by broker-dealers to institutional customers. The privileges result from an exception to Regulation T that requires customers to pay for securities within seven business days after the date of purchase. The exception permits payment on delivery within 35 calendar days of a purchase. See 12 CFR 220.8(b)(2)(1986).

(the second type of clearing agency). 26/ NIDS sends trade confirmations to broker-dealers' customers and elicits "affirmations" from those customers. If the customer affirms the trade by the third day after trade date and the deliverer has sufficient securities in his account, settlement generally occurs automatically by book-entry at the depository on T+5. Unlike CNS settlements, each NIDS trade settles on a trade-by-trade or gross basis. If selling customers do not affirm and deliver securities on time (and buyers do not pay for or accept securities), broker-dealers are obligated to pay funds or deliver securities on their behalf. 27/

During the week of October 19, broker-dealers distributed to institutional investors an average of 142,218 trade confirmations a day through NIDS. Generally, broker-dealers submitted that data on the day trades were executed for distribution on T+1. 28/ Agents for institutions affirmed approximately 77,000 trades each day that week and affirmed, by T+3, approximately 85% of the trades broker-dealers confirmed that week ("affirmation rate"), only 4% less than the normal affirmation rate of 89%.

NIDS deliveries for the week of October 26 averaged nearly 65,000 per day and, on October 26, DTC made 81,663 NIDS deliveries, almost 250% above normal levels. For the week of October 19, 89% of all affirmed trades settled on T+5, only 1% less than the 90% rate for October and 2% less than the 1986 average of 91%. For the week of

26/ DTC acts as the central processor for NIDS, which includes links with the Midwest Securities Trust Company ("MSTC") and the Philadelphia Depository Trust Company ("Philadep"). In 1986, DTC processed over 35 million transactions in NIDS, compared with 9 million in 1982. Today, over 6,500 institutions, banks, and broker-dealers use the NIDS. Broker-dealers, banks and institutions that do not participate directly in depositories access NIDS through correspondent relationships with depository members. DTC estimates that 99% of all institutional transactions (by dollar value) settle by book-entry at depositories. See Securities Exchange Act Release No. 25120 (November 13, 1987), 52 FR 44506.

27/ In 1982, the Commission approved exchange and NASD rule changes that require their members to deny COD privileges to certain institutional customers if those customers do not use depositories. See Securities Exchange Act Release No. 19227 (November 9, 1987), 47 FR 51658. In November 1987, the Commission approved NYSE, NASD, and PSE proposals that, in effect, require all members and customers to use depositories for COD trades. See Securities Exchange Act Release No. 25120 (November 13, 1987), 52 FR 44506.

28/ Fewer than a dozen broker-dealers submitted that data on T+1, rather than trade date; however, that delay does not appear to have affected institutional trade settlement rates significantly, because customers can affirm trades on T+1, T+2, or T+3 without delaying settlement on T+5.

October 19, 77% of trades confirmed settled on T+5, 2% higher than the normal rate, and the October rate, of 75%. 29/

d. Discussion

The experience of the October 1987 record market volume and volatility indicates that automated trade execution systems and same-day, floor-derived compared trades are essential to efficient markets. Without those systems, the securities processing industry during the week of October 19 would have been unable to process the record number of transactions within the normal settlement cycle. Nevertheless, while the securities industry deserves praise for its fast resolution of an unprecedented number of uncomparated trades, the Division staff believes that the NYSE and NASD should consider accelerating their efforts, as described below, to generate same-day compared trades, thereby enabling members to know their positions and market exposure before trading commences the next day.

i. Automating NYSE Trade Data Submissions

The NYSE is developing a floor-derived comparison system (termed "FDC") that eventually will enable trade-date comparison of NYSE trades and resolution of errors no later than T+1. In the first phase of that system, which NYSE has begun testing, NYSE will process locked-in trades and report those compared trades directly to members throughout the trading day in an on-line, real-time system. In the second phase, beginning in the first quarter of 1988, NYSE members will begin reporting non-locked-in trades (currently reported to NSCC through two-sided input) directly to NYSE for matching on trade date. 30/ In the third phase, NYSE intends to require members to resolve all uncomparated and error trades on the NYSE floor on T+1. The NYSE has indicated that the FDC system, which it expects to make mandatory for all members, will display comparison results during trade date and enable on-line correction and resolution. NYSE intends to complete those phases in stages during 1988.

ii. Expanded Use of Automated Systems For OTC Trades

The NASD recently proposed several initiatives that, if implemented, would increase the number of locked-in, compared trades. The NASD recently proposed to establish the Order Confirmation Transaction ("OCT") service. That service would enhance existing NASDAQ communication facilities to capture, in machine-readable

29/ Interfaces between clearing agencies reduced the number of inter-city deliveries of stock certificates, checks and related documents. For example, during the week of October 26, banks, broker-dealers and clearing corporations made an average of 19,600 deliveries per day through the depository interfaces. The dollar value of interface deliveries for the week of October 26 averaged \$1.34 billion. The number of interface reclaims and rejects averaged 1,241 a day or 5.7% of the deliveries through depository interfaces, well within normal rates.

30/ NYSE plans for members to submit non-locked-in trade data to FDC through direct computer links, data entry terminals at NYSE, and through NYSE's Common Message Switch.

form, all key trade terms. OCT would allow NASDAQ market-makers to communicate electronically with each other for the purpose of comparing on a same-day basis all NASDAQ transactions without the use of telephones, and to report the terms of those trades to clearing agencies for settlement as compared, locked-in trades. ^{31/}

The NASD also proposed by-law amendments designed to increase member use of clearing agency facilities to compare, clear and settle OTC trades that do not result from automated execution services. For example, the NASD proposed to require all NASD members conducting an inter-dealer business in OTC securities to submit trade data to the national OTC comparison service (directly or through an agent). Second, the NASD proposed to require NASD members that participate in clearing agencies to use those facilities to clear and settle their OTC trades. Third, the NASD has proposed to require all NASDAQ/NMS market-makers to use clearing agency facilities for comparison, clearance and settlement of inter-dealer trades. Although these initiatives will not result in locked-in trades on trade date, they will allow NASD members to automate and centralize OTC trade comparison and identify uncomparated trades routinely on T+2 instead of several days later. The proposals also will increase activity subject to central netting and monitoring.

2. Clearing Member Fails and Financial Responsibility

The October market break tested clearing agency systems for monitoring member financial condition and managing member default. Three firms defaulted or withdrew from clearing agency membership. As discussed in Section C, OCC assessed its membership for losses from one of those firms (H.B. Shaine). Clearing agencies processing corporate and municipal securities transactions did not suffer significant losses and will cover those projected losses (\$395,000) from current or retained earnings. For the first time, however, these clearing agencies were required to contend simultaneously with multiple, actual and potential, member defaults.

Effective safeguards against member defaults are critical to the smooth operation of clearing corporations that provide clearance and settlement facilities for corporate equity transactions (e.g., BSECC, NSCC, MCC, SCCP). The majority of those transactions settle in CNS systems, in which the clearing corporation becomes the buyer to every seller and the seller to every buyer, guaranteeing payment and delivery to all. In order to fund this guarantee, clearing corporations maintain clearing funds based on contributions from members. ^{32/} Losses from one member's default are first charged against that member's clearing fund contribution and then charged against the clearing corporation's retained earnings or the clearing fund.

Because the equity clearing corporations guarantee trade settlements, they centralize credit judgments, default risks and default administration for traders in the equity securities markets. Accordingly, broker-dealers using exchange or NASDAQ facilities are not dependent on individualized credit judgments concerning counter-party risk for routine trades. Moreover, in the event of member default, clearing corporations

^{31/} See File No. SR-NASD-87-54.

^{32/} Clearing fund contributions traditionally have been calculated as a percentage of the participant's average daily settlement activity (e.g., 2% or 5% of daily settlement debits or credits, averaged monthly).

centralize default administration, offset open positions, liquidate net positions and streamline creditor relations with the defaulting member.

Effective safeguards against member defaults are also critical at other types of clearing agencies (e.g., securities depositories) because those clearing agencies provide central delivery, communication and payment facilities for member banks and broker-dealers. Although depositories do not guarantee member payment obligations in the same way clearing corporations guarantee member delivery and payment obligations in CNS systems, the volume of deliveries effected daily to each member's depository account may require, as a practical matter, similar diligence to credit and member monitoring decisions. For example, perhaps as much as 90% of all institutional corporate equity trade settlements with broker-dealers occur through depository facilities. Supporting those settlements, moreover, is an extensive stock-loan business, deliveries and payments for which occur at securities depositories. ^{33/} Because most stock loan agreements allow borrowers to return securities on short notice (five days or less) in exchange for collateral (usually cash equal to or greater than the market value of the borrowed securities), rumors concerning a member's solvency can generate hundreds of deliveries and multimillion dollar payment obligations overnight. Because depositories do not guarantee settlement, depositories can (and did) reverse some of those deliveries to reduce a defaulting member's payment obligation and allocate any loss to members who chose to deal with the defaulting member. ^{34/} Such reversals can have serious consequences for the defaulting member and other members that dealt with the defaulting member (e.g., constricting their cash flow and requiring them to liquidate the borrowed securities, often at a loss). Thus, effective member monitoring and early detection of problem firms help prevent disorderly liquidations of financially troubled firms and related market disruptions.

Each clearing agency has its own safeguards to prevent and handle member defaults. For example, NSCC employs a number of devices to protect against member defaults. First, NSCC maintains membership standards to screen out potentially high-risk members. ^{35/} Second, NSCC monitors members in various ways to provide early warning of a member posing excessive risk to NSCC. NSCC monitors members' financial and operational condition by examining financial reports, settlement activity, position reports and through communication with other SROs on common members. From those reports, NSCC can project individual member net settlement obligations for the next three days, and in consultation with DTC, identify whether particularly large settlement obligations are agency (rather than proprietary) trades and thus more likely to settle because an institutional customer is prepared to pay funds or deliver securities at DTC. If NSCC perceives that a member poses undue risk to NSCC, NSCC can increase surveillance of that member's activity and can require additional clearing fund deposits,

^{33/} For example, during October 1987, a group of 17 firms conducting a public business borrowed securities valued at approximately \$34.3 billion and loaned securities valued at approximately \$20.3 billion through depositories. See Table 10-8.

^{34/} Depository rules concerning delivery reversals are designed to protect fully-paid customer securities, as determined by the member's segregation instructions.

^{35/} Full settling broker-dealer members using NSCC's CNS system must maintain a minimum of \$50,000 in excess net capital.

increased mark-to-the-market payments and additional reports. Finally, in the event that a member defaults, NSCC can reverse allocations of securities to the member for which NSCC has not received payment. If necessary, NSCC also can use the member's clearing fund deposit to cover losses resulting from the member's default. Any losses resulting from the liquidation are charged either to NSCC's earnings and profits or, if necessary, to the appropriate clearing fund. The consequence of clearing fund assessment is a pro rata assessment of all members contributing to that fund.

a. Late Payments to Clearing Agencies

As noted above, settlement of stock transactions (i.e., the exchange of money for securities) generally occurs five business days after trade date. Clearing corporations net each member's purchase and sales activity in each security to arrive at a single net money settlement debit or credit for each member each business day. Similarly, depositories net each participant's cash debits and credits associated with securities deliveries. Clearing members settle those net obligations on a daily basis, paying the clearing agency (clearing corporation or depository, as appropriate) by certified check if the net obligation is a debit, and receiving funds from the clearing agency by check if the net obligation is a credit. If a member with a net debit obligation fails to deliver a certified check by settlement time at the end of the business day, the clearing agency may carry the obligation overnight. ^{36/} In most cases, the member then makes the late payment the next morning by a Fedwire payment. Late settlement payments are violations of clearing agency rules. Thus, under appropriate circumstances, the clearing agency, as an SRO, may discipline the member (e.g., fine, censure or cease to act for that member).

Late settlement payments to clearing agencies during October 1987 were similar to preceding and following months, in terms of frequency and amount. Generally, late payments ranged from \$39.75 to \$90,000,000. Late payments at all clearing agencies in excess of the member's clearing fund deposit occurred approximately 50 times between October 19-30, 1987. ^{37/} In each case, however, the clearing agency identified the reason for the late payment, reviewed carefully the member's financial condition, and took what it considered to be appropriate action. ^{38/} Moreover, as discussed below, only three instances resulted in account liquidations.

^{36/} If the clearing agency perceives that the member may be in financial difficulty, it will consider, in consultation with the member's designated examining authority, whether to suspend the member and close out its positions.

^{37/} For each late settlement payment, the clearing agency called the member to find out the reason for the late payment. In most instances, members failed to obtain a certified check or to deliver that check to the clearing agency by settlement time. Those late payments were not due to member financial problems.

^{38/} The clearing agency may warn the member against making further late payments and also may assess a fine. In addition, if the situation warrants, a clearing corporation may reverse unpaid securities positions from the member's account to its own to cover the unpaid settlement amount. Similarly, as discussed above, a depository will retain its lien for unpaid securities in the member's account and if necessary, sell those securities to cover the late payment.

Late settlement payments typically occurred more frequently with regional participants (*i.e.*, participants outside New York City and Chicago) than with New York City and Chicago participants, because of their different circumstances. For example, at DTC during October 1987, 37 late payments were made by regional participants versus 27 late payments made by New York City participants. New York City and Chicago participants are more frequently members of both the clearing corporation and the depository. As a result, these participants may be able to transfer credits from the clearing corporation to the depository to cover a debit. For example, DTC allows its members who are also NSCC members to apply credits in their NSCC accounts to satisfy their DTC obligations. ^{39/} That procedure avoids the need in many cases to obtain a certified check when the payment deadline approaches and reduces the frequency of late payments.

In general, regional participants, especially banks, must follow a more time-consuming process in order to deliver a certified check to the clearing agency. The regional participant, upon receiving notice from the clearing agency of its debit settlement amount in its settlement statement, must instruct its clearinghouse bank to pay the clearing agency the debit amount. The participant must then wire funds to the bank, at which time the bank will issue a certified check in the participant's name and deliver it to the clearing agency by the payment cut-off time. During October, late settlement payments by regional participants not caused by financial problems fell into four general categories: (1) participant failure to provide its clearinghouse bank with payment instructions; (2) failure by the bank to make timely payment after receiving instructions; (3) adjustments to the settlement amount made after the clearing agency issued a preliminary payment statement and prior to the payment deadline, but for which the participant could not obtain a certified check to the clearing agency by the payment deadline; and (4) adjustments made after the payment deadline, which generally occur too late in the day for the participant to obtain a certified check from its bank.

b. Clearing Agency Suspensions of Members and Participants

Clearing agencies ceased to act for three clearing members during the week of October 19. DTC and NSCC ceased to act for Metropolitan Securities ("Metropolitan"), American Investors Group ("AIG") and H.B. Shaine & Co. ("Shaine"). OCC ceased to act for Shaine ^{40/} and the MBS Clearing Corporation ("MBSCC") ceased to act for Metropolitan. The clearing agencies froze assets of those firms, liquidated the accounts, and performed delivery reversals as provided for under their respective rules.

i. Metropolitan

DTC ceased to act for Metropolitan at the close of business on October 20. Metropolitan did not owe DTC money; DTC held \$175,000 representing Metropolitan's clearing fund contribution for Metropolitan or its trustee. MBSCC lost no money and returned approximately \$1.6 million to Metropolitan or its trustee. NSCC however,

^{39/} Through cross-endorsements, a member can deliver to DTC a check it receives from NSCC. Similar procedures exist at MCC/MSTC and SCCP/Philadep.

^{40/} See discussion, *infra*, at Section C.

expects Metropolitan's liquidation will cost \$395,000 over Metropolitan's clearing fund deposit. 41/

NSCC ceased to act for Metropolitan prior to the opening of business on October 21 because of Metropolitan's failure to meet its settlement obligation on October 20. NSCC effected the liquidation of 166 security positions over the period October 22 through November 3, with a total contract value of approximately \$58,438,000 42/ and reversed CNS allocations from Metropolitan's account totalling approximately \$5.6 million in value. In accordance with NSCC's instructions and their respective rules and agreements, DTC completed those reversals to the extent securities remained in Metropolitan's DTC account. Although some of those securities were delivered to another DTC participant, NSCC achieved a return of those securities from that member. 43/ NSCC estimates that its loss from Metropolitan's default prior to applying Metropolitan's clearing fund contribution will be approximately \$570,000. After applying Metropolitan's \$175,000 clearing fund contribution, NSCC expects to suffer a projected loss of \$395,000. The loss will be covered by NSCC retained earnings and no assessments to other participants will be made. 44/

MBSCC ceased to act for Metropolitan on October 21 after it learned that Metropolitan failed to meet its settlement obligations to NSCC on October 20, and Metropolitan's representatives failed on the morning of October 21 to provide MBSCC with reasonable assurances of its ability to meet its financial obligations to MBSCC and its participants. As provided for in its rules, MBSCC began to dispose of Metropolitan's open commitments by identifying Metropolitan's open settlement balance order ("SBO") 45/ trades. Metropolitan only had one open unsettled SBO October trade. MBSCC cancelled that trade from the SBO system and the original trade partner (the "contra-side participant") liquidated the trade with another MBSCC participant. MBSCC also closed out Metropolitan's open purchase and sale commitments for November and December. In accordance with MBSCC rules, the contra-side participants received bids

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- 41/ In light of this experience, the Division believes clearing agencies should consider cross-liens on joint member assets, thereby allowing a clearing agency to pay over to another clearing agency the balance of a joint defaulting member's clearing fund deposit, if any, after satisfaction of losses at the first clearing agency.
- 42/ Equity position liquidations ranged from 100 shares to 87,200 shares and debt security position liquidations ranged from \$3,000 to \$670,000 in par value. The contract value of no single position exceeded 15% of the total contract value liquidated.
- 43/ Metropolitan received those securities, in accordance with NSCC's rules, subject to a constructive trust.
- 44/ NSCC had retained earnings of \$7,900,000 as of December 31, 1986. As of the same date, DTC had \$12,141,000, MCC had \$3,343,803, and MSTC had \$2,681,615 in retained earnings.
- 45/ The SBO system is an MBSCC Clearing Division trade recording and accounting system. Participant transactions in a given class of securities are netted, based upon current market value. This reduces the settlement obligations to one net credit or debit amount for each class of securities for each participant.
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and in both cases chose to match the highest bid, resulting in a cumulative gain of \$402,255. Under MBSCC rules, that amount is payable to MBSCC. Thus, MBSCC suffered no losses in connection with closing Metropolitan's accounts. MBSCC refunded Metropolitan's participant fund deposit (approximately \$762,000 plus interest, less \$4,500 in fees and charges owed to MBSCC), as well as the \$402,265 profit on the liquidations of the November and December open trades.

ii. Shaine

NSCC and OCC ^{46/} ceased to act for Shaine before the opening of business on October 20. Shaine did not default on its settlement obligation to NSCC. Nevertheless, NSCC reversed positions valued at a total of \$28,971 from the DTC account of Shaine to NSCC's control account at DTC, reflecting CNS delivery allocations made to Shaine earlier that day. NSCC effected the liquidation of 173 securities positions over the period October 26 through December 1, with a total contract value of \$1,757,000.^{47/} NSCC was not required to appropriate any of Shaine's clearing fund contribution (\$30,000). NSCC expects to pay approximately \$198,500 to the Shaine representative.

DTC ceased to act for Shaine before the opening of business on October 20. On that day DTC reversed two deliveries, leaving Shaine in a net flat position with DTC. DTC did not apply Shaine's participant fund contribution (\$10,000) nor did it suffer a loss as a result of ceasing to act for Shaine.

iii. AIG

AIG ceased operations on October 20. DTC ceased to act for AIG on that day. AIG was left with a settlement obligation to DTC of approximately \$22,000, which it has not paid at the time of this writing. Because AIG's participant fund contribution is approximately \$400,000, however, DTC does not expect to suffer a loss. AIG also participated in NSCC, primarily to use NSCC's Envelope Settlement Service ("ESS").^{48/} Accordingly, NSCC deleted AIG from its list of members on that day. On October 20, AIG was in a credit position with NSCC.

^{46/} OCC's loss on liquidating Shaine's positions exceeded \$8 million. *See, infra*, at Section C.

^{47/} Equity positions liquidated ranged from 5 shares to 8,000 shares and debt security position liquidations ranged from \$1,000 to \$80,000 in par value. The contract value of no single position exceeded 15% of the total contract value liquidated.

^{48/} NSCC's ESS allows a member to deliver securities to another member against payment via an envelope containing such securities (payments are netted with CNS and other activity for settlement at the end-of-day). Envelopes are delivered to NSCC, which sorts them and then makes them available for pick-up by representatives of members to whom the envelopes are addressed. NSCC does not examine the contents of envelopes nor does it guarantee those contents.

c. Clearing Agency Communication

The unprecedented trading volume and volatility during the week of October 19 required clearing agencies to monitor closely their members' financial positions. Because each of the firms that failed was a member of two or more clearing agencies, it was essential that each clearing agency communicate with other interested SROs and clearing agencies concerning those members' financial condition.

Improved clearing agency and SRO communications resulted, in part, from contingency planning by the Monitoring Coordination Group ("MCG"). MCG was formed in 1984 following the Division of Market Regulation's 1984 Securities Processing Roundtable, ^{49/} with representatives from the Amex, CBOE, DTC, MSE/MCC/MSTC, NASD, NSCC, NYSE, OCC, Phlx/SCCP/Philadep and PSE. MCG established formal procedures for communication among clearing corporations, depositories or other self-regulatory designated examining authorities ("DEA") ^{50/} whenever a common clearing member's financial condition threatens the financial or operational condition of member firms, clearing agencies or marketplaces. Under the established protocol, whenever a clearing agency or SRO has reason to believe that a member firm is experiencing financial or operational difficulties, that organization must advise the DEA for that firm, which will investigate and, if appropriate, will notify other relevant MCG entities of the situation and its recommendations and conclusions. Thereafter, each involved MCG entity is to be apprised continually of the member firm's status.

Clearing agency monitoring and information coordination during the week of October 19 generally were conducted in accordance with MCG procedures. In the case of failed and other closely-watched firms, each clearing agency was informed of possible and actual financial problems of its multimember participants and was able to act quickly when necessary. For example, OCC, NYSE and SEC regional office staff discussed Shaine's financial condition throughout the day on October 19, and all interested SROs were advised of the decision to place Shaine in liquidation in a timely manner before markets opened on October 20.

d. Broker-Dealer Fails to Deliver And Receive

Broker-dealer fails to deliver and fails to receive in clearing agency CNS systems during the week of October 19 caused few, if any, financial or operational problems. ^{51/} Under normal settlement procedures, CNS transactions that are not settled on settlement

^{49/} See SEC, Division of Market Regulation, Report of the 1984 Securities Processing Roundtable, 5-8 (May 1984).

^{50/} Rule 17d-2 under the Act (17 CFR 240.17d-2) permits two or more SROs to file with the Commission a plan designating a single SRO as responsible for receiving regulatory reports, conducting examinations, enforcing compliance and performing other regulatory functions of members who are participants or members of more than one such SRO.

^{51/} Indeed, the total dollar value of fails to receive, fails to deliver, stock loan and stock borrow on October 30 for 17 firms conducting a public business declined significantly from the total dollar value of those items on September 30. See Table 10-8.

day are carried over to the next settlement day as open obligations. The clearing agency protects itself against financial risk by obtaining mark-to-the-market payments ^{52/} from members whose open obligations move against them. Most open obligations are settled quickly to avoid the risk that the market will move away, creating large mark-to-the-market payments, and also because certain net worth adjustments must be made on aged fails. ^{53/} The experience of brokers and dealers during the market break was unlike that of the Paperwork Crisis of the late 1960s, when brokers and dealers were unable to keep track of mushrooming numbers of fails to deliver and receive. In the 1960s, without central clearing and marking-to-the-market systems, sound brokers and dealers were endangered by the operational and financial problems of brokers-dealers with whom they conducted business. ^{54/}

e. Exposure From Customers' Positions

The steep decline in stock prices on October 19 made some clearing members vulnerable to financial loss because of exposure from their customers' positions, through customer inability to meet either margin calls or transaction settlement obligations. This in turn increased the risk that a clearing agency might suffer a loss if one of its members failed or became insolvent.

Many customers, institutional and otherwise, open their accounts with an introducing broker. The introducing broker, in turn, uses an executing broker (which is usually a member of a clearing agency) to execute and clear trades made by the customer. During periods of high volatility, especially when the market decreases sharply, some customers may walk away from their losing trades or may not be able to meet margin calls on financed or pledged positions. If the customer fails to meet margin calls made by the clearing firm or fails to pay on T+5 the settlement amount for securities it has purchased, then the introducing or executing broker must pay that debt. If this amount is too great for the introducing broker to pay (market volatility also may affect its ability to cover customer defaults) and it fails, the responsibility for covering the customer's debt will run to the clearing firm. Potentially, one or more clearing members could fail under this scenario, creating enough momentum to jeopardize the clearing agency and all its members.

During and after the week of October 19, over 50 introducing brokers failed, many as a result of an inability of their customers to meet margin calls and pay

^{52/} "Marking-to-the-market" refers to the process by which the difference between securities' market value and the contract price is collected from parties to a transaction.

^{53/} Rule 15c3-1(c)(2)(ix) under the Act requires a broker or dealer to deduct from its net worth for each fail to deliver that remains outstanding for more than five business days after settlement date an amount equal to the appropriate haircut for the underlying security. In addition, if the market value of the security falls below its contract value, this difference must also be deducted from net worth. See 17 CFR 240.15c3-1(c)(2)(ix).

^{54/} See Securities and Exchange Commission, Study of Unsafe and Unsound Practices of Brokers and Dealers, H.R. Doc. No. 231, 92nd Cong., 1st Sess. 13 (1971).

settlement obligations. 55/ In some cases several failed introducing brokers cleared through the same clearing member. For example, 10 failed introducing brokers cleared through one NSCC member, while six cleared through another NSCC member. Although some strain resulted, no clearing members failed as a result of the failure of introducing brokers. Many of the introducing brokers reopened later when they received capital infusions from a parent corporation, their customers paid, or they obtained subordinated loans from their clearing firms to increase their net capital. 56/

f. Analysis

Clearing agency systems for monitoring member financial condition and managing member defaults were tested by the extreme volatility and volume of the recent October market break. Overall, the clearing agencies handled well the actual and potential member defaults; in general, the clearing agencies were able to spot potential member defaults and follow them until the situation eased or the member ceased doing business. Clearing agency monitoring and communication among clearing agencies enabled them to minimize or eliminate loss. The October market break, however, did bring to light areas where the Division believes improvement of present procedures should be considered. These areas include: (1) coordination among clearing agencies and DEAs; (2) protecting against clearing agency losses occasioned by clearing member customers' losses; (3) clearing agency exposure from earlier trade guarantees; (4) earlier trade settlements; and (5) clearing member capital requirements.

i. Information Coordination Among Clearing Agencies

MCG procedures for coordination of information among clearing corporations, depositories, DEAs and regulators should be reexamined and reconfirmed. Communication among these entities during the week of October 19 regarding common member firms in financial or operational difficulty generally was good. The DEA's designation as the primary focal point for the collection and dissemination of information on common members helped to keep all interested entities well-informed and allowed them to take appropriate actions to protect themselves and their members. To assure the continuation and emphasize the importance of information coordination in the future, however, MCG members should meet in the near future to discuss how well the procedures operated during the week of October 19 and any further improvements in the procedures that may be added. In addition, the MCG should include commodity futures clearing corporations and other appropriate futures entities to assure complete coordination and dissemination of information on common members. Finally, procedures should be established for updating regularly contact persons and telephone numbers for each MCG member.

55/ For example, First Potomac Securities Corp. of Falls Church, Virginia, closed on October 23 because it could not cover \$3.2 million in unsecured debts. Of the \$3.2 million, \$1.5 million was from customers' failure to meet futures margin calls and \$1.7 million was attributed to customers' default on stock transactions. See also discussion, supra, in Chapter Five.

56/ See Chapter Five.

ii. Clearing Member Customer Information

Customer failure to meet margin calls or to pay for purchased securities, as discussed above, exposed some clearing members to financial loss. Member insolvency is a significant external risk for a clearing agency and minimization of this risk is an important and necessary goal. Accordingly, it may be appropriate to consider ways that clearing agencies, on a routine basis, can look through their members to those firms or customers whose activity is most likely to cause clearing member insolvency. ^{57/}

One alternative is for clearing agencies to require disclosure of basic general information concerning all broker-dealers who use clearing member services. Information to be disclosed on a monthly or quarterly basis might include name, average dollar value of daily settlements, type of trading activity (e.g., municipal, mortgage-backed, government, equity, option, index option) and general financial data.

Disclosure of certain general information to the clearing agency about firms for whom the clearing member maintains positions on an omnibus basis would provide a number of benefits. First, if the clearing agency detects that a member has customers that may not pay and thereby would place the member in financial difficulty, an early warning system would enable it to take appropriate action earlier (such as consulting with the member, increasing margin on the member's account or on certain sub-accounts or collecting an additional mark-to-the-market payment) to prevent a possible member default and subsequent draw on the clearing fund and other clearing agency or member assets. Second, this information might allow clearing agencies to determine whether it is appropriate to collect additional clearing fund contributions from clearing members with a large concentration of introducing brokers, market-makers or specialists. This could help reduce risk of member default if one or more of these customers fail and could decrease the chance of market disruption. ^{58/}

Another alternative might be for clearing agencies to require clearing members to process on a fully disclosed, rather than omnibus, basis transactions for broker-dealers whose average daily activity or open positions may pose financial risk to the clearing member or the clearing agency. Those thresholds, of course, might be set after comment from interested parties through SRO rulemaking. One possible benefit would be real-time disclosure of settlement activity for each clearing member's account, thereby allowing clearing agencies to identify positions that pose extraordinary financial risk with sufficient time for corrective action. That benefit, however, may be

^{57/} As discussed in Chapter Three, disclosure of information concerning customers holding large positions should be considered. Moreover, disclosure concerning market-makers, specialists and broker-dealers using clearing member services would appear to be a near-term step that should be considered. Those firms must file certain financial information with the Commission and DEAs on a routine basis, and they generally are active market participants.

^{58/} Failure of such a clearing member, in addition to possibly causing a loss to the clearing agency (and then a possible draw on the clearing fund and pro rata assessment on the remaining clearing members), also could force the clearing member's other customers to seek a new clearing firm. If enough of these customers are specialists or market-makers, market disruption could result if they do not find a new clearing firm quickly.

outweighed by the increased cost of processing transactions at clearing agencies on such a basis.

iii. **Earlier Mark-to-the-Market Payments to Cover Exposure from Clearing Agency Trade Guarantees**

Prior to the market break, NSCC announced that it would guarantee trades on the day they are reported as compared, generally T+1 or T+2. ^{59/} Other clearing corporations have filed similar proposals with the Commission. ^{60/} NSCC also adjusted its clearing fund formula to provide safeguards against exposure from those earlier guarantees. ^{61/} Because of the unprecedented price volatility experienced during the

^{59/} See Securities Exchange Act Release No. 24301 (April 3, 1987), 52 FR 11892; NSCC Notice to Members No. A-2753 (April 23, 1987). Earlier clearing corporation guarantees were discussed at the 1984 Securities Processing Roundtable ("Roundtable"). A number of Roundtable participants indicated their belief that earlier guarantees would increase the certainty of trade settlements. This was viewed as particularly desirable for trading strategies that couple stock trades with options or futures trades, because options and futures trades settle on a next-day basis. Earlier equity trade guarantees also would decrease the need for members to make credit judgments regarding their counter trading parties.

Roundtable participants also discussed an earlier mark-to-the-market ("marks") system as a desirable safeguard for the increased clearing corporation exposure that would result with an earlier guarantee. Many broker-dealers believed that for customer-related activity, they would be forced to fund earlier marks themselves, because institutional customers generally settle on a cash-on-delivery basis and would be unwilling to, or legally restrained from, paying marks prior to settlement. Those brokers, however, believed that they could fund non-cash marks by depositing letters of credit or valued securities with the clearing corporation. It was suggested that smaller brokers could have difficulty even with non-cash marks.

^{60/} See, e.g., Securities Exchange Act Release No. 24705 (July 15, 1987), 52 FR 27486.

^{61/} Under the earlier guarantee, mark-to-the-market payments are still made on T+5. Because there is the risk that the market price of a trade will move away from the contract price before settlement date (T+5), NSCC is at risk for that market movement if the participant fails to settle the transaction. Therefore, NSCC adjusted its CNS clearing fund formula to consist of three components, including a component that is based on the difference between the contract price and current market price for all compared trades that have not reached settlement. This is the mark-to-the-market component of the formula. Because NSCC uses a rolling 20-day average of all compared guaranteed trades, the actual clearing fund contribution attributable to marks-to-the-market is less than what daily collection of marks-to-the-market would dictate. The other two components of the clearing fund formula cover allocation risk and liquidation risk. Allocation risk is the risk that a member may be unable to pay for securities it has purchased when those securities are delivered. The clearing fund contribution attributable to this component is 2% of the member's projected total long CNS positions. Liquidation risk is the risk that a member may become insolvent and NSCC will cease to act

market break, the Division currently is reassessing clearing corporation safeguards applicable to earlier CNS guarantees.

Overall, NSCC's aggregate clearing fund was sufficient to cover its market risk exposure during the market break. On October 20, NSCC's total CNS market risk exposure was approximately \$90.7 million, ^{62/} and on October 21, that exposure was approximately \$97.25 million. By comparison, the total exposure on October 14 was approximately \$42.96 million. NSCC's clearing fund, with approximately \$437 million in deposits on October 31, 1987, was sufficient to cover NSCC's market risk exposure during the market break. For the period October 12-30, NSCC made 29 requests for additional clearing fund deposits, all of which were met. Of the 29 requests, 13 were made on retail firm members, six on institutional members, five on specialists and the remaining on various other types of members. Those requests ranged from \$1,000 to \$6,000,000 and totalled \$16,505,000 during the period.

In some individual cases, however, a member's clearing fund deposit was not sufficient to cover what would have been its daily mark-to-the-market obligation if NSCC collected marks-to-the-market on all guaranteed trades. Those deficiencies provide an estimate of NSCC's potential losses on liquidation. For example, in a sample of 30 NSCC members (including five members in each of six categories: retail, specialist, market-maker, clearing, institutional and arbitrage members), four members on October 19, six members on October 20, and seven members on October 21 would have had daily marks in excess of their clearing fund deposits. In each case, however, it appears that each member's excess net capital as of the end of September 1987 would have been sufficient to cover that portion of the daily mark not covered by the member's clearing fund deposit. In summary, although the potential exposure is significant, the Division believes NSCC's member monitoring procedures, as enhanced by new systems NSCC expects to implement in the next few months, coupled with NSCC's aggregate clearing fund, provide adequate overall protection for an earlier guarantee. Nevertheless, the Division believes that earlier marks-to-the-market provide the greatest level of

for the member and liquidate its positions. To protect against any potential difference between the liquidation price of the member's positions and the current market price, the liquidation risk component is 0.25% of the net of all the member's guaranteed pending CNS trades and open CNS positions.

NSCC collects clearing fund deposits from members on a monthly basis, although participants under surveillance can be requested to make additional deposits daily. Participants may request the return of excess clearing fund deposits, which NSCC will make available if the member is not on surveillance or if NSCC determines that the amount on deposit exceeds the risk requirements.

^{62/} The total exposure figure represents the aggregate negative marks-to-the-market on guaranteed NSCC member open positions prior to settlement date (T+1 through T+5). Under NSCC's earlier guarantee, these trades are guaranteed as of midnight of the day they are reported as compared (generally T+1 or T+2) but a mark-to-the-market assessment is not made until settlement date, T+5. Thus, \$90.7 million reflects NSCC's exposure associated with selling out or buying in securities for trades executed on October 14-16 and for trades executed through automated systems on October 19 and reported as compared on October 20.

protection. Accordingly, the Division will continue discussions with NSCC regarding additional steps to ameliorate remaining exposures from an earlier guarantee.

In addition, the Division believes that NSCC's current risk monitoring system should be enhanced. As discussed above, NSCC monitors its members' guaranteed positions that have not reached settlement in order to assess the liquidation exposure to NSCC of each member. NSCC marks the member's open but unsettled positions to the closing prices of the previous day to determine the potential cost of liquidation to NSCC if that firm defaults. This monitoring system is limited, however, because it does not provide real-time estimates of liquidation cost; *i.e.*, it marks the positions to yesterday's close but does not take into account today's price movements or, perhaps more importantly, potential price movements tomorrow. Thus, if current prices vary significantly from yesterday's close, NSCC will not have an accurate, up-to-the-minute cost of liquidation. The Division understands that NSCC expects to upgrade its system within the next few months to provide estimated liquidation costs based on current and projected future prices.

iv. Earlier Trade Settlements

Questions have been raised over the impact of different clearing systems and procedures for stock, options, and futures. ^{63/} At some point in the future, it may be possible and desirable to shorten the current five-business-day settlement cycle for stock transactions. A shorter corporate equity settlement cycle (*e.g.*, next-day, T+2 or T+4) would coordinate more closely with next-day settlement in futures, options, and government debt markets and also would reduce clearing agency exposure from the time of trade guarantee to settlement. As discussed below, however, current practices involving trade comparison, customer-side settlement, and broker-dealer financing would need to be reconsidered and could be an impediment to any near-term switch to earlier trade settlement.

Trades executed and compared through automated systems often account for over 50% of NYSE volume. Because those trades are compared by T+1, the comparison process would not prevent earlier settlement. For all other trades, however, including more than 90% of NASDAQ trades, the comparison process currently requires several days. Broker-dealers first learn of initial comparison results on T+2 and attempt to resolve uncomparated trades on T+2 and T+3. Although locked-in trades currently could be settled earlier, a bifurcation of settlement dates between locked-in versus other trades could require significant systems changes to avoid confusion. Increased use of locked-in trading systems and improvements to the two-sided comparison process, however, could enable earlier settlement of most trades.

As noted above, broker-dealers settle trades with customers in the same five-business-day settlement cycle that is used for inter-dealer settlement. Although the customer-side settlement process has been automated, particularly for institutional trades, widespread use of NIDS is a relatively recent development. Initiatives requiring broker-dealer use of NIDS were first put in place in 1983 and recent changes will

^{63/} See Report of the Presidential Task Force on Market Mechanisms (January 1988) (available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402).

require nearly all broker-dealers and institutions to use NIDS. ^{64/} Currently, NIDS enables affirmation of nearly 90% of institutional trades, but 25% of confirmed trades either fail to settle on T+5 or are settled outside securities depositories. Because it appears infeasible to move to earlier customer-side settlement at this time, earlier street-side settlement would impose substantial costs on broker-dealers to finance street-side settlements pending customer-side settlement.

Broker-dealer financing and stock deliveries for transaction settlements currently are arranged within the five-day settlement cycle. The five-day cycle allows broker-dealers at least several business days ^{65/} to arrange, if necessary, bank financing for net security purchases or stock loans for delivery obligations. ^{66/} Lenders also have several days to decide whether, and to what extent, they will finance broker-dealers' activity. An earlier settlement cycle, especially if money settlement were effected in same-day funds, ^{67/} would require broker-dealers and lenders to accelerate all actions necessary to complete financing arrangements. This acceleration could increase the likelihood of fails and resulting potential difficulties for clearing members.

v. Clearing Agency Capital Requirements

Reexamination and possible strengthening of clearing agency rules that establish net capital requirements for clearing members would serve as a further layer of protection for clearing agencies against member defaults as a result of volatile markets. Rule 15c3-1 requires brokers and dealers to maintain net capital of not less than \$25,000 and a ratio of aggregate indebtedness ^{68/} to net capital of no more than 15 to 1, or under the alternative method, the greater of \$100,000, or 2% of aggregate debit

^{64/} See note 27, *supra*.

^{65/} NSCC distributes to members on T+3 a projected settlement report that gives members a preliminary indication of T+5 net settlement obligations.

^{66/} Equity securities, unlike other securities such as options or U.S. government securities that settle next-day in same-day funds, vary greatly in availability and public float. Thin trading interest, float, or events such as a tender offer, among other things, may make it difficult to arrange a stock loan of certain securities to meet settlement obligations related to short sales or fails to receive.

^{67/} Same-day funds are immediately available whereas clearinghouse funds generally are not available until presented and paid, typically the day after settlement. See Same-Day Funds Settlement For Securities Transactions: A Research Report (July 1985) (sponsored by American Bankers Association and Securities Industry Association).

^{68/} "Aggregate indebtedness" is the total money liabilities of a broker or dealer arising in connection with all its transactions. See 17 CFR 240.15c3-1(c)(1).

items. 69/ Most clearing agencies provide for a somewhat higher standard for their members. For example, OCC requires minimum net capital of \$100,000. 70/

In light of the failures experienced by a number of clearing member customers during the market break and the apparent increased risk caused by market volatility, clearing agencies should consider strengthening their member net capital standards or instituting additional financial requirements such as those required for participants in DTC's recently approved Same Day Funds Settlement ("SDFS") Service. 71/ Although increased capital requirements for clearing members could strengthen clearing member financial positions and decrease default risk, especially during periods of high market volatility, such requirements also would have other effects. As discussed below in Section C, increased clearing agency requirements could decrease the number of broker-dealers eligible for clearing agency membership and increase costs for broker-dealers that cannot maintain membership.

3. Certificate Handling by Depositories, Transfer Agents, and Broker-Dealers

Depositories, transfer agents, 72/ and broker-dealers processed an unprecedented quantity of securities certificates resulting from trading activity during October. Notwithstanding that volume, certificate handling, transfers, and registrations from October trades overall were prompt and accurate. As a result of the lessons learned during the Paperwork Crisis of 1967-70, securities processing organizations have successfully automated their procedures. 73/ In addition, depositories are widely utilized, reducing the number of certificates that must be transferred; and some depositories maintain Transfer Agent Custodian ("TAC") arrangements 74/ and Direct

69/ See Exhibit A to Rule 15c3-3(a) under the Act [17 CFR 240.15c3-3(a)] for a definition of the term "aggregate debit items."

70/ See OCC Rules, Chapter III, Rule 302.

71/ The SDFS Service requires that each participant make a minimum cash deposit of \$200,000 into the SDFS Fund. In addition, each participant must maintain sufficient collateral on all SDFS transactions to cover projected settlement obligations. Participants also are subject to a net debit cap, which limits each participant's net debit at any time during the processing day to a certain ceiling amount calculated for that participant. See Securities Exchange Act Release No. 24689 (July 9, 1987), 52 FR 26613.

72/ Publicly-held companies contract with transfer agents, among other things, to maintain shareholder ownership records and issue negotiable securities certificates to purchasers.

73/ Indeed, many transfer agents' systems are highly automated and may include the capacity to accept depository transfer instructions via automated tape transmission.

74/ Under a TAC arrangement, the transfer agent maintains custody of some or all of the depository's holdings in a "balance certificate." When a depository requests a withdrawal, TAC arrangements allow a transfer agent to issue the certificate withdrawal and merely change the depository's certificate to reflect the change in

Mail Programs 75/ with large transfer agents. Furthermore, transfer agents now have larger and better trained staffs and a regulatory scheme has been enacted to ensure that clearing agencies and transfer agents process securities transactions in a prompt and accurate manner. 76/ In large part, these achievements made possible smooth certificate processing as well as efficient clearance and settlement of transactions during the market break.

While the overwhelming majority of trades are settled by book-entry movements at a securities depository and securities remain on deposit at the same location thereafter, 77/ many customers who purchase securities require issuance of negotiable securities certificates in their names. Moreover, most state corporate laws authorize shareholders to obtain negotiable certificates, on demand, evidencing their ownership interest in the corporation. In addition, Arkansas, New Mexico, and Wyoming require local insurance companies to maintain custody of certificates evidencing their equity investments within the boundaries of those states. Thus, issuing, cancelling, and negotiating physical securities certificates remain integral parts of clearing and settling corporate equity transactions.

Nevertheless, today's depositories are increasingly central players in certificate processing. For example, purchasers who receive securities certificates do so as a result of the coordinated efforts of a broker-dealer, a depository, and a transfer agent. Upon request by a customer, the broker-dealer instructs the depository to debit the broker-dealer's account and make available certificates registered in appropriate names for forwarding to customers. The depository either withdraws a certificate from its vault and sends it to the transfer agent for cancellation and reissuance in the customer's name, or if the depository has a custodial arrangement with the transfer agent, the depository submits instructions to the transfer agent to debit the depository's account and prepare a certificate for the customer.

share ownership. This avoids the delay and risk associated with shipping physical certificates between the transfer agent and the depository.

75/ Under a Direct Mail Program, certificates intended for customers may be sent by the transfer agent directly to the broker-dealer or customer, without first having to go back to the depository.

76/ See Section 17A of the Act, which directs the Commission to facilitate establishment of a national clearance and settlement system and establishes the Commission's authority to register and regulate clearing agencies and transfer agents. See, e.g., Rules 17Ab2-1 through 17Ad-14, 17 CFR 240.17Ab2-1 through 240.17Ad-14 (1987).

77/ Many investors request broker-dealers or banks to safekeep their securities; broker-dealers and banks use depositories to safekeep those and other securities. For ease of transfer and handling, depositories separate the legal and beneficial ownership of securities by re-registering the certificates in the depository's nominee name and maintaining accounts for each member bank or broker-dealer. In turn, broker-dealers and banks maintain records of customer securities.

a. Depository Certificate Processing During the Market Break

Despite increases in the number of physical certificates deposited and dramatic increases in withdrawals, depositories processed these requests smoothly during the market break. 78/ The Division reviewed deposit and withdrawal statistics from the three active registered securities depositories: DTC, MSTC, and Philadep. At all three depositories the number of deposits increased and the number of customer-name withdrawals increased dramatically. As indicated in Table 10-9, deposits at DTC from October 26 through November 2 increased by 17% over the September average. Withdrawals from October 26 through November 2 increased by 103% over the September average. 79/ Table 10-9 also indicates that by early November, two weeks following the market break, the number of withdrawals had tripled when compared with prior averages.

MSTC's and Philadep's deposits and withdrawals followed the same pattern. MSTC's deposits remained essentially unchanged and Philadep's declined slightly. MSTC processed approximately twice as many withdrawals following the market break as it did during the week before the market break. Philadep processed triple the number of withdrawals following the market break in comparison to the prior few weeks, with peak withdrawals on November 2 that were more than six times higher than the prior week's average.

b. Transfer Agent Performance

Transfer agents also had significantly increased workloads as a result of the increased transaction volume and market volatility. All available evidence, however, indicates that transfer agent performance throughout the market break met regulatory and industry performance standards 80/ and facilitated prompt and accurate clearance and settlement of securities transactions. For example, the Securities Transfer

78/ As noted above, book-entry deliveries through DTC also increased, as CNS receipts and deliveries during this period were 300% greater than normal and NIDS deliveries peaked at almost 250% of normal levels.

79/ Participants may withdraw certificates from depositories by one of two methods: "customer-name" withdrawals or "street-name" withdrawals. When a participant requests a customer-name withdrawal, the depository instructs the appropriate transfer agent to prepare a securities certificate registered in the participant's name or a customer's name and to deduct a corresponding number of shares from the number of shares held by the depository's nominee. Street-name withdrawals are provided to the requesting participant as certificates registered in the depository's nominee name.

80/ To ensure that physical certificates are transferred in a prompt and accurate manner, the Commission has established minimum performance standards for transfer agent certificate processing. Rule 17Ad-2(a), for example, requires certain registered transfer agents to process at least 90% of all routine items received for transfer during each month within three business days of receipt. If a transfer agent fails to meet this requirement, Rule 17Ad-2(c) requires the transfer agent to file with the Commission and its appropriate regulatory agency a notice describing the problem and the steps it is taking to prevent a recurrence.

Association ("STA"), in its report to the Presidential Task Force on Market Mechanisms ("STA Report") concluded that,

despite increases in workloads, no significant problems in certificate processing were reported at major transfer agents during November. Moreover, no increase appears to exist in customer complaints pertaining to delays in receiving certificates, processing transfer requests, handling shareholder inquiries, or effecting purchase or liquidation orders for dividend reinvestment or other custodial securities maintained by investors directly with transfer agents. ^{81/}

Indeed, the Commission received only one turnaround exception notice reporting non-compliance with the turnaround requirements caused by the increased volume during the market break period. ^{82/} Furthermore, 89% of the transfer agents that responded to the STA reported that the volume increase had no effect on their ability to meet the turnaround requirements, calculated on a monthly basis. ^{83/} Moreover, DTC (the single largest user of transfer agent services) reported that transfer agents responded to its requests in a timely manner. DTC prepares a periodic report on the timeliness of transfer agents. Analysis of this report's statistics from before and after the market break reveals that while transfer agents processed a 96% increase in withdrawals and a 19% increase in deposits, overall timeliness of transfer agents' performance appears to have improved.

^{81/} The Securities Transfer Association, Report of the Securities Transfer Association to the Presidential Task Force on Market Mechanisms, 13 (December 24, 1987). To obtain the information discussed in the report, the STA contracted with Market Facts, Inc., a market research firm, to conduct interviews with transfer agents and broker-dealers. Some of the data in the STA survey was provided after a review of the pertinent records and some of the data is the result of estimates. The STA Report surveyed 96 transfer agents of various sizes and geographical locations, and 13 broker-dealers representing regional, discount, national full-service and very large firms.

The STA Report stated that 47% of the 96 transfer agent respondents experienced an increase in activity, measured by the number of certificates issued and debited, since the October market break. Seventy-seven percent of major transfer agent respondents reported an increase in activity. Twenty-six percent of all transfer agents and 59% of the major transfer agents that reported an increase in volume of work reported that they worked overtime or added extra resources or both to meet the increased workload resulting from the market break.

^{82/} The only transfer agent that reported missing the turnaround deadline for reasons related to the market break processed 77.4% of routine items within three days of receipt. It stated that it did not meet the turnaround requirements because of a higher than normal number of transfer requests, turnover of transfer personnel, and computer malfunctions. It subsequently has taken corrective actions to address these problems.

^{83/} Six of the 96 responding transfer agents reportedly missed the 90% turnaround standard on one to three days during the market break period, and one respondent reported missing the 90% standard on 10 days during that period.

According to the STA Report, some transfer agents are considering changes to their processing capacity and procedures as a result of the volume increase during the October market break. Changes being considered include: increasing systems hardware capacity; changing procedures; implementing new interfaces with depositories; increasing staff; and increasing telephone capacity.

c. Broker-Dealer Certificate Turnaround

Broker-dealers are an integral part of the securities certificate-handling chain. Generally, broker-dealers obtain certificates in three circumstances: when a customer sells securities that he or she had held personally; when a customer requests that the broker-dealer safekeep certificates on the customer's behalf; and when a customer elects to receive the certificates he or she has purchased.

As part of its study, the Division surveyed 23 broker-dealers conducting a public business concerning the number of business days broker-dealers took to deliver certificates from transfer agents or depositories to customers. 84/ Twenty-one of the 23 responding broker-dealers reported that they delivered certificates to customers in three business days or less. Two broker-dealers reported that they delivered certificates to customers in four to seven business days. 85/

The Division believes broker-dealers should deliver certificates promptly to customers, transfer agents or depositories, as appropriate. Prompt delivery of certificates is essential to safe and efficient broker-dealer operations and consistent with broker-dealer obligations to customers.

d. Lost and Stolen Securities Program

During the market break, broker-dealer and bank use of key aspects of the Lost and Stolen Securities Program ("Program") declined, perhaps because of higher market trading volume. While recovery reports increased, inquiries declined significantly in October and November. 86/ The Program 87/ requires financial institutions, including, among others, broker-dealers, and federally insured banks, to report securities losses,

84/ These statistics reflect October 14 - November 6 activity.

85/ The Division also requested information concerning the number of business days broker-dealers took to transmit securities to a depository or a transfer agent. Thirteen of the 23 broker-dealers that responded reported that they forwarded customers' certificates within one day of receipt. Six of the 23 responding broker-dealers reported that they forwarded customers' certificates within three days of receipt. The remaining four broker-dealers reported that they forwarded customers' certificates from three to seven business days after receipt.

86/ See Tables 10-10 and 10-11.

87/ In 1976, the Commission adopted Rule 17f-1 under the Act, establishing the Program. The Rule was intended to deter trafficking in lost, stolen and counterfeit securities. See 17 CFR 240.17f-1(1987). See also Securities Exchange Act Release No. 13832 (August 5, 1977), 42 FR 41022. The Securities Information Center ("SIC") was designated by the Commission to operate the Program.

thefts and instances of counterfeiting ("reports") 88/ and to inquire whether securities coming into their possession were reported as such ("inquiries"). 89/

The statistics show that, during October 1987, SIC received 65,430 reports, including 12,164 recovery reports ("recoveries"), and 158,248 inquiries. Loss and recovery reports approximated SIC's 1987 monthly averages (based on January through August 1987 activity), but inquiries were well below that average despite record trading volume. According to SIC, the sharpest decline occurred during the two-week period starting from October 19, when the number of inquiries dropped approximately 16,000 from the expected number of inquiries in a two-week period. 90/ The reason for the decrease in inquiries is unclear, but it is possible that during that high volume period, firms moved personnel who normally work on Rule 17f-1 compliance to other more pressing, labor-intensive operations such as trade resolution.

During November 1987, SIC received 83,902 reports, including 36,655 recoveries, and 148,506 inquiries. Reports increased substantially due to an unusually high number of recoveries. 91/ Unlike reports, inquiries decreased. SIC received 10,000 fewer inquiries in November than in October, an amount well below SIC's January through August 1987 monthly average. 92/

According to Program participants, recent high trading volume and market volatility levels have made Rule 17f-1 compliance more difficult. Although firms believe they have made reports and inquiries at an average rate during this time, they still are assessing the impact of recent events on their participation in the Program. The Division will continue to monitor developments and compliance.

88/ Reports of lost, stolen, or counterfeit securities are made to SIC on Form X-17F-1A. Stolen and counterfeit securities must be reported within one business day of discovery of the theft or counterfeiting. Missing securities are deemed lost after two business days and, with certain exceptions, must be reported within one business day of the end of that period. Firms also must report the recovery of any security previously reported lost, stolen, or counterfeit. For January through August of 1987, SIC averaged approximately 67,000 reports a month. Of these 67,000 reports, approximately 14,000 were recovery reports. See Tables 10-10 and 10-11 for a monthly breakdown of 1987 inquiries, loss reports, and recovery reports.

89/ Generally, inquiries are phoned in to SIC headquarters. For January through August of 1987, SIC averaged 190,000 inquiries a month.

90/ From October 19 to the end of the month, 78,964 inquiries were made at SIC. For January through August 1987, SIC averaged 95,000 inquiries for a two-week period.

91/ One transfer agent accounted for 20,000 of the 36,655 recoveries reported because of a recent tender offer. Apparently, the high volume of securities received in the tender offer generated a large number of recoveries that subsequently were reported to SIC.

92/ In December, SIC received 184,614 inquiries, 74,776 loss reports, and 16,331 recovery reports. Inquiries and recovery reports for December approximated SIC's January through August 1987 average, and loss reports exceeded that average.

e. Analysis

During the market break, depositories, transfer agents, and broker-dealers were required to process an enormous volume of physical securities certificates. They avoided the paralysis that occurred during the Paperwork Crisis of 1967-70 because of the efforts to establish a safe and efficient National Clearance and Settlement System. Improved automation was critical to the securities industry during the market break. For example, automated tape transmissions to transfer agents of depository withdrawal requests enabled transfer agents to accommodate large increases in volume without adverse effects on turnaround performance. Nevertheless, several transfer agents reported a sharp increase in transfer requests directly from broker-dealers. Accordingly, the Division believes transfer agents and depositories should continue their efforts to automate the securities transfer process and ensure that their computer systems have sufficient capacity to handle the even higher volumes which may occur in the future.

In addition, transfer agents and depositories should continue to expand Direct Mail programs and TAC arrangements. Direct Mail programs and TAC arrangements reduce the physical movement of certificates, especially during periods of high volume, and the number of intermediaries who must handle certificates before those certificates reach public investors.

Certificate immobilization at depositories provides many benefits. It reduces the number of physical transfers of securities certificates and the cost, inefficiency, and risk such transfers pose. Indeed, use of depository services facilitated the extraordinary transfer volume during the market break period. Broker-dealers, depositories and transfer agents should explore ways to increase certificate immobilization. Those organizations also should explore ways to increase the role of depositories as conduits for broker-dealer transfer requests. To ensure that depository participants have easy access to, and make maximum use of, depository services, depositories also may wish to consider increasing the standardization and compatibility of their services. ^{93/}

C. Options

1. Background

a. Options Clearance and Settlement

OCC issues, clears, and settles all standardized options traded on securities exchanges or quoted on NASDAQ facilities. ^{94/} Unlike trades in equity securities that clear and settle at several registered clearing agencies, OCC provides common clearing facilities for all securities options. Thus, all securities option trades are cleared and

^{93/} The securities and banking industries generally support these goals. See, e.g., SEC, Division of Market Regulation, Progress and Prospects: Depository Immobilization of Securities and Use of Book-Entry Systems, Draft Staff Report (June 14, 1985).

^{94/} OCC is owned by its participating exchanges (i.e., Amex, CBOE, NYSE, PSE, and Phlx) and the NASD.

settled at OCC through an OCC clearing member. ^{95/} OCC maintains book-entry ownership interests in options for its clearing members, who in turn maintain ownership records for their customers and other broker-dealers, including options market-makers.

OCC provides comprehensive options clearance and settlement services for its clearing members. First, OCC receives trade data from options markets and settles premium payments between writing and purchasing clearing members on the business day after the trade date in immediately-available funds. Upon payment of the premium by the OCC clearing member, OCC "accepts" the trade and becomes guarantor on the transaction, crediting clearing member buyers (holders) with long positions and debiting clearing member sellers (writers) with short positions on OCC's books and records.^{96/} Second, and as discussed below, OCC collects margin from clearing members with short positions as part of its safeguarding systems to secure its obligations to option holders. OCC also can call for the deposit of additional margin, known as variation margin, at any time during the business day whenever OCC deems it is advisable for the protection of OCC, clearing members or the general public. Third, OCC randomly assigns to clearing members with short positions exercise notices OCC receives from option holders. OCC combines all premium, margin, and settlement obligations to arrive at a net daily settlement amount for each account each day, which is collected or paid in immediately-available funds each morning between 10:00 a.m. and 11:00 a.m.^{97/} Because OCC provides common clearing facilities for standardized securities options, broker-

^{95/} OCC currently has approximately 190 clearing members. Purchases and sales of options on common stocks are cleared and settled at OCC, but delivery obligations of underlying equity securities and related payments associated with exercised options clear and settle at correspondent clearing corporations, e.g., NSCC or MCC, like any other inter-dealer purchase or sale. Index options (e.g., OEX and XMI) are cleared and settled for cash exclusively at OCC.

^{96/} Each clearing member maintains several accounts at OCC including a firm account, separate market-maker's or specialist's accounts, combined market-makers' or specialists' accounts, and a customers' account. Clearing members also may establish and maintain pledge accounts for each market-maker, specialist or combined market-makers' or specialists' account, as well as a registered trader's account, combined registered traders' account, and a stock market-maker's or stock specialist's account.

^{97/} All times refer to Eastern Standard Time. See, *infra*, at Section C.4 for a discussion of OCC's money settlement procedures.

OCC also offers its clearing members a variety of specialized clearing services. For example, and as discussed below, the OCC pledge program enables clearing members to pledge certain options positions to banks as collateral for bank loans. Additionally, the escrow receipt program enables clearing members to post underlying securities in lieu of margin by depositing shares of underlying stock (or cash or securities equal to the value of the underlying asset in the case of non-equity options) with an OCC-approved custodian. This can be accomplished in an automated environment through the escrow receipt depository system.

dealers trading on more than one market can settle their activity through one account with one net payment at OCC. 98/

As discussed below in greater detail, OCC protects itself against exposure from member defaults in a number of ways. Most importantly, OCC collects margin or other collateral from clearing members for the writers' positions that they carry. Additionally, OCC requires that clearing members meet special financial and capital maintenance and reporting requirements, and monitors members' compliance with those requirements. OCC also maintains stock and non-equity option ("NEO") 99/ clearing funds. Clearing members that carry positions in stock options must contribute to the stock clearing fund, which collateralizes the obligations of all clearing members in connection with stock options. The NEO clearing fund serves the same function for options other than stock options, e.g., foreign currency options and stock index options. Each fund also may be drawn upon to collateralize the other, should the other prove to be insufficient.

b. Margin

OCC requires clearing members to post margin on all uncovered short positions and uncovered assigned positions carried in OCC accounts. An uncovered position is one that is not satisfied by a deposit of the underlying asset with an OCC-approved bank or trust company or offset by an unsegregated long position in the same option class. OCC's margin requirements apply only to OCC clearing members and should not be confused with the minimum margin that must be maintained in customer accounts as set by the options markets in accordance with Regulation T. 100/

OCC maintains two separate margin systems, one for equity options and another for NEOs. Under the equity system, margin on an uncovered short put or call position is the marking price (i.e., premium) times the unit of trading (i.e., 100 shares) and the multiplication factor (i.e., 1.3). 101/

OCC clearing members can reduce clearing margin requirements through OCC netting of certain hedged positions within the same option class, i.e., options on the same underlying asset (spread margin). The margin calculation procedures for spreads and how they are applied differ according to the type of clearing member account.

98/ Although multiple clearing agencies provide services for corporate and municipal securities markets, interfaces among those organizations permit broker-dealers to enjoy the principal benefit of common clearing, one-account settlement.

99/ Non-equity options include stock index, foreign currency, and interest rate options.

100/ Customer and broker-dealer margin requirements are discussed in Chapter Five.

101/ The marking price is the closing ask price for the option as reported by OCC's primary price-reporting vendor. If this price violates certain edit criteria in OCC's system, a warning is generated and OCC refers to another vendor for appropriate price information. The unit of trading is generally 100 shares of stock per contract and the multiplication factor for all equity options currently is 1.3. OCC can change the multiplication factor or impose special margin requirements under special conditions.

Generally, in a customers' or firm non-lien account, OCC nets unsegregated long positions in a series against short positions in that series, and also nets exercises and assignments of the same series. OCC then nets those net positions for each option series within the same option class by using equivalent contract quantities of longs with the same or a later expiration date to offset shorts. The same treatment applies to a firm lien account, a market-maker's account, a specialist's account or a combined market-makers' or specialists' account, except that for these accounts a margin credit in one options class can be used (subject to a deduction) to reduce margin requirements for other classes of options carried in the account.

OCC's NEO margin system uses options price theory to project the cost of liquidating a member's portfolio of positions in the event of an assumed "worst-case" change in the price of the underlying asset or index. The margin requirement or credit for options on the same class equals the premium plus (in the case of a negative liquidating value) ^{102/} or minus (in the case of a positive liquidating value) the "additional margin" amount for that class group. Additional margin is calculated by determining assumed maximum one-day price movements in the underlying assets (the "margin interval") ^{103/} and projecting the effect of such movements (up, down, and at any exercise price falling in between) on the liquidating value of the positions on the basis of options pricing models. ^{104/} An upside projection reflecting an increase in liquidating cost, or a downside projection reflecting a decrease in liquidating value, results in a clearing margin requirement. To provide additional protection, the per-unit cost of liquidating out-of-the-money short call positions in the upside projection and short put positions in the downside projection is presumed to increase by a minimum of 25% of the margin interval. For example, the minimum margin requirement on deep out-of-the-money short index options would be \$500 if the margin interval was 20 points.

OCC margin requirements can be satisfied in several ways. OCC accepts cash, government securities, letters of credit, and valued securities. Eligible valued securities are provided clearing margin credit at one-half their current market value (computed daily). ^{105/} To the extent that clearing margin on deposit exceeds the clearing margin requirement for a particular day, the excess is refundable upon request by the clearing

^{102/} The liquidating value is OCC's estimate of the proceeds or loss OCC would realize if it liquidated the position.

^{103/} Historical volatilities are built into the system and are updated on a daily basis. OCC's margin interval is set at a level where, based on historical rates of change, a close-to-close change in underlying asset value greater than the interval would occur less than 5% of the time. See, *infra*, at Section C.5 for a discussion of OCC's changes in certain margin intervals before and during the market break.

^{104/} See Securities Exchange Act Release No. 23167 (April 22, 1986), 51 FR 16127, in which the Commission approved OCC's NEO margin system.

^{105/} Eligible valued securities are common stocks having a market value greater than \$10 per share that are either traded on a national securities exchange or traded in the over-the-counter market and designated as National Market System Securities pursuant to Rule 11Aa2-1 under the Act. Stocks of any one issuer can not be valued at an amount in excess of 10% of the margin requirement in the account for which such stocks are deposited.

member. Many clearing members leave excess margin with OCC to reduce liquidity problems in the event OCC issues a variation margin call. 106/

2. Options Market Volume and Statistics

OCC issues, clears, and settles over one million equity and NEO contracts (trades) per day. In December 1986, average daily contract volume was 966,000; by September 1987, average daily contract volume was 1,291,000. During the month of October 1987, when all markets were experiencing extraordinary volume, OCC's daily contract volume averaged approximately 1.5 million with an average of 13 contracts per transaction. 107/ On October 16, OCC cleared a record 3,137,619 option contracts. As discussed below, OCC pledge activity also increased during the month of October.

a. NEO

NEO options, i.e., stock index, foreign currency, and interest rate options, accounted for approximately 43% of the total cleared contract volume of 32,513,049 for the month of October. During October, OCC cleared 12,804,165 index option contracts, 1,176,518 foreign currency option contracts, and 8,516 interest rate option contracts.

Index options 108/ account for over 90% of NEO volume. In October, OCC cleared 12,804,165 index options contracts, averaging 582,008 contracts per day, with an average premium of \$765.41 per contract. These figures were up from May 1987 when OCC cleared 9,821,353 index option contracts for an average of 491,068 per day, with an average premium of \$404.12.

The most active stock index option is the OEX traded on the CBOE. In October, OCC cleared 9,923,049 OEX contracts (representing 77.5% of all the index options

106/ Unlike unexercised options, futures contracts always entail mutual obligations. One party must deliver a commodity, or cash in lieu of a product (or a basket of products), whose value generally fluctuates daily; the other party must pay for that product upon delivery at the contract price. Because the obligations are mutual and complementary, it is possible to mark each party's obligation to the market each day and pass through the marks-to-the-market to the contra party, thereby reducing potential exposure from default, and reducing settlement obligations on expiration to the latest mark, or facilitating close-outs through offsetting transactions.

107/ See Table 10-12 for statistics concerning OCC equity and stock index options.

108/ Options are traded on the S&P 500 ("SPX") and the S&P 100 ("OEX") on the CBOE; the Major Market Index ("XMI") on the Amex and the European Options Exchange ("EOE"); the Institutional Index ("XII"), the Computer Technology Index ("XCI"), and the Oil Index ("XOI") on the Amex; the New York Composite Index ("NYA") and the Beta Index ("NBH") on the NYSE; the Value Line Index ("XVL"), the Gold and Silver Index ("XAU"), the Utility Index ("UTY"), and the National OTC Index ("XOC") on the Phlx; and the Financial News Composite Index ("FNCI") on the PSE.

traded), with an average premium per contract of \$700.29, for premiums totaling \$6,949,006,032. 109/

b. Equity Options

Volume in equity options also increased in October 1987, up from 12,696,088 cleared contracts in May 1987 to 18,523,850 in October. 110/ Daily volume averaged 841,993 contracts and the average premium per contract was \$339.28. On October 16, Amex, Phlx, and PSE experienced record volume in equity options with 495,200, 187,224 and 201,214 cleared contracts on each of the respective exchanges. On that day, CBOE equity option volume was 659,144, just below its record volume of 666,457 set on October 12, 1987. 111/

c. Pledges

During October 1987, OCC members pledged 375,407 equity options contracts valued at over \$300 million, primarily to three pledgee banks. Several OCC members that provide clearing services to other broker-dealers accounted for the bulk of that activity. For NEO options, OCC members pledged 26,944 contracts valued at over \$50 million.

OCC's options pledge program provides one method for clearing members to obtain funds. 112/ Although long options can be used to offset OCC margin requirements, 113/ and thereby free up funds, unpaired long options also can be pledged as collateral for loans. 114/ The program also can be used in conjunction with DTC's pledge system to

109/ See Table 10-13 for a breakdown by account type of OEX and other actively-traded stock index options.

110/ Of the total number of cleared equity option contracts in October, approximately 44% of the trades occurred on the CBOE, 33% on the Amex, 12% on the PSE, 10% on the Phlx and 1% on the NYSE.

111/ In contrast, during May 1987, average daily contract volume on the Amex was 204,356; on the CBOE, 291,161; on the Phlx, 62,558; and on the PSE, 68,340.

112/ Long options paired with short options of the same series and strike price negate any OCC margin requirements. For unpaired long options, OCC gives margin credit equal to 35% of their in-the-money value. At the same time, Commission net capital provisions would haircut those options by 50%, thus giving 50% of the in-the-money value as credit for capital purposes. Under Regulations T and U, long options cannot be used as margin equity. Thus, for clearing members with unpaired long options and excess margin on deposit with OCC, a pledge of those options for financing can be the least expensive method of raising funds if lenders are willing to haircut long options by less than 50%.

113/ See OCC Rule 601(b)(4).

114/ The Division is concerned, however, over the unwillingness of at least one bank that had previously accepted long options as collateral to accept these pledge positions during the October market break. Although volatility concerns about

provide lenders with collateral consisting of long securities positions hedged with long put options that protect against market price declines.

3. OCC Services During the Market Break

OCC's systems were tested by the unprecedented market decline and record trading volumes experienced in the markets during the month of October. Despite substantial increases in volume, OCC generally met all routine processing standards and distributed reports within established time frames. ^{115/} Activity in specialized services, such as the escrow receipt program, increased during the month but OCC's systems handled the increased activity without event. As discussed in detail below, market price volatility forced OCC to change dramatically its margin intervals and to call for substantial variation margin.

OCC experienced problems during the week of October 19 in obtaining and verifying daily options marking prices and daily last-sale price information from its three price reporting vendors. ^{116/} Pricing is critical to OCC's operations, both for calculating margin requirements and for valuing securities held as margin. During the week of October 19, OCC reported abnormally high incidences of missing price records and records with a marking price less than the option's intrinsic value. ^{117/} In addition, as a result of the market's overall decline, the options markets added over 6,000 new option series, many of which were not reported by OCC's price-reporting vendors. Consequently, OCC had to obtain last-sale reports from the options markets and correct manually over 5,000 marking prices during evening processing on the 20th and 21st. ^{118/}

OCC took a number of steps to respond to pricing problems. For example, during the week of October 19, OCC converted to a new primary vendor who was providing the timeliest new series inclusions. OCC also enhanced its price editing programs to identify errors and obtained last sale reports from options markets to verify other services. Moreover, as a result of the problems experienced in October, OCC is taking steps to reduce its reliance on outside pricing vendors.

these positions may be greater than for many stocks, long put positions clearly had substantial value during the market break.

^{115/} During the month, however, settlements were delayed a number of times, as discussed below. OCC also received several late reports of matched trades from options markets. Even the latest reports, however, were received within 40 minutes of OCC's 2:00 a.m. deadline and OCC position and margin reports were distributed to members in advance of OCC's 8:00 a.m. report distribution standard.

^{116/} See Chapter Eight for a detailed discussion of the problems encountered by price reporting vendors during the market break.

^{117/} For example, on October 23, the SPX December 350 put was marked at \$1,400 per contract. This marking price was obviously in error since the option was 102 points in-the-money at the time (equivalent to \$10,200 per contract).

^{118/} Prior to the market break, OCC price corrections averaged 300 per day.

4. Settlement

On October 19, 20, and 21, OCC received late payments from certain members and on October 20, OCC delayed, by two and one-half hours, payments to all members due to receive funds from OCC. Moreover, instructions to OCC clearing banks and bank payments to OCC for variation margin were delayed a number of times during the market break. It appears, however, that most of those delays were due to delays in OCC and bank operations processing or otherwise were consistent with OCC's contractual relationships with its clearing banks. In several instances, however, OCC contends that bank payments had been withheld or reversed in a manner inconsistent with or not covered by those contractual relationships. The following discussion describes OCC money settlement procedures, OCC clearing bank obligations, and the settlement problems during the market break.

Currently, OCC maintains clearing accounts at 15 clearing banks. OCC requires members to establish and maintain bank accounts at one of these banks and to authorize the bank to make debits and credits to the member's account in accordance with OCC's instructions. OCC calculates daily each member's net money settlement for all OCC activity. Members' net obligations to OCC ("Pays") are settled at 10:00 a.m. when the clearing bank makes a transfer from the member's bank account to OCC's account at that bank. OCC's obligation to members ("Collects") are settled at 11:00 a.m. by a transfer from OCC's account at the clearing bank to the clearing member's account at that bank. Pays and Collects are made in immediately-available funds. ^{119/}

Under OCC's contractual agreements with OCC clearing banks, OCC is obligated to deliver debit or credit settlement instructions to OCC clearing banks at least one hour before applicable settlement times. For variation margin, OCC also must notify clearing banks of the settlement time. OCC clearing banks are obligated to notify OCC prior to the applicable settlement time if any settlement instructions are to be dishonored. Absent such notice, clearing banks are required to make debits and credits according to OCC's instructions and those debits or credits are deemed by the contract to be final at the earlier of the time they are made or when confirmed to OCC, which must occur within 30 minutes of settlement. ^{120/} In the futures markets, on the other hand, it is unclear whether confirmation to the clearing organization represents a binding commitment by the settlement bank to honor its clearing member customers' obligations.

Because clearing banks are obligated to notify OCC prior to settlement if they intend to dishonor OCC's instructions, OCC clearing banks were forced to make

^{119/} See Securities Exchange Act Release No. 23601 (September 5, 1986), 51 FR 32707, which approved an OCC proposal to effect all money settlements in immediately-available funds.

^{120/} Those agreements also provide for delayed settlement if OCC fails to deliver settlement instructions one hour before settlement time. Under those circumstances, clearing banks are obligated to use their best efforts to complete settlement by settlement time, but the clearing banks are not obligated to effect settlement until one hour after settlement instructions are received from OCC. Variation margin calls are not accepted by clearing banks after 3:00 p.m., except with the consent of the bank.

decisions related to their lending relationships with OCC's clearing members during the week of October 19. On several occasions during the week, OCC clearing members had inadequate funds in their clearing bank accounts to satisfy OCC debit instructions. At the same time, the clearing banks were unable to establish whether OCC clearing members could immediately transfer the necessary funds to the bank. As a result, the clearing banks were forced to decide whether to allow clearing members to overdraft their accounts, or to refuse to pay OCC and risk OCC declaring those members in default and OCC liquidating their options positions. 121/

Interviews by Division staff with a number of clearing banks indicate that, in most cases, the clearing banks extended credit to OCC clearing members with which the banks had preexisting relationships. This involved a significant extension of daylight overdrafts, but all of the clearing banks with whom staff members met indicated that their borrowers had repaid these overdrafts by the end of the day by substituting letters of credit to satisfy margin obligations. 122/ Indeed, several of the banks indicated that once their borrowers reached the limits of the advance rate generally extended to them, the banks, after some consideration, extended their advance rates as much as 100% in some instances in order to ensure that their clearing firm customers were able to meet their settlement obligations and margin calls.

Although most banks responded to the credit needs of their customers, on a number of occasions during the week of October 19, established time frames were not met and settlements were delayed while counterparties verified that clearing members' accounts would receive a transfer of funds by Fedwire. Specifically, on October 19, one New York clearing bank delayed confirmation of payments to OCC for three clearing members that owed OCC approximately \$4 million. OCC also delayed payments to collecting clearing members at that bank. Pays and Collects with that bank were completed approximately two hours after the market opened (approximately 90 minutes after OCC's normal settlement time). 123/

During the day on the 19th, OCC made four variation margin calls on its clearing members at 11:00 a.m., 1:00 p.m., 3:30 p.m., and 5:30 p.m. Clearing members generally are given one or two hours to line up collateral before debit instructions are delivered to the clearing banks. On the 19th, by the time debit instructions were generated in OCC's New York office for delivery to clearing banks for the first variation margin call, a second variation margin call had been issued. OCC determined to combine the two and deliver one set of debit instructions to the clearing banks, and called the clearing banks for extensions of the normal cut-off time for acceptance of variation margin calls. However, when debit instructions for the combined first and second margin calls

121/ As discussed in Chapter Five, certain clearing firms experienced liquidity problems because some options market-makers whose accounts they carry withdrew excess capital held by the clearing firms.

122/ During the week of October 19, the five largest issuers of letters of credit (Bank of America, Irving Trust Co., Bankers Trust Co., First National Bank of Chicago, and Continental Illinois National Bank) each increased, by approximately \$100 million from the previous week, the amount of letters of credit issued to OCC.

123/ Timely settlement is important because OCC must meet its obligation to collecting clearing members by 11:00 a.m.

were generated in New York, a third margin call had been made. Again, OCC determined to combine these instructions with earlier instructions. Consequently, debit instructions for the first three margin calls were delivered together and at least one New York clearing bank did not receive those instructions until approximately 6:30 p.m. ^{124/} Indeed, most banks had closed before OCC completed the final margin call.

Again on October 20, at least three clearing banks delayed settlement confirmations for two and a half hours, apparently for credit reasons. ^{125/} OCC also delayed payments to collecting clearing members during that time. Although OCC is obligated to make those payments, because of the continued decline in the market, OCC anticipated making an intra-day margin call and was attempting to complete margin calculations in order to compare margin requirements with credits to OCC members. Additionally, OCC deviated from standard settlement practice and accepted a cashier's check when a clearing member's clearing bank would not honor OCC's draft. ^{126/} On October 21, morning settlement was delayed for approximately thirty minutes because of a credit-related delay by one clearing bank. As a result of these problems, OCC is confirming its agreements with settlement banks with respect to the procedures for handling cash settlements.

5. Margin and Options Settlements During October 1987

Throughout the weeks of October 12, 19, and 26, OCC called for substantial amounts of cash and other collateral from clearing members through various forms of margin calls to reduce the risk associated with the market's increased volatility. Under OCC's NEO margin system, as market volatility increased, the range of prices over which underlying securities are expected to trade continually changed, prompting OCC to increase margin intervals (and consequently, margin levels) for all stock index options a number of times during the month. For example, OCC increased the margin interval for the OEX from 7.0 points (which translates into a maximum margin requirement equal to the option premium plus \$700 per uncovered short position) to 8 points on October 15, to 10 points on October 16, to 16 points on October 19, and to 20 points on October 21. ^{127/} Although OCC has the authority to increase the multiplication factor for equity options, it has remained at 1.3. In addition, as the stock market continued to decline, so too did the prices of valued securities that OCC accepts for clearing margin purposes, thus generating even greater clearing margin requirements.

^{124/} OCC contends that the bank confirmed all settlement instructions after 7:00 p.m. that evening. With respect to one clearing member now in SIPC liquidation, the bank claims to have confirmed a debit instruction for approximately \$2.4 million only to the extent of \$584,000 (the amount of funds in the clearing member's account). The remaining \$1.8 million currently is in dispute.

^{125/} The Division understands that the Fedwire shut down in Chicago from 11:00 a.m. to 1:30 p.m. because of a computer problem. Although this may have contributed to the settlement delays, the extent to which the shut down affected OCC settlements is unclear at this time.

^{126/} Thus, OCC was paid in next-day, instead of same-day funds.

^{127/} See Table 10-14 for a summary of changes in futures margin.

During the week of October 12, when the margin interval on the OEX was 7.0 and 8.0 points, OCC issued intra-day margin calls 128/ on October 14, 15, and 16 for \$98 million, \$2 million, and \$240 million respectively. 129/ All variation margin calls were met and, as of the close of business on October 16, OCC held \$4.2 billion in margin deposits against total clearing margin requirements of \$3.3 billion, 130/ providing excess collateral of approximately \$900 million.

On October 19, OCC issued four margin calls totalling \$1.2 billion. OCC collected approximately \$586 million in cash; \$424 million was met by excess margin already on deposit. 131/ At 11:00 a.m., with the DJIA down 200 points and the OEX down 20 points, OCC issued the first of its four variation margin calls. 132/ As the market continued to decline on October 19, OCC made three additional margin calls at

128/ Generally, an intra-day call is made when the market moves through a pre-determined parameter. For equity options, OCC makes intra-day variation margin calls based on movements in the S&P 500 Index. Generally, each 1.25% move in that Index generates a margin call. For example, OCC makes a first level intra-day variation margin call whenever the S&P 500 Index has moved by more than 1.25%, and a second level margin call whenever that Index has moved by more than 2.50%. For index options, OCC makes intra-day variation margin calls based on movements in either the underlying index within a product group or the option prices themselves. OCC makes a first level call for a particular product group whenever either the underlying index has moved by more than 75% of the current margin interval, or the option prices have moved by more than 75% of their projected theoretical values. For example, OCC called for variation margin when the OEX moved 15 points and the margin interval was 20 points. OCC makes a second level call when the underlying index has moved by more than 100% of the current margin interval, or the option prices have moved by more than 100% of their projected theoretical values.

129/ Variation margin requirements are expressed in gross figures based on all open positions at OCC. To the extent that a clearing member has excess margin on deposit, the aggregate amount of the intra-day variation margin call is reduced accordingly.

130/ The \$4.2 billion in margin deposits was composed of approximately \$2.9 billion in letters of credit, \$1.1 billion in valued securities (only 50% credit given against \$2.2 billion in valued securities on hand), \$108.5 million in government securities, and \$33.5 million in cash. See Table 10-17 for a breakdown of margin deposits, composition of margin, and margin requirements for the period during the October market break.

131/ The Chicago Mercantile Exchange ("CME") (which represents approximately 75% of the volume in stock index futures) had collected over \$2.5 billion in variation margin that day. See Table 10-15 for a comparison of OCC, CME, and Board of Trade Clearing Corporation ("BOTCC") variation margin.

132/ Although a drop of 7.5 points in the OEX triggered an intra-day variation margin call, under normal circumstances OCC would make the call at noon. Due to the market's precipitous decline, however, OCC determined to make the first call at 11:00 a.m.

1:00 p.m., 3:30 p.m., and 5:30 p.m. for a total of \$1.2 billion in variation margin calls that day. ^{133/} With respect to the final margin call for \$273 million, in most cases, the OCC clearing banks had closed before OCC's drafts on clearing member accounts could be submitted. Consequently, OCC cancelled this last call and collected those margin requirements in morning settlement on October 20.

On the morning of October 20, OCC drafted its clearing members for a total of \$898 million in settlement obligations, which included outstanding margin requirements from the previous day. With the exception of a debit settlement instruction in the amount of \$6.6 million for a defaulting clearing member, as discussed below, all clearing members met their morning settlement obligations. Around mid-day, with the DJIA up 87 points, OCC made an intra-day margin call for \$466 million. By late in the afternoon that call had been met. Overnight, clearing members had been able to line up collateral so that OCC drafted clearing members for only approximately \$40 million. The majority of that call was met by increases in letters of credit, and with government securities and valued securities. ^{134/}

On the morning of October 21, clearing members owed OCC a total of \$280 million for morning settlement. OCC held \$6.2 billion in margin deposits against total margin requirements of \$5 billion, leaving an excess of \$1.2 billion in margin on deposit. OCC again made an intra-day margin call on October 21. Of a total call for \$272 million, approximately \$74 million was met through drafts on clearing banks, and the remainder through excess margin on deposit and increased letters of credit, government and valued securities. ^{135/} Given the sustained high volatility, OCC elected to increase margin intervals at this point, e.g., the margin interval on the OEX was increased from 16 to 20 points. OCC made no variation margin calls on October 22 or 23. Although the equity parameter ^{136/} was broken, OCC clearing members had sufficient excess margin on deposit.

6. OCC Clearing Member Financial Difficulties

During October 1987, several OCC clearing members experienced severe liquidity and financial difficulties that required special OCC attention and management. The filing of an application on October 20, 1987, to liquidate Shaine, an OCC clearing member, resulted in OCC's closing out Shaine's open positions that day, at a loss of \$8.5 million. In accordance with OCC's rules, OCC allocated that loss pro rata among OCC's clearing members. This represents the first time members of a clearing agency have been assessed pro rata for losses occasioned by a member's default.

^{133/} According to OCC, the first three calls were met in their entirety, although one clearing bank denies confirming a debit instruction on a clearing member's account in the amount of \$1.8 million.

^{134/} See Table 10-16 and 10-17 for OCC margin deposits, composition, and requirements during the month of October. On October 20, the CME collected variation margin totaling over \$900 million.

^{135/} The CME collected over \$1.5 billion in variation margin on this day.

^{136/} See discussion, supra, regarding OCC's procedures for margin calls.

Moreover, one clearing member experienced difficulty marshalling assets to meet OCC margin and settlement obligations (as well as futures margin and settlement obligations) on behalf of its customers. That firm clears (on an omnibus basis) for approximately 1,200 specialists, market-makers, and other broker-dealers. At least two other OCC clearing members experienced similar difficulties.

a. Shaine

On October 19, OCC, CBOE, and NYSE monitored closely Shaine's financial condition because of its difficulty meeting settlement obligations and its substantial market exposure on OEX put options. Before the start of trading on October 20, the NYSE and SIPC notified OCC that Shaine was being placed in SIPC liquidation. Consequently, OCC cancelled a debit settlement instruction in the amount of \$6.6 million representing Shaine's margin deficit and other settlement obligations and suspended the firm. Appropriate notifications were sent to correspondent clearing corporations (e.g., NSCC), participant options markets, the SEC and OCC's clearing membership. In accordance with its rules ^{137/} and by-laws, OCC converted margin and clearing fund deposits to cash, ^{138/} netted open positions, and entered market orders with OCC's broker-dealer liquidation agent to close out Shaine's remaining open positions. All open positions were closed out by the close of business on October 20, 1987. OCC sustained an \$8.5 million loss on the liquidation: \$1.8 million currently in dispute with a settlement bank and \$6.7 million in losses resulting from the purchase of long put positions.

As discussed in Chapter Five, the primary reason for Shaine's failure appears to be the activity of several customers writing naked OEX put options. Although Shaine was able to cover its margin requirements from October 16 in its morning settlement with OCC on October 19, the fall in the OEX on October 19 created margin calls that Shaine and its customers could not meet.

As noted above, the *pro rata* assessment of OCC clearing members represents the first time any clearing agency's members have been assessed for a member's default. In proportion to Shaine's aggregate margin requirements on the date of suspension, 99.25% of the loss was charged to the NEO clearing fund and 0.75% to the equity clearing fund.

b. Other Firms Suffering Financial Difficulties

Several OCC clearing members, although they did not become insolvent, experienced severe liquidity constraints during October 1987. One of those firms, First Options, is a clearing agent for options market-makers, specialists, and registered traders; First Options cleared for approximately 1,200 of such entities during October 1987. ^{139/} On October 19, OCC called for a total of approximately \$31 million of

^{137/} See OCC Rules, Chapter XI.

^{138/} At that time OCC held \$5,614,279 in margin for Shaine; \$4,614,279 in cash and \$1,000,000 in a letter of credit. Shaine's clearing fund contribution totalled \$74,330 in the form of treasury securities.

^{139/} Excepting five fully-disclosed separate accounts, the firm cleared those accounts through combined or omnibus accounts.

intra-day variation margin from First Options through four separate calls. ^{140/} Three calls were met by the firm on October 19, and the fourth call was met on October 20. ^{141/}

On October 20, First Options paid an OCC net money settlement debit of approximately \$62 million and during the day met a variation margin call of approximately \$1.2 million. ^{142/} On October 21, First Options paid an OCC net settlement debit of approximately \$27 million. During that day, an intra-day margin call for nearly \$50 million based on equity and index options positions was made. First Options telephoned OCC and explained that it would be unable to meet the call but was reducing open positions and probably would have a Collect from OCC the next day. OCC sent representatives to First Options to satisfy itself that positions were being reduced and OCC subsequently cancelled the variation margin call.

First Options faced further liquidity problems on October 22 when a lender called for a substitution of collateral. As discussed in Chapter Five, First Options had pledged \$250 million in long put options to the lender, which the lender demanded be substituted with an equivalent value of long stock positions. Based on a release from pledge that OCC received from the bank with respect to the long options, OCC recomputed First Options' margin requirement that day and no draft against the firm's account was required. The firm agreed not to open new accounts without OCC's approval.

Another OCC clearing member experienced liquidity problems and also net capital deficits during October 1987. That firm, Fossett, also acted as a clearing firm for approximately 160 accounts (cleared on an omnibus basis) and maintained 33 proprietary accounts. On October 20, OCC learned that the firm had net capital deficits^{143/} resulting from trading losses and activity on October 19 and that its proprietary trading accounts had been placed on a liquidating-only status by the CBOE, the firm's DEA. OCC received assurances from Fossett, however, that it expected to be in capital

^{140/} The bulk of that total represented calls on foreign currency options market-maker accounts, index options, and equity options.

^{141/} On October 16, OCC held approximately \$322.6 million of margin for First Options (composed of approximately \$316 million in letters of credit, \$6 million in Treasury securities, and \$600,000 in cash) and \$57.7 million in clearing fund deposits (composed of \$20 million cash and \$37.7 million in Treasury securities). By the end of the day on October 19, OCC held approximately \$373 million in margin for First Options. First Options' collateral composition changed through an addition of \$87 million in cash and a decrease of \$37 million in letters of credit.

^{142/} The clearing firm's total margin for October 20 was approximately \$377 million with a change in composition from the prior day through an \$88 million reduction in cash and a \$92 million increase in letters of credit.

^{143/} According to OCC, the estimates it received indicated that the firm's net capital deficit could have been \$10 million. See Chapter Five for a description of that firm's capital positions during October 1987.

compliance by the next day. 144/ OCC placed the firm on special margin status (130% of normal margin requirements) effective October 21. 145/

On the morning of October 21, Fossett's clearing bank informed OCC that the bank would not honor a \$3.1 million variation margin call on the firm. 146/ OCC staff analyzed the risks posed by the firm in relation to the approximate \$12.5 million in collateral OCC held and determined to relieve the firm of its obligation to meet the variation margin call. OCC later learned that the firm faced a \$30 million settlement at NSCC related to the return of stock loaned by the firm to another broker-dealer. That information was not available readily to OCC when it made its decision to relieve the firm of the margin call. 147/ Although the NSCC settlement was made, OCC again placed the firm on 130% margin status on October 23 and imposed a number of additional restrictions on the firm. 148/ Since that time, the firm has met all OCC obligations.

The third OCC clearing member that experienced unusual liquidity problems during the market break was engaged in proprietary activity in both the securities options and financial futures markets ("Firm"). Before and during the week of October 19, the Firm had accumulated large options and futures positions in a variety of index products. 149/ Those positions triggered greatly increased margin requirements that drew down the Firm's liquid assets. 150/ On Monday, October 26, the Firm faced a margin deficit of \$10 million to OCC. It appeared at that time that the Firm could not obtain additional financing and OCC was forced to consider the risks and disruptions of liquidating the

144/ Estimates indicated that the firm had approximately \$3.5 million in capital as of October 22. See Chapter Five.

145/ On October 19, 20, and 21, OCC held approximately \$10 million of margin for the firm and approximately \$2.5 million in clearing fund deposits.

146/ The firm's normal margin call requirement would have been approximately \$2.4 million, but was subject to OCC's special margin status requiring 130% of that amount.

147/ Stock loan activity, unlike stock purchase and sale transactions, generally is not handled by centralized clearing agency systems, but is done on a case-by-case basis between the parties to the loan through miscellaneous deliveries at clearing agencies. As a result, clearing agencies and other SROs cannot readily determine the nature and extent of broker-dealers' stock loan obligations.

148/ Those restrictions included: reporting to OCC daily capital computations; special financial reporting requirements; capital restrictions; and a prohibition against the firm opening new accounts without OCC's consent.

149/ Those positions included significant percentages of total open interest in the Value Line Index, NYSE Composite Index, and the Financial News Composite Index.

150/ The Firm's margin requirement at OCC progressed as follows (in approximate amounts): October 1 - \$1.3 million; October 9 - \$8 million; October 16 - \$13.8 million; October 19 - \$28 million; October 26 - \$35.8 million; October 27 - \$45 million. On October 19 and 20, the Firm paid intra-day variation margin at OCC in the amount of \$5.6 million and \$6.7 million, respectively.

Firm against the risks of maintaining the Firm's positions without the additional \$10 million in margin. 151/

OCC's analysis indicated that a significant amount of the Firm's options and futures positions were in the nature of intermarket hedges at OCC and its futures clearing organization subsidiary, the Intermarket Clearing Corporation ("ICC"), such that any losses in one market would be offset by gains in other markets. In sum, although certain positions created exposure and margin requirements, other positions provided economic justifications for reduced margin as long as the hedge was maintained. OCC also determined that the size and nature of the Firm's positions could create market-wide disruptions if liquidated. Pursuant to its authority under new Rule 609A, 152/ and after consultation with Division staff, OCC determined to waive the clearing member's required margin. OCC thereafter entered into an agreement with the clearing member whereby the member agreed that OCC could transfer funds between its OCC and ICC bank accounts. Pursuant to this agreement, on October 27, \$8.9 million was transferred from the Firm's ICC account to its OCC account. On October 28, after the market had reversed, an excess in the OCC account was transferred to the ICC account to meet an ICC variation margin call. OCC thereafter worked with the Firm to raise capital and transfer positions to other firms. These efforts resulted in a considerable reduction of the Firm's positions, with two major firms assuming a number of open positions of the Firm.

7. Analysis

a. Summary

Every aspect of OCC's clearing operation was tested rigorously in October 1987, more so than at any other time in its history. In one instance, OCC suffered an \$8.5 million loss as a result of the liquidation of Shaine and assessed that loss against its participants. In at least three other instances, OCC management 153/ confronted the real possibility of significant participant defaults and acted to assist those members in maintaining sufficient liquidity to avoid OCC's liquidating their options positions.

151/ At that time OCC held approximately \$35 million in margin for the Firm and \$2.7 million in clearing fund deposits.

152/ On October 22, 1987, OCC filed, and on October 23, 1987, the Commission approved on an accelerated, temporary basis, a change to OCC's rules that authorizes OCC, in unusual circumstances, to adjust margin requirements for particular OCC clearing members encountering liquidity problems. See Securities Exchange Act Release No. 25059 (October 23, 1987), 52 FR 41645.

153/ OCC's management is responsible for implementing OCC systems and safeguards and making a variety of judgments in response to daily events. To implement safeguards, OCC management must react at appropriate times, for example, to change margin intervals or impose appropriate special conditions on members. OCC management also must decide in a crisis when it must suspend a member and how OCC can best manage that member's assets to minimize losses. Finally, OCC management must interact with clearing member, bank, and other SRO managements.

Despite those difficulties and the relatively minor loss, on balance, the Division believes OCC performed exceptionally well during this period of unprecedented volume and price volatility in a product which by its nature provides large exposure during volatile market conditions. Nevertheless, OCC, its members, the options markets, and Division staff should re-examine all aspects of OCC's operations to re-affirm their adequacy or identify changes needed in response to events in October 1987.

OCC's management has identified several improvements that have been or may be implemented. For example, in response to pricing problems, OCC is taking a number of steps to reduce the chance of recurring problems. Moreover, as discussed below, OCC plans to enhance its member monitoring to improve its ability to detect excessive position concentration in relation to each member's financial strength or market size and liquidity, and also to improve its ability to monitor members' borrowing power.

Additionally, OCC has filed or discussed with the Division several proposed rule changes that would enable OCC to manage more effectively, or prevent, clearing member difficulties such as those encountered during the market break. As discussed above, during the market break, OCC filed and the Commission temporarily approved an OCC rule change that gives OCC broad authority to take extraordinary action under unusual market circumstances. The rule change enables OCC, upon prior consultation with the Division, to waive clearing member margin requirements when it is advisable in the interest of maintaining fair and orderly markets or is otherwise advisable in the public interest or for the protection of investors. As discussed above, OCC used this authority once during October 1987 to relieve a clearing member of a margin deficit totalling \$10 million. Because of the clearing member's severe liquidity problems and an effective hedge in another market, the Division agreed with OCC that relief was warranted. Nevertheless, the Division is continuing to study the implications of such authority and to assess the extent to which OCC should have permanent ability to provide extraordinary relief in crisis situations.

On December 11, 1987, OCC filed a proposed rule change with the Commission that, if approved, would increase OCC's flexibility to manage clearing member defaults and liquidity problems. Under current OCC rules, OCC is restricted, generally, to liquidating clearing member positions in the event of clearing member default or insolvency. Among other things, the proposal would authorize OCC to hedge a defaulting member's open positions and carry those positions until expiration. Because of the size and nature of some positions, e.g., where an option position represents a significant proportion of total open interest, it may be impossible or inadvisable to liquidate that position.

Although the Division has not completed its review of these proposals, the proposals demonstrate OCC's commitment to take necessary steps to enhance its ability to deal safely with more volatile markets. Nevertheless, the Division believes a number of areas deserve further review.

b. Margin

OCC's use of options pricing models ^{154/} attempts to provide the most accurate

^{154/} See, e.g., J. Cox & M. Rubenstein, Options Markets (1985); R. Jarrow & A. Rudd, Option Pricing (1983).

estimate of the risk of each options position and assesses margin accordingly. ^{155/} The Division continues to believe that OCC's NEO margin system is a reliable method of risk measurement and tends to avoid overmargining or undermargining that can occur with flat percentage-based margin requirements. Nevertheless, OCC should reassess its NEO margin system in light of volatility experienced during and after October 1987 to assure itself, its members, and the Division that the NEO margin system works adequately in volatile markets such as occurred in October 1987.

As discussed above, OCC's NEO margin requirements are based on measurements of historical and theoretical (or implied) price volatility in the options markets and markets for underlying assets. OCC applies those measures to each member's options portfolios to estimate dollar risk and potential liquidation cost. The actual margin requirement for each portfolio each day is the most recent premium plus an additional amount reflecting estimated liquidation costs. OCC tests liquidation values across a range of prices within the margin interval and sets margin at an amount designed to cover the highest liquidation cost. The narrower the margin interval, therefore, the less likely a member's margin will be sufficient to meet potential liquidation costs in a highly volatile market. Wider margin intervals, of course, generally provide for greater member margin requirements but reduce the member's available working capital.

In setting NEO margin, therefore, the margin interval is one critical element. The margin interval is designed to protect OCC from adverse intra-day price moves by collecting margin that covers at least 95% of historical price movements. Because premium margin is marked-to-the-market daily, only a portion of the margin interval generally is required to provide margin that would exceed the intrinsic value of the portfolio given a price change equal to the margin interval. ^{156/} OCC increases a

^{155/} See Securities Exchange Act Release No. 23167 (April 22, 1985), 51 FR 16127.

^{156/} Equity option margin, like NEO margin, is based in part on option premiums. In both systems, margin is marked-to-the-market daily based on closing ask prices, which reflect the most recent measure of closing out short positions. The second component of equity margin is an amount equal to a flat 30% of the current value of the underlying securities, e.g., 100 shares per option contract. In contrast, the second component of NEO margin is more flexible and floats with OCC's margin interval. For example, an OEX Nov 285 put written on October 23 would have required premium margin of \$6,100 and additional margin of \$1,250 for a total of \$7,350. Additional margin was approximately 5% of the index value. At the close on that day, the option was \$4,123 in-the-money and OCC's margin interval was 20 points, which equates to maximum additional margin of \$2,000. OCC's additional margin was based on a projection of a 20 point drop in the S&P 100 (which would have put the option at \$6,123 in-the-money) and price estimates from options pricing models. At the close on October 26, the following business day, the S&P 100 had dropped 20.13 points and the option premium had risen to \$7,800. Generally, OCC's equity margin is higher than NEO margin in relation to the potential dollar exposure on short positions. For example, an IBM Nov 130 put written at the close on October 23 would have required \$1,900 premium margin and \$3,360 additional margin for a total of \$5,260.

particular margin interval if more than three price observations in a three month period exceed the margin interval. 157/

Although the staff believes OCC's NEO margin system is sound, further analysis of the margin intervals appears appropriate. In particular, the 95% coverage level may not be appropriate if the range of historical price movements is sufficiently large to pose substantial exposure to OCC. Accordingly, the Division will review with OCC whether some additional cushion should be built into the system.

The Division is particularly concerned with the exposure to OCC posed by naked short options in volatile markets. Many options portfolios are margined on the basis of offsets between short and long options positions. By using pricing models, OCC can predict certain gains on some positions that will offset exposure on other positions, whether the market moves up or down. In other words, regardless of volatility a certain amount of protection will accrue to OCC without immediate access to additional assets of members. The ability to maintain naked short options, however, depends initially upon OCC's margin interval and dollar margin requirement. When intra-day price movements exceed OCC's margin, the only recourse is to attempt to obtain additional margin during the day through variation margin calls. As illustrated by Shaine, that process will not necessarily provide the needed protection.

As described above, OCC's loss from Shaine resulted from Shaine's concentration in naked short options positions that generated losses far in excess of the firm's and its customers' financial resources. Although OCC demanded greatly increased margin from Shaine via intra-day margin calls on October 19, Shaine simply was unable to pay. Moreover, Shaine's other assets available to OCC were insufficient to cover the initial \$8.5 million loss on liquidation.

On the morning of October 19, Shaine paid to OCC (90 minutes after normal settlement time) a net money settlement debit of approximately \$960,000. The market opened with the DJIA down significantly (67 points) and OCC began calculating its first variation margin call. By the time OCC had calculated its first variation margin call, the market had fallen to a point where OCC needed to make a second variation margin call. OCC decided that it would recalculate the first variation margin call to reflect that additional market drop and combined its first and second calls into one call. OCC had never before made more than one variation margin call on a single day.

The market continued its decline in the afternoon of October 19, and OCC began calculating its third variation margin call. OCC has indicated that it takes approximately 90 minutes for its systems to price and calculate variation margin calls. OCC staff reported that the combined first, second and third margin call on Shaine were not delivered to Shaine's clearing bank until approximately 6:40 p.m.. Although it appeared on October 19 that Shaine's obligations exceeded its ability to pay, because of the delay in delivering debit instructions to the clearing banks for variation margin calls, Shaine's default was not apparent until late in the day, at which time it was too late to liquidate Shaine's positions.

157/ Thus, on any given occasion, OCC's margin deposits may be inadequate during three of those observations. OCC, however, would rely on members' excess margin and clearing fund deposits.

The Division has begun discussions with OCC to determine what measures can be taken to guard against a similar, or even larger, loss from recurring. In particular, the staff intends to analyze the feasibility of special margin requirements for increased concentrations in customer, or proprietary, accounts. Another alternative might be concentration limits keyed to positions such as uncovered short options that are excessive in light of the OCC member's financial strength. Although those limits can infringe on members' options activity, the Division preliminarily believes that more restrictive limits may be appropriate. The Division will continue to discuss with OCC, clearing members, and other interested parties these and other alternatives. 158/

The Division also believes that a number of improvements should be considered regarding OCC's variation margin process. First, it appears desirable for OCC to deliver debit instructions for variation margin calls to clearing banks at the earliest possible time. Although that priority could result in multiple calls and a greater number of dishonored drafts, it would provide OCC with the earliest possible access to funds and information about member financial difficulties. The failure of Shaine highlights the financial exposure inherent in delaying one margin call in order to combine that call with a second margin call. Second, OCC should consider whether automated means, as opposed to messengers, could be used to transmit call instructions to clearing banks. Third, OCC should consider whether, in highly volatile markets that require a margin call early in the day, a special call should be made before markets close to protect against late-in-the-day volatility and to reflect OCC's potential inability to calculate and collect variation margin after markets close. 159/

c. Clearing Fund

The Division continues to believe that OCC's aggregate clearing fund levels,160/ coupled with margin and other safeguards, provide OCC with appropriate overall protection. For example, during October 1987, OCC clearing funds of approximately

158/ See Chapter Five.

159/ In the last hour of trading, between 3:00 p.m. and 4:00 p.m., on October 19 the DJIA dropped approximately 214 points or 42% of the total 508 point drop for the day. That dramatic volatility in the last hour of trading posed special problems for OCC. Because OCC's clearing banks generally cut off variation margin calls at 3:00 p.m. and it takes 90 minutes to calculate variation margin calls, it is virtually impossible for OCC to calculate and collect variation margin reflecting volatility during the final several hours of trading. As a result, OCC must wait until the following morning's settlement to collect that margin.

160/ OCC's clearing funds provide a contingency safeguard, in addition to OCC's other protections, in the form of required deposits of assets by each member in relation to its OCC activity. Specifically, the minimum continuing contribution for each member is \$10,000 for the stock clearing fund and \$50,000 for the NEO clearing fund. Those minimum requirements are increased to the extent exceeded by an amount equal to 7% of the member's average daily margin requirements for equity or NEO options during the preceding month. OCC's clearing fund contributions must be in the form of cash or U.S. government securities. During October 1987, OCC held approximately \$331 million of assets in its clearing funds.

\$331 million exceeded the total settlement debits of all members on all but three settlement days. ^{161/} On those three days, however, OCC held over \$5 billion in member assets, including margin deposits. Moreover, on each day during October 1987, OCC clearing funds of approximately \$331 million exceeded the total settlement credits of all members.

Although OCC's aggregate clearing fund assets are substantial, the clearing fund contribution of each member plus its margin deposits and other assets determine whether other OCC members' clearing fund deposits will be assessed after the suspension and liquidation of a defaulting member. OCC's aggregate clearing fund enables it to obtain quickly funds needed to cover the default of individual members. If a defaulting member's positions liquidate to a loss after exhaustion of all assets including clearing fund contributions, OCC must absorb the loss itself or assess non-defaulting members pro rata, who must restore their clearing fund deposits to required levels.

In connection with its reassessment of overall protections, the Division believes that OCC should consider whether any modifications are needed to its clearing fund requirements. In the case of Shaine, for example, OCC held a clearing fund deposit of approximately \$74,000, indicating average daily margin requirements for Shaine during September 1987 of approximately \$1,057,000. Shaine's margin requirements like many OCC members' margin requirements, rose dramatically during several weeks, in October compared to averages during September. ^{162/} Corresponding increases in clearing fund deposits, however, are not collected until after the end of the month. OCC should consider whether mandatory additional clearing fund contributions callable on demand or within a specified number of hours or days notice are appropriate when a member's current margin requirements exceed significantly levels from the preceding month. Although such a requirement, at times, could strain member resources (if the contribution were collected in immediately available funds on short notice or if demanded at the same time as significant variation margin), those deposits would increase OCC's protection and provide early warning of member difficulty. ^{163/}

^{161/} For most days during October, total debits of OCC members ranged from approximately \$60 million to a high of \$280 million. Total OCC debits exceeded clearing fund levels, however, when those debits, including variation margin calls, reached approximately \$1.1 billion on October 19, \$898 million on October 20, and \$360 million on October 26.

^{162/} Shaine's margin requirements increased during the week of October 12 from \$985,000 on October 12, to \$1.4 million on October 14, and to \$3.2 million on October 16.

^{163/} The Division intends to discuss with OCC the advantages and disadvantages of mandatory intra-month clearing fund requirements versus discretionary margin increases or clearing fund requirements. Although mandatory intra-month clearing fund requirements based on greatly increased margin requirements could be calculated automatically, that approach would not necessarily provide flexibility, which may be desirable. Discretionary margin or clearing fund requirements would provide more flexibility, but could impose burdens on OCC management. In addition, it must be considered that clearing fund contributions currently must be made in cash or government securities, whereas margin deposits also can be

d. Member Monitoring

OCC incorporates its financial data on members, members' positions, and options pricing systems into an on-line system termed Concentration Monitoring System ("System"), which measures dollar risk exposure posed by each member. Currently, the System measures two types of concentration risk. First, it identifies when underlying security prices have changed in an amount that exceeds OCC's margin interval. The System then recalculates the liquidating cost or exposure posed by that member and expresses that exposure as a percentage of the member's capital strength. That capability enables OCC to determine when to make intra-day margin calls and provides early warning of potential member difficulties. For example, late in the week of October 12, OCC's monitoring system indicated that Shaine's potential exposure exceeded the firm's net capital. At that time, OCC began conversations with the NYSE, Shaine's DEA, and learned that Shaine's concentration in short options represented the activity of approximately 70 public customers. Second, the System measures a member's diversification by expressing the number of positions contained in any one portfolio as a percentage of all open positions.

OCC uses several sources to monitor its members' outside activity. OCC reviews members' FOCUS reports to monitor activity involving futures and commodities, equity securities, U.S. government securities, municipal securities, and other financial endeavors. OCC also exchanges information routinely with other securities clearing agencies about common members. To a much lesser extent, and in an informal manner, OCC exchanges limited information with commodities clearing organizations. In addition to other clearing entities, OCC receives information from securities exchanges and the NASD, which generally act as DEAs for OCC members.

The Division believes that OCC should examine the general adequacy of its ability to monitor members and act affirmatively to improve that ability in several areas. Although OCC's Concentration Monitoring System provides information necessary to monitor all aspects of members' options activity, improvements may be possible to detect naked short option concentrations in relation to capital, and position concentrations in relation to options open interest. Of equal importance, and as discussed above, the Division and OCC will continue discussions as to the most appropriate OCC responses to early indications of undue concentration.

OCC and appropriate DEAs also should examine whether improvements are necessary in their ability to identify concentrated individual broker-dealer or customer activity that is cleared through omnibus accounts. Generally, when the combined activity of multiple broker-dealers and customers is cleared through an omnibus account, the concentration of positions of a single broker-dealer or customer may not be immediately apparent, and the net position may mask significant risks. Although OCC can obtain necessary information from clearing members or DEAs (who can obtain information from correspondent broker-dealers concerning their public customers), OCC should consider whether any steps should be taken to provide earlier and more extensive information about specific activity cleared through omnibus accounts. ^{164/} In this

satisfied with letters of credit or valued equity securities.

^{164/} See Section B above.

connection, the Division notes that each options exchange requires reports about persons with substantial options positions. 165/

Additionally, OCC and commodities clearing organizations should improve their information-sharing channels. OCC's experience with the Intermarket Trading Firm demonstrates the invaluable information that can be available to a clearing organization in one market from a clearing organization in another market. Because many securities options broker-dealers and market-makers engage in significant futures and commodities activity, it is essential for OCC to have access to current information about its members' activity in those markets. In this regard, OCC should consider an interface with the BOTCC, which is coordinating the development of a system for the routine, electronic exchange of Pay and Collect data between futures exchanges and clearing organizations, 166/ and should explore the possibility of exchanging additional data for financial surveillance purposes. Although OCC can obtain some information from its members directly, through FOCUS reports, or from DEAs, OCC only can obtain necessary up-to-the-minute information from commodities clearing organizations through sophisticated on-line monitoring systems that some of those organizations maintain.

e. OCC's Relationship with Clearing Banks

As described above, options money settlement occurs quickly, on the morning after trade date or, in the case of intra-day variation margin calls, within one hour of demand. That structure forces members to marshal assets within those time frames and often in response to unexpected demands. That structure may not provide adequate time for extensive deliberations if the clearing member must turn to its clearing bank for unusual amounts of credit. Indeed, OCC's agreements with its clearing banks require those clearing banks to effect settlements or notify OCC which clearing members did not satisfy their payment obligations. Although clearing banks may wish to delay that notice (hoping the clearing member will marshal sufficient assets or provide sufficient assurance to justify further credit), it is critical for OCC to know, at the earliest possible time, whether a member is likely to default on OCC payment obligations.

OCC and its clearing banks should discuss whether improvements can be made in the options money settlement process. During the market break, morning settlement with OCC clearing members, *i.e.*, Pays by the members to OCC (which generally occur at 10:00 a.m.) were delayed a number of times while clearing banks assessed the creditworthiness of their customers or verified that funds were being transferred to customer accounts. Such delays create uncertainty and fuel rumors in the marketplace.

OCC, as guarantor, is obligated to credit members with Collects at 11:00 a.m. and should consider exploring banking relationships that would enable OCC to pay collecting

165/ Each exchange member must file a report giving the name, address, social security number or tax identification number of any customer who, on the previous business day, held aggregate long or short positions of 200 or more option contracts of any single class of options dealt in on the exchange. *See, e.g.*, CBOE Rule 4.13(a); Amex Rule 906C; PSE Rule VI, Section 7; NYSE Rule 706; and Phlx Rule 1003.

166/ *See* Commodity Futures Trading Commission, Supplementary Report on Stock Index Futures and Cash Market Activity During October 1987 (January 6, 1988).

clearing members on time regardless of delays by paying clearing members. In fact, OCC has indicated that it did pay collecting clearing members before all settlements with paying clearing members were confirmed at least once during the market break, although OCC withheld payments to the clearing bank causing the delay. The Division believes that all funds due from OCC should be available at settlement time and intends to continue discussions with OCC in this regard. Additionally, OCC and the clearing banks should clarify their agreements regarding when and how payments or partial payments are to be made and confirmed.

f. Uniform Pledge and Transfer Rules

OCC has suggested that it may be possible to improve the process by which OCC members pledge assets to banks. ^{167/} As discussed below, OCC believes that state commercial law, which governs security interests in investment securities, should be clarified in certain ways to reduce existing uncertainty. For example, because OCC maintains options positions exclusively in book-entry form, the method for perfecting security interests in options may vary from state to state, depending upon whether applicable law reflects the 1977 Amendments to the Uniform Commercial Code ("UCC") Article 8 or an earlier version. Indeed, determining which law applies in multi-state transactions may be difficult, because the conflict of law rules under revised UCC Article 8 yield a different result from the result under earlier versions of UCC Article 8. ^{168/} Although it is possible to perfect security interests using both methods, doing so is both cumbersome and error-prone. To date, approximately 22 states have adopted key provisions of the 1977 UCC Article 8 amendments. Because state commercial law is far from uniform at this time and because states appear to be modifying the UCC Article 8 amendments rather than adopting those amendments wholesale, OCC has recommended consideration of legislation authorizing the SEC to promulgate uniform pledge and transfer rules (that in effect would pre-empt UCC Article 8) similar to U.S. Treasury Department rules for pledges and transfer of U.S. Treasury securities.

The Division believes uniformity would increase commercial certainty, lender confidence in options markets and thus, public confidence. Therefore, the Division intends to explore with the Commission the appropriateness of such a legislative proposal.

g. Cross-Margining System

OCC has indicated that the liquidity problems of several OCC clearing members during the market break could have been eased with an intermarket margin system. Many OCC members also are clearing members of futures clearing organizations and, during October 1987, had to meet margin calls on their futures positions, as well as their options positions, despite reduced risk posed by some positions because of hedge positions carried at other clearing organizations. Moreover, futures and options settlement times are not necessarily coordinated.

^{167/} See OCC, Report of the Options Clearing Corporation to the Presidential Task Force on Market Mechanisms (December 1, 1987).

^{168/} See, e.g., Haley, Investment Securities, Annual Survey of the Uniform Commercial Code, 37 Bus. Law. 997-98 (1982).

OCC and ICC have proposed a system of cross-margining between options and futures, which the Division currently is reviewing, that could facilitate intermarket hedging, reduce certain margin requirements, and minimize liquidity demands on hedged positions. ^{169/} The OCC and ICC proposal would calculate initial, maintenance, and settlement margin in proprietary (firm) accounts of dual clearing members based on aggregate options and futures positions.

The potential benefits of a cross-margin system are substantial. In a fully-integrated cross-margin account, margin requirements could be fixed to reflect more accurately the net risk of such positions taken as a whole, thus reducing certain margin requirements that result when each leg of an intermarket hedge or spread position is maintained at separate clearing organizations. Moreover, cross-margining positions on the same, or closely-related underlying assets can enhance the integrity of a clearing system because an increase in the risk associated with one leg of a hedged position can be offset by a corresponding increase in the value of the other position. Cross-margining also could offer net money settlements for securities options and futures activity, including variation margin calls, that could increase clearing organization safety and decrease the need for members to move funds during the day among clearing organizations. ^{170/}

OCC and ICC, however, have identified several impediments to full implementation of a cross-margining system. First, customer segregation provisions of the Commodity Exchange Act ("CEA") prohibit commingling of customer funds and could be interpreted to preclude the CFTC from adopting rules permitting cross-margining. Second, because a cross-margined account would contain both commodities and securities positions, it could be subject to conflicting claims under the Bankruptcy Code and the Securities Investor Protection Act. ICC has proposed amendments to the CEA to overcome these regulatory obstacles. ^{171/} The Division believes that the potential for reductions in risk exposure for both futures and options clearing corporations warrants an increased

^{169/} See Securities Exchange Act Release No. 23547 (August 21, 1986), 51 FR 30504. ICC has filed a corresponding proposal with the CFTC. Those proposals and the discussion above concern risks posed to clearing organizations and not broader questions of leverage in derivative markets.

^{170/} In a comment letter to the CFTC, the SEC generally supported the concept of cross-margining. See letter from Jonathan G. Katz, Secretary, SEC, to Jean A. Webb, Secretary, CFTC, dated May 5, 1987. The SEC noted, however, that the structure of a cross-margining system must assure maximum safety and minimum restraint on competition among organizations providing clearing and brokerage services, thus indicating that, in the SEC's view, the ability to offer cross-margining services should be available to any eligible clearing organization.

^{171/} See Statement of the Intermarket Clearing Corporation before the Subcommittee on Conservation, Credit, and Rural Development, Committee on Agriculture, U.S. House of Representatives, April 15, 1986. See also, Commodity Futures Trading Commission, Cross-Margining of Commodity Futures, Commodity Options, and Securities Options; Request for Comments on Petition for Rulemaking, 51 FR 41117 (November 13, 1987), in which ICC proposed that the CFTC issue a rule of general applicability that would permit cross-margining.

commitment by both the SEC and CFTC to resolve outstanding issues and permit the implementation of a cross-margining system for market professionals.

10-59
Table 10-1

		New York Stock Exchange															
		MICRINAL															
		AVERAGE															
TRADING DAY	OR SAMPLE	OCT. 12	OCT. 13	OCT. 14	OCT. 15	OCT. 16	OCT. 19	OCT. 20	OCT. 21	OCT. 22	OCT. 23	OCT. 26	OCT. 27	OCT. 28	OCT. 29	OCT. 30	
Share volume (millions)	180.5	141.9	172.9	207.4	263.2	338.5	604.3	608.1	449.4	392.2	245.6	308.8	260.2	279.4	258.1	303.4	
Transaction volume	165,250	144,857	149,830	182,356	225,550	309,645	533,120	488,838	496,156	402,444	224,786	293,781	264,147	247,141	214,841	247,644	
=====																	
Automated trade systems	315,000	293,182	290,952	373,954	466,388	670,474	1,231,000	990,410	1,175,400	884,732	479,182	647,081	582,972	503,038	412,122	501,302	
Trade date compared sides	65.632	68.292	66.302	68.892	67.362	71.752	75.752	69.382	76.192	72.472	71.012	72.172	72.292	68.552	68.122	68.442	
% of total trade sides																	
Number of transactions	78,750	73,296	72,738	93,489	116,597	167,619	307,750	247,603	293,850	221,058	119,796	161,770	145,743	125,760	108,031	125,326	
% of total transactions	47.662	50.602	48.552	51.272	51.692	54.132	57.732	50.652	59.232	54.932	53.292	55.062	55.182	50.892	50.282	50.612	
Share volume (millions)		71.624	72.456	101.432	121.767	177.94	305.641	233.7	191.893	160.772	99.858	135.156	122.649	110.098	98.776	114.961	
% of share volume		50.472	41.912	48.912	46.262	52.572	50.582	41.722	42.702	40.992	40.662	43.772	47.142	39.412	38.272	37.892	
=====																	
Other systems (two-sided comparison)																	
(t+1) compared sides	165,000	136,112	147,866	168,862	206,058	263,954	394,114	433,058	367,360	335,850	195,658	249,516	223,470	230,784	202,246	231,146	
% of total trade sides	34.382	31.712	33.702	31.112	30.642	28.252	24.252	30.422	23.812	27.532	28.992	27.832	27.712	31.452	31.882	31.562	
Number of transactions	86,500	71,561	77,092	88,868	108,953	142,026	225,370	241,236	202,306	181,386	104,990	132,011	118,404	121,382	106,810	122,319	
% of total transactions	52.342	49.402	51.452	48.732	48.312	45.872	42.272	49.352	40.772	45.072	46.712	44.942	44.822	49.112	49.722	49.392	
Share volume (millions)	180.5	70.276	100.444	105.968	141.433	160.56	298.659	354.4	257.507	231.428	145.742	173.644	137.551	169.302	159.324	188.439	
% of share volume		49.532	58.092	51.092	53.742	47.432	49.422	58.282	57.302	59.012	59.342	56.232	52.862	60.592	61.732	62.112	
Uncompared trades (t+2 report)	8,000	7,010	6,298	8,873	11,848	20,098	56,626	49,413	37,251	26,922	14,322	14,506	13,337	11,979	11,374	13,491	
Initial uncompared (total trade-sides)	1.642	1.612	1.412	1.612	1.732	2.112	3.372	3.352	2.362	2.162	2.082	1.592	1.632	1.612	1.762	1.812	
Initial uncompared (2-sided input)	4.622	4.902	4.082	4.992	5.442	7.082	12.562	10.242	9.212	7.422	6.822	5.492	5.632	4.932	5.322	5.512	
Error and Uncompared Trade Resolution																	
t+2 Advisories Returned	1000	992	871	1159	1554	2616	5081	5491	3974	3505	1,479	1371	1329	1514	1770	1563	
Questioned Trade and As of's processed	6,500	5541	4998	7331	9847	16,983	67,673	62,564	34,182	24,004	12,378	13,672	11,404	9586			

10-60
Table 10-2

		NASDAQ/Over-the-Counter															
		NORMAL															
TRADING DAY		AVERAGE															
OR SAMPLE		OCT. 12	OCT. 13	OCT. 14	OCT. 15	OCT. 16	OCT. 19	OCT. 20	OCT. 21	OCT. 22	OCT. 23	OCT. 26	OCT. 27	OCT. 28	OCT. 29	OCT. 30	
Share volume (millions)		145.5	117.8	131.7	145.6	159.8	195.9	222.9	284.1	288.1	249.8	177.0	190.5	202.2	205.9	208.4	
Transaction volume		50,850	43,934	42,526	48,626	52,452	78,178	101,337	111,542	118,261	110,368	63,133	88,805	80,790	72,913	64,677	71,565
=====																	
Automated trade systems																	
Trade date compared sides		15,000	13,340	14,464	14,776	16,754	21,782	43,214	22,252	25,982	21,678	20,806	21,846	24,598	20,132	18,480	23,348
Tot total trade sides		14,562	15,052	16,652	15,062	15,742	14,022	21,982	10,742	11,642	10,462	16,522	12,472	15,092	13,772	14,192	16,102
Number of transactions		3,750	3,335	3,616	3,694	4,189	5,446	10,804	5,563	6,496	5,470	5,202	5,467	6,150	5,033	4,620	5,842
Tot of total transactions		7,372	7,592	8,502	7,602	7,992	6,972	10,662	4,992	5,492	4,962	8,242	6,162	7,612	6,902	7,142	8,162
Share volume (millions)		1.775	1.775	1.916	1.933	2.212	3.161	7.363	3.465	3.593	3.057	2.814	2.177	2.434	1.964	1.867	
Tot share volume		1.512	1.352	1.322	1.212	1.132	1.422	2.592	1.202	1.442	1.732	1.482	1.052	1.202	0.952	0.902	
=====																	
Other systems (two-sided comparison)																	
(1-1 compared sides)		88,000	75,318	72,412	83,306	89,660	133,592	151,382	184,922	197,264	187,310	105,116	153,428	138,400	126,110	111,728	121,758
Tot total trade sides		85,442	84,952	83,352	84,942	84,262	85,982	78,072	89,262	88,362	89,542	83,482	87,532	84,912	86,232	85,812	83,902
Number of transactions		47,100	40,599	38,910	44,932	48,264	72,733	90,534	105,979	111,765	104,899	57,932	83,338	74,640	67,880	60,057	65,723
Tot total transactions		92,632	92,412	91,502	92,402	92,012	93,032	89,342	95,012	94,512	95,042	91,762	93,842	92,392	93,102	92,862	91,842
Share volume (millions)		116.025	129.925	143.684	157.867	193.688	219.739	276.737	284.635	246.207	173.943	187.686	205.123	199.766	203.936	206.533	
Tot share volume		98.492	98.652	98.682	98.792	98.872	98.582	97.412	98.802	98.562	98.522	98.952	98.952	98.802	99.052	99.102	
Uncompared trades (1-2 report)		6,200	5,879	5,408	6,558	6,867	11,873	27,685	27,035	26,266	22,487	13,248	10,880	9,649	8,385	9,688	
Initial uncompared (total trade-sides)		5,682	6,222	5,862	6,272	6,062	7,102	12,342	11,542	10,532	9,712	7,862	7,032	6,262	6,192	6,052	6,262
Initial uncompared (2-sided input)		6,582	7,242	6,952	7,302	7,112	8,162	15,292	12,752	11,752	10,722	9,282	7,952	7,292	7,112	6,982	7,372
Error and Uncompared Trade Resolution																	
1-2 Advisories Returned		2,800	2,869	2,463	3,122	2,548	4,149	10,792	8,375	7,346	7,406	3,445	4,765	4,232	3,983	3,473	3,598
1-3 Advisories Returned		1,200	344	305	401	492	2,201	4,835	6,161	9,350	5,726	5,148	4,859	3,502	3,318	3,103	3,600

10-61
Table 10-3

American Stock Exchange																
NORMAL																
AVERAGE																
OR SAMPLE	OCT. 12	OCT. 13	OCT. 14	OCT. 15	OCT. 16	OCT. 19	OCT. 20	OCT. 21	OCT. 22	OCT. 23	OCT. 26	OCT. 27	OCT. 28	OCT. 29	OCT. 30	
TRADING DAY																
Share volume (millions)	10.5	8.5	10.9	9.8	12.8	18.5	35.4	43.4	34.5	26.6	18.7	22.4	21.5	20.3	16.8	72.3
Transaction volume	15,000	12,912	13,611	15,214	16,873	24,915	47,125	50,617	48,432	37,570	22,611	29,335	29,597	26,403	22,530	25,605

Automated trade systems	22,000	18,310	20,164	21,124	23,744	34,940	73,802	82,892	85,586	61,124	33,774	41,508	45,222	36,570	33,350	38,100
Trade data compared sides	55,001	53,751	55,371	52,801	53,271	53,781	59,321	61,461	63,801	60,411	56,681	54,271	56,961	53,161	55,641	55,861
Tot total trade sides																
Number of transactions	5,500	4,578	5,041	5,281	5,936	8,735	18,451	20,725	21,397	15,281	8,444	10,377	11,306	9,143	8,338	9,525
% of total transactions	36.671	35.452	37.041	34.712	35.182	35.062	39.152	40.942	44,001	40.672	37.542	35.372	38.202	34.632	37.012	37.202
Share volume (millions)		2.03	2.16	2.40	2.80	4.03	8.51	8.89	8.73	6.45	3.81	4.97	5.19	4.22	3.86	4.40
Tot share volume	0.401	23.932	19.791	24.512	21.882	21.792	24.031	20.482	25.312	24.242	20.352	22.172	24.132	20.782	22.982	19.742

Other systems (two-sided comparison)	18,000	15,755	16,253	18,886	20,815	30,025	50,605	51,990	48,558	40,063	25,811	34,983	34,140	32,217	26,587	30,106
(6-1 compared sides)	45,001	46,251	44,631	47,202	46,711	46,221	40,681	38,542	36,201	39,592	43,321	45,732	43,021	46,942	44,362	44,142
Tot total trade sides																
Number of transactions	9,500	8,335	8,570	9,933	10,937	16,180	28,674	29,894	27,256	22,289	14,168	18,958	18,292	17,260	14,193	16,080
Tot total transactions	63,331	64,552	62,961	65,292	64,821	64,942	60,851	59,062	56,001	59,332	62,662	64,632	61,802	65,372	62,992	62,802
Share volume (millions)	10.5	6.466	8.743	7.398	10	14.469	26.893	34.513	25.768	20.151	14.894	17.433	16.312	16.002	12.94	17.897
Tot share volume		76.072	80.212	75.492	78.132	78.212	75.972	79.522	74.692	75.762	73.652	77.832	75.872	79.222	77.022	80.262

Uncompared trade-sides (to 2 report)	1,000	914	886	980	1,058	2,335	6,743	7,798	5,913	4,514	2,524	2,933	2,443	2,303	1,798	2,654
Unilateral uncompared (total trade-sides)	2,441	2,612	2,382	2,392	2,372	3,472	5,142	5,472	4,272	4,272	4,062	3,692	2,992	3,242	2,912	2,921
Unilateral uncompared (2-sided input)	5,261	5,482	5,172	4,932	4,842	7,222	11,762	13,042	10,862	10,132	8,912	7,742	6,682	6,672	6,332	6,592

Error and Uncompared Trade Reconciliation																
1-2 Advisories Returned	240	202	191	172	219	355	1,064	1,164	870	785	507	458	404	385	331	326
Questioned Trade and Its of's processed	400	344	305	401	492	1166	3,452	4,480	3,218	2,056	1,192	1,387	1,163	1,052		

10-62
Table 10-4

New York Stock Exchange Trade Comparison and Resolution Statistics Composite Data for 12 Firms Conducting a Public Business											
	(10/14)	(10/15)	(10/16)	(10/19)	(10/20)	(10/21)	(10/22)	(10/23)	(10/26)	(10/27)	(10/28)
Two-sided trade input	60,941	70,108	99,342	208,712	192,998	171,362	123,798	73,704	96,411	85,439	80,487
Trade-date trade-sides	70,694	78,214	116,154	244,836	196,433	188,586	133,426	91,677	101,046	89,211	78,354
total sides	131,635	148,322	215,496	453,548	389,431	359,948	257,224	165,381	191,457	172,641	158,841
1 Trade date trade-sides/total	53.702	52.732	53.902	53.982	50.442	52.392	51.872	55.432	52.782	51.672	49.333
T+1 reported compared (sides)	71,196	81,355	119,352	236,474	194,493	172,671	124,002	74,799	92,920	83,476	78,928
T+1 reported uncomparad (sides)	1,297	1,607	2,986	11,152	8,068	5,673	4,097	2,388	2,091	1,761	1,754
2 Uncomparad/Two-sided input	2.132	2.292	3.012	5.342	4.182	3.312	3.312	3.242	2.312	2.112	2.182
Uncomparad trade-sides resolved											
T+2	277	409	525	1103	965	805	622	376	321	309	333
T+3	805	1264	2552	7763	2409	4333	3289	1672	1615	1292	1412
T+4	322	366	580	5446	5738	1922	1370	728	661	618	380
T+5	61	40	91	2055	2141	769	378	147	99	65	40
Total uncomparad resolved	1,465	2,079	3,748	16,367	11,253	7,829	5,659	2,923	2,696	2,784	2,165
Uncomparad not resolved by settlement date	32	28	102	1723	1723	426	453	114	618	1212	1440
Value of unresolved	\$1,022,714	\$7,610,440	\$4,508,614	\$90,917,961	\$1,038,719,734	\$33,712,839	\$39,866,762	\$8,541,387	\$14,626,125	\$83,233,650	\$3,775,792
Uncomparad not resolved as of last calculation	0	1	1	10	17	8	14	2	1	1	1

10-63
Table 10-5

Over-The-Counter
Trade Comparison and Resolution Statistics
Composite Data for 12 Firms Conducting a Public Business

	[[10/16]]	[[10/15]]	[[10/16]]	[[10/19]]	[[10/20]]	[[10/21]]	[[10/22]]	[[10/23]]	[[10/26]]	[[10/27]]	[[10/28]]
Two-sided trade input	20,725	22,448	34,429	46,054	46,364	47,734	44,156	27,611	37,340	32,462	30,542
Trade-date trade-sides	9,677	10,560	15,686	24,714	20,993	22,183	19,818	14,080	17,263	16,100	14,578
total sides	30,402	33,008	50,115	70,768	67,357	69,917	63,974	41,691	54,603	48,762	45,140
Z Trade date trade-sides/total	31.83%	31.99%	31.30%	34.92%	31.17%	31.73%	30.98%	33.77%	31.62%	33.02%	32.34%
T+1 reported compared (sides)	19,694	21,344	32,193	40,702	41,528	43,468	40,841	25,179	35,073	31,299	28,999
T+1 reported uncomparad (sides)	1,021	1,140	2,188	4,689	5,417	4,411	3,481	1,749	2,695	1,826	1,678
Z Uncomparad/Two-sided input	4.93%	5.08%	6.36%	10.18%	11.68%	9.24%	7.88%	6.33%	7.22%	5.59%	5.56%
Uncomparad trade-sides resolved (T+2)											
T+2	431	404	748	1494	1467	1099	1263	680	816	744	649
T+3	318	523	713	1552	1576	1432	1335	837	939	628	588
T+4	122	117	344	643	870	858	470	494	329	255	219
T+5	58	73	124	218	255	167	143	90	146	95	118
Total uncomparad resolved	929	1,117	1,929	3,907	4,168	3,556	3,211	2,101	2,230	1,722	1,594
Uncomparad not resolved by settlement date	208	304	443	1054	1189	650	624	425	678	684	710
Value of unresolved	\$28,803,857	\$17,093,353	\$35,057,879	\$67,704,954	\$103,625,894	\$75,506,159	\$88,675,813	\$62,164,134	\$30,430,692	\$34,674,078	\$27,851,789
Uncomparad not resolved as of last calculation	1	0	0	94	95	4	7	2	7	2	2

10-64
Table 10-6

American Stock Exchange Trade Comparison and Resolution Statistics Composite Data for 12 Firms Conducting a Public Business												
	(10/14)	(10/15)	(10/16)	(10/19)	(10/20)	(10/21)	(10/22)	(10/23)	(10/26)	(10/27)	(10/28)	
Two-sided trade input	5,165	6,165	8,640	16,306	17,352	16,707	12,049	8,420	10,562	9,081	9,300	
Trade-date trade-sides	4,000	4,653	6,610	13,694	16,159	15,526	9,474	6,167	7,954	7,783	6,821	
total sides	9,165	10,818	15,250	30,000	31,511	32,233	21,723	14,587	18,516	17,464	16,201	
2 Trade date trade-sides/total	43.932	43.012	43.272	45.652	44.932	48.172	44.532	42.202	42.962	44.062	42.102	
1+1 reported compared (sides)	5,029	6,246	8,700	17,171	17,121	15,495	11,523	8,054	10,363	9,639	8,917	
1+1 reported uncomparad (sides)	143	185	372	1,023	1,444	744	556	429	610	332	396	
2 Uncomparad/Two-sided input	2.802	3.002	4.302	6.272	6.022	4.452	4.612	5.102	3.002	3.562	4.222	
Uncomparad trade-sides resolved												
1+2	32	95	115	151	154	130	113	75	88	71	85	
1+3	54	99	106	440	496	516	345	192	227	106	109	
1+4	34	70	132	369	450	199	216	146	137	122	101	
1+5	11	14	29	130	67	34	24	23	19	16	17	
Total uncomparad resolved	151	199	462	1106	1175	805	698	436	471	395	392	
Uncomparad not resolved by settlement date	18	15	49	118	167	29	37	34	75	140	121	
Value of unresolved	\$125,214	\$135,113	\$425,002	\$2,579,110	\$2,422,639	\$410,911	\$105,893	\$210,430	\$303,133	\$1,575,793	\$478,163	
Uncomparad not resolved as of last calculation	0	0	0	1	0	0	0	0	0	0	1	

10-65
Table 10-7

SETT DATE	VALUE OF CNS RECEIPTS		CNS NET SETTLEMENT (One Side)	VALUE OF CNS DELIVERIES		NO. OF CNS FAILS (Long)	NO. OF CNS FAILS (Short)	VALUE OF CNS FAILS		LONG AVERAGE DOLLAR Value/Items	SHORT AVERAGE DOLLAR Value/Items
	(Debits)	(Credits)		(Credits)	(Debits)			(Long)	(Short)		
10/14	6.4	6.4	1.2	6.4	6.4	33,921	26,103	.8	.8	23.6	30.6
10/15	6.3	6.3	1.1	6.3	6.3	33,003	25,363	.8	.8	24.2	31.5
10/16	6.0	6.0	1.1	6.0	6.0	32,795	25,083	.8	.8	24.4	31.9
10/19	8.1	8.1	1.4	8.1	8.1	33,863	26,745	.9	.9	26.6	33.7
10/20	4.6	4.6	.9	4.6	4.6	33,676	25,571	.8	.8	23.8	31.3
10/21	5.5	5.5	1.4	5.5	5.5	33,536	26,063	.8	.8	23.9	30.7
10/22	6.6	6.6	1.3	6.6	6.6	32,941	26,025	.9	.9	27.3	34.6
10/23	9.3	9.3	2.5	9.3	9.3	33,216	26,796	1.1	1.1	33.1	41.1
10/26	12.1	12.1	3.7	12.1	12.1	36,149	33,059	1.2	1.2	33.2	36.3
10/27	11.0	11.0	2.3	11.0	11.0	35,333	31,448	1.2	1.2	34.0	34.2
10/28	9.9	9.9	2.4	9.9	9.9	37,727	31,281	1.3	1.3	34.5	41.6
10/29	8.6	8.6	1.8	8.6	8.6	37,258	30,648	1.0	1.0	26.8	32.6
10/30	6.3	6.3	1.1	6.3	6.3	36,576	29,844	.9	.9	24.6	30.2
11/02	6.7	6.7	1.1	6.7	6.7	35,865	30,395	.9	.9	25.1	29.6
11/03	6.7	6.7	1.1	6.7	6.7	35,737	30,504	.9	.9	25.2	29.5
11/04	6.5	6.5	1.0	6.5	6.5	34,764	28,824	.8	.8	23.0	27.8
11/05	6.3	6.3	1.1	6.3	6.3	34,433	28,281	.8	.8	23.2	28.3
11/06	7.0	7.0	1.1	7.0	7.0	35,686	28,610	.8	.8	22.4	28.0

NOTE: All dollar figures in billions except average fail dollar value, which is in thousands.

Fails to Deliver/Fails to Receive and Stock Loan/Stock Borrow
As of Month-end September 1987 and October 1987
Aggregate Data from 17 Firms
[In \$Thousand]

	September	October	Difference Sept-Oct	Percentage Decrease
Fails to Deliver Securities Borrowed	\$9,508,763 \$37,443,989	\$8,034,438 \$34,306,271	\$1,474,325 \$3,137,718	15.50% 8.38%
Fails to Receive Securities Loaned	\$7,212,465 \$23,626,413	\$6,789,967 \$20,267,339	\$422,498 \$3,359,074	5.86% 14.22%

10-67
Table 10-9

Number of Corporate Deposits and Withdrawals (in thousands)						
Date:	Deposits 1/			Withdrawals 2/		
	DTC 3/	MSTC	Philadep	DTC	MSTC	Philadep
9/1-31	23.2	N/A	N/A	23.2	N/A	N/A
10/14	N/A	4.1	2.4	N/A	2.3	1.3
10/15	N/A	4.8	2.3	N/A	2.3	1.6
10/16	N/A	4.0	2.4	N/A	2.0	1.7
10/19	23.5	3.6	2.0	22.5	1.8	1.2
10/20	23.5	4.1	2.0	22.5	4.0	1.4
10/21	23.5	4.2	2.7	22.5	2.6	1.8
10/22	23.5	5.0	2.1	22.5	1.9	1.2
10/23	23.5	3.8	1.5	22.5	2.4	1.3
10/26	28.5	4.6	1.7	24.9	2.4	1.6
10/27	29.1	4.4	2.1	27.1	2.9	1.7
10/28	30.0	4.7	1.8	45.3	4.2	2.1
10/29	27.6	4.1	1.7	54.4	4.7	5.0
10/30	25.3	4.2	1.6	67.5	5.4	2.7
11/02	22.4	3.1	1.4	63.0	5.1	10.0
11/03	N/A	4.0	1.4	N/A	6.2	3.9
11/04	N/A	3.9	1.4	N/A	5.4	3.4
11/05	N/A	3.6	1.2	N/A	5.0	4.5

-
- 1/ A deposit may include multiple certificates in the same issue from the same participant.
- 2/ The withdrawals column includes the number of requests to remove certificates from each depository's custody.
- 3/ DTC deposits and withdrawals from 9/1 - 31 and 10/19 - 10/23 represent averages.
-

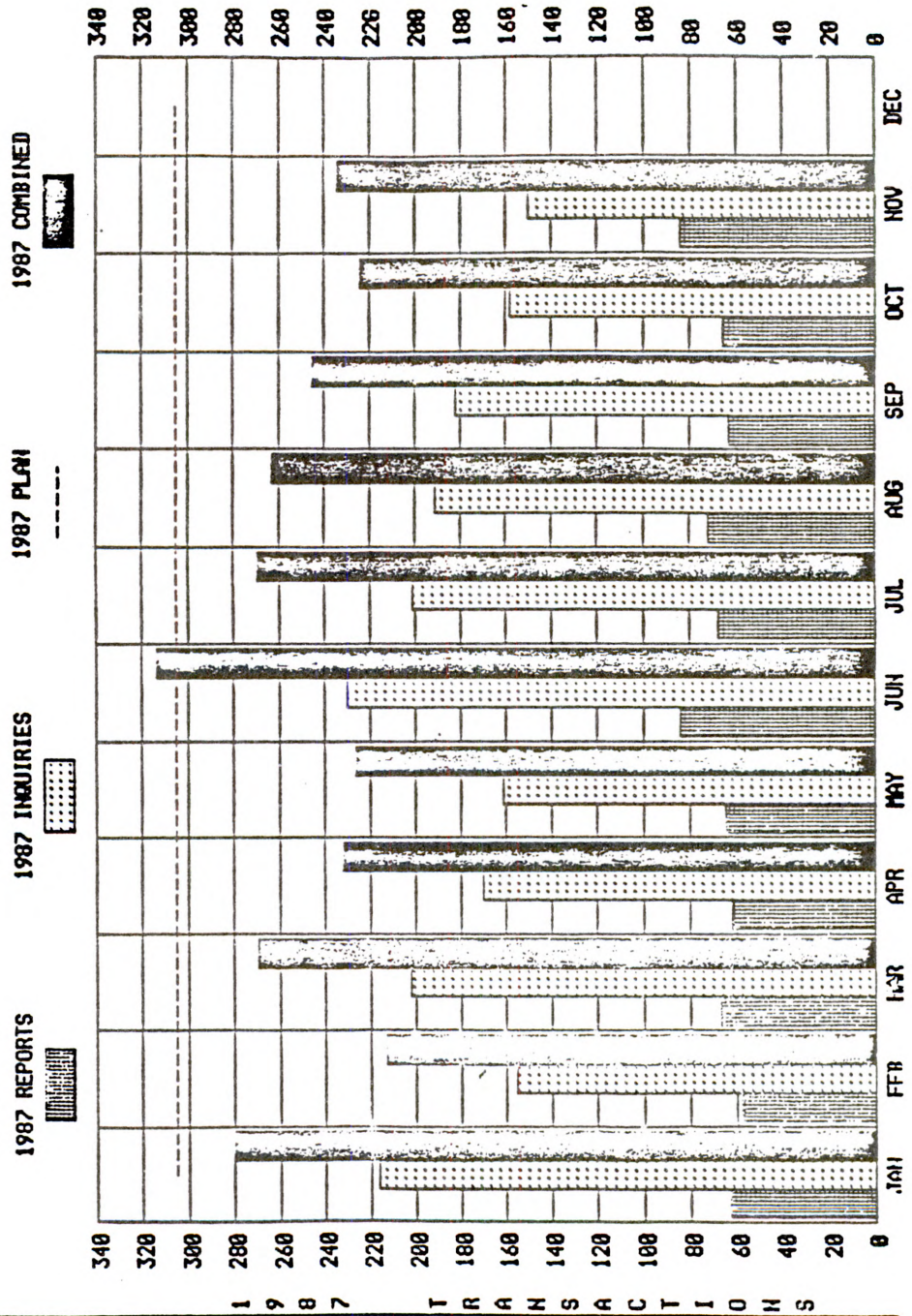
10-68
Table 10-10

SIC 1987 INQUIRIES, LOSS REPORTS, AND RECOVERY REPORTS

	Monthly Average January-August	September	October	November
Inquiries	190,327	181,938	158,248	149,506
Loss Reports	52,767	53,192	53,266	47,247
Recovery Reports	14,391	8,937	12,164	36,655

10-69
Table 10-11

SIC REPORTS AND INQUIRIES (IN THOUSANDS)



10-70
Table 10-12

OCC Volume and Statistics for Equity and Index Options													
EQUITIES	Total Cleared		Average Daily		Average Premium		Cleared Contracts by Account Type						
	Contracts		Contracts		per contract		Customer		Firm		Market-Makers/Specialists		
	May '87	Oct. '87	May '87	Oct. '87	May '87	Oct. '87	May '87	Oct. '87	May '87	Oct. '87	May '87	Oct. '87	
TOTAL	12,676,088	118,523,850	634,804	841,993	8341.73	8339.28	110,747,385	15,827,148	11,658,044	2,218,892	112,986,747	19,001,660	
CALLS	10,233,283	113,880,142	511,664	630,916	8375.47	8258.42	8,843,357	12,066,496	11,312,376	1,780,801	110,310,833	13,912,987	
LONG							4,353,463	6,616,944	680,324	838,678	5,199,496	6,426,320	
SHORT							4,489,894	5,451,552	632,052	942,123	5,111,337	7,486,667	
PUTS	2,442,285	4,643,708	123,140	211,078	8201.33	8580.99	1,904,028	3,760,652	345,668	438,091	2,675,914	5,088,673	
LONG							923,404	2,024,241	200,748	259,189	1,330,653	2,360,278	
SHORT							980,624	1,736,411	144,920	178,902	1,345,261	2,728,395	
INDEX OPTION													
TOTAL	9,821,353	112,804,165	491,068	582,088	8404.12	8763.41	6,265,760	8,319,588	773,210	1,095,723	112,683,736	16,193,819	
CALLS	5,776,206	6,659,645	288,810	302,711	8462.21	8364.85	3,620,750	4,459,936	430,891	525,855	7,580,771	8,333,499	
LONG							1,805,149	2,460,005	223,442	266,810	3,747,613	3,924,830	
SHORT							1,815,601	1,999,931	207,449	259,045	3,753,158	4,408,669	
PUTS	4,045,147	6,144,520	202,257	279,296	8321.16	101206.42	2,645,010	3,859,652	342,319	569,868	5,102,965	7,859,320	
LONG							1,381,361	1,916,101	173,459	275,062	2,490,327	3,953,357	
SHORT							1,263,649	1,943,551	168,860	294,806	2,612,638	3,906,163	

10-71
Table 10-13

OCC Volume and Statistics for Actively-Traded Index Options						
October 1987						
DEX (S&P 100)	Total Cleared Contracts	Average Daily Contracts	Average Premium per Contract	Cleared Contracts by Account Type		
				Customer	Firm	Market-maker/ Specialist
TOTAL	9,923,049	451,048	\$700.29	6,463,266	763,614	12,619,218
Calls	5,166,421	234,837	\$288.32	3,467,597	359,635	6,505,610
Long				1,930,829	184,069	3,051,523
Short				1,536,768	175,566	3,454,087
Puts	4,756,628	216,210	\$1,147.75	2,995,669	403,979	6,113,608
Long				1,470,935	197,708	3,087,985
Short				1,524,734	206,271	3,025,623
IMI (Major Market Index)						
TOTAL	530,045	24,093	\$524.73	400,416	41,580	618,094
Calls	424,491	19,295	\$302.77	329,457	29,810	489,715
Long				190,438	16,176	217,877
Short				139,019	13,634	271,838
Puts	105,554	4,798	\$1,417.34	70,959	11,770	128,379
Long				34,734	5,751	65,069
Short				36,225	6,019	63,310
IMZ (Major Market Index)						
TOTAL	866,211	39,378	\$732.71	657,009	68,727	1,006,686
Calls	401,246	18,238	\$468.58	302,855	35,989	465,648
Long				157,627	16,829	226,790
Short				145,228	19,160	236,858
Puts	464,965	21,135	\$960.64	354,154	32,738	543,038
Long				175,617	17,372	271,976
Short				178,537	15,366	271,062
SPI (S&P 500)						
TOTAL	454,876	20,676	\$1,301.12	227,320	79,281	603,151
Calls	240,239	10,920	\$573.11	129,226	34,484	316,768
Long				74,215	13,292	152,732
Short				55,011	21,192	164,036
Puts	214,637	9,756	\$2,115.96	98,094	44,797	286,383
Long				47,682	19,511	147,444
Short				50,412	25,286	138,939

STOCK INDEX FUTURES MARGIN

Stock Index Futures Contract	Exchange Multiplier	10-14-87 Closing Contract Price*** Contract Value	10-14-87 Initial Hedged Margin as Percentage of Contract Value	11-02-87 Closing Contract Price*** Contract Value	11-02-87 Initial Hedged Margin as Percentage of Contract Value	1-06-88 Closing Contract Price**** Contract Value	1-06-88 Initial Hedged Margin as Percentage of Contract Value
Standard & Poor's 500 Index	CME 500	I* \$5,000	3.2%	312 \$156,000	I \$15,000 M \$15,000	259 \$129,500	7.7%
		M** \$5,000					
Major Market Index	CBT 250	I \$3,000	2.4%	496 \$124,000	I \$10,000 M \$10,000	409 \$102,250	9.8%
		M \$4,500					
Value Line Index	KCBT 500	I \$3,000	2.2%	267 \$133,500	I \$20,000 M \$20,000	210 \$105,000	4.8%
		M \$4,500					
NYSE Composite Index	NYFE 500	I \$1,750	2.0%	175 \$87,500	I \$5,000 M \$5,000	145 \$72,500	5.6%
		M \$3,500					

* / Initial margin requirement.
** / Maintenance margin requirement.
*** / Contract expiring December 1987.
**** / Contract expiring March 1988.

10-73
Table 10-15

Variation Margin Calls and Settlements (in thousands of dollars)

	10/19	10/20	10/21	10/22	10/23
OCC					
intra-day	1,272,426	466,100	272,492	-	-
settlement	123,211	1,114,202	280,509	239,668	195,667
total	1,395,637	1,580,302	553,001	239,668	195,667
CME					
intra-day	1,620,000	321,000	986,000	519,000	111,000
settlement	914,900	603,000	612,900	255,900	149,700
total	2,534,900	924,000	1,598,900	774,900	260,700
BOTCC					
intra-day	209,750	876,230	617,810	464,635	37,615
settlement	225,109	568,423	416,184	466,582	653,180
total	434,859	1,444,653	1,033,994	931,217	690,795

OCC Beginning and End of Day Margin Requirements

DATE	-----BEGINNING OF DAY TOTALS-----			INTRA-DAY VARIATION MARGIN CALLS	END OF DAY TOTAL MARGIN REQUIREMENTS
	EQUITY MARGIN REQUIREMENTS	NEO MARGIN REQUIREMENTS	TOTAL MARGIN REQUIREMENTS		
OCT. 12	\$2,467,299,710	\$1,087,670,290	\$3,554,970,000	\$0	\$3,554,970,000
OCT. 13	\$2,388,753,622	\$1,077,967,008	\$3,466,720,629	\$0	\$3,466,720,629
OCT. 14	\$2,456,897,933	\$1,063,532,460	\$3,520,430,392	\$98,664,000	\$3,619,094,392
OCT. 15	\$2,341,612,251	\$1,221,099,557	\$3,562,711,808	\$2,120,000	\$3,564,831,808
OCT. 16/17	\$2,283,929,893	\$1,369,557,433	\$3,653,487,325	\$240,475,000	\$3,893,962,325
OCT. 19	\$2,066,722,919	\$1,297,659,617	\$3,364,382,536	\$1,221,299,000	\$4,585,681,536
OCT. 20	\$3,175,550,232	\$2,296,481,733	\$5,472,031,965	\$466,100,000	\$5,938,131,965
OCT. 21	\$3,032,384,525	\$1,992,820,347	\$5,025,204,871	\$272,492,000	\$5,297,696,871
OCT. 22	\$2,598,091,365	\$1,543,913,701	\$4,142,005,066	\$0	\$4,142,005,066
OCT. 23	\$2,575,881,709	\$1,735,170,958	\$4,311,052,667	\$0	\$4,311,052,667
OCT. 26	\$2,462,277,711	\$1,749,361,934	\$4,211,639,646	\$0	\$4,211,639,646
OCT. 27	\$2,564,222,572	\$1,885,963,339	\$4,450,185,911	\$2,329,000	\$4,452,514,911
OCT. 28	\$2,350,934,565	\$1,798,878,504	\$4,149,813,069	\$32,571,000	\$4,182,384,069
OCT. 29	\$2,289,061,522	\$1,806,085,791	\$4,095,147,314	\$39,263,000	\$4,134,410,314
OCT. 30	\$2,132,573,307	\$1,711,558,731	\$3,844,132,038	\$5,400,000	\$3,849,532,038
NOV. 2	\$2,024,033,313	\$1,568,633,819	\$3,592,667,132	\$0	\$3,592,667,132
NOV. 3	\$1,931,904,364	\$1,637,428,323	\$3,569,332,687	\$331,580,000	\$3,900,912,687
NOV. 4	\$1,901,420,306	\$1,616,745,773	\$3,518,166,079	\$0	\$3,518,166,079
NOV. 5	\$1,874,840,806	\$1,629,374,009	\$3,504,214,815	\$154,210,000	\$3,658,424,815
NOV. 6	\$1,843,211,949	\$1,730,407,277	\$3,573,619,226	\$0	\$3,573,619,226

OCC Beginning and End of Day Margin Deposits

DATE	-----BEGINNING OF DAY TOTALS-----					DEPOSIT (WITHDRAWAL) ACTIVITY	END OF DAY TOTAL DEPOSITS
	CASH	GOVERNMENT SECURITIES	VALUED SECURITIES	LETTERS OF CREDIT	TOTAL DEPOSITS		
OCT. 12	\$21,420,264	\$92,378,145	\$1,153,801,477	\$3,044,591,003	\$4,312,190,889	\$37,627	\$4,312,228,516
OCT. 13	\$31,278,730	\$92,378,145	\$1,143,980,638	\$3,044,591,003	\$4,312,228,516	(\$110,320,844)	\$4,201,907,672
OCT. 14	\$19,472,831	\$109,553,647	\$1,157,419,191	\$2,915,462,003	\$4,201,907,672	\$38,782,375	\$4,240,690,047
OCT. 15	\$22,941,136	\$109,605,920	\$1,143,779,988	\$2,964,363,003	\$4,240,690,047	(\$22,440,805)	\$4,218,249,242
OCT. 16/17	\$33,319,814	\$108,293,120	\$1,101,697,305	\$2,974,939,003	\$4,218,249,242	\$33,373,090	\$4,251,622,332
OCT. 19	\$61,970,911	\$103,491,252	\$1,098,288,166	\$2,987,872,003	\$4,251,622,332	\$944,577,966	\$5,196,200,298
OCT. 20	\$554,051,398	\$105,515,252	\$1,224,523,645	\$3,312,110,003	\$5,196,200,298	\$1,092,465,278	\$6,288,665,576
OCT. 21	\$495,817,652	\$130,340,794	\$1,259,133,128	\$4,403,374,003	\$6,288,665,576	(\$218,006,884)	\$6,070,658,692
OCT. 22	\$119,646,518	\$151,607,979	\$1,337,490,191	\$4,461,914,003	\$6,070,658,692	(\$388,899,927)	\$5,681,758,765
OCT. 23	\$119,746,130	\$135,898,140	\$1,340,929,493	\$4,085,185,003	\$5,681,758,765	(\$94,457,523)	\$5,587,301,242
OCT. 26	\$116,349,948	\$133,140,695	\$1,316,280,595	\$4,021,530,003	\$5,587,301,242	\$54,307,628	\$5,641,608,870
OCT. 27	\$121,956,374	\$136,746,891	\$1,214,365,602	\$4,166,540,003	\$5,641,608,870	\$99,188,610	\$5,740,797,480
OCT. 28	\$94,390,365	\$136,746,891	\$1,265,185,221	\$4,242,475,003	\$5,740,797,480	(\$248,463,831)	\$5,492,333,649
OCT. 29	\$73,928,589	\$143,745,343	\$1,227,578,714	\$4,047,081,003	\$5,492,333,649	\$54,793,969	\$5,547,127,618
OCT. 30	\$69,256,265	\$115,444,946	\$1,331,235,404	\$4,031,191,003	\$5,547,127,618	(\$335,603,576)	\$5,211,524,042
NOV. 2	\$57,091,020	\$116,619,658	\$1,346,079,361	\$3,691,734,003	\$5,211,524,042	(\$295,995,369)	\$4,915,528,673
NOV. 3	\$70,637,905	\$113,776,658	\$1,325,014,106	\$3,406,100,003	\$4,915,528,673	(\$14,912,009)	\$4,900,616,664
NOV. 4	\$52,075,354	\$115,103,883	\$1,301,077,423	\$3,432,360,003	\$4,900,616,664	(\$186,631,266)	\$4,713,985,398
NOV. 5	\$58,085,808	\$117,582,183	\$1,243,955,403	\$3,294,362,003	\$4,713,985,398	\$22,219,413	\$4,736,204,811
NOV. 6	\$74,569,916	\$124,458,229	\$1,239,796,663	\$3,297,380,003	\$4,736,204,811	(\$65,398,932)	\$4,670,805,879

Chapter Eleven

THE INTERNATIONAL CAPITAL MARKETS

A. The Trend Toward Internationalization of the Securities Markets 1/

In the last ten years the world's securities markets have become increasingly linked, both psychologically and through improved communications technology that has made possible both trading and information sharing arrangements. Regulatory barriers to participation in foreign markets are steadily being lowered and increasingly money managers and institutional investors are looking to the world's markets for alternative investment opportunities. 2/

Generally, this trend has been positive, providing new sources of capital to issuers worldwide. More liquid capital markets mean more buyers and sellers and, ordinarily, greater stability and efficiency. Moreover, investment in foreign markets can provide investors needed diversification. 3/ The events of the latter part of October, however, also demonstrate how easily price volatility can spread among globalized markets. Clearly, the ability of investors to shift capital from one market to another almost instantaneously can have dramatic consequences. The interdependency of the world's markets has led investors to look internationally for alternative vehicles to adjust relative debt, equity and currency exposure. The result has been that events in each individual market increasingly exert an influence over the course of trading in other markets. The first part of this section analyzes this trend and the extent to which events in domestic markets triggered events in foreign markets in October, and vice versa.

Although the markets are increasingly interdependent, they also have retained their individuality and have resisted complete integration. Globalized markets continue to have different structures and operating rules. The second part of this section briefly discusses the London, Tokyo and Hong Kong markets and analyzes how those markets

1/ The Division would like to express its gratitude to the staffs of the International Stock Exchange of the United Kingdom and Republic of Ireland, Ltd. ("ISE"), the Tokyo Stock Exchange ("TKE") and the Hong Kong Office of the Commissioner for Securities and Commodities Trading, without whose patient assistance this chapter would have been considerably briefer. The Division also greatly appreciates the support and assistance the Directorate of Economic and Policy Analysis ("DEPA"), the Office of the Chief Economist ("OCE") and the Division of Investment Management ("IM") provided the Division.

2/ See Staff of the U.S. SEC, Report on the Internationalization of the Securities Markets, (July 27, 1987) ("Internationalization Study").

3/ It has been reported that some institutional investors believe that investments in foreign markets helped cushion the steep drop in U.S. equities in October. For example, money managers that attempt to match the Morgan Stanley Capital International European, Australian, and Far East ("EAFE") index found their portfolios declined 10.9%, compared with a 22.9% drop in the Standard & Poor's 500 stock index through October 22. See Givant, Foreign Diversity Pays Off, Pensions and Investment Age, Nov. 2, 1987, at 3, 49.

performed under the extraordinary market conditions in the latter part of October. Finally, the third part of this section discusses the effect the dramatic drop in prices worldwide in October had on new issue activity.

B. Interrelationships of the World's Securities Markets

1. Volume of International Trading in October

It has become commonplace to speak of the development of 24-hour markets in which world-class securities are traded around the clock and around the globe. Indeed, the staff's analysis indicates that international trading in U.S. securities, at least for institutional accounts, did occur during the market break. Nevertheless, as discussed below, the importance of this trading can be overemphasized. First, preliminary evidence suggests that foreign investor participation in U.S. markets was not a disproportionate factor in U.S. market moves. Second, much of the foreign market volume in U.S. securities involves special purpose trades already negotiated in the United States and executed, for convenience, abroad.

a. Level of Foreign Investor Participation in U.S. Markets

During the market break, particularly on October 19 and 20, rumors were circulating that foreign investors were "dumping" U.S. stocks and perhaps substantially contributing to the massive price declines. Information from market participants interviewed by the Division indicates that this probably was not the case. ^{4/} Of the thirteen major firms interviewed, six indicated that European investors were selling more than usual, but none of those firms characterized that selling as extraordinarily heavy. ^{5/} One of the firms noted that European investors had been selling, in fact, for some time. Only one firm seemed to believe that selling by these investors had a significant effect on U.S. markets. That firm believed that a large influx of pre-opening sell orders from foreign investors on October 19 may have been a significant factor in pre-opening price declines.

Although much was made of Japanese investors' activity during the market break, the information collected from the firms interviewed seems to indicate that Japanese investors were not directly a significant factor in the U.S. market decline. A few firms found Japanese investors increased their selling activity but the majority of firms believed that their major Japanese clients were not big sellers. The latter group also stated, however, that Japanese investors were not big buyers during this period and that their noticeable absence and the loss of liquidity that resulted had an effect on the market.

Although this anecdotal evidence is far from conclusive, it is supported by preliminary data obtained by the Commission. Its data show that the trend toward increased foreign investor interest in U.S. equities has continued during recent periods

^{4/} One firm, however, stated that foreign mutual funds were among its heaviest customers during the market break.

^{5/} Several firms noted that these sellers opted to send orders to U.S. markets because they are the primary markets for U.S. securities, where, at least in theory, the most liquidity could be found.

despite the global decline in stock prices. For the past eleven months foreign investors have been increasing their holdings of U.S. stocks and preliminary data indicate that foreign investors were net purchasers of U.S. stocks during October, 6/ increasing their investment positions in U.S. equities by \$2.4 billion.7/ Of that amount, \$2.3 billion is attributed to net buying by Japanese investors.

b. Trading Volume in U.S. Stocks in London and Tokyo

Volume in foreign stocks in London was up substantially for the week of October 19, 1987. Daily exchange volume for the approximately 650 blue-chip foreign issues traded was 60% higher and, on October 21, was twice the daily average. 8/ The ISE reported that foreign equity volume increased from 510 million pounds (U.S. \$944 million) 9/ per day to over 800 million (U.S. \$1,481 million), largely attributable to trading in European and Japanese stocks. Volume in U.K. American depositary receipts ("ADRs") also was substantially higher: approximately 2.5 million ADRs were traded per day compared with one million per day on average. 10/ The ISE believes that the ADR volume suggests that there was a relatively high degree of U.S. participation in the London market. 11/

The ISE's volume statistics show that reported trades in U.S. stocks listed on the ISE from the week of October 19 increased 65% over a representative week, October 5, 1987. 12/ Similarly, share volume was up 54.7% from 23,803,234 shares for the week of October 5 to 36,832,344 shares during the week of October 19. Dollar volume for the week of October 19, however, was \$253.45 million, a 47% decrease over the week of October 5, during which dollar volume was \$480.82 million.

6/ See Chart 11-1, which indicates that for the first ten months of 1987 foreign investors were net purchasers of more than \$31 billion of U.S. stocks, a 63% increase over total net purchases for 1986.

7/ See *id.*

8/ See Forman, London Market for Non-British Stocks Is Growing Rapidly in Time of Turmoil, Wall St. J., Nov. 2, 1987, at 39, col. 2.

9/ Exchange rate: U.S. \$1.00 = .54 pounds.

10/ An ADR is a receipt evidencing ownership in a pool of foreign securities held on deposit by a U.S. financial institution. Certain institutional investors, and many retail investors, whose ability to purchase foreign shares directly is limited use ADRs as surrogate investment vehicles. While ADRs are primarily traded in the United States, they are also actively traded in, among other markets, the U.K.

11/ As discussed in Chapter Two, a substantial percentage of this volume involved futures-related transactions.

12/ The ISE's volume statistics underreport the actual trading volume in U.S. stocks in London because a significant amount of trading in those stocks occurs between non-ISE members, who are not required to report trades to the ISE.

Share volume for the week of October 19 peaked on October 19 at 9,517,212 shares, or 26% of the weekly total. An analysis of the volume figures reveals that the average number of trades per issue increased 65% from 6.6 trades per issue during the week of October 5, 1987, to 10.9 trades per issue for the week of October 19, 1987. Of the 404 U.S. securities listed on the ISE, 201 issues showed an increase in the number of trades reported during October 19-23 (compared with the week of October 5). There was a decrease in trade volume in 119 issues and 84 issues' trade volume remained the same. The average number of shares per trade for the week of October 19 was only 6.4% less than the earlier period. ^{13/} This seems to indicate that the ratio of proprietary and institutional trades to retail trades remained roughly the same.

Because the ISE's rules do not require that all trades in foreign stocks be reported, the staff also requested trade data from a sampling of firms who trade in London. ^{14/} Based on both share and dollar volume, the trade information received shows that, with the exception of two firms, all firms increased significantly their trading activity in U.S. stocks in London during the break. The increases in purchase and sale volume on October 19 and 20 ranged from 1.2 times the firm's average daily volume for October to as much as 25 times the firm's average daily volume.

While trading in U.S. securities increased consistently with trading on the ISE generally it should be kept in mind that volume in U.S. securities remained relatively small. Indeed, total ISE volume in U.S. securities during the week of October 19 was less than 1.6% of total share volume on the NYSE and approximately 0.3% of total dollar volume on the NYSE. Additionally, a significant number of these trades were what can be generically referred to as special purpose trades. Trade information submitted indicates that firms may have effected a number of trades as part of program trading strategies. On October 20, 1987, the NYSE formally requested that firms refrain from routing program trades automatically to the floor for execution. As a result, the Division believes some of these strategies were accomplished in the London market. ^{15/}

In addition, other futures-related strategies contributed to the increase in volume. In particular, a strategy referred to as "exchange of futures for physicals" or "EFPs" played a part in the increased volume during the break. In an EFP, the two sides to the trade swap stock index futures for a basket of stocks and cash, the value of which roughly equals the futures' value. ^{16/}

The Division also believes, based on the information submitted by the firms, that a large percentage of the trades executed by U.S. firms in London are prenegotiated crosses involving U.S. parties in which the firm acts as agent for both the buyer and seller. This information from the firms is supported by trade reports from the ISE. On October 19 and 20, the trade reports submitted to the ISE that were identified as

^{13/} For the week of October 5, the average number of shares per trade was 8,935 and for the week of October 19, was 8,365.

^{14/} The Division solicited foreign market trade data from firms who were the largest net sellers on the NYSE during the market break.

^{15/} See discussion in Chapter Two.

^{16/} See discussion of EFPs executed in London in Chapter Two.

crosses outnumbered the trades designated as buys and sells by 40% and 36%, respectively. ^{17/}

Unlike London, where volume was sharply higher after October 19, liquidity appeared to evaporate in U.S. stocks traded on the TKE. For the first half of October, average daily share volume in the 42 U.S. stocks listed on the exchange was 993,681 shares. ^{18/} From October 19 through the end of the month, average daily share volume dropped nearly 70% to 301,564 shares. Further, the number of stocks in which there was no volume increased dramatically after October 19. From October 1 through October 16, the average number of stocks with no volume was 3.7 per day. From October 19, however, that figure increased to 9.7 per day, a 162% increase. On October 31, there was no volume in 15 U.S. stocks, nearly one third of all the U.S. stocks listed on the TKE. These statistics seem to reflect the fact that Japanese and foreign investors who ordinarily look to the TKE as a source of liquidity in certain U.S. stocks were not trading in those stocks, or alternatively, that those investors preferred United States or other markets.

2. Analysis of Market Triggering Effects

An attempt to evaluate the impact and causes of the October market break would not be complete without an evaluation of the interrelationships of the world's major equity trading markets. Indeed, at least one study of the October events pointed to the price declines in foreign markets that do not have actively traded stock index futures as some evidence that derivative market trading did not contribute to the depth or speed of the October market break in the United States. ^{19/} Thus, the Division examined intra-day stock price movements in several international markets and found that price movements before and after the October, 1987 market break, particularly in London, Tokyo and the United States, illustrate the strong ties between the world's equity markets.

During the week of October 12, the Dow Jones Industrial Average ("DJIA") declined by a total of 9.6% from the opening on Monday, October 12. Tokyo reacted quickly on Monday, October 19, when heavy selling pressure forced the market down steadily throughout the day to close down 2.3%. Trading opened in London later that day down 7.8% from the previous week. Throughout early trading in London, the market steadily declined. After staging a brief rally in the afternoon, London closed down 12.6% for the day. The U.S. market followed, opening down 10.9% from Friday's close. At the time, the London market was down approximately 13% from the previous week's

^{17/} As discussed in Chapter Two, certain firms also executed short sales in U.S. stocks in London, for both proprietary and agency accounts, in what may have been an attempt to avoid U.S. regulatory restrictions.

^{18/} Volume for the month peaked on October 1 at 2,511,590 shares. On October 19, share volume in these stocks was 268,960, which was below average for that period, and on October 20, was 462,480 shares.

^{19/} See Chicago Mercantile Exchange Committee of Inquiry, Preliminary Report to Examine the Events Surrounding October 19, 1987, at 6-7 (December 22, 1987) ("CME Report").

close and 6% from its October 19 opening. The DJIA closed down a record 22.6% for the day.

When the trading day began in Tokyo on October 20, 95% of the stocks were unable to open because of an order imbalance on the sell-side. Consequently, the Nikkei Dow Jones Industrial Index ("Nikkei"), an index of 225 leading TKE stocks, fell 7.5% during the morning session and dropped further during the afternoon session, for a record one-day decline of 14.7%.

When trading commenced in London later on October 20, the market immediately dropped 19.3% from its previous close and fell even further over the course of the morning. In afternoon trading, London staged a rally; the rally faltered, however, and the market closed down 12.2% for the day.

New York opened with the DJIA up 211 points. Although the Dow gained 5.9% for the day, the rally was not broad-based: On the New York Stock Exchange ("NYSE"), the advance/decline ratio was only 7 to 6 and the American Stock Exchange ("AMEX") and NASDAQ indexes also were both down.

A reversal seemed likely, as the rise in the DJIA carried over to the Tokyo market. The Nikkei climbed steadily throughout the day on October 21, closing up 9.3%. By the opening in New York, buy orders were pouring in from investors.

To measure the degree to which U.S. markets led or followed other markets, the Division and the staff of the Office of the Chief Economist ("OCE") examined the correlation of movements in several international stock indexes. As discussed below, the data reviewed indicated that the United States markets did influence price movements in other markets. OCE calculated partial correlation coefficients for the percentage changes among several foreign indexes and the DJIA. ^{20/} Partial correlation coefficients measure the degree to which two variables (for example, two stock indexes) move together. When two variables change entirely independently of one another (in other words, they exhibit no correlation) they are assigned a partial correlation coefficient of 0. When changes in two variables are always of the same magnitude and in the same direction (for example, if a 1% rise in the DJIA is always accompanied by a 1% rise in the Nikkei) the coefficient is 1. On the other hand, if two variables always exhibit changes of equal magnitude but in opposite directions, their partial correlation coefficient is -1. (For example, if a 1% rise in the DJIA is always accompanied by a 1% drop in the Nikkei, the coefficient is -1.)

OCE examined correlation coefficients between intra-day percentage changes in the S&P 500 and subsequent opening values, early trading and closing values of the TKE Composite, a broad-based index calculated by the TKE, and the Financial Times-Stock Exchange ("FT-SE") 100, an index of 100 of the most actively traded ISE stocks, during the period from October 12 through October 23, 1987. OCE found that during the weeks of October 12 and October 19 the percentage change in the S&P 500 index had a significant effect on the next day's opening value and early trading value of both the TKE Composite and the FT-SE 100. The correlation coefficient between the S&P 500 and the percentage change at the opening from the previous day's close was 0.4183 for

^{20/} See Chart 11-2 for accompanying tables prepared by OCE.

the TKE Composite ^{21/} and was 0.8200 for the FT-SE 100. ^{22/} Further, the correlation coefficients increased when the previous day's change in the S&P 500 was compared with the percentage change in the foreign index after the first hour of trading from the previous day's close. For the TKE Composite, the correlation coefficient jumped to 0.8473 and for the FT-SE 100, the coefficient increased to 0.8747.

OCE also examined the effect of intra-day changes in the S&P 500 on the close-to-close movements in the London and Tokyo markets and found in both instances a significant effect. For the FT-SE 100, the correlation coefficient was 0.6664 ^{23/} and for the TKE Composite, 0.8929.

Finally, OCE compared the correlation coefficients assuming the foreign market led the United States. OCE concluded that during the weeks of October 12 and October 19, movements in the TKE Composite had a relatively small effect on the same-day opening value, early trading value and closing value of the S&P 500 index. The correlation coefficient between the TKE Composite and the percentage change in the S&P 500 at the open from the close the day before was 0.2220; after one hour of trading, was -0.1440; and at the close, 0.0744. Thus, the U.S. market appeared to have a much larger effect on the TKE than vice versa.

Although changes in the FT-SE 100 immediately before U.S. markets opened appeared to have had a greater effect on the U.S. opening, this effect was considerably smaller than the corresponding effects of the S&P 500 on the FT-SE 100. OCE's data showed that the correlation between the percentage change at 8:00 a.m. E.S.T. (1:00 p.m. London time) from the previous day's close and the percentage change in the S&P 500 at the opening from the close the day before was 0.5602. After one half hour of trading in the United States, however, the coefficient dropped to 0.3329. This suggests that U.S. markets were much less affected by London than London was influenced by U.S. markets.

The correlation coefficient between the change in the S&P 500 and the change in FT-SE 100 at the close increased to 0.5435. As noted above, however, London and New York trading days overlap and it is difficult to tell the degree to which this correlation reflects the effects of the U.S. markets on London.

Caution should be used in drawing conclusions from this correlation data. As noted above, it has been only in recent months that significant correlations between U.S. and foreign stock price movements can be identified. Nevertheless, it does appear

^{21/} See Chart 11-2, Table 1.

^{22/} See Chart 11-2, Table 2.

^{23/} See Chart 11-2, Table 2. Because London's trading day partially overlaps with the start of trading in the United States, this coefficient also may reflect partially the effect of this trading on the London market, rather than exclusively reflecting the prior day's S&P 500 movement. Thus, OCE believes that the correlation between the intra-day S&P 500 percentage change and the opening value and early trading value of the FT-SE 100 are better measures of the inter-market correlations.

that a cataclysmic market event such as that which occurred on October 19 can be expected to have world-wide repercussions.

C. Market Performance -- London, Tokyo and Hong Kong

While the discussion of market correlation indicates the substantial impact the U.S. market has on other markets, it is instructive to focus more closely on trading in certain major foreign markets. In particular, the United Kingdom and Japan deserve analysis because, along with the United States, they are by far the most active trading markets. Moreover, recent loosening of restrictions on access have led U.S. broker-dealers recently to make substantial capital investments, enabling them to become active participants in both those markets. Finally, U.S. institutions are active purchasers of both U.K. and Japanese securities. Accordingly, the operation of those markets directly affects a large number of U.S. participants. In addition, trading in London and Japan is of interest because their trading systems and regulatory provisions differ somewhat from those in the United States and therefore offer useful models to measure the performance of our own markets. ^{24/} Finally, this section also includes a discussion of trading on the Hong Kong exchanges because of the attention and concerns raised by the closure of that market for four days.

1. London

The London securities market was transformed radically on October 27, 1986, generally referred to as "Big Bang Day." The Big Bang heralded a wholesale restructuring of London's capital markets, including changing the name of the stock exchange to the International Stock Exchange of the United Kingdom and the Republic of Ireland. Among the most significant changes was the introduction of a new system of trading, referred to as "dealing," -- using the Stock Exchange Automated Quotations System ("SEAQ"). Under the new system, trading is very similar to over-the-counter ("OTC") trading in the United States. The screen-based system provides competitive market makers the ability to input "firm" quotations into SEAQ terminals. ^{25/} Trades, referred to as "bargains," are negotiated and finalized over the phone between market makers or between a market maker and his customer. The ISE has not yet developed automatic routing or execution systems.

During the October market break, the ISE experienced many of the same problems as the U.S. OTC market. On Monday, October 19, the FT-SE 100 dropped 249.6 points, losing nearly 10.1% of its value. ^{26/} Tuesday saw that record eclipsed with a 250.7 point

^{24/} Much of the information provided in the sections on London and Tokyo has been drawn from preliminary data provided to the Division by the ISE and TKE.

^{25/} The ISE generally requires that market makers deal at their posted quotes for at least the number of shares posted. Quotations subject to this requirement are referred to as "firm quotations."

^{26/} The London market effectively was closed on Friday, October 16 because of a severe wind storm that paralyzed the city. Thus, the greater than 200-point drop in the FT-SE 100 is partly explained as pent-up selling demand from Friday in response to the 109-point drop in the DJIA.

drop in the index, or 11.6%. 27/ More than 2,000 stocks declined while only 75 stocks rose on October 20. Volume of 798 million shares was 250% greater than a year earlier and 31% over the previous week's volume.28/

Staff discussions with ISE members revealed that instances of market makers' phones going unanswered, locked and crossed markets, widened spreads and inaccurate quotes occurred in London as they did in the U.S. OTC market. Despite the strain of the unprecedented volume, however, 29/ the ISE's quotation system operated smoothly. 30/ Systems modifications and increases in capacity since Big Bang Day

The London press reported that on October 19, most of the trading was between market makers for their own accounts and by foreign investors, primarily from the United States, rather than domestic retail investors. Market makers reportedly had large inventory positions before October 19. See Wolman, Bears Catch British Market-Makers in a Vulnerable Position, Fin. Times, Oct. 22, 1987, at 2, col. 2.

27/ This compares with an 11% drop in the value of the NASDAQ Composite Index (a broad-based index of U.S. OTC stocks) on Monday, October 19, and a 9% drop on Tuesday, October 20.

28/ Despite the heavy processing burden the increased volume caused, ISE's settlement systems functioned well. The New York Times reported that settlements appeared to have been conducted normally and no significant liquidity problems appeared on November 2, the first settlement day since the October market break. The article also reported that approximately 85% of settlements are normally concluded on settlement day and that that level appeared to have been achieved. See Trades Settled in London, N.Y.T., Nov. 3, 1987, at D22.

29/ The ISE reported that on both October 21 and 22, the ISE experienced all-time highs of over 100,000 bargains. Volume has dropped to 20,000-25,000 bargains per day since the break, which is still a significant increase over "pre-break" volume. Prior to the break, the ISE only had tested the automated system's capability, in fact, to handle a maximum of 60,000 trades per day.

30/ SEAQ's computer system suffered few failures and processed the unprecedented volume of activity with relatively few problems. The ISE's systems handled on October 22 and 23 over 100,000 trade reports and 100,000 quote changes each day. Additionally, SEAQ accommodated over 8 million inquiries for price information, twice the weekly volume of 4 million inquiries in the week following Big Bang. As discussed below, however, the ISE instituted fast market procedures in several instances, partly because of systems overloads, and, at one point on Wednesday, October 22, was forced to stop computing the FT-SE 100 index for approximately three hours. Heavy volume caused technical problems, which the ISE preliminarily believes was the result of a software fault. The problem apparently involved the link between the computers that calculate the FT-SE 100 index and the SEAQ computers that process market data. During this period, the ISE halted trading on options and futures on the index. Subscribers were deprived of the page of information containing data on the 100 stocks that comprise the FT-SE 100, in addition to the value of the index itself. Subscribers could retrieve data on all the 100 stocks individually, however.

proved adequate under the extraordinary market conditions. Although the FT-SE 100 index fell by more than 10% on October 19 and again on October 20, the SEAQ dealer market, at least as measured by the operation of the quotation system, technically never ceased trading.

This is not to say, however, that market participants did not encounter obstacles in transacting business on October 19 and 20. Because of the non-centralized nature of an OTC market (compared with an auction market), participants are able to effectively cease trading to avoid their responsibility to provide a continuous two-way market simply by refusing to answer their phones. ^{31/} Reports in the financial press and interviews with market participants indicate, for example, that there were numerous instances in London of market makers not answering their phones. ^{32/} The ISE believes that, as was the case in the NASDAQ market, the primary problem was that firms did not have the capacity to handle the deluge of in-coming calls. On October 19 and 20, ISE members' customer business was 60% greater than during an average period in September and intra-market trades (*i.e.*, between market makers) were up 45% over the same period. Firms estimated that the volume of calls they were receiving was four to five times higher than average. ^{33/}

Market makers also may limit their exposure without formally withdrawing from the market by reducing quote size. ^{34/} The ISE's examination of quote size indicated that market makers reduced their quote size drastically during the break. In this way, they were able to limit their exposure. The ISE's rules specify that the minimum bargain size dealers may post is 1,000 shares; before the break, however, dealers frequently were quoting bargain sizes of up to 100,000 shares. The ISE found that since October 19, such liquidity has been greatly reduced and brokers continue to find that to fill customer orders, they frequently have to call several market-makers.

^{31/} The ISE prohibits a market maker who withdraws from making a market in a stock from re-entering quotes in that security for 90 days. There is only one exception -- if to continue would force the market maker to violate other rules or laws (*e.g.*, rules governing conflicts of interest). The ISE's withdrawal prohibition is referred to as a prohibition against "fair-weather market making." This is a much narrower exception than the U.S. OTC market now affords its market makers who may withdraw for such reasons as illness or vacations. The National Association of Securities Dealers, however, recently proposed an amendment to this rule that would allow market makers an excused absence only for certain physical circumstances (*e.g.*, equipment malfunction or relocation) or legal considerations.

^{32/} See, *e.g.*, Economist, Nov. 14, 1987, at 83, 84; and Waters, Market-Makers Not Ignoring Phones, Says SE, Fin. Times, Oct. 23, 1987, at 2, col. 4.

^{33/} *Id.* The Economist reported one incident, however, of a head dealer of one firm instructing his staff not to trade.

^{34/} See Chapters Four and Nine for a comparable discussion of NYSE and NASDAQ quotation size.

Statistics provided by the ISE confirm that quote size has indeed declined. For alpha stocks, ^{35/} the average maximum quote size ("AMQS") for September was 289,000 shares and was as high as 304,000 shares by October 14. By October 21, however, the AMQS had dropped 52% to 145,000 shares and dropped an additional 19% by October 28 to 117,000 shares. The trend reversed slightly by November 4, increasing 4% to 122,000 shares. Similar patterns were observed in beta and gamma stock quotes. For beta stocks the AMQS dropped 52% by October 21, declining from 54,000 shares to 22,000. A further 36% drop to 14,000 shares was only slightly offset by a 12.5% increase to 16,000 shares by November 4. The most striking reduction in quote size, however, occurred in the gamma stock quotes. From October 14 to October 21 average maximum quote size dropped from 11,000 shares to 3,000 shares, a 73% reduction, and has remained at that level since. While these reductions are substantial, it is important to emphasize that the quote sizes continued to be at least comparable to quote sizes on the NYSE. ^{36/}

Another problem faced by both the U.S. OTC market and the ISE was a dramatic widening of spreads. The ISE analyzes spreads by examining the "touches," the spread between the best bid and ask quotation. The ISE found that touches widened most on alpha stocks, the most liquid stocks traded through its facilities, roughly tripling. In addition, the touches appear to be continuing to increase. On October 14, 1987, touches on alpha stocks were .84%; on October 21, 1.37%, 2.1% on October 28, and as high as 2.17% on November 4. The same trend was observed for beta and gamma stocks. Betas increased 255% from 1.35% on October 14 to 3.45% on November 4. Similarly, touches on gamma stocks increased from 2.57% to 5.37% for the same period. ^{37/} As of November 27, 1987, the ISE noticed no significant narrowing of spreads.

Interviews with firms active in London also revealed that market makers indirectly withdrew from the market by not honoring their posted quotes. Market makers in London are required to deal in stocks at the price and in the size they post on their screens. On several occasions, however, market makers were unable to change their quotes quickly enough. Reportedly this was in part due to SEAQ's inability at certain times to process the enormous number of quote updates market makers were attempting simultaneously. During these periods, the ISE instituted "fast market procedures," which, while in effect, suspend the requirement that market maker quotes

^{35/} Stocks are divided into several categories, based primarily on the volume of trading. The most heavily traded are referred to as alpha stocks and comprise approximately 60-70% of the market capitalization traded through ISE facilities. ISE rules require market makers in these stocks to publish firm, continuous, two-way quotations. Trade data is reported through SEAQ and disseminated on TOPIC terminals. The next tier of 500 stocks are referred to as beta stocks, for which market makers also must publish firm, continuous, two-way quotes. Trade data on these stocks is not immediately disseminated on TOPIC terminals. Gamma stocks are the next tier of stocks, for which the quotes are not required to be firm and generally are indicative. The final tier is composed of delta stocks. Only an approximate middle price is disseminated by SEAQ for delta stocks.

^{36/} See Chapter Four.

^{37/} See Chapters Four and Nine for a comparable discussion of NYSE and NASDAQ quotation spreads.

be firm. ^{38/} During fast markets, SEAQ informs all participants through their terminals that all quotes are merely indicative. In one sense, the declaration of fast markets on October 19 and 20 was akin to official recognition that market maker quotes actually were not firm and could not be expected to be firm, given the extreme market conditions. Although the institution of fast market procedures clearly eased the burden for market makers, the effect on their customers may not have been as positive. During periods when the procedures were in effect, institutions and agency brokers could not ascertain whether their executions represented the best price available, particularly as quotes were rapidly changing.

The October market break was the first time the ISE instituted fast market procedures and, since that time, the ISE has polled its membership to determine whether market makers believed the procedures were of benefit to the market. The ISE informally reported that market makers almost uniformly supported the fast market procedures, stating that without them, the market would have been far more chaotic. The Division also understands that, as part of its market review, the ISE also will study execution quality by assessing how close a correlation existed between the dealing price (*i.e.*, trade price) and the quote posted for a security at the time of execution.

Our interviews with firms elicited significant anecdotal evidence that the ISE experienced, as did the U.S. OTC market, locked (referred to as "choice") and crossed markets. The ISE may analyze the number of such occurrences, although specific statistics on the number of these instances are not yet available. Choice and crossed markets added to confusion about where the markets for securities were at any given moment. Instances of choice and crossed markets, however, did not have quite the same paralyzing effect on the London market as they did in the United States because the ISE has not yet developed automatic order routing and execution systems, which in the U.S. OTC market are not programmed to operate when the market for a security is locked or crossed.

Although various program trading strategies appear to have had a significant impact on the U.S. markets during the market break, program trading does not appear to have been a significant factor in the U.K. ^{39/} Computer trading techniques involving U.K. stock index futures and options do not play much of a role in the London market.^{40/} In fact, the ISE noted trading in index futures and options was moderate during the break. In response to wide-spread discussion in the United States on whether derivative markets had a substantial destabilizing effect on the markets, however, the ISE has stated that it intends to study the issue carefully in the coming months.

^{38/} The ISE instituted fast market procedures on October 19 from 9:10 a.m. - 9:23 a.m. (London time) and 11:00 a.m. - 12:00 p.m.; October 20 from 9:00 a.m. - 11:00 a.m. and 2:32 p.m. - 4:00 p.m.; October 21 from 9:00 a.m. - 9:30 a.m.; October 22 from 9:08 a.m. - 10:00 a.m. and 11:47 a.m. - 12:40 p.m.

^{39/} See Chapter Two for a discussion of program trading techniques involving the sale of U.S. stocks in the London market.

^{40/} Although volume on the ISE is approximately 25% of the volume on the NYSE, volume in the recently created London International Financial Futures Exchange stock index futures contract is only 1.7% of U.S. stock index futures volume. CME Report, *supra* note 19, at 6-7.

2. Tokyo

The Tokyo Stock Exchange is an auction market that operates similarly to U.S. stock exchanges. ^{41/} Stocks that are traded on the TKE are assigned to special TKE members called "saitori" who perform functions much like U.S. exchange specialists, with one important distinction: although saitori are responsible for matching buy and sell orders in their stocks, they are prohibited from trading for their own account. Thus, unlike U.S. exchange specialists, saitori do not have an affirmative obligation to provide liquidity to ensure a fair and orderly market. Another difference between the U.S. exchange markets and the TKE is that there are pre-established daily price limits for each stock, as well as the stock index future. Once the limits are reached, the TKE halts trading in the issues until the next trading session. ^{42/}

Like the U.S. exchange markets, the TKE experienced a lack of liquidity on October 20 and 21. On Tuesday, October 20, the Nikkei dropped 620 points to 25,745, a 2.4% decline. On Wednesday the Nikkei suffered an additional 14.9% loss in its value, by far the worst one-day drop in the TKE's history. By November 19, the Nikkei had fallen a total of 19% from its pre-market break high. On October 20, the sell orders so overwhelmed the buy orders that some 80 stocks never opened. ^{43/} In addition, the TKE informed the staff that during the day trading in 700 stocks (nearly half the 1,500 that are listed on the exchange) was halted because prices in those stocks plunged at

^{41/} One potentially significant difference between the markets is that the TKE does not have a well-developed stock index futures market. In fact, the first stock index future in Japan was only recently introduced on the Osaka Stock Exchange. Although there is also a stock index futures contract on the Nikkei stock index that is traded on the Singapore International Monetary Exchange, or Simex, the combined volume on both these contracts has been 60 times less than the volume of stock index futures on U.S. stocks. CME Report, supra note 19, at 6. The Japanese Ministry of Finance ("MOF") believes trading in the Osaka futures contract, as well as the SIMEX contract, did not appear to have accelerated the decline during October. See letter from Toshimi Konno, Director, Co-ordination Division, Securities Bureau, MOF, to Richard G. Ketchum, Director, Division of Market Regulation, dated December 28, 1987. On October 20, in fact, trading was halted in the future before the trading session opened because the price already had dropped to its pre-established price limit.

^{42/} A stock's price limit is determined on the basis of the previous day's closing price. For example, Sony Corporation closed on the TKE at 4950 yen (U.S. \$39.60) on Monday, October 19. Its daily price limit for October 20, based on that closing price, was 500 yen (U.S. \$4.20). See also note 43, infra. Thus, because the price decline in Sony in the United States on October 19 was greater than 500 yen, it, along with many other stocks, was not opened on Tuesday. See Tokyo Market is Shaken by New York's Collapse, The Asian Wall St. J. Weekly, Oct. 26, 1987, at 31, col. 1.

^{43/} See Economist, Nov. 14, 1987, at 85. The TKE's rules specify a maximum ratio between buy and sell orders. When that ratio is exceeded, trading is temporarily halted.

an unprecedented rate to their pre-set daily price limits. ^{44/} The intense sell pressure on October 20, which caused prices to collapse, led the exchange to seek ways to attract buy interest and stabilize market conditions. Thus, the TKE lowered its initial margin collateral requirement to 50% from 70% and raised the collateral valuation rate to 70% from 60%. These eased margin requirements were intended to encourage purchases to offset the sell order imbalances.

It was not until the final two hours of trading that any buyers emerged at all. Although four major Japanese firms, Nomura, Daiwa, Nikko and Yamaichi, reportedly entered the market as buyers of industrial stocks, their activity was not enough to turn the tide on October 20 and the Nikkei closed down 14.9%. ^{45/} By Wednesday, October 21, however, a dramatic change in sentiment had occurred. A torrent of buy orders flowed in, causing serious liquidity problems on the sell side. During the first half hour of trading, only three stocks were traded. During the course of the day, trading in 151 stocks was halted because their prices had risen to the level of their daily price limits.

^{44/} Daily price limits are intended to check extreme volatility by stipulating the maximum a stock's price may change during a trading day. Once the limit is reached, trading is halted until the next trading day. The daily price limits are:

Stock Price Range*				Daily Limit	
0	(\$.00) -	100 yen	(\$.80)	30 yen	(\$.24)
100	(\$.80) -	200 yen	(\$ 1.60)	50 yen	(\$.40)
200	(\$ 1.60) -	500 yen	(\$ 4.00)	80 yen	(\$.64)
500	(\$ 4.00) -	1,000 yen	(\$ 8.00)	100 yen	(\$.80)
1,000	(\$ 8.00) -	1,500 yen	(\$ 12.00)	200 yen	(\$ 1.60)
1,500	(\$ 12.00) -	2,000 yen	(\$ 16.00)	300 yen	(\$ 2.40)
2,000	(\$ 16.00) -	3,000 yen	(\$ 24.00)	400 yen	(\$ 3.20)
3,000	(\$ 24.00) -	5,000 yen	(\$ 40.00)	500 yen	(\$ 4.00)
5,000	(\$ 40.00) -	10,000 yen	(\$ 80.00)	1,000 yen	(\$ 8.00)
10,000	(\$ 80.00) -	30,000 yen	(\$ 210.00)	2,000 yen	(\$ 16.00)
30,000	(\$ 240.00) -	50,000 yen	(\$ 400.00)	3,000 yen	(\$ 24.00)
50,000	(\$ 400.00) -	100,000 yen	(\$ 800.00)	5,000 yen	(\$ 40.00)
100,000	(\$ 800.00) -	200,000 yen	(\$ 1,600.00)	50,000 yen	(\$ 400.00)
200,000	(\$ 1,600.00) -	500,000 yen	(\$ 4,000.00)	80,000 yen	(\$ 640.00)
500,000	(\$ 4,000.00) -	1 mill.	(\$ 8,000.00)	100,000 yen	(\$ 800.00)
1 mill.	(\$ 8,000.00) -	1.5 mill.	(\$12,000.00)	200,000 yen	(\$ 1,600.00)
1.5 mill.	(\$12,000.00) -	2 mill.	(\$16,000.00)	300,000 yen	(\$ 2,400.00)
2 mill.	(\$16,000.00) -	3 mill.	(\$24,000.00)	400,000 yen	(\$ 3,200.00)
3 mill.	(\$24,000.00) -	5 mill.	(\$40,000.00)	500,000 yen	(\$ 4,000.00)
5 mill.	(\$40,000.00) -	10 mill.	(\$80,000.00)	1 mill.	(\$ 8,000.00)
above 10 mill.	(\$80,000.00)			2 mill.	(\$16,000.00)

Source: Tokyo Stock Exchange
*Exchange Rate: U.S. \$1.00 = 125 yen.

^{45/} See *Fin. Times*, Oct. 21, 1987, at 2, col. 1.

Firms reported that it was nearly impossible to find sellers on that Wednesday. The Nikkei closed up a record 2,037.32.

The MOF's review of investor activity found that the heaviest selling on October 20 came from individual investors who panicked at the drops in markets around the world. ^{46/} These investors also were quick, however, to come back into the market as buyers and ended the week as net buyers of stocks. The MOF also found that Japanese institutional investors opted to wait for the markets to normalize and reduced drastically both purchases and sales: for the week of October 19, institutional investors were net purchasers of 40 billion yen (U.S. \$320 million) of securities. By far the largest sellers in Tokyo during the market break were foreign investors. The MOF believes that foreign mutual fund managers may have sold Japanese securities to meet huge numbers of shareholder redemption requests. During the week of October 19, foreign investors were net sellers of 1.05 trillion yen (U.S. \$8.4 billion). Foreign investors continued to sell Japanese securities through at least mid-December. ^{47/}

It is significantly easier to stabilize the securities markets in Japan because of two unique characteristics of the Japanese markets. First, a large percentage of the float of most Japanese firms is owned by other corporations who wish to cement business relationships and to signify good will. These shares are tightly held and are almost never traded. Second, the securities industry is decidedly dominated by Nomura, Daiwa, Nikko and Yamaichi. Together, they account for roughly 60% of the trading on the TKE and perhaps up to 75% if their affiliates are included. ^{48/} It has been suggested that the four firms also were largely responsible for bringing individual investors back into the market. For the week of October 19, these investors were net purchasers of 650 billion yen (U.S. \$5.2 billion) of Japanese securities. ^{49/} Japanese institutional investors, with reportedly large cash positions, returned to the market later in the week. ^{50/}

Share volume statistics evidence the liquidity problems experienced on October 20 and 21. On October 20 and 21, share volume was approximately 500 million shares and

^{46/} See letter from Toshimi Konno, Director, Co-ordination Division, Securities Bureau, MOF, to Richard G. Ketchum, Director, Division of Market Regulation, dated December 28, 1987.

^{47/} The MOF's figures indicate that foreign investors were net sellers each week from October 19 through December 7 of a total of 2.9 trillion yen (U.S. \$23.2 billion) of securities.

^{48/} *Id.* Reports in the financial press speculate that a meeting between the MOF and these firms on October 20 may have been to encourage the firms to enter the market as buyers to help support stock prices. See, e.g., *Wall St. J.*, Oct. 21, 1987, at 48, col. 1. The MOF, however, consistently has denied these suggestions and the staff cannot substantiate those stories.

^{49/} See *Economist*, Nov. 14, 1987, at 85.

^{50/} Tokyo Market Is Shaken By New York's Collapse, *The Asian Wall St. J. Weekly*, Oct. 26, 1987, at 31, col. 1; and Tokyo's Big Players Escape the Fall-Out, *Far Eastern Economic Review*, Nov. 5, 1987, at 62.

419 million shares, respectively. These figures are half the average daily volume figures for most months in 1987, and are almost one quarter of the two billion share volume the TKE experienced on its heaviest day ever. 51/ Further, pre-market break volume has not yet returned to the exchange -- average daily volume for November was a light 472 million shares.

Volatility on the TKE has been a continuing force in the market since October 19. During each trading day in October after October 19, numerous stocks reached their daily price limits and were closed. 52/ In several instances, order imbalances pushed stock prices to their daily limits before trading opened in the morning and thus no trading was permitted in those stocks until the next day. Although the TKE has no statistics on how frequently stocks reached their daily price limits before the October market break, conversations with TKE officials indicated that such instances were quite rare.

Clearly, on a day like October 20, when trading on the TKE was dominated by concerted selling, the application of daily price limits stopped trading long enough to allow for investor perceptions to change dramatically before trading re-opened on Wednesday, October 21. Had market sentiment not changed, however, halting trading

51/ The TKE reports that average daily share volume on the exchange for 1987 was:

January	-	900 million
February	-	1 billion
March	-	1.4 billion
April	-	1.4 billion
May	-	1 billion
June	-	980 million
July	-	656 million
August	-	918 million
September	-	1 billion
October	-	999 million

52/ As an indication of continuing volatility, the following is a list, by trading day, of the number of stocks that reached their daily price limits and an indication as to whether the stock price rose or fell to the daily limit:

October 20-	780(low)
October 21-	151(high)
October 22-	21(high)
October 23-	1(high)
-	12(low)
October 24-	0
October 26-	7(low)
October 27-	3(high)
October 28-	4(high)
-	1(low)
October 29-	2(high)
-	2(low)
October 30-	10(high)
October 31-	8(high)

early probably would have only delayed the inevitable drop. Moreover, market participants were forced to accept the risk of holding their positions overnight because of the absence of any continuing market.

Since its peak on October 14, 1987, at 26,646, the Nikkei had fallen 20% by year's end to 21,217. It has not come close to matching the 31% drop in the DJIA from its peak in August.

3. Hong Kong

In Hong Kong the decline in stock prices was far more dramatic than in any other market. On October 19, the Hang Seng Index plunged 420 points (or 11.3%); the biggest one-day fall in the market's history. The seriously deteriorating market conditions on October 19 and the probability that conditions were likely to worsen were the impetus for closing the Hong Kong Stock Exchange for the remainder of the week. The unprecedented drop in the index left many futures investors facing losses up to H.K.\$60,000 (U.S. \$7,700) ^{53/} on contracts many purchased on margin for only H.K. \$15,000 (U.S. \$1,925). ^{54/} The steep drop in prices of the underlying securities raised the specter of massive defaults in the futures market and it was feared that a collapse of the futures market would spill over into the stock market, bankrupting many small to medium-sized stockbrokers.

Like the Hong Kong stock market, the futures exchange closed after October 20, leaving brokers and investors without a marketplace to liquidate positions for cash to meet margin calls. Speculators in stock-index futures faced huge losses on 87,400 outstanding contracts, having a value of H.K. \$15.7 billion (U.S. \$2 billion). After the 420-point drop in the Hang Seng index on October 19, many futures buyers already had difficulty meeting margin calls. To meet their liabilities it was widely believed that these futures exchange members would have been forced to sell shares so heavily that the already weakened stock exchange could have been destroyed. Many market observers believed that without a significant upturn in prices, an enormous increase in defaults was likely.

The financial press reported that during the week the exchanges were closed, stock and futures exchange officials considered several options to avert massive defaults.^{55/} Pressure was mounted by futures buyers (mostly local brokers and their customers) to settle all contracts at a fixed price that would leave them relatively solvent, rather than at a price determined by the market. The sellers of those contracts (mostly banks and some local and foreign brokerage firms) strongly opposed the suggestion, believing it would limit or deprive them entirely of profits on those contracts. This concern was heightened for many firms by the fact that those contracts were hedging stock positions

^{53/} Exchange rate: U.S. \$1.00 = H.K. \$7.79.

^{54/} See *Economist*, Oct. 31, 1987, at 68; Dodwell, Hong Kong Prepares Itself for Double Wave of Defaults on Exchanges, *Fin. Times*, Oct. 28, 1987, at 2, col. 2.

^{55/} See Dodwell, Hong Kong's Secret Bid to Rescue Firms, *Fin. Times*, Oct. 23, 1987, at 2, col. 4.

that had fallen substantially in value. Another proposal called for annulling all outstanding futures contracts.

Over the weekend of October 23, the Hong Kong government devised a rescue plan involving a loan totalling H.K. \$2 billion (U.S. \$256 million) to the Hong Kong Futures Guarantee Corporation, which guarantees all futures contracts executed on the futures exchange. Half the loan was supplied by the Hong Kong government and the other half by a group of twelve brokers and the Guarantee Corporation's shareholders, which are mostly banks, including Hong Kong and Shanghai Banking Corporation and Barclays and Standard Chartered. ^{56/} An additional one percentage point reduction in the base lending rate to 7.5% also was announced, ensuring easier availability of funds to exchange members to meet margin calls and settlement liabilities. ^{57/}

In spite of the compromise developed over the weekend, however, the Hang Seng Index plunged another 1,120 points, a 33% drop, on Monday October 26. To a large extent the plunge was attributed to pent-up selling demand from investors who faced huge margin calls because of the earlier drop in the index. The loan was designed to cover defaults by all investors sustaining losses on outstanding contracts for roughly a 1,000-point drop in the Hang Seng index. ^{58/} Much of that cushion was exhausted on October 26. On Wednesday October 28, the government injected an additional H.K. \$2 billion (U.S. \$256 million) into the Hong Kong Futures Guarantee Corporation in response to the collapse in stock prices on Monday and the suspension of 43 members of the futures exchange on Tuesday. ^{59/} Additionally, the futures exchange raised margin requirements from H.K. \$15,000 (U.S. \$1,900) to H.K. \$50,000 (U.S. \$6,400) on contracts worth approximately H.K. \$180,000 (U.S. \$23,000) or roughly 28% of the

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- ^{56/} The loan is to be repaid from new levies on transactions in the stock and futures markets. The levies include a new H.K. \$30 (U.S. \$3.90) charge for each futures contract and a charge of H.K. \$3 (U.S. \$3.9) for every H.K. \$10,000 (U.S. \$1,300) in stock market transactions.
- ^{57/} At least one investor sought a limited exemption from buy-back restrictions to help boost stock prices by buying back shares of companies his holding company controls.
- ^{58/} Before the loan, the Guarantee Corporation had only H.K. \$22.5 million (U.S. \$2.9 million) in capital and reserves and would have been unable to meet large defaults.
- ^{59/} The People's Republic of China, whose citizens collectively are estimated to own about 10% of the markets' total capitalization, have assisted in the loan program. The Bank of China acceded to Hong Kong's request to lend the Guarantee Corporation H.K. \$333 million (U.S. \$42.7 million) as part of the second cash infusion and made statements that it would continue to honor credit lines extended to Hong Kong securities firms. The latter action was seen as intended to relieve selling pressure on firms increasingly pressed to meet settlement liabilities and margin calls.

contract value. ^{60/} This was intended to eliminate some of the speculative interest that earlier fueled the market.

As of November 5, market participants reported that there were only 34 instances of firms failing to make payment and in each of those cases, payment was made late. The Office of the Commissioner for Securities in Hong Kong informed the staff that, as a result of the drop in the Hang Seng index, between 30 and 40 of the 100 futures exchange member firms in business in October have been liquidated.

In a move to restore investor confidence, the governor of Hong Kong appointed a special committee to study the events of October and to make recommendations on the operation of stock and futures markets. The committee also will analyze the role of the Securities Commission and the Commodities Trading Commission, governmental authorities charged with regulating the stock and futures markets.

Several U.S. firms informed the Division that the closing of the exchanges locked them into positions they otherwise would have liquidated. Firms also could not roll forward futures hedge positions or initiate new long or short futures positions; nor could they withdraw funds carried on the books of exchange clearing members. Additionally, it was suggested that the closure of the Hong Kong markets fueled fear that spread to other markets. Four firms informed the Commission that while the Hong Kong markets were closed, they lost nearly U.S. \$5.5 million. Despite these losses, however, none of these firms have significantly scaled back their presence in Hong Kong and one firm felt confident enough in the market to participate in the loan arranged for the Hong Kong Futures Guarantee Corporation.

The closure of the Hong Kong markets also affected several U.S. investment companies. Because of the unavailability of prices to value fund assets, two suspended redemptions ^{61/} and one fund valued its Hong Kong securities at a discount of 20% on October 20 and 30% during the period October 21 through October 23. ^{62/}

^{60/} This compares with margin requirements for SPZ futures contracts of approximately 8% of contract value for hedged futures positions and 12% for speculative futures positions.

^{61/} In letters to each of these funds, the Division of Investment Management ("IM") stated that it would not recommend enforcement action to the Commission under Section 22(c) and Rule 22c-1 of the Investment Company Act of 1940 ("Investment Company Act") if the companies suspended redemptions for a limited period because of the Hong Kong closure. See letters from Mary Podesta, Chief Counsel, IM, to Christopher Wells, Esq., Coudert Brothers (GAM Funds, Inc.), dated October 21, 1987; Elliott Cohan, Esq., Federated Investors, dated October 20, 1987; and Michelle Neureuter, G.T. Global Growth Series, dated October 20, 1987. One of the funds suspended redemptions until October 26; the day the Hong Kong Stock Exchange reopened. The second fund resumed redemptions on October 21 and gave all customers who submitted redemption requests on October 20 the option to reinstate them or cancel them.

^{62/} The fund resumed its normal valuation method on October 26. Section 22(c) and Rule 22c-1 of the Investment Company Act govern pricing with respect to the purchase or redemption of investment company securities. Section 2(a)(41)

The staff of the regional offices inspected these three funds and, among other things, questioned the companies on how shareholders were notified of the changes in the suspension and asset valuation policies. One of the two funds that suspended redemptions stated that it did not notify its shareholders of the suspension. During that week, however, the fund received no redemption requests; nor has the firm received any complaints or inquiries from shareholders on the suspension. The second fund is promoted primarily to institutional clients who were notified of the suspension on October 20 through the fund's computer system. The fund reprogrammed its system to prevent its customers from entering purchase or redemption orders during the period redemptions were suspended. The fund also called several large customers to notify them of the suspension. The fund that altered its valuation method did not inform its customers of the change or its resumption of its normal valuation method. Of these three firms, two stated that the Hong Kong closure has caused them to reduce their Hong Kong holdings.

D. The Aftermath

The world-wide decline in stock prices may have a substantial effect on international capital formation and new issue activity in international markets. To illustrate, the volume of international bond offerings during October, 1987 equaled \$9.6 billion; 29% less than September's \$13.5 billion and 13 times less than the \$120.8 billion raised in January, 1987. Both sections of the international bond market, Eurobonds and foreign bonds, declined substantially from their September, 1987 levels.

Primarily as a result of the world-wide decline in stock prices, the value of new international equity offerings declined 13-fold from an all time record of \$6.6 billion in September, 1987 to \$498 million in October, 1987. Further, the number of new issues declined from 28 to seven during October.

The privatization efforts of many foreign governments also were postponed. France, Germany and the U.K. each cancelled all pending privatizations until at least next year. ^{63/} Since 1980, France and the U.K. have accounted for about 66% of the \$60 billion raised through the sale of shares in state-owned firms. ^{64/}

governs the valuation of the current price of an investment company security. That section permits fair value of a security to be determined in good faith by the board of directors if market quotations are not readily available.

The fund stated that, in addition to the difficulty of determining asset value on its Hong Kong securities, it was concerned that the application of daily price limits on the TKE masked the true value of portfolio securities traded on that exchange.

^{63/} One major exception was the British Petroleum Offering. See Chapter Five for a discussion of that offering and its effects on U.S. underwriters.

^{64/} The October, 1987 market break also affected the new issues market in the United States. The number of common stock new issues dropped dramatically in November, 1987. Another measure of the effect of the market break on new issues is the change in their market value. *Forbes* magazine follows a group of

E. Analysis

The events of October, 1987 compellingly demonstrated that the world's securities markets have become inextricably linked. That trend is irreversible and requires that securities regulators around the globe cooperate to ensure the integrity of our markets, while at the same time remain adaptive to changes that will be needed to accommodate the increasing sophistication of those markets.

In the past the Division has examined the development of the international trading mechanisms and has found much that needs to be accomplished before international markets will be able to operate smoothly in conjunction with one another.^{65/} One of the most pressing needs is the development of compatible, safe and efficient domestic clearance and settlement systems, as well as international linkages among those systems. Without effective systems, all firms engaging in an international securities business will be exposed to greater risk. ^{66/}

Another pressing need is the development of international trade and quote reporting mechanisms. The Commission in the past has considered the feasibility of developing an international consolidated reporting system in globally traded securities similar to U.S. consolidated systems. Although development of an international system for the publication of transaction reports would strengthen the operation of the markets, there are obstacles hindering progress toward that goal. Of primary concern is the fact that widely differing domestic systems would have to be integrated.

Perhaps even more crucial is ensuring that adequate financial oversight systems are in place. It may well be that U.S. markets' financial responsibility requirements, including minimum net capital and recordkeeping requirements, customer funds and securities segregation requirements, customer margin requirements, and clearing agency margin and mark-to-the-market systems were an important factor in preventing a total collapse of the U.S. markets during the market break. International markets need to work together to assure that adequate oversight mechanisms are in place and that our current financial responsibility standards are adequate in light of the extraordinary events of October. The failure of a U.S. firm's foreign affiliate could have substantial

551 initial public offerings ("IPOs") issued during 1987. During the market break, Forbes traced the price performance of 497 of those issues and found that they had lost 32.17% of their September 30, 1987 value. These IPOs raised \$13.7 billion and had increased in value to \$15.6 billion by September 30. When Forbes calculated their value on November 5, however, it had dropped to \$10.6 billion. Forbes, Dec. 17, 1987, at 53, 54.

^{65/} See generally Internationalization Study, Chapter V.

^{66/} See id. and Staff of the Division of Market Regulation Summary of February 17, 1987, Internationalization Roundtable (August 1, 1987).

repercussions on the related U.S. firm. Accordingly, the Commission may wish to pursue agreements with the governments of countries with active trading markets to permit the exchange of broker-dealer financial information.

Finally, the need for adequate enforcement and surveillance arrangements has never been more pressing. During periods of severe market stress, such as the October market break, the opportunity and motivation to avoid strict compliance with regulatory requirements may be present.

CHARTS

CHART 11-1

International Transactions in U.S. and Foreign Corporate Stocks

(U.S. \$ Millions)

Foreign Activity in U.S. Stocks

U.S. Activity in Foreign Stocks

Year	Purchases	Sales	Net Capital Flow	Purchases	Sales	Net Capital Flow
1978	20,145	17,723	2,422	3,139	3,666	527
1979	22,783	21,104	1,679	5,434	4,617	-817
1980	40,298	34,870	5,428	10,044	7,897	-2,147
1981	40,686	34,856	5,830	9,586	9,339	-247
1982	41,881	37,981	3,900	8,504	7,163	-1,341
1983	69,770	64,360	5,410	17,046	13,281	-3,765
1984	59,834	62,814	-2,980	15,917	14,816	-1,101
1985	81,995	77,054	4,941	24,803	20,861	-3,942
1986	148,101	129,382	18,719	50,699	48,787	-1,912
1987 (P)	\$265,859	\$234,737	\$31,122	\$98,367	\$98,030	\$ 282
1986						
Oct.	\$10,979	\$12,300	\$-1,321	\$ 5,026	\$ 6,011	\$ -985
Nov.	12,033	12,086	-53	3,764	4,095	-331
Dec.	14,100	12,320	1,780	4,507	4,570	-63
1987						
Jan.	17,641	15,964	1,677	5,110	4,906	204
Feb.	20,702	17,598	3,104	7,736	7,175	561
March	23,064	18,001	5,063	7,799	7,015	784
Apr.	20,735	17,390	3,345	8,297	7,124	1,173
May	19,632	15,956	3,676	7,379	8,016	-637
June	18,682	17,054	1,628	9,035	8,778	257
July	23,645	21,883	1,762	8,593	8,583	10
Aug.	24,774	24,554	220	9,047	8,672	375
Sept.	22,468	19,435	3,033	8,204	8,655	-451
Oct.	\$30,206	\$27,779	\$ 2,427	\$10,774	\$12,768	\$-1,994

P = Preliminary, ten months data at annual rates not seasonally adjusted.

SOURCE: U.S. Treasury Bulletin (various issues)

TABLE 1

**Correlation Coefficients Between Stock Indexes
in the United States (S&P 500) and Tokyo
(Tokyo Exchange Composite) -- October 12 to October 23, 1987***

**All Percentages are Calculated
from the Prior Trading Day's Close**

United States leading Tokyo

United States percentage change the day before and the percentage change in Tokyo at the open.	.4183 (10)
United States percentage change the day before and the percentage change in Tokyo after one hour of trading.	.8473 (10)
United States percentage change the day before and the percentage change in Tokyo at the close.	.8929 (10)

Tokyo leading the United States

Tokyo percentage change at the close and same day United States percentage change at the open.	.2220 (10)
Tokyo percentage change at the close and the same day United States percentage change at 10:00 A.M.	.1440 (10)
Tokyo percentage change at the close and the same day United States percentage change at the close.	.0744 (10)

*** Number of observations in parentheses**

TABLE 2

**Correlation Coefficients Between Stock Indexes
in the United States (S&P 500) and London (FTSE)
October 12 to October 23, 1987***

**All Percentages are Calculated
from the Prior Trading Day's Close**

United States leading London

United States percentage change the day before and the percentage change in London at the open.	.8200 (9)
United States percentage change the day before and the percentage change in London after one hour of trading.	.8747 (9)
United States percentage change the day before and the percentage change in London at the close.	.6664 (9)

London leading the United States

London percentage change at 2:00 PM London time and the United States percentage change at the open.	.5602 (9)
London percentage change at 2:00 PM London time and the United States percentage change at 10:00 AM EST.	.3329 (9)
London percentage change at the close and the percentage change in the United States at the close.	.5435 (9)

*** Number of observations in parentheses**

Chapter Twelve

INVESTOR COMPLAINTS

A. Introduction

The Securities and Exchange Commission's ("SEC" or "Commission") Office of Consumer Affairs and Information Services (the "Office") conducted an in-depth special study of complaints received by the Commission and self-regulatory organizations ("SROs") to identify and analyze the kinds of problems experienced by investors during, or associated with, the market break. "Market break complaints" were broadly defined as those complaints and inquiries filed by, or on behalf of, individual or institutional investors that stemmed from the volatile market activity during the period of October 14-30, 1987.

1. Brief Background on SEC Complaint Processing

The Commission's consumer affairs staff in headquarters (Washington, D.C.) and the nine regional offices received in excess of 40,000 investor complaints and inquiries during Fiscal Year (FY) 1987. These written or telephone complaints and inquiries are routinely tracked and analyzed through the Complaint Management and Processing Index (CMPI) mainframe computer program. In addition to tracking basic information about the specific entity named, investor information and dates of correspondence, special codes are used to identify the type of entity and the nature of the complaint.

Upon receipt of a call or letter, consumer affairs specialists research reference materials or databases in order to respond to inquiries. The investor is required, however, to submit a complaint in writing if he or she wants Commission assistance in obtaining an explanation or resolution. In processing the majority of written complaints, the consumer affairs specialist requests a review of the complaint by the compliance or legal department of the appropriate broker-dealer, mutual fund, or issuer, along with a report of that department's findings. This report is then reviewed to determine whether it is responsive to the issues raised in the complainant's letter. In many cases, corrective action is initiated by the firm to resolve the problem. In others, the investor's claims or allegations are disputed. Since the Commission is not authorized to serve as a judge or arbitrator, the specialist advises the investor of his or her general rights of private recourse.

Investor complaints serve as an important source of information in the Commission's regulatory and enforcement programs. Historically, between 20% and 25% of the enforcement investigations opened each year result, at least in part, from information on a variety of securities industry or corporate violations obtained through investor complaints. Complaints alleging broker-dealer sales practice abuses are carefully screened for indications of violations of Federal securities laws or SRO rules and, where warranted, are referred for further review to Commission regulatory staff and/or SRO staff. In some cases, these reviews may ultimately result in SRO disciplinary action against a firm or registered representative, increased oversight of specific regulated entities, or administrative proceedings. Analysis of overall trends in complaint types, complaints about industry practices, or complaints against specific entities also assists in planning oversight and regulatory program activities.

2. Study Methodology

The Office collected detailed information from Commission headquarters, regional and branch offices, and SROs on both written and telephone complaints. The information collected on telephone complaints was necessarily general because of differences in the extent to which various regional offices and SROs captured data on telephone calls, as well as the general lack of detail and supporting documentation inherent in such complaints. Emphasis was therefore placed on the analysis of written complaints.

Prior to sending out the data requests (copies of which are attached as Appendix H), a special personal computer ("PC") based program was developed to provide a means for tracking multiple complaints in a letter and to define better the specific types of problems associated with the high market volume and volatility. ^{1/} The categories of complaints chosen were based on trends identified in investor telephone complaints during the three week period beginning October 19. Five broad categories of complaints were selected, each consisting of a series of between five and twelve specific complaint codes, as follows:

- a. General Inquiry or Complaint -- This series of 12 codes was divided into four categories for the analysis:
 - o Access to brokers or quotes;
 - o Public Commentary (general comments about the market break, program trading, or SEC/SRO intervention)
 - o Allegations of law or rule violations, or faulty advice
 - o Miscellaneous
- b. Confirmation Problems -- The pricing code in this category was combined with execution pricing problems for the analysis.
- c. Execution Problems

^{1/} The program was designed to supplement the existing CMPI system; therefore, it did not duplicate the majority of normal complaint codes, such as those associated with sales practices, fees, and issuer problems. Some identifying data such as assigned number, entity code, entity name, and issuer were repeated in order to facilitate analysis and to permit manual cross referencing between the two systems. The new system also captured additional data elements, such as the transaction date(s), the securities market or exchange associated with the problem(s), the type of security, and the source of the complaint. The format included a "NOTES" column and a supplemental sheet to cover information not adequately captured in the existing codes or format, and to allow for additional comments. The supplemental sheet was an integral part of the program and entries were analyzed for trends in complaint data. The Office also developed a special designator in the CMPI system to distinguish market break complaints from regular complaints received during the same time period.

d. **Margin Problems**

- e. **Mutual Fund Problems** -- This series contained 11 codes related to redemptions, transfers, and pricing.

SEC and SRO staff reviewed the written complaints related to the market break and summarized pertinent information using the special format and coding instructions provided with the data requests (Appendix H). Data in the new system and in the regular CMPI system, for SEC complaints, was reviewed to identify evidence of possible securities law violations and sales practice abuses that may have been brought to light as a result of the extraordinary market drop.

B. Summary of Telephone Complaints

Information was collected on trends evidenced by approximately 14,430 calls made by investors to the SEC and SROs during the period of October 14 to November 27, 1987. Of these, the SEC received approximately 9,360 calls. 2/

Table 12-1, a graph depicting daily SEC call volume for the last half of October, demonstrates the dramatic increase in telephone complaints following the October market break. Table 12-2 displays weekly totals of telephone complaints for the last half of October and for November, 1987. The volume of calls, which was highest for the week of October 19, 1987, remained well above average (approximately double the normal average) for most of the period, gradually decreasing until the end of November, when the number of telephone complaints stabilized. The increase in telephone complaints is attributable to the market break.

The most prevalent problems mentioned by investors who contacted the SEC were inability to contact brokerage firms, problems with order executions, and complaints about margin calls. The callers also indicated dissatisfaction and frustration stemming from the inability to confirm whether certain transactions had been executed, as well as uncertainty about the ability of the market to function properly under the conditions of the market break.

Discount brokers tended to be the target of the most telephone complaints, particularly during the week of October 19, 1987. Numerous calls also were received in connection with firms rumored to be experiencing financial difficulties or going out of business. During the early part of that week, investors also complained about mutual funds, particularly fund redemption policies and difficulties in reaching funds by telephone.

2/ The Office maintained close contact with regional and branch offices to gather information on the total number of calls as well as to elicit comments on general categories of complaints. Some of the regional offices reported as much as four times the normal volume of complaints. Due to the heavy volume and assignment of additional staff to cover phones, normal documentation of telephone complaints was not universally maintained; as a result, the statistics in the CMPI system for October only partially reflect the telephone complaints received and shown in the graphs.

SEC Telephone Complaints by Day

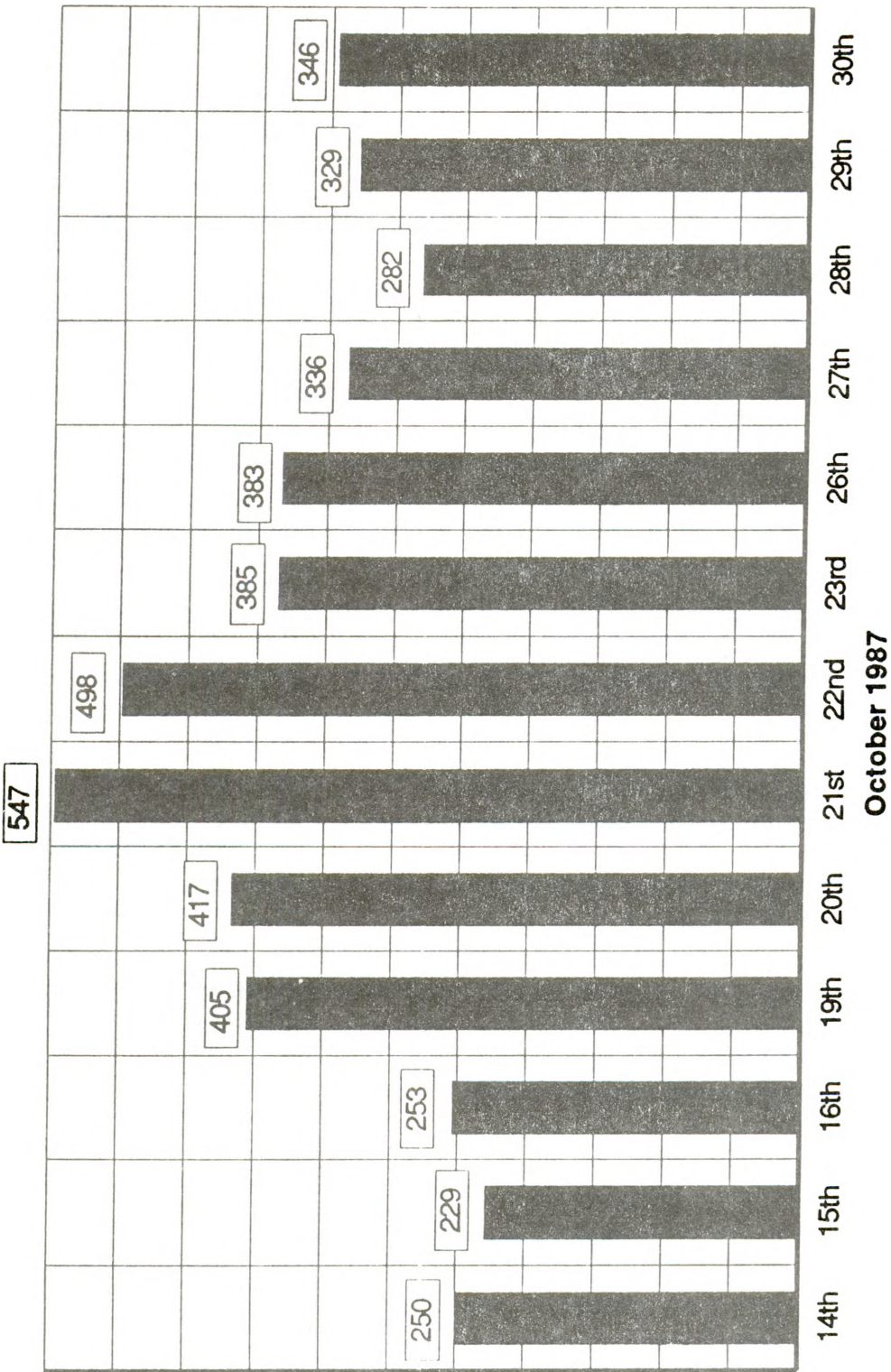


Table 12-1

CHARTS

CHART 11-1

International Transactions in U.S. and Foreign Corporate Stocks

(U.S. \$ Millions)

Foreign Activity in U.S. Stocks				U.S. Activity in Foreign Stocks		
Year	Purchases	Sales	Net Capital Flow	Purchases	Sales	Net Capital Flow
1978	20,145	17,723	2,422	3,139	3,666	527
1979	22,783	21,104	1,679	5,434	4,617	-817
1980	40,298	34,870	5,428	10,044	7,897	-2,147
1981	40,686	34,856	5,830	9,586	9,339	-247
1982	41,881	37,981	3,900	8,504	7,163	-1,341
1983	69,770	64,360	5,410	17,046	13,281	-3,765
1984	59,834	62,814	-2,980	15,917	14,816	-1,101
1985	81,995	77,054	4,941	24,803	20,861	-3,942
1986	148,101	129,382	18,719	50,699	48,787	-1,912
1987 (P)	\$265,859	\$234,737	\$31,122	\$98,367	\$98,030	\$ 282
1986						
Oct.	\$10,979	\$12,300	\$-1,321	\$ 5,026	\$ 6,011	\$ -985
Nov.	12,033	12,086	-53	3,764	4,095	-331
Dec.	14,100	12,320	1,780	4,507	4,570	-63
1987						
Jan.	17,641	15,964	1,677	5,110	4,906	204
Feb.	20,702	17,598	3,104	7,736	7,175	561
March	23,064	18,001	5,063	7,799	7,015	784
Apr.	20,735	17,390	3,345	8,297	7,124	1,173
May	19,632	15,956	3,676	7,379	8,016	-637
June	18,682	17,054	1,628	9,035	8,778	257
July	23,645	21,883	1,762	8,593	8,583	10
Aug.	24,774	24,554	220	9,047	8,672	375
Sept.	22,468	19,435	3,033	8,204	8,655	-451
Oct.	\$30,206	\$27,779	\$ 2,427	\$10,774	\$12,768	\$-1,994

P = Preliminary, ten months data at annual rates not seasonally adjusted.

SOURCE: U.S. Treasury Bulletin (various issues)

TABLE 1
Correlation Coefficients Between Stock Indexes
in the United States (S&P 500) and Tokyo
(Tokyo Exchange Composite) -- October 12 to October 23, 1987*

All Percentages are Calculated
from the Prior Trading Day's Close

United States leading Tokyo

United States percentage change the day before and the percentage change in Tokyo at the open.	.4183 (10)
United States percentage change the day before and the percentage change in Tokyo after one hour of trading.	.8473 (10)
United States percentage change the day before and the percentage change in Tokyo at the close.	.8929 (10)

Tokyo leading the United States

Tokyo percentage change at the close and same day United States percentage change at the open.	.2220 (10)
Tokyo percentage change at the close and the same day United States percentage change at 10:00 A.M.	.1440 (10)
Tokyo percentage change at the close and the same day United States percentage change at the close.	.0744 (10)

* Number of observations in parentheses

SEC Telephone Complaints by Week

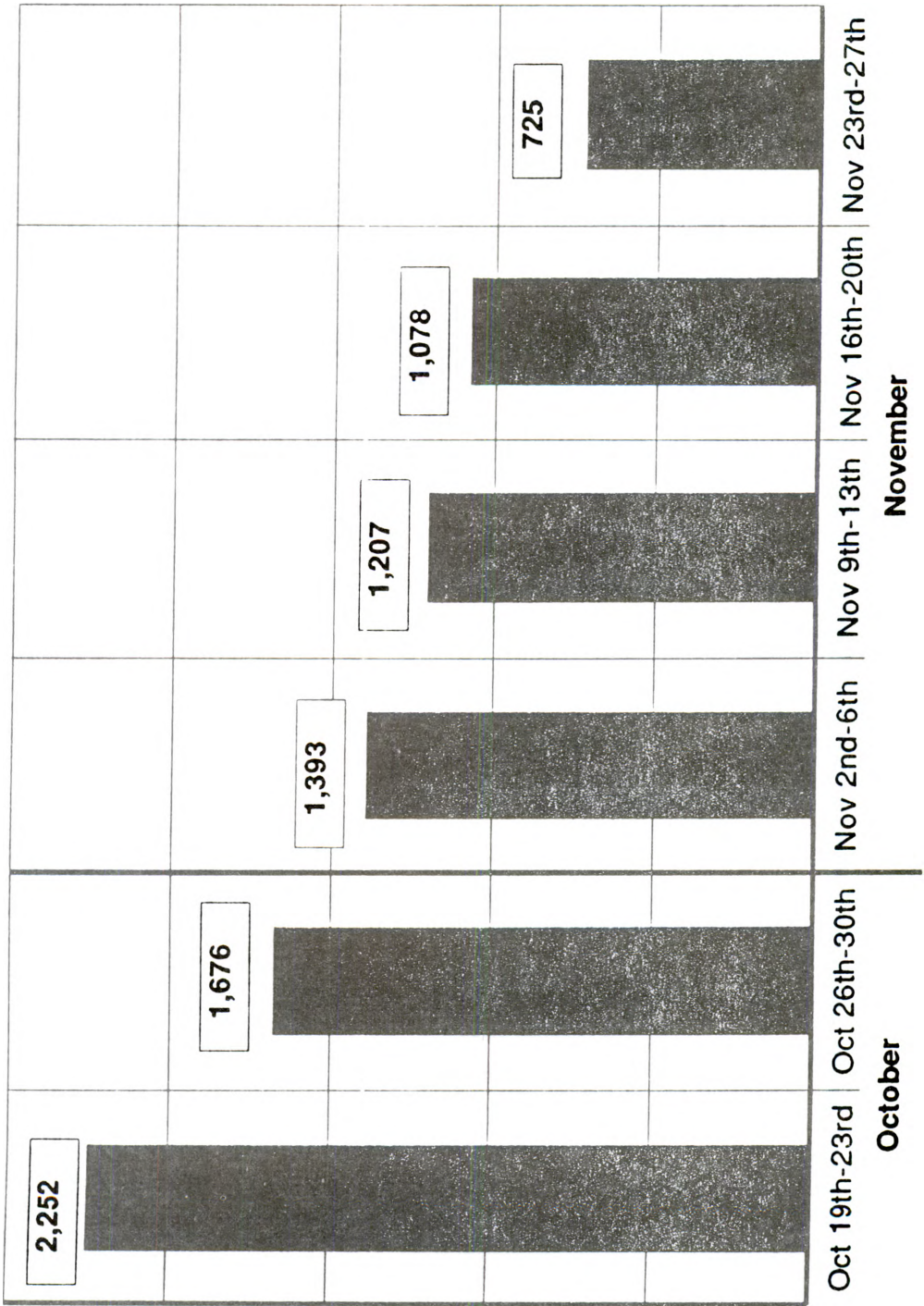


Table 12-2

The SROs submitted information on approximately 5,070 telephone complaints. Of these, 2,972 calls were received by the New York Stock Exchange ("NYSE"). The National Association of Securities Dealers ("NASD") estimated that 1,870 calls were handled by its headquarters and district offices. The only other SROs reporting substantial telephone traffic related to the market break were the Chicago Board Options Exchange ("CBOE") with 120 calls and the American Stock Exchange ("Amex") with 86. The SROs' analyses of their telephone complaints revealed that execution problems were predominant, although numerous problems involving confirmations and margin accounts were also cited. This analysis of trends paralleled the Commission's experience.

C. Analysis of Written Complaints

A total of 1,283 market break complaint letters, representing 1,973 categorized complaints, were analyzed for this Study. The 620 letters to the SEC contained 1,170 categorized complaints, or an average of 1.9 complaints per letter. The 663 letters to the SROs contained 803 complaints, or 1.2 complaints per letter. The difference in categorized complaints per letter was primarily attributed to differences in the extent to which the Office received general comments and complaints about the market break, program trading, and similar issues. ^{3/} Table 12-3 provides a summary of the letters and complaints received by each of the SROs and SEC offices.

Over 97% of the written complaints were related to problems experienced by individual investors. Of these, 91% represented investors who wrote directly to the SEC or to one of the SROs, approximately 3% of the complaints came from individual investors through a representative (e.g., Congressman or attorney), and 3% were from brokers writing on behalf of individual investors. The remaining 3% were divided between complaints from institutional investors and brokers themselves.

The overall distribution of complaints by category (representing all entities) is shown in Table 12-4. Execution problems represented the largest single category of complaints, accounting for over 43% of the total received and almost equaling the total percentage of the next five categories in the ranking. Three categories, public commentary, ^{4/} confirmation problems, and margin problems each accounted for approximately 10% of the total complaints.

^{3/} There also were noticeable differences in the extent to which the various SEC offices and SROs identified and categorized multiple complaints as provided for in the special computer program.

^{4/} The public commentary category was used to track complaint letters containing general comments, complaints, or suggestions on the market break situation, program trading, or degree of SEC or SRO intervention; questions about broker solvency/insolvency or the Securities Investor Protection Corporation; and general allegations that firms put their own interests before investors' interests. These general complaints and comments provided an indication of public sentiment and perceptions of the market break. Allegations of firms' promoting their own interests ahead of investors' will be reviewed for possible referral during complaint handling in the context of the specific situation or problem.

Complaints were also analyzed by the type of entity about which the complaint was lodged, as shown in Table 12-5. Broker-dealer (BD) complaints represented almost 74% of the total complaints categorized and were the subject of approximately 72% of the letters.

Table 12-3. SUMMARY OF LETTERS AND COMPLAINTS

SEC	<u>Letters</u>	<u>Complaints</u>
Headquarters	263	620
Atlanta Regional Office	19	38
Boston Regional Office	35	35
* Chicago Regional Office	52	66
** Denver Regional Office	20	21
Fort Worth Regional Office	27	39
Houston Branch Office	27	81
Los Angeles Regional Office	46	49
Miami Branch Office	11	30
New York Regional Office	34	70
Philadelphia Regional Office	22	30
San Francisco Branch Office	42	60
Seattle Regional Office	22	31
SEC Total:	<u>620</u>	<u>1170</u>
SRO		
American Stock Exchange (Amex)	58	60
Chicago Board Options Exchange (CBOE)	114	116
National Association of Securities Dealers (NASD)	250	356
New York Stock Exchange (NYSE)	230	253
Philadelphia Stock Exchange (Phlx)	9	14
Pacific Stock Exchange (PSE)	2	4
SRO Total:	<u>663</u>	<u>803</u>
SRO & SEC Total:	<u>1283</u>	<u>1973</u>

* Includes complaints received by the Detroit Branch Office.

** Includes complaints received by the Salt Lake City Branch Office.

Table 12-4. OVERALL DISTRIBUTION OF COMPLAINTS BY CATEGORY
(all entities)

<u>Rank</u>	<u>Category of Complaint</u>	<u>SEC</u>	<u>SROs</u>	<u>Total</u>	<u>%</u>
1.	Execution Problems	349	505	854	43.3%
2.	Public Commentary	203	8	211	10.7%
3.	Confirmation Problems	140	65	205	10.4%
4.	Margin Problems	108	91	199	10.1%
5.	Mutual Fund Problems	131	24	155	7.8%
6.	Miscellaneous	74	56	130	6.6%
7.	Access Problems	89	30	119	6.0%
8.	Allegations of violations, abuse, or faulty advice	76	24	100	5.1%
	Total	<u>1170</u>	<u>803</u>	<u>1973</u>	<u>100.0%</u>

Table 12-5. COMPLIANT DISTRIBUTION BY ENTITY TYPE

<u>Rank</u>	<u>Entity Type</u>	<u>Total Complaints</u>	<u>%</u>	<u>Number of Letters</u>	<u>%</u>
1.	Broker-Dealer (BD)	1451	73.5	928	71.7
2.	General and Miscellaneous (GN)	206	10.4	118	9.1
3.	Self-Regulatory Organizations (SR)*	155	7.8	142	11.0
4.	Mutual Fund (MF)	134	6.8	91	7.0
5.	Transfer Agent (TA)	10	0.5	5	0.4
6.	Bank (BK)	9	.5	6	0.4
7.	Investment Adviser (IA)	7	.4	4	0.3
8.	Issuer (IS)	<u>1</u>	<u>0.1</u>	<u>1</u>	<u>0.1</u>
	TOTAL	1973	100.0%	1295**	100.0%

* This code was used by some SROs to categorize complaints about options market makers, specialists, and SRO order execution facilities.

** Some letters contained complaints against more than one entity type.

1. Broker-Dealer Complaints

Broker-dealer ("BD") complaint data was analyzed separately, in order to facilitate more direct comparisons between SEC and SRO data. The pie chart in Table 12-6 shows the relative percentages of BD complaints by problem category. In addition, as shown in Table 12-7, the findings were compared with summary information on market break complaints received by a selected group of broker-dealers that accounted for a substantial portion of NYSE volume during the October market break. ^{5/}

Execution problems (48% of total BD complaints) represented 40% of complaints received by the SEC and 59% of complaints received by the SROs. Complaints categorized by the SEC and SROs indicated that failure to execute an order was the problem most frequently encountered, constituting 45% of all execution problems. Also significant, in descending order of importance, were pricing problems, delayed execution of orders, and problems specifically associated with specialist or market maker performance. These three additional problem areas totaled 47% of the execution category. In comparison, 45% of complaints received by the selected group of broker-dealers related to execution problems.

Confirmation problems was the second largest category of BD complaints, accounting for 17% of SEC complaints and 10% of SRO complaints. Inability to obtain or delays in receiving oral confirmations represented 60% of these problems, and the remaining 40% were various problems with written confirmations such as late or no written confirmation and discrepancies between oral and written confirmations. In addition, supplemental sheet entries described several cases of subsequent corrections made to written confirmations adjusting the price to either the maximum limit set by the investor in a limit order or to the maximum/minimum price of the issue for the day (depending upon whether the order was a buy or sell order, respectively). For the complaints received by the selected group of broker-dealers, lack of oral confirmations accounted for 9% of complaints received and problems with written confirmations were included in their "general" category.

Problems associated with margin accounts comprised the third largest category of BD complaints, accounting for 13% of SEC complaints and 14% of SRO complaints. Almost 84% of margin-related complaints concerned lack of notice or time to meet margin calls and/or of liquidation of their position or account without notice. Other complaints described changes from brokers' past practices with regard to handling margin calls; unknown or changing margin requirements; and complaints about the extent of liquidation of holdings or the particular sales made to cover margin calls. The supplemental notations contained a number of allegations that investors were not aware they had been placed in margin accounts or were not aware of the specific provisions for margin calls or account liquidations. The selected group of broker-dealers reported

^{5/} The Division of Market Regulation requested and received reports of written (and in some cases oral) customer complaints from a selected group of 25 broker dealers that have an aggregate of close to 13 million customer accounts. These firms were asked to report total complaints in five categories: inability to contact the broker-dealer, verbal confirmation problems, execution problems, lack of notice related to margin accounts, and other.

Total Broker-Dealer (BD Entity) Complaints by Category

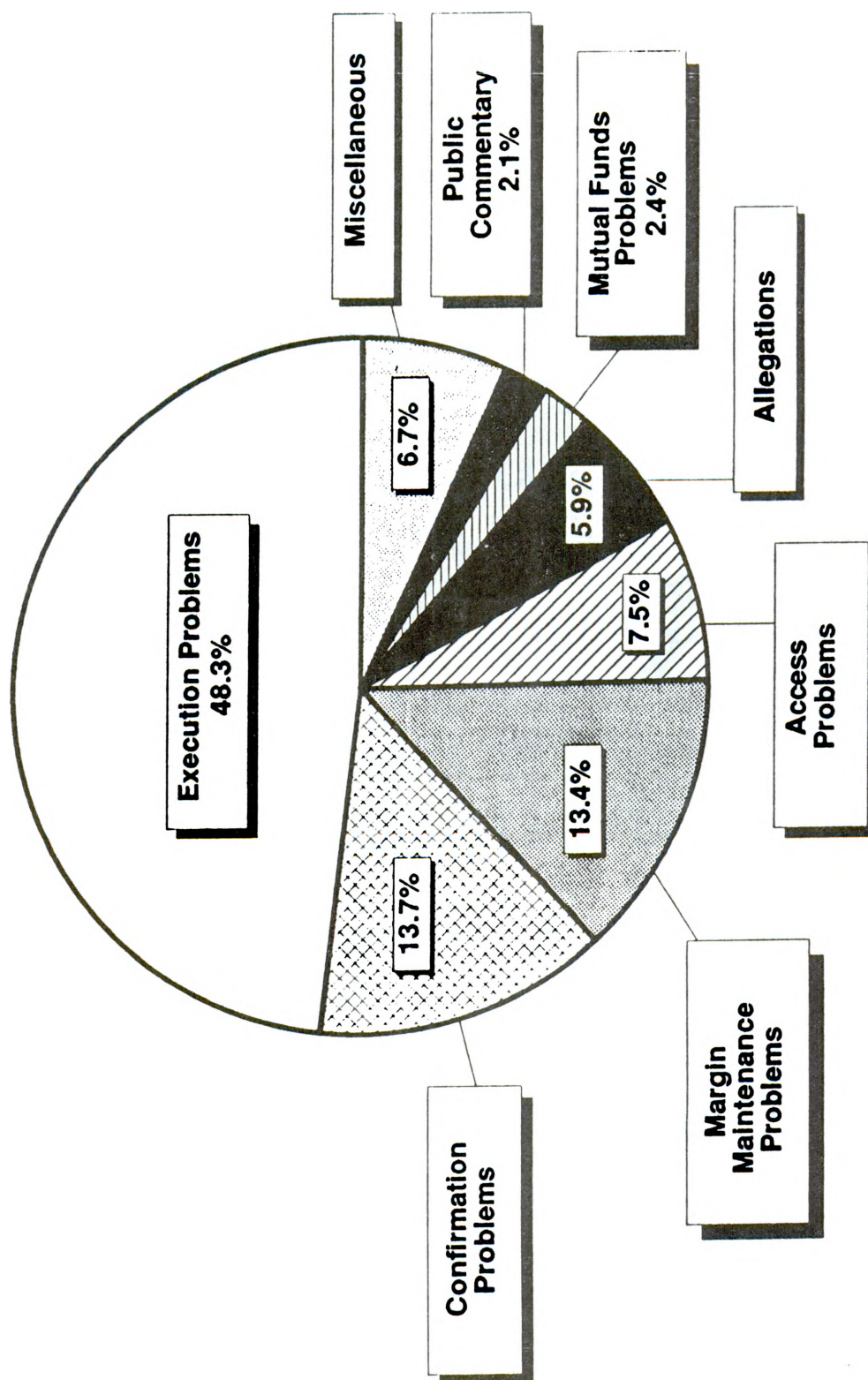


Table 12-6

COMPLAINTS TARGETED AT BROKER-DEALERS (AS ENTITY)						
Type of Complaint	SEC		SROs		Selected Broker-Dealers	
	#	%	#	%	#	%
Execution No execution Delay Price Discrepancies Specialist/Market Maker Stop/limit orders Systems Problems Refusals to accept orders	77	39.6%	165	59.1%	1243	44.9%
	65	9.5	72	25.7		
	82	8.0	61	11.2		
	22	10.1	30	9.5		
	24	2.7	22	4.7		
	19	3.0	16	3.4		
	32	2.3	13	2.5		
		4.0		2.0		
Confirmation No/Late Oral Confirmations Problems with Written Confirmations	134	16.5%	65	10.1%	269	9.7%
	79	9.8	40	6.2	269	*
	55	6.8	25	3.9		
Margin Liquidation without notice Insufficient time or notice Other	104	12.8%	91	14.2%	501	18.1%
	46	5.7	35	5.5		
	41	5.1	41	6.4		
	17	2.1	15	2.3		
Access To Brokers To Quotes	81	10.0%	28	4.4%	182	6.6%
	55	6.8	24	3.7	182	*
	26	3.2	4	0.6		
General Alleged abuses Mutual-fund specific Public commentary Miscellaneous	170	21.0%	78	12.1%	573	20.7%
	64	7.9	22	3.4		
	20	2.5	15	2.3		
	25	3.1	5	0.8		
	61	7.5	36	5.6		
	810		641		2768	
*complaints would be included in general category						

Table 12-7

that over 18% of their complaints concerned lack of notice in connection with margin accounts.

Another area of complaint concerned the inability to contact a broker or to obtain timely or accurate price quotes. These complaints, which accounted for 8% of the BD problems, were typically a secondary complaint in the letter, although they tended to exacerbate the main problem, particularly in cases of inability to contact brokers in connection with margin problems. As expected, the overall distribution by date of complaints about inability to contact brokers showed that investors had the most difficulty reaching brokers and mutual funds on October 19 and 20, when 39% and 48% of these complaints, respectively, were reported to have occurred. Inability to contact brokers accounted for 10% of SEC and 4% of SRO BD complaints. Almost 7% of the complaints received by the selected broker-dealers concerned inability to contact the broker. Inability to obtain quotes was included in their general category.

Allegations of securities law violations, faulty advice and breach of fiduciary duty accounted for 6% of the SEC and SRO BD complaints. These complaints were not broken out in the data received from the selected group of broker-dealers and are included in the general category, which constituted 21% of their complaints. The remaining BD complaints to the Commission and SROs were related to mutual fund problems (2%), public commentary (2%), and miscellaneous (7%).

a. Comparison of Complaints by Type of Broker-Dealer

The complaint data was analyzed by the broker-dealer firm named in the complaint. Those firms about which ten or more complaints were received were identified and categorized as Discount, National Full Service or Other. The categorization as Discount or National Full Service was based upon a number of factors including the firm's customer account base, its classification by the NASD, and the firm's description as provided in Standard & Poor's Security Dealers of North America (1987 Edition). This subset of broker-dealers represents over 48% of the entire database of complaints and is a reasonably representative sample. Table 12-8 depicts the distribution within the subset by proportion of complaints and proportion of customer account base for each category, as well as the average number of complaints per 1000 accounts and the range of average complaints for firms within the category.

Table 12-8 highlights the higher proportion of complaints targeting those firms in the Discount and Other categories relative to their respective customer account bases. It also points out the lower proportion of complaints (relative to the account base) citing National Full Service firms. A comprehensive comparison of the three categories by type of complaint is presented in Table 12-9.

As Table 12-8 illustrates, the firms in the Discount category received a greater proportion of complaints relative to their known account base in all categories, and more than their overall percentage of complaints in the execution, confirmation, and access areas. Access complaints constituted the highest proportion of complaints. It is likely that the overall number of executions handled by Discount firms was greatly increased; however, the percentage of problems reported by investors is still very significant. The one Discount firm included in the group of selected broker-dealers who reported on investor complaints received directly, provided similarly high levels of investor complaints across the board.

The four firms in the Other category are generally regional firms; however, given the small sample and its not being representative of the majority of regional firms, no general conclusions can be drawn. These particular firms received a greater proportion of complaints relative to their account base in all categories; however, this was not true for all regional firms in the database, most of which received fewer than 10 complaints.

In contrast, the National Full Service firms received both the lowest proportion of complaints relative to account base and the lowest ratio of complaints per 1000 accounts. Care must be exercised in drawing definitive conclusions from this subset and categorization of firms. Factors such as each firm's level of trading activity during the period, peak period operating capacity and identified business philosophy or objectives must be taken into account, as well as the unprecedented volume experienced during the market break.

Table 12-8. COMPLAINT DISTRIBUTION BY TYPE OF FIRM
(Firms with 10 or more complaints)

<u>Category</u>	<u>Proportion of Customer Acct. Base</u>	<u>Proportion of Complaints</u>	<u>Average Number of Complaints per 1000 Accounts</u>	<u>Category Range of Average Complaints</u>
Discount	13.0%	49.3%	.36	.052 - .602
National	85.8%	44.0%	.03	.015 - .070
Other	1.2%	6.7%	.95	.085 - 2.00
Total	100.0%	100.0%		

BROKER-DEALER FIRMS					
Accounting for 10 or More Complaints			Total 958 = 48.5 of all complaints		
Type of Complaint	Discount (7 firms) #	National (11 firms) #	Other (4 firms) #	Total	
Execution					
Sub-total	200	196	36	100%	
No execution	52	69	19	8.3%	
Delay	36	41	4		
Price Discrepancies	55	43	3		
Specialist/Market Maker	8	15	0		
Stop/limit orders	25	15	1		
Systems Problems	16	4	3		
Refusals to accept orders	8	9	6		
Confirmation					
Sub-total	86	42	9	6.6%	100%
No/Late Oral Confirmations	50	25	5		
Problems with Written Confirmations	36	17	4		
Margin					
Sub-total	79	60	5	3.5%	100%
Liquidation without notice	27	28	1		
Insufficient time or notice	34	24	3		
Other	18	8	1		
Access					
Sub-total	57	16	8	9.9%	100%
To Brokers	43	7	7		
To Quotes	14	9	1		
General					
Sub-total	50	108	6	3.7%	100%
Alleged abuses	9	51	0		
Mutual-fund specific	0	17	0		
Public commentary	12	9	1		
Miscellaneous	29	31	5		

Table 12-9

b. Sales Practice Complaints Related to the Market Break

The CMPI mainframe tracking system was researched to identify SEC market break complaints that alleged sales practice abuses. Percentages of complaints alleging sales practice abuses against broker-dealers were compared for the market break and for all broker-dealer complaints during several time frames. The relative percentages of complaints primarily concerning execution problems and margin problems were likewise compared. Table 12-10 summarizes the result of these comparisons.

The CMPI data substantiates the finding that order execution problems accounted for the largest percentage of market complaints. ^{6/} Whereas only 9% of total FY 1987 broker-dealer complaints involved order execution problems for equities or options transactions, 49% of the market break complaints focused on this problem.

Margin account problems was the category of complaint that showed the largest increase in percentage, from .7% for FY 1987 to 17% for the market break complaints, an increase of twenty-four fold. Seventy-two market break complaints concerned margin problems; however, only 137 similar complaints were registered during all of FY 1987. As evidenced by the earlier discussion of margin problems identified by the special market break coding system, these complaints primarily dealt with situations in which no notice or what was characterized as inadequate notice of margin calls was given, with investors' positions in many cases being liquidated to cover maintenance margin requirements. It should be noted that margin agreements typically provide the broker wide latitude to take action to meet margin requirements without providing notice. A few margin-related complaints raised questions of suitability.

The overall percentage of sales practice complaints related to the market break (13%) was 3% less than the percentage of sales practice complaints for FY 1987, according to CMPI data. The drop is primarily attributable to a decrease in complaints of "High pressure sales, fraudulent statements, or churning." By comparison, two other individual sales practice code percentages were higher for market break complaints than for the fiscal year. Unauthorized transactions in equity securities were alleged in 6.1% of market break complaints but only 4.8% of FY 1987 BD complaints. Option account suitability problems showed a slight increase for market break complaints; however, with only three market break complaints, the sample is too small to draw a conclusion.

When a preliminary analysis of these same categories of sales practice complaints was prepared on December 4, 1987 for a Congressional staff briefing, the analysis showed that 10% of the market break complaints received at that time concerned sales practice problems. The increase to 13% in the intervening three weeks, along with a slight decrease in the percentage of order execution problems from 51% to 49%, is understandable assuming that most complainants first try to resolve problems directly with their brokers before writing to the SEC. Order execution problems involve a specific incident that occurred at a particular point in time and these problems tend to be more clear-cut, so that the broker's position in a dispute can be more quickly identified. Sales practice problems, on the other hand, frequently involve the entirety of the account history and particularly the relationship between the investor and the

^{6/} Since the CMPI system tracks only one complaint per letter and the PC based system established for this study tracked multiple complaints, the percentages in this section differ slightly from the percentages discussed above.

COMPARISON OF SALES PRACTICE, MARGIN, AND ORDER EXECUTION COMPLAINTS Market Break vs. All Complaints				
Complaint Codes & Categories/Numbers	ALL FY 1987 (prelim.) ¹	October 1986	October 1987 (prelim.) ^{1, 2}	Market Break Letters Oct. 14-Dec. 14 ³
All Complaints & Inquiries	40,441	3,315	3,698	648
All Broker Dealer Complaints	19,763	1,484	2,080	423
Sales Practices				
12—High Pressure Sales, Fraudulent Statements, or Churning	1,959 (9.9%)	134	186	25 (5.9%)
24—Unauthorized Transactions	948 (4.8%)	69	97	26 (6.1%)
25—Suitability Problems — options	105 (.5%)	11	8	3 (.7%)
29—Unauthorized Trans- actions — options	57 (.3%)	7	8	0
Total %	3,069 (15.5%)⁴	221 (15 %)	299 (14%)	54 (12.7%)
Margin Problems				
10—Margin	111	9	54	65
28—Margin — options	26	0	8	7
Total (%)	137 (.7%)	9 (.6%)	62 (3%)	72 (17 %)
Order Execution				
06—Execution of Order	1,651 (8.4%)	129	363	192 (45.4%)
27—Execution of Order — Options	101 (.5%)	8	17	17 (4.0%)
Total (%)	1,752 (9.1%)	137 (9 %)	380 (18%)	209 (49.4%)
¹ Preliminary figures —not all complaints received within this time frame have been entered into SEC's CMPI system in regions. Based on December 17, 1987 printout. ² Due to the volume of telephone complaints in late October, the majority of telephone complaints received were not documented for entry into CMPI. ³ Written market break complaints were tracked with a special designator in the CMPI system. On-line statistics as of December 30, 1987. ⁴ Percentages computed as total of all BD complaints, not all complaints and inquiries.				

Table 12-10

registered representative; therefore, the broker-dealer tends to require more time to research the situation and respond to the investor. This built-in delay, which would account for the increase in percentage of sales practice complaints between December 4 and December 30, would also lend support to the hypothesis that as additional market break complaints are received, the proportion of sales practice complaints would also be higher.

Information on the market break supplemental coding sheets was also reviewed to identify alleged sales practice abuses. In particular, the review centered on supplemental entries for allegations of violations, abuse, or faulty advice; margin problems; and miscellaneous. For SEC complaints, the vast majority of the notes relating to sales practices repeated the problem identified by the corresponding CMPI code.¹⁷ The following table (Table 12-11) contains SRO and additional SEC complaints that had textual notes indicating sales practice problems. These SEC complaints are distinguished from those included in Table 12-10 because the sales practice notes represented secondary rather than primary problems, which therefore were not captured on the CMPI system.

Table 12-11. SUPPLEMENTAL SALES PRACTICE COMPLAINTS

	<u>Number of Letters</u>		
	<u>SEC</u>	<u>SRO</u>	<u>Total</u>
Unauthorized transactions (sales or purchases)	4	9	13
Suitability	1	0	1
Churning	2	0	2
Unaware of, or no authorization for, margin account	1	3	4
Unauthorized trading (options)	<u>2</u>	<u>0</u>	<u>2</u>
TOTAL	10	12	22

Of the complaints analyzed for the study, sales practice complaints represented a smaller percentage of BD complaints than are normally received. Nevertheless, the letters containing such potential sales practice abuses described situations that were amplified by the market volatility. For example, one investor held a margin account with an equity position of over \$210,000 on Friday, October 16. After the market's severe drop on October 19, the account had an ~~unsecured~~ deficit of over \$170,000. The investor was unable to meet a margin maintenance call; consequently the account was liquidated, resulting in a debit balance of approximately \$116,000. This deficit was primarily due to the fact that the account was short index put options.

In this instance the investor did not raise the issue of suitability. However, questions arise concerning the amount of money at risk as well as the investor's understanding of the product involved. Whether this complaint and other complaints in this category involve actual sales practice abuses depends on the investor's overall

¹⁷ The balance of supplemental notes included with the entries primarily related to execution errors or to back-office problems (payments, fees, delivery, etc.).

trading history, investment objectives and financial condition. The regular complaint handling process, which generally includes an opportunity for the firm to respond to the complaint letter, will shed additional light on which complaints involve actual sales practice abuses. In those cases, appropriate referrals will be made.

2. Complaints Concerning Mutual Funds

Mutual fund complaints were reviewed in the aggregate as a category of complaints involving a type of security. Mutual fund complaints, which accounted for 9.6% of the total market break complaints, were most frequently directed at the mutual funds as the entity responsible for the problem (70.5%), but complaints were also directed at broker-dealers (18.4%), transfer agents (5.3%), banks (3.7%) and investment advisers (2.1%). ^{8/} Table 12-12 provides the distribution of complaints by general category and entity, with the SEC and SRO complaints against mutual funds ("entity") identified separately.

Only 7% of all complaint letters analyzed by the SEC and SROs were directed at mutual funds. ^{9/} SEC staff identified 122 problems in the 82 letters received (1.5 complaints per letter), while SROs found 12 complaints in the 9 letters analyzed (1.3 complaints per letter).

The 35 broker-dealer (BD) complaints concerning mutual fund investments accounted for 18.4% of all mutual fund related complaints but only 2% of the market break complaints about broker-dealers. Of these 35 complaints, at least 26% involved a mutual fund sponsored by the broker-dealer named in the complaint.

Overall, 76.8% of mutual fund complaints involved, generally, redemptions and transfers. Delayed redemptions were the most frequently cited problem, accounting for almost 30% of all mutual fund complaints. Problems involving transfers within a "family" of funds was second, accounting for almost 23% of total mutual fund complaints. Other redemption complaints were divided among the subcategories of redemption procedures, exit fees, and miscellaneous matters.

The remaining 23.2% of mutual fund complaints was distributed among the six categories shown in Table 12-12 under the caption "Other". Of significance is the small number of complaints in these "Other" categories. Only 8 complaints (4.2% of mutual fund complaints) related to the inability to contact funds by telephone (access problems), which was surprising given that the SEC had received a substantial number of telephone complaints about this during the week of October 19 and considerable media attention had been focused on this aspect of mutual fund performance during the market break. A similar small percentage (4.2%) of mutual fund problems involved sales practice problems, such as misrepresentation of market risks and faulty advice or breach of fiduciary duty.

^{8/} All but four of the small number of complaints concerning transfer agents, banks and investment advisers dealt with mutual fund transactions.

^{9/} CMPI data show that 8.5% of complaint letters received by the Commission in FY 1987 concerned mutual funds.

COMPLAINTS RELATING TO MUTUAL FUNDS

(Targeting Mutual Funds, Broker-Dealers and Other Entities)

OTHER													
TYPE	TRANSFERS		REDEMPTIONS			Other Difficulties	Confirmation	Pricing	Access	Public Commentary	Sales Practices Allegations	Miscellaneous	TOTALS
	Intra-Family	Inter-Family	Delayed	None									
Entity	28	6	27	2	21	3	14	7	6	2	122	64.2%	
SEC: Mutual Fund Entity								1	1		12	6.3%	
SRO: Mutual Fund Entity	4		6					3		1	35	18.4%	
BD Entity with Mutual Fund Complaint	10	2	14		5						10	5.3%	
Transfer Agent Entity with Mutual Fund Complaint			4	3	3						7	3.7%	
Bank Entity with Mutual Fund Complaint			4		3						4	2.1%	
Investment Advisor Entity with Mutual Fund Complaint	1	1	1	1	1						3	1.6%	
TOTALS	43	9	56	5	33	17	3	8	6	7	190	100%	
	22.6%	4.7%	29.5%	2.6%	17.4%	8.9%	1.6%	4.2%	3.2%	3.7%	1.6%		

Table 12-12

Table 12-12

Under the direction of the Division of Investment Management, ("Investment Management"), the regional offices conducted limited inspections of 16 fund complexes and 4 transfer agents to obtain information on the number and type of complaints and inquiries they received. While most of the funds and transfer agents inspected did not have records identifying by category the complaints and inquiries received, 10/ the regional office examiners were able to collect data on the number of telephone and written complaints and inquiries. Table 12-13 shows the weekly tally over a five week period.

Table 12-13. COMPLAINTS AND INQUIRIES RECEIVED BY THE
MUTUAL FUNDS AND TRANSFER AGENTS INSPECTED

October 12 to 16	297,768
October 19 to 23	443,596
October 26 to 30	312,139
November 2 to 6	239,464
November 9 to 13	219,107

The findings of those inspections indicated that the funds and transfer agents examined, on average, experienced roughly a 50% increase in the level of shareholder complaints and inquiries during the week of October 19 as compared to the level of complaints received during the preceding week. The largest surge of investor complaints and inquiries experienced by one fund was 72%.

Data from the only fund complex that could distinguish complaints from inquiries and categorize them revealed that complaints accounted for only 6% of the total calls and letters received. The remaining shareholder contacts were considered inquiries. Most complaints were related to problems experienced by shareholders in executing fund share transactions, primarily transfers and other redemptions, as illustrated in Table 12-14.

10/ While Rule 31a-1 under the Investment Company Act of 1940 requires funds and their agents to maintain copies of written complaints received from investors, it does not require funds to categorize these complaints in any particular way or to categorize them at all. Furthermore, it does not prohibit funds from filing complaint letters in ways that are associated with individual shareholder accounts so that retrieving all shareholder correspondence received in a particular period during an inspection is virtually impossible. Normally, this approach to filing complaints does not impede the inspection process. Within the time constraints imposed on the limited inspections, however, it would not have been feasible for the regional office staff to attempt to retrieve and categorize all complaints and inquiries received from investors during even part of the five-week period reviewed.

Table 12-14. MOST FREQUENT COMPLAINTS -- ONE COMPLEX'S EXPERIENCE

<u>Complaint</u>	<u>Percentage Week of Oct. 19</u>	<u>Average Percentage Week of Oct. 12 to Week of Nov. 13 (excluding) Week of Oct. 19</u>
Problems transferring between funds	27%	11%
Non-execution or delayed execution of transactions	12%	6%
Inability to contact the fund or its transfer agent <u>11/</u>	14%	4%

Of the total of 19 entities examined, 5 reported that they did not experience a significant increase in either the volume of transactions or the number of complaints and inquiries during the week of October 19. Those fund groups that did have significant increases in the volume of complaints uniformly reported being able to handle the increased volume without delaying the processing of transactions. The profile of complaints resulting from Investment Management's review was generally consistent with the analysis of SEC and SRO complaints.

3. Complaints Directed at Self-Regulatory Organizations

Of the complaint data targeting SROs as the entity about which the complaint is made (SR category), 84% were received by the SROs themselves, while only 16% were received by the SEC. There were 155 SR complaints constituting 8% of the entire data base. 12/ Once again, execution problems were most prevalent, accounting for 80% of the complaints targeting SROs. An even more striking statistic is that "problems

11/ This problem was primarily attributed to an insufficient number of telephone lines to handle the extremely high number of shareholders calling in; however, some problems were also attributed to overloading the telephone company's trunk line in one area.

12/ This entity code was used by some SROs to categorize complaints about market makers, specialists, and SRO order execution facilities.

specifically associated with market makers' or specialists' performance" accounted for 65% of all SR complaints. The other 20% of the complaints in this category were categorized as general. There were no complaints about margin problems and only one complaint concerning a written confirmation was found within the SR category.

The CBOE submission accounted for 75% of the SR complaints received and 78% of the SR coded complaints. Most of these complaints named market makers in "the crowd" on the floor of the exchange who are responsible for fixing prices on various options products. Since those market makers are members of the CBOE, complaints against them were designated as complaints against the CBOE. It should be noted that a majority of these complaints (94%) involve pricing or execution problems and, as such, are attributable to the CBOE in its capacity as a market, rather than in its capacity as a regulator.

4. Market-Specific Complaints

Complaints were also analyzed in relation to the market or exchange upon which the transaction complained about was executed. The exchange/market was identified in 56% of the complaints. The remainder either did not identify a particular market or the market category did not apply (e.g., general complaints and inquiries or mutual fund problems).

Table 12-15 provides the breakdown of complaints identified by market for confirmation and execution problems, as well as the proportion of total complaints identified for each market.

Table 12-15. MARKET-SPECIFIC COMPLAINTS WHERE MARKET WAS IDENTIFIED

<u>Market</u>	<u>% of Total Complaints</u>	<u>Confirmation Problems</u>		<u>Execution Problems</u>	
		#	%	#	%
NYSE	25.0%	95	66.0%	276	41.7%
NASDAQ	10.7%	19	13.2%	131	19.8%
CBOE	10.5%	10	6.9%	154	23.3%
Amex	4.9%	9	6.3%	56	8.4%
OTC	3.4%	10	6.9%	28	4.2%
Phlx	1.0%	0		11	1.7%
PSE	.5%	1	.7%	6	.9%
	56.0%	144	100.0%	662	100.0%

As expected, the number of complaints citing problems with transactions on these respective markets is reasonably proportionate to the volume of trading on each. However, there were several instances where a particular market received a disproportionate share of complaints. For example, 66% of the confirmation problems were experienced in connection with transactions on the NYSE. The only other market with a significant percentage in this category was the NASDAQ which was cited in 13.2% of these complaints.

Analysis of execution problems revealed that over 70% of the complaints were concentrated in three subcategories: non-execution of orders (31.9%); delays in the execution of orders (19.2%); and problems specifically associated with specialists' or

market makers' performance (19.3%). Table 12-16 presents the percentage of complaints attributable to each market.

Table 12-16. SPECIFIC EXECUTION PROBLEMS BY MARKET

	<u>NYSE</u>	<u>NASDAQ</u>	<u>CBOE</u>	<u>Amex</u>	<u>OTC</u>	<u>Other</u>
No Execution	42.2%	21.3%	8.5%	6.2%	4.6%	17.3%
Delays	27.7%	18.1%	10.3%	2.5%	4.5%	36.9%
SP/MM Performance	16.0%	3.2%	63.4%	11.5%	.1%	5.8%

It should be emphasized that this data does not necessarily reflect the performance of a given market, since the complaint may not result from a problem with the market itself but may have occurred at some other stage in the transaction process. However, complaints of problems associated with specialists' or market makers' performance are attributable to a particular market. Table 12-16 shows that the CBOE was most often cited, with the Amex also showing a relatively high percentage compared to its other complaint percentages.

5. General Inquiries and Complaints

The General and Miscellaneous (GN) category of complaints represented 10% of the total complaints and 9% of the letters. Ninety-four percent of these complaints were filed with the SEC. Most significant of the SEC general complaints were: comments or suggestions on the degree of SEC or SRO intervention (36%); comments on program trading (34%); and general comments and complaints on the market break (19%).

The overall theme of the GN category concerned investors' vehement opposition to program trading. Most complaints categorized as the degree of SEC or SRO intervention were actually requests for SEC action to curtail program trading. A number of investors called on the SEC to eliminate program trading altogether. Specific suggestions for improving the market included restricting program trading to a limited number of hours each trading day, imposing a small tax on each securities trade, placing daily fluctuation limits on stock index futures, eliminating street name holdings of securities for hidden owners, developing further the Commission's short sale rule and abolishing all sell or buy orders "at the market." While other causes for market volatility were named, such as overpriced corporate shares due to misapplication of corporate income tax and changes in long term capital gains tax law, investors were virtually unanimous in their perception that program trading is a detriment to the stock market, and that it places the small investor at an unfair disadvantage.

D. Comparison With Other Sources of Investor Complaint Data

Data collected by the SEC and the SROs was compared and contrasted with that reported by the North American Securities Administrators Association (NASAA), which instituted a hotline to receive investor complaints on November 9, 1987. NASAA reported on 2,562 specific complaints (out of the more than 8,000 total calls received). Of these, they identified 1,321 complaints, or 51.6%, as "crash-specific", and 1,242

complaints as "pre-existing". ^{13/} The "crash-specific" complaints were categorized as follows:

Table 12-17. NASAA COMPLAINTS RELATED TO MARKET BREAK

	<u>No.</u>	<u>% of Crash-specific</u>	<u>% of NASAA Total</u>
Trade Execution Problems	752	56.9%	29.4%
Margin Calls	349	26.4%	13.6%
Broker Not Available	<u>220</u>	<u>16.7%</u>	<u>8.6%</u>
Total	1321	100.0%	51.6%

These complaints are the only ones that appear to be directly comparable to the "market break complaints" definition covered in the scope of the Commission's study of investor complaints. In this regard, the NASAA data is generally consistent with SEC and SRO telephone and written complaint data.

Among the remaining 1,242 pre-existing complaints, NASAA found a high percentage of sales practice complaints. Unsuitable investments (362 complaints) was the most prevalent problem, particularly with regard to options (144, or 39.8%, of those complaints).

Since the NASAA data did not appear to distinguish between pre-existing complaints and those only brought to light by the unprecedented steep decline in prices on October 19, it is difficult to determine the extent to which the market break was associated with the various kinds of sales practice abuses they reported. To date, the written complaints received by the SEC and SROs relating to the market break do not contain similarly high percentages of sales practice abuses. The SEC historical database indicates that approximately 12 - 15% of broker-dealer complaints each year are attributable to sales practice problems. The one category identified in the NASAA statistics that does appear to have rapidly increased as a result of the market break is options-related suitability complaints. The SEC received a total of 105 options-related suitability complaints during all of FY 1987, whereas NASAA received 144 during the first four weeks of the hotline's operation.

Investor complaints are also received in generally smaller quantities by state securities regulators. NASAA, however, testified that no follow-up survey had been conducted to determine the numbers or types of complaints received by the states.

A representative of the Commodity Futures Trading Commission ("CFTC") has indicated that they have received very few complaints related to the market break. The

^{13/} NASAA's Report to the Subcommittee on Telecommunications and Finance, Committee on Energy and Commerce, House of Representatives (December, 1987) defines pre-existing complaints as problems arising as a "consequence of abusive sales practices that had taken place before Black Monday." (emphasis in original)

CFTC normally anticipates a three to six month lag between an investor's experiencing a problem and his or her filing a formal application to their reparations program.

E. Implications for Investor Protection

The market break was a sobering experience to a great many investors. The complaints received underscore the importance of the Commission and the SROs acting decisively to address weaknesses identified during the market break.

As discussed in Chapter Seven, while the volume of the market break was extraordinary, customer complaints concerning order execution and confirmation problems suggest a need for both the firms and the self-regulatory organizations to look carefully at the capacity of existing broker-dealer systems. The customer complaint data will be useful to the SROs in allocating examiner resources to this area. Furthermore, the complaint data suggests a need for a comprehensive review by the SROs of their systems and operational capacity to handle future requirements associated with increased volume. The small investor must be assured of liquidity (ready access to both brokers and the market) and efficient execution of small orders.

Customer complaints relative to margin account problems suggest that this area merits close scrutiny in relation to investor protection. Indications that some investors were unaware of the ramifications of holding a margin account point to the need for better, or more easily understandable, disclosure of the information required under Rule 10b-16 under the Securities Exchange Act of 1934. The feasibility of requiring specific notice and time for investors to meet margin calls (consistent with the need to assure broker-dealer solvency) might be worthy of study, as well as the feasibility of raising futures and options margin requirements.

Disclosure is the cornerstone of investor protection. In addition to margin agreements, the account agreements, options agreements, and risk disclosure statements used by broker-dealers may need to be reviewed and modified as necessary to ensure that they are written in plain language.

It is important for the SEC, in cooperation with the SROs and the securities industry, to take visible and effective steps to correct any systemic problems that may be identified through this study and its aftermath; to utilize the information on investor complaints, including any sales practice abuses that may be uncovered, in targeting examinations; and to positively influence the perceptions of the market held by small investors.

APPENDIXES

APPENDIX A

OCTOBER 6

TRADING CHRONOLOGY FOR OCTOBER 6

On Tuesday, October 6, 1987, the Dow Jones Industrial Average ("DJIA") lost a then-record 91.55 points (3.47%), apparently on little fundamental economic news. The market decline was widely attributed to investor sensitivity to bearish reports by two influential investment advisors, 1/ arbitrage sell programs, 2/ and general concerns over interest rates. 3/

While the price drop was sharpest in the DJIA, each of the U.S. markets experienced similar declines. 4/ The NYSE composite index dropped 4.46 points (2.4%) and declining issues leading advancing issues by 4 to 1 on total NYSE volume of 175,082,030 shares. The Standard & Poors ("S&P") 500 stock index declined 8.86 points (2.7%). Similarly, the composite indexes on the American Stock Exchange ("Amex") and the NASDAQ computerized quotation system for over-the-counter ("OTC") stocks declined 3.89 points (1.1%) and 6.12 points (1.3%), respectively. 5/ The index futures markets also declined sharply, with an 11 point decline (3.3%) in the December expiration S&P 500 index futures ("SPZ") traded on the Chicago Mercantile Exchange ("CME"). Bond prices, on the other hand, climbed abruptly in the last hour of trading, evidently in response to the rapid decline in the DJIA. 6/

I. Summary of Market Movements

While the DJIA declined throughout most of the day, the sharpest movements were at the opening and close when over two-thirds of the decline for the day occurred, largely from price declines in 6 of the 30 index stocks. 7/ Shortly after the opening,

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- 1/ Newswires carried reports from interviews with Robert Prechter, the Elliot Wave theorist, and Peter Eliades, editor of the Stock Market Cycles News letter. See Smith & Garcia, Stocks Plunge, Partly In Reaction To Sell Signals From Forecasters, Wall St. J., Oct. 7, 1987, at 3.
 - 2/ Garcia, Stocks Plunge; Interest Rate Fears, Computerized Sell Programs Cited, Wall St. J., Oct. 7, 1987, at 65.
 - 3/ Wiggins, Dow Drops a Record 91.55 Points on Interest Rate and Dollar Fears, N.Y. Times, Oct. 7, 1987, at A1.
 - 4/ While the Tokyo Nikkei Index actually had risen 70.7 points (0.27%) on October 6, the London Financial Times - Stock Exchange 100 Share Index declined 17.9 points (0.75%).
 - 5/ Amex trading volume was 10.3 million shares, down 1.6% from the previous day; NASDAQ volume was 158.6 million shares, up 8.8%.
 - 6/ Quint, Bonds Rise Abruptly in Final Hour, N. Y. Times, Oct. 7, 1987, at D1.
 - 7/ These stocks were International Business Machines (IBM) (close at 151, down 5 1/2), Merck (MRK)(201, down 7), Phillip Morris (MO)(113 1/2, down 4), Eastman Kodak (EK)(101 3/8, down 1 7/8), Proctor & Gamble (PG)(99 1/2, down 4), and Du Pont (DD) (118 1/2, down 4 1/4).
-

the DJIA dropped below 2,620, recovered about 10 points to 2,627.1 at 10:18, and then declined about 46 points until the last half hour of trading. At approximately 3:30, the DJIA decline accelerated, falling over 30 more points to close at 2,548.63.

Each of these movements in the stock market was preceded by similar price movements in the index futures markets. The SPZ futures on the CME mostly traded at a premium to the value of the stocks comprising the index ("cash value") but less than the theoretical value of the SPZ contract. ^{8/} The SPZ futures traded at or above theoretical value only for brief periods around 9:45 to 9:50, 12:45, 1:15 to 1:20 and 3:50.

II. Breakdown of Trading

As discussed above, while the DJIA declined throughout most of the day, the sharpest movements were at the opening and close, when over 66% of the decline and most of the arbitrage selling on this day occurred.

A. Portfolio Insurance

Portfolio insurance related futures selling does not appear to have been a factor in the SPZ futures trading below theoretical value on October 6. The level of reported portfolio insurance sales of SPZ futures on this day was insignificant, with only 181 contracts sold.

B. Other Index-Related Trading

Almost all of the index arbitrage sales of stock, totaling 16.2 million shares, ^{9/} were executed as part of SPZ programs. ^{10/} As discussed above, throughout most of the day, the SPZ contract traded at premiums below theoretical value, at a level sufficient to close pre-existing arbitrage positions at favorable prices but not sufficient to enable arbitrageurs to execute sell programs to establish new positions. In fact, almost all of the index arbitrage reported in the SPZ contract closed previously established buy programs.

Although arbitrage and non-arbitrage program sales accounted for approximately 12% of volume in all NYSE stocks for the day and 16% of volume in the S&P 500 stocks for the day, stock sales associated with these strategies appear to have been significant contributing factors to the decline at the opening and at the close. The following section of the Appendix provides an analysis of the timing and magnitude of index-related trading during key periods of the trading session.

^{8/} See Chapter One of the Study for a discussion of the theoretical value of a stock index futures contract.

^{9/} Of this 16.2 million shares of index arbitrage selling, 2.4 million shares (15%) were part of customer programs. Of the total arbitrage selling, only 800,000 shares (4.9%) were sold short. See Tables D-4 and D-5, providing breakdowns of short versus long arbitrage and customer versus proprietary arbitrage for October 6 and October 14-20.

^{10/} Conversely, most of the index arbitrage buy programs were executed with Major Market Index ("MMI") futures.

1. Open to 10:00

Within the first ten minutes, the DJIA declined 22.7 points (0.86%) to 2617.4. Thereafter, the DJIA stabilized trading between 2617.4 and 2625.6. The SPZ futures mostly traded at a premium to cash value but less than the theoretical value of the SPZ contract. As a result, index arbitrage programs sold 860,450 shares between 9:30 and 9:40 and an additional 832,700 shares in the next ten minutes ^{11/}. In addition, non-arbitrage programs sold 322,698 shares from 9:30 to 9:50. Total selling from programs involved over 2 million shares, comprising 11% of NYSE volume in S&P stocks from 9:30 to 9:40 and 17% from 9:40 to 9:50.

2. 10:00 to 11:00

The DJIA recovered 2.6 points to 2625.9 from 10:00 to 10:11. Thereafter, from 10:17 to 10:42, the DJIA fell 17.1 points (0.65%) to 2608.8, recovering slightly to 2610.3 by 11:00. The SPZ contract traded below theoretical value throughout this period, and index arbitrage programs sold 702,950 shares (22% of NYSE volume in S&P stocks) from 10:00 to 10:10, 669,384 shares from 10:20 to 10:30 (18% of S&P stock volume), and 1.6 million shares from 10:30 to 10:40 (24% of S&P volume). A non-arbitrage program sold an additional 280,000 shares around 10:35, raising the level of total program selling in this ten minutes to 28% of NYSE volume in S&P stocks.

3. 11:30 to 12:00

From 11:00 to 11:30, the DJIA traded in a five point range, but experienced a sudden 10 point (0.38%) drop to 2597.7 by 11:43, recovering to 2602.6 by 12:00. During the price drop from 11:30 to 11:40, arbitrage programs sold 460,900 shares or 15% of NYSE volume in S&P stocks.

4. 1:40 to 2:20

At 1:40, the DJIA stood at 2605.7, but fell 21.2 points (0.81%) to 2586.3 around 2:20. The sharpest price decline during this period was from 2:00 to 2:10 when the DJIA dropped 13.7 points (0.52%) and 1.1 million shares were sold in arbitrage programs and 661,600 shares were sold in non-arbitrage programs, together representing 45.9% of NYSE volume in S&P stocks.

5. 3:20 to Close

The DJIA lost 43.17 points (1.67%) over this period to close at 2548.63. Thus over 47% of the 91.55 point loss for the day occurred within the last 40 minutes of trading. Index arbitrage selling was especially heavy during this period. From 3:30 to 3:40, 1.4 million shares were sold in arbitrage programs and an additional 531,300 shares were sold in non-arbitrage programs, together constituting 41.8% of NYSE volume in S&P stocks. In the next ten minutes, arbitrage selling more than doubled to 3.5 million shares, and, together with 727,600 shares of non-arbitrage program selling, represented 60.5% of S&P stock volume. Finally, from 3:50 to 4:00, arbitrage and non-arbitrage

^{11/} In addition, four arbitrage buy programs using MMI futures were executed between 9:33 and 9:58.

programs sold 1.8 million shares and 1.6 million shares, respectively, constituting 46.2% of volume in S&P stocks over this period.

OCTOBER 14

TRADING CHRONOLOGY FOR OCTOBER 14

On Wednesday, October 14, 1987, the U.S. securities markets experienced the first of several record price declines, ^{12/} culminating by the end of the week in a pullback of 235.48 points in the Dow Jones Industrial Average ("DJIA") -- representing a 17.5% decline from its August 25 high of 2,722.42. This series of back-to-back market drops set the groundwork for the near chaos that overtook the markets on the 19th and 20th.

Trading volume on October 14 on the New York Stock Exchange ("NYSE") exceeded 209 million shares, ^{13/} a 19.3% increase from the prior week's average daily volume. ^{14/} The Standard & Poors ("S&P") 500 stock index declined 9.29 points (2.95%) on the day, and the NYSE, Amex, and NASDAQ Composite Indexes declined 4.76 points (2.7%), 3.9 points (1.13%), and 6.53 points (1.5%), respectively.

The leading stock index futures market, the Chicago Mercantile Exchange's market in the S&P 500 futures, similarly experienced a significant price decline on October 14. The December S&P 500 future ("SPZ") closed at 305, down 10.65 points (3.37%).

I. Summary of Market Movements

The price declines on October 14 hit the U.S. markets immediately upon their opening and continued to drive prices down most of the day. On the NYSE, except for a relatively stable period from 10:00 to 12:30, the DJIA suffered a series of declines throughout the day, closing at 2412.7, down 95.46 points (3.81%). During much of the trading day, the premium for the SPZ future was below theoretical value. ^{15/} Premium values in the Major Market Index ("MMI") futures contract expiring in November traded below theoretical value for most of the day. The near term October MMI futures traded more erratically during the day, at times trading at discounts to cash.

II. Breakdown of Trading

Overall, it appears that while the sell-off on October 14-16 was broad based, institutional selling was the most significant component on each day. The trading information obtained by the Division from the most active broker-dealers on the NYSE indicates that approximately 47% of selling on the NYSE on the 14th was from institutional accounts, with the remaining 26% and 27% from retail and proprietary accounts, respectively.

^{12/} While the Tokyo Nikkei Index rose 245.8 points (0.93%), the London Financial Times - Stock Exchange 100 Stock Index fell 27.3 points (1.16%).

^{13/} Declining issues lead advancing issues on the NYSE by 1634 to 290.

^{14/} Trading volume on the American Stock Exchange ("Amex") was 9.86 million shares, down 9.5% from the prior week's daily average; volume on the NASDAQ computerized quotation system was 145.5 million shares, down 4.2%.

^{15/} For an explanation of "theoretical" or "fair" value, see Chapter One of the Study.

A. Portfolio Insurance

This preponderance of institutional selling was also reflected in the index futures markets. The CFTC has found that combined net positions (net long and net short) for institutional accounts in aggregate increased from about 2,700 contracts net short on October 9 to nearly 15,000 contracts net short on October 15. ^{16/} While the Division was able to identify sales of only 1732 SPZ contracts (1.5% of SPZ volume) which were directly attributable to portfolio insurance strategies, approximately 27% of this portfolio insurance related selling was concentrated in the last 40 minutes of trading.

B. Other Index-Related Trading

For the entire trading session, only 29.4 million shares (14% of NYSE volume) represented program selling. Of this activity, 26 million shares were sold in index arbitrage programs, 1.4 million shares in index substitution, and 2 million shares in non-arbitrage programs. ^{17/} Of the 27.4 million shares of arbitrage-related selling, 13.4 million shares (49%) were for customer programs, and 5.9 million shares (21.6%) were sold short. ^{18/} The daily aggregate figures, however, fail to describe the effects that highly concentrated arbitrage-related selling had at key periods of the October 14 trading session. The following sections of the Appendix will focus primarily on four trading periods during the day: (1) open through 10:00 (DJIA declined 43.4 points); (2) 12:30 through 1:30 (DJIA declined approximately 24 points); (3) 2:30 through 2:45 (DJIA declined approximately 20 points); and (4) 3:30 through close (DJIA declined 17 points in the last ten minutes of trading). ^{19/}

1. Open to 10:00

During this period, the DJIA moved from 2,508.1, its high for the day, to 2,464.7 for a loss of 43.4 points on NYSE volume of approximately 25,042,280 shares. During this period, the SPZ contract generally traded below theoretical value. ^{20/} Similarly, both the near term and November MMI contracts traded below theoretical value except

^{16/} Interim Report on Stock Index Futures and Cash Market Activity during October 1987 to the U.S. Commodity Futures Trading Commission (November 9, 1987) ("CFTC Interim Report"), at 76.

^{17/} Only 168,700 shares were sold as part of portfolio insurance strategies.

^{18/} See Tables D-4 and D-5.

^{19/} The following program trades were executed throughout the day: (1) an arbitrage sell program for 680,000 shares of stock and 426 MMI contracts and an arbitrage buy program for 440,000 shares and 275 MMI contracts; (2) a non-arbitrage buy programs for 205,000 shares; and (3) a non-arbitrage sell program for 1,480,000 shares.

^{20/} The discount to theoretical value for S&P 500 Futures contracts fluctuated during this time period from a discount to cash value at the opening to premium values approximately 1.83 to 0.59 points above cash.

around 10:00. 21/ As a result, nine index arbitrage sell programs for 1.7 million shares (6.9% of NYSE volume, and 9.7% of NYSE volume in S&P stocks) were executed during this period. 22/ In addition, 65,100 shares were sold as part of two non-arbitrage programs, one entered at the opening and one at 9:44. Stock sales associated with index arbitrage and non-arbitrage trading comprised approximately 7.2% of NYSE volume and almost 10% of volume in S&P 500 stocks.

2. 12:30 to 1:30

During this period, the DJIA fell to 2,438.4, a decline of 24 points (0.96%), on NYSE volume of 33,211,920 shares. The SPZ contract traded below theoretical value by one point or more over this period, while both the near term October and November MMI contracts traded below fair value, with the near term contract at times trading below cash value. As a result, arbitrage selling increased significantly, 27 arbitrage sell programs 23/ were executed for a total of 7.4 million shares, accounting for 22.3% of NYSE volume and 29.4% of NYSE volume in S&P stocks. 24/

3. 2:30 to 2:50

In this 20 minute period, the DJIA declined to 2425.4, a loss of 10.3 points (0.41%) on NYSE volume of approximately 14.4 million shares. The SPZ futures generally traded below theoretical value during this period, with the discount at times exceeding one point. Nine arbitrage programs were executed during this period, with a total of 3.6 million shares sold, representing 25.5% of NYSE volume and 32.9% of NYSE volume in S&P stocks. 25/

4. 3:30 to Close

In the last half-hour of the trading session, the DJIA declined to 2412.7 (down 17.1 points or 0.68%) on NYSE volume of approximately 23.5 million shares, for a total decline of 95.4 points (3.8%) for the day. The SPZ futures prices, which had approached theoretical value just prior to 3:30, thereafter fell and remained substantially below

21/ Both of these contracts opened at steep discounts to cash with the MMI contract at one point trading 6 points below cash value.

22/ All of those programs except one closed out pre-existing arbitrage positions.

23/ One sell program of 54,500 shares entered at 12:52 used the Kansas City Value Line ("KVL") futures and another entered at 1:14 involving 533,267 shares used XOC option contracts. All other arbitrage sell programs were executed with SPZ and MMI futures.

24/ Only one non-arbitrage sell program was executed during this period. This program, entered at 12:39, involved the sale of 10,000 shares.

25/ Eight of these programs were executed with SPZ futures with one program of 19,800 shares executed with MMI futures. With the premium in SPZ futures sufficiently below fair value, five of these programs established new arbitrage positions. Four, including the MMI program, closed out established positions.

theoretical value. ^{26/} As a result, 2.6 million shares were sold (including 248,000 shares sold short) in index arbitrage programs, and an additional 476,200 shares were sold as index substitution. Thus, total arbitrage-related selling represented approximately 13.2% of NYSE volume and 18.2% of NYSE volume in S&P stocks in this final half hour.

^{26/} A few arbitrage buy programs were executed with MMI futures during this period as both the near term and November contracts traded above theoretical value around 3:30. For the most part, however, the near term October contract traded at a discount to cash and the November contract traded at a premium below its theoretical value.

OCTOBER 15

TRADING CHRONOLOGY FOR OCTOBER 15

On Thursday, October 15, the U.S. markets opened down, 27/ but sustained an erratic recovery throughout much of the day, only to experience a dramatic price plunge in the final 30 minutes of trading. The Dow Jones Industrial Average ("DJIA") lost 57.61 points (2.39%) for the day. This sharp market drop on the close, following the then-record 95 point decline on the 14th, left the DJIA down approximately 5% for the first four days of the week. The Standard & Poors ("S&P") 500 stock index also declined 7.15 points (2.34%), and the composite indexes for the New York Stock Exchange ("NYSE"), American Stock Exchange ("Amex"), and the NASDAQ computerized quotation system for trading over-the-counter ("OTC") stocks declined 3.81 points (2.22%), 4.92 points (1.44%), and 5.77 points (1.35%), respectively. Trading volume on the NYSE increased to 266 million shares (up 27% from October 14), while volume on the Amex rose to 12.8 million shares (a 30% increase) and the NASDAQ system volume was 159.8 million shares (a 9.8% increase). Similar price declines on increasing trading volume also were experienced in the index futures markets. The most heavily used index futures, the December expiration S&P 500 index futures ("SPZ"), traded on the Chicago Mercantile Exchange ("CME"), declined 6.75 points (2.21%) on volume of 125 thousand contracts (10.3% above the prior day's volume).

I. Summary of Market Movements

As discussed above, although the securities and index futures markets experienced a series of minor intra-day price declines and recoveries, in the last half-hour of the trading session the markets were hit with a broad sell-off on increasing volume. The Division's analysis of these market movements has focused on 11 key periods: (1) 9:30 to 10:00 -- the DJIA loses 22.4 points, then rises 9.6 points; (2) 10:00 to 10:10 -- DJIA declines 11.6 points; (3) 10:10 to 11:20 -- DJIA recovers 26.8 points; (4) 11:20 to 11:40 -- DJIA falls 6.5 points; (5) 11:40 to 12:40 -- DJIA gains 17.4 points; (6) 12:40 to 1:00 -- DJIA falls 15.3 points; (7) 1:00 to 1:20 -- DJIA recovers 7.5 points; (8) 1:20 to 1:50 -- DJIA drops 19.7 points; (9) 1:50 to 2:30 -- DJIA recovers 20.5 points; (10) 2:30 to 3:20 -- DJIA declines 7.0 points; and (11) 3:20 to Close -- DJIA drops 57 points. Each of these key periods was preceded by similar price movements in the index futures markets which resulted in index arbitrage programs.

II. Breakdown of Trading

The Division's analysis of trading data from the most active broker-dealers on the NYSE indicates that the overall breakdown of selling on the 15th was similar to that on October 14. The largest component still was selling from institutional accounts, which comprised approximately 36%, with 24% from retail accounts and 40% from proprietary accounts.

27/ The U.S. markets' declines on October 14 had carried over to foreign markets overnight. On October 15, the Tokyo Nikkei Index dropped 218.2 points (0.82%) and the London Financial Times - Stock Exchange 100 Share Index declined 21 points (0.90%).

A. Portfolio Insurance

The level of SPZ futures selling which the Division was able to attribute to portfolio insurance strategies increased from 1732 contracts on the 14th to 3,609 contracts (2.8% of total CME volume) on October 15. ^{28/} These futures sales do not appear to have played a significant role in this trading session's price declines, but were a precursor of more substantial portfolio insurance selling in both the futures and stock markets on the 16th, 19th, and 20th. ^{29/} In addition, there may have been substantial futures selling by traders on the 15th in anticipation of sizeable portfolio insurance related futures sales. ^{30/}

B. Other Index-Related Trading

While total stock selling as part of index arbitrage and index substitution on October 15 involved only 15.8 million shares or 5.8% of NYSE volume, ^{31/} this concentrated selling hit the stock market during key periods of the day, thereby accelerating price movements. This was particularly true in the final 40 minutes of the trading session, when approximately one-third of the day's arbitrage related selling coincided with the sharpest decline in the DJIA. The following sections provide a detailed breakdown of index-related trading during several of the day's key time periods.

1. 9:30 to 10:00

On October 15, the DJIA opened at 2394.42, down approximately 19 points from the previous day's close. This 0.7% drop in the DJIA was roughly in line with the opening of SPZ futures on the CME, where heavy sell pressure caused the futures to open at 302.9, down 2.1 points or 0.7%. Of this sell pressure in the SPZ, the Division has identified sales of at least 1268 SPZ futures (roughly 7% of SPZ volume from 9:30 to 10:00) which are clearly attributable to portfolio insurance strategies due to the markets' declines over the previous trading sessions.

The SPZ futures briefly traded at a discount to the price of the index component stocks (termed the "cash value") before recovering to slight premiums. These premiums, however, were sufficiently below the contract's "theoretical value" to bring in sell

^{28/} The actual level of such selling, however, may be significantly larger, given the difficulties encountered in computing these statistics. See Chapter One of the Study.

^{29/} The Division's interviews with users of portfolio insurance strategies suggest that the hesitancy by some funds to implement the strategies' indications for futures sales on October 14 and 15, and even the 16th, may have contributed to the last-minute "dumping" of futures and stocks on the 19th and 20th.

^{30/} See Report of the Presidential Task Force on Market Mechanisms (January 1988) ("Brady Report"), at 15-17.

^{31/} Of this 15.8 million shares, 3.9 million shares (24.7%) were for customer programs and 4.1 million shares (26%) were sold short. See Tables D-4 and D-5.

arbitrage. 32/ Seven arbitrage programs were entered at the opening, selling 2 million shares of stock (including 226,200 shares sold short). 33/ Four more arbitrage programs were executed by 9:40 to sell 1.5 million shares. 34/ In addition, four non-arbitrage sell programs and three buy programs were entered at the opening. A total of 385,400 shares of stock were sold and 1 million shares purchased in these programs. An additional non-arbitrage sell program involving 283,000 shares of stock was entered at 9:37. In sum, arbitrage and non-arbitrage program selling comprised approximately 30.5% of NYSE volume in S&P stocks from 9:30 to 9:40, and 18.3% from 9:40 to 9:50.

The Major Market Index ("MMI") futures and the Financial News Composite Index ("FNCI") futures intermittently traded sufficiently above theoretical value between 9:40 and 10:00 to result in four arbitrage buy programs for 109,900 shares. 35/ The SPZ futures traded close to fair value until 9:46, when it declined sufficiently below fair value to bring in a sell arbitrage program for 650,000 shares. Around 9:55, the MMI also traded below fair value, resulting in two MMI arbitrage sell programs for 49,900 shares. Arbitrage selling constituted 7.7% of S&P stock volume from 9:50 to 10:00. Three non-arbitrage buy programs involving purchases of 1,144,500 shares also were executed over this period, comprising 7.7% of NYSE volume and 12.7% of volume in S&P stocks from 9:50 to 10:00 while the DJIA recovered 9.6 points to 2399.9 before resuming its decline.

2. 10:00 to 10:10

Between 10:00 and 10:10, when the DJIA dropped to 2388.3, six arbitrage programs involving the sale of 1 million shares were entered. 36/ In addition, one non-arbitrage sell program of 300,000 shares of stock was entered at 10:07. Total program sales of stock comprised approximately 10.9% of S&P stock volume.

32/ For a discussion of index futures theoretical or "fair value," see Chapter One of the Study.

33/ Both near term MMI futures contracts also opened at discounts to the price of the index component stocks. Two of the seven arbitrage programs were executed with MMI futures contracts.

34/ In addition, because a premium to theoretical value existed between the MMI stocks and futures around 9:38, two MMI arbitrage buy programs for 80,000 shares of stock were executed around this time.

35/ The arbitrage involving the FNCI was actually implemented using FNCI options (combinations of puts and calls replicating a futures contract) traded on the Pacific Stock Exchange ("PSE").

36/ Four of these programs were executed with MMI futures with the near term contract trading at a discount to cash value. In addition, all of these programs closed previously established MMI arbitrage positions. One program involving short sales of 177,900 shares of stock was executed using options on the Over-the-Counter stock index. Only one program was executed with SPZ futures although the SPZ contract traded at premiums below fair value throughout this period.

3. 10:10 to 11:20

During this period, the DJIA rose 26.8 points. The SPZ future continued to trade below theoretical value from 10:05 to 10:10. As a result, two arbitrage sell programs were entered at 10:06 and 10:09 for 709,100 shares and an index substitution program was entered at 10:10 for the sale of an additional 632,000 shares. This selling, along with 300,000 shares sold as part of non-arbitrage programs, constituted 16.2% of NYSE volume and 23% of volume in S&P stocks from 10:10 to 10:20. Thereafter, the SPZ futures traded at premiums only slightly below or above theoretical value until approximately 11:20, denying further arbitrage opportunities. Meanwhile, the near term and November MMI futures traded at premiums considerably in excess of theoretical value, resulting in MMI arbitrage programs and arbitrage programs using combinations of puts and calls in the S&P 100 stock index ("OEX") options. Total arbitrage purchases of 1.3 million shares constituted 2.3% of NYSE volume and 3.5% of volume in S&P stocks from 10:10 to 11:20.

4. 11:20 to 11:40

During this period, the DJIA fell 6.5 points, but arbitrage selling does not appear to have played a major role. From 11:20 to 11:30, 22,000 shares were sold in an MMI arbitrage program, 179,900 shares were sold as part of portfolio insurance strategies, and 105,100 shares were sold in other programs -- together constituting only 6.8% of S&P stock volume. Arbitrage and non-arbitrage programs sold only 290,000 shares or 5.3% of S&P volume from 11:30 to 11:40.

5. 11:40 to 12:40

Several arbitrage buy programs were executed while the DJIA gained 17.4 points. Both the SPZ and November MMI futures traded at premiums exceeding theoretical value throughout this period, resulting in the execution of 11 buy arbitrage programs for a total of 1.5 million shares. This arbitrage-related buying constituted 4.2% of NYSE volume and 5.7% of S&P volume, 37/ as the DJIA rose to 2426.0.

6. 12:40 to 1:00

The DJIA fell 15.3 points during this period, but arbitrage selling was minimal. The near term MMI futures traded at a discount to cash from 12:40 to 12:55. From 12:47 to 12:56, three arbitrage sell programs for 128,000 shares were entered as the discount to cash value widened. This selling constituted only 1.5% of NYSE volume and 3.3% of S&P stock volume from 12:50 to 1:00, and only 1.4% of NYSE volume and 1.8% of S&P stock volume from 1:00 to 1:10.

7. 1:00 to 1:20

The DJIA recovered 7.5 points while the SPZ and MMI futures traded at premiums to fair value for most of this period. Four arbitrage buy programs and one non-arbitrage buy program were executed for a total of 226,700 shares (approximately 4% of NYSE volume and 6% of NYSE volume in S&P stocks).

37/ In addition, 285,400 shares were purchased in non-arbitrage programs.

8. 1:20 to 1:50

The DJIA declined to 2398.5 by 1:50 as arbitrage sell programs in the SPZ and MMI futures were entered to close pre-existing positions when the SPZ futures and November MMI futures at times traded at premiums less than theoretical value. ^{38/} A total of 1.3 million shares were sold in these programs, comprising 10% of S&P volume from 1:20 and 1:30, 19% from 1:30 and 1:40, and 14% from 1:40 to 1:50.

9. 1:50 to 2:30

The DJIA recovered 20.5 points while, during most of this period, the SPZ and MMI futures prices traded slightly above theoretical value. ^{39/} Twelve arbitrage buy programs with SPZ futures, MMI futures and OEX options were executed for 1,317,950 shares, or 7.1% of NYSE volume and 10.3% of volume in S&P stocks from 1:50 to 2:30. In addition, 1,511,806 shares were purchased in four non-arbitrage buy programs executed during this period. Total program purchases comprised 15.2% of NYSE volume and 22% of volume in S&P stocks from 1:50 to 2:30.

10. 2:30 to 3:20

In this 50 minute period the DJIA declined 7 points. Arbitrage selling during this period exceeded arbitrage buying by more than a 3 to 1 ratio. Arbitrage selling constituted up to 15% of S&P stock volume from 2:30 to 2:40. Four arbitrage programs were executed between 2:30 and 3:00 involving sales of 270,000 shares. These sales comprised 3.6% of NYSE and 5.7% of S&P volume from 2:30 to 3:00 during which time the DJIA declined 5.4 points.

From 3:00 to 3:20, arbitrage selling slightly exceeded arbitrage related buying. Two sell programs involving 105,200 shares were executed with SPZ and MMI futures. These programs were entered around 3:06 and 3:08. Two buy programs involving 79,700 shares also were executed with SPZ and MMI futures, with the orders for these programs entered around 3:13 and 3:15. In addition, one non-arbitrage program for the purchase of 115,800 shares was entered at 3:11 and one non-arbitrage program for the sale of 575,842 shares was entered at 3:15. Over this period, the DJIA lost 6.2 points by 3:13 but recovered slightly thereafter. Total program sales of stock accounted for 9% of NYSE volume and 11.8% of S&P volume. Total program purchases accounted for 2.6% of NYSE volume and 3.3% of S&P volume.

11. 3:20 to Close

The DJIA fell rapidly in the last 40 minutes, closing the day at 2355.09 for a loss of 57.61 points, or 2.39 percent. The SPZ contract traded at premiums below fair value

^{38/} In addition, the near term MMI future briefly traded at one point discounts to cash. These values provided opportunities to close established buy programs at favorable prices.

^{39/} One SPZ arbitrage program in which 250,000 shares were sold short around 1:50 took advantage of a brief drop below fair value while another SPZ arbitrage program involving the sale of 130,000 shares entered at 1:58 closed an existing position.

throughout most of this period. NYSE volume was heavy, with a total of 33,262,450 shares traded.

Both arbitrage and non-arbitrage selling was heavy during this period. A total of 18 arbitrage programs and 6 non-arbitrage programs sold 6,959,302 shares of stock: 3,128,460 shares from 3:30 to 3:50 (20% of NYSE volume / 26% of S&P volume) and 3,702,342 shares from 3:50 to the close (25.6 percent of NYSE volume / 33.7% of S&P volume). Total program selling from 3:20 to 4:00 constituted 21 percent of NYSE volume and 27.6% of NYSE volume in S&P stocks during this period. 40/

40/ In the last 10 minutes, 74,000 shares were purchased in MMI and FNCI arbitrage programs. In addition, 2,400 shares were purchased in a non-arbitrage program.

OCTOBER 16

TRADING CHRONOLOGY FOR OCTOBER 16

Trading on Friday, October 16, 1987, finished off a week of general price declines in the U.S. securities markets, 41/ with the Dow Jones Industrial Average ("DJIA") closing at 2,246.74, down 108.35 points for the day (4.60%) on then-record volume of 344 million shares on the New York Stock Exchange ("NYSE"). 42/ For the week, the DJIA lost 9.49%, down 17.5% since its August 25, 1987 high of 2,722.42. The 16th was the DJIA's first 100 point close-to-close decline, a factor which may have played a role in the market psychology of the next week.

Price declines were experienced on all markets on the 16th. The Standard & Poors ("S&P") 500 stock index declined 15.38 points (5.16%) for the day. In addition, the composite indexes for the NYSE, American Stock Exchange ("Amex"), and the NASDAQ computerized quotation system for over-the-counter ("OTC") stocks declined 8.32 points (4.97%), 12.25 points (3.65%), and 16.18 points (3.83%), respectively, on the 16th. 43/ The price declines in the index futures markets were even sharper on October 16. The most heavily used index futures, the Chicago Mercantile Exchange's ("CME's") contract on the S&P 500 stock index (the December expiration futures, or "SPZ"), declined 16.0 points (5.36%) to close at 282.25, a slight discount to the price of the component stocks ("cash" value).

I. Summary of Market Movements

Despite several minor market rallies during October 16, the overall price declines continued throughout the day and accelerated in the last hour of the trading session. The Division's analysis of the day's market movements has focused on 10 key periods: (1) Open to 10:00 -- the DJIA gained 12 points from 9:30 to 9:45, but lost 14 points between 9:45 and 9:59; (2) 10:00 to 11:00 -- DJIA traded in an 18 point range; (3) 11:00 to 11:30 -- DJIA declined 28 points to 2319; (4) 11:30 to 12:00 -- DJIA gained 22 points to 2341; (5) 12:00 to 1:00 -- DJIA declined 18 points to 2323; (6) 1:00 to 2:00 -- DJIA lost 53 points to 2270; (7) 2:00 to 2:30 -- DJIA recovered 38 points to 2308; (8) 2:30 to 3:00 -- DJIA declined 11 points to 2297; (9) 3:00 to 3:30 -- DJIA declined 23 points to 2275; and (10) 3:30 to Close -- DJIA lost 28 points to close at 2246.7. These price movements on the NYSE were accompanied (and often preceded) by similar movements on the index futures markets, particularly the SPZ futures on the CME. The Division's analysis of the above time periods illustrates the interrelationships of these markets on the 16th.

II. Breakdown of Trading

The trading information obtained by the Division from the most active broker-dealers during the market break indicated that the heavy institutional selling from the 14th and the 15th continued on October 16. Overall, institutional accounts represented

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- 41/ The Tokyo Nikkei Index closed down 61.5 points (0.23%) on October 16, while the London market was closed for the day due to a severe storm.
 - 42/ On the NYSE, declining issues outnumbered advancing issues by 17 to 1.
 - 43/ Trading volume on the Amex was 18.5 million shares (up 30.4% from the 15th) and for the NASDAQ system was 123 million shares (an increase of 18.4%).
-

approximately 39% of selling on the NYSE, while retail and firm proprietary accounts represented approximately 26% and 35% of the day's selling.

A. Portfolio Insurance

The analysis by the CME staff of SPZ futures trading on the 16th indicates that most activity appeared to be related to hedging strategies by institutional accounts. ^{44/} The CME's finding of largely institutional trading in the futures markets on October 16 is consistent with the index related information obtained by the Division and CFTC. This information indicates that the level of SPZ futures selling directly attributable to institutional accounts' portfolio insurance strategies was substantially greater on the 16th than on the 14th or 15th. Specifically, the Division was able to identify sales on October 16 of approximately 9,000 SPZ futures, or 6.3% of total volume.

In addition, the Division identified a small but significant amount of program stock selling during the afternoon of October 16 which can be directly attributed to portfolio insurance strategies. Although this form of selling only constitutes roughly 4.6 million shares on the 16th, its significance is that any portfolio insurance related stock selling arguably indicates real or supposed difficulties in selling a sufficient amount of futures economically. Portfolio insurance strategies, under normal circumstance, use sales of index futures to reduce equity exposure in order to take advantage of the lower transaction costs in the futures markets. The fact that the alternative of more expensive stock sales was used late on October 16 was a precursor of further stock selling on a massive scale on the 19th.

B. Other Index-Related Trading

The index trading information compiled by the Division and the CFTC indicates that significant amount of index arbitrage selling, in fact, hit the NYSE floor in relatively concentrated intervals during each period of stock price decline on the 16th.^{45/}

^{44/} See CME, Preliminary Report, at 10-13, 37.

^{45/} The following chart illustrates this relationship.

<u>Time Period</u>	<u>Arbitrage Selling (Shares)</u>	<u>% NYSE Volume</u>	<u>% S&P Volume</u>	<u>DJIA Movement</u>
9:50- 10:00	2.8 million	23.7%	30.4%	- 9.4
11:00- 11:30	3.8 million	14.3%	19.5%	-28.4
1:30- 1:40	3.1 million	35.2%	51.7%	+ 8.2
1:50- 2:00	1.3 million	9.9%	13.3%	-21.2

Although for the day, index arbitrage selling increased to 37.2 million shares or 11.0% of daily NYSE volume, ^{46/} its effects were most pronounced at the end of the session when the SPZ future developed over a four point discount to cash. From 3:30 to 3:50, when the DJIA lost over 50 points (breaking the 100 point close-to-close record), arbitrage related stock selling comprised over 30% of NYSE volume and 38% of S&P volume.

The Division also identified a substantial amount of stock selling, particularly near the close on the 16th, which is attributable to the futures and options expirations on that day. ^{47/} For example, one firm's customers sold approximately 1,100,000 shares on the October 16 market close to replace expiring S&P 500 index options traded on the Chicago Board Options Exchange ("CBOE"). Non-program stock selling related to expiring options or futures positions of institutional and retail accounts also may have been significant, but the aggregate selling information compiled by the Division for trading outside of "programs" makes such determinations difficult.

Finally, the Division's review indicates that a significant amount of index-related trading was effected off the NYSE, primarily in the London market, as exchanges-for-physicals ("EFPs"). ^{48/} The Division identified 5.9 million shares that were sold short in London EFPs on October 16.

The following sections describe in detail the various types of index-related trading in the securities and futures markets during key periods on the 16th.

<u>Time Period</u>	<u>Arbitrage Selling (Shares)</u>	<u>% NYSE Volume</u>	<u>% S&P Volume</u>	<u>DJIA Movement</u>
3:00-3:10	1.8 million	19.8%	25.7%	-21.8
3:30-3:40	0.7 million	7.1%	9.1%	-15.8
3:40-3:50	6.6 million	45.5%	58.9%	-34.4

^{46/} Of this 37.2 million shares, 18.5 million shares (49.6%) were part of customer programs (including 6.2 million shares sold for index substitution programs) and 5.4 million shares or 14.6% were sold short. See Tables D-4 and D-5.

^{47/} See Chapter Two of the Study (discussing monthly and quarterly expiration cycles for derivative products).

^{48/} As used in the Study, EFPs involve simultaneous transactions in a basket of index stocks (a "cash" commodity) and index futures in a noncompetitive transfer of ownership between the parties; one party buys the stocks and simultaneously sells (or gives up a long) futures contract while the other party sells the stocks and simultaneously buys (or receives a long) futures contract. See the discussion of EFP transactions in Chapter Two of the Study.

1. Open to 10:00

The SPZ contract opened at a 2.68 premium to the cash value of the index. Over the first five minutes of trading, the value of the premium declined to less than one point. The Division was able to identify portfolio insurance related sales of 60 SPZ contracts at the opening, 200 contracts between 9:30 and 9:45, and 241 SPZ contracts between 9:50 and 9:59, accounting for approximately 3.2% of SPZ trading during the period.

The October Major Market Index ("MMI") futures, traded on the Chicago Board of Trade ("CBT"), expired on the 16th, and as a result the October and November MMI contracts traded differently during the day. The October MMI contract opened and traded at premiums from one to three points from 9:15 to 9:40. From 9:45 to 9:50 and from 9:55 to 10:00, the October MMI contract traded at a small discount to cash. The November MMI contract, traded above its basis, at times by more than two points, throughout this period. The closest the November MMI contract traded to theoretical value was from 9:50 to 9:55 when the contract traded approximately one point over cash. 49/

The index-related trading information compiled by the Division also indicates that 309,500 shares of stock were sold at the NYSE opening and 53,300 shares between 9:30 and 10:00 as part of portfolio insurance programs. In addition, three index arbitrage sell programs were executed at the opening on October 16, 1987. 50/ These programs involved short sales of 1,286,289 shares of stock. One program was executed with KVL contracts in which 1,065,689 shares of stock were sold short. The other programs were executed with SPZ contracts with a total of 220,600 shares of stock sold short. 51/

From the NYSE opening to 9:45, the DJIA rose 12 points to 2367. During this period, one index arbitrage sell program and two MMI index arbitrage buy programs were executed. 52/ The sell program involved the short sale of 87,100 shares of stock against options on the OTC stock index ("XOC") and was entered at 9:34. The two MMI buy programs were entered at 9:35 and 9:39 and involved a total of 80,000 shares of stock (0.5% of total NYSE volume and 0.7% of NYSE volume in S&P stocks from 9:30 to 9:40).

49/ While all of the other major stock index futures contracts traded at premiums to cash value during the day, the December expiration Value Line futures contract ("KVL"), traded on the Kansas City Board of Trade ("KCBT"), was the only one that traded at a discount to cash value throughout the day. During the period from 9:30 to 10:00, the KVL futures traded at a discount of more than 2 points below cash value.

50/ One non-arbitrage program was executed at the opening which involved the sale of 1.1 million shares.

51/ These programs comprised the portion of arbitrage sell programs that had not been executed on the previous day.

52/ In addition, four non-arbitrage sell programs were reported in this period. A total of 194,000 share were sold in those trades.

From 9:45 to 10:00, the DJIA reversed course, losing 13 points (0.6%). Nine index arbitrage sell programs were executed during this period, involving the sale of 3,010,733 shares (650,000 shares sold short). These programs represented 25% of NYSE volume and 32.6% of NYSE volume in S&P stocks from 9:50 to 10:00.

2. 10:00 to 11:00

The Division was able to identify portfolio insurance related sales of 966 SPZ contracts, with this selling comprising 4.3% of total volume. The SPZ futures traded over 2.0 points above cash value by 10:50, thereafter dropping to approximately a 1.50 point premium by 11:00.

The October MMI contract traded at small discounts to cash around 10:15 and 10:30 but otherwise traded above theoretical value except around 11:00 when the contract traded at a very slight premium to cash. The November MMI contract traded at a premium to cash value throughout this period. The value of this premium was lowest, at only 1.0 point over cash by 10:25 and highest by 10:40, at 2.0 to 3.0 points over cash.

Six index arbitrage sell programs, one substitution program and one non-arbitrage sell program for 142,000 shares were entered between 10:11 and 10:35. Two of these programs were executed with MMI contracts involving the sale of 64,000 shares of stock. Both of these programs closed pre-existing arbitrage positions. The index substitution program was entered at 10:18 and involved the substitution of 1,294,900 shares of stock for 205 SPZ contracts. In addition, three sell programs were executed using options on the S&P 100 index ("OEX") involving the sale of 439,400 shares of stock. All three of these programs closed pre-existing positions. The remaining sell program consisted of the short sale of 400,000 shares of stock and the purchase of 104 SPZ contracts. In addition, 680,700 shares of stock were sold as part of portfolio insurance strategies.

From 10:11 to 10:36 the DJIA fell 17.5 points from 2360, an intra-period high, to 2342.5, an intra-period low. Total sales of stock associated with programs constituted 33% of NYSE volume in S&P stocks from 10:20 to 10:30, and 16% from 10:30 to 10:40. 53/

3. 11:00 to 11:30

The Division has identified portfolio insurance related sales of only 379 SPZ futures contracts (3% of total volume) during this period. The premium to cash value in the SPZ contract eroded from 1.5 points at 11:00 to a small discount at 11:25. By 11:30, SPZ contracts recovered trading at a 1.0 premium to the cash value of the index.

The November MMI contract traded at premium values exceeding the theoretical value of the contract throughout this period. The November contract traded closest to

53/ Three index arbitrage buy programs were entered during this period, one at 9:56, one at 9:58 and one at 10:36. A total of 104,000 shares of stock were purchased and 66 MMI contracts sold in these trades. As a percent of total NYSE volume from 10:40 to 11:00, buying associated with these arbitrage programs comprised less than one percent.

theoretical value at 11:25. The October MMI contract also traded at premiums exceeding theoretical value except at 11:25 when the October contract fell to a discount to cash value.

Three arbitrage buy programs, five sell programs and two index substitution programs were executed during this period. ^{54/} The buy programs were small involving total purchases of 103,100 shares. Stock sales in index arbitrage and substitution programs equalled 3,695,700 shares. ^{55/} During this period, the DJIA declined 28 points to 2319. Total program stock sales comprised 13% percent of NYSE volume in S&P stocks from 11:10 to 11:20 and 32% from 11:20 to 11:30.

4. 11:30 to 12:00

Portfolio insurers reported sales of 719 SPZ futures (7.5% of total CME volume) during this period. Despite these sales, SPZ premiums increased from value below theoretical value around 11:30 to 2.0 points greater than theoretical values by 11:40 and thereafter. The October MMI contract traded at premiums in excess of theoretical value throughout the period but traded close to theoretical value at 11:45. The November MMI contract traded above its theoretical value by more than a point throughout the period.

On the NYSE, seven arbitrage buy and three sell programs were entered between 11:26 and 11:55. Five of the buy programs were executed with MMI contracts, and two were executed with SPZ contracts. The total number of shares of stock purchased in these programs equalled 706,300 shares or 2.7% of NYSE volume and 3.9% of S&P volume between 11:30 and 12:00. During this period, the DJIA rose from 2319 to 2341 for a gain of 22 points (0.9%).

5. 12:00 to 1:00

Portfolio insurance related sales involved at least 758 SPZ futures, or 17% of total volume from 12:00 to 12:30 and 10% from 12:00 to 1:00. The SPZ contract traded at a premium throughout this period, from a low value of 0.77 to a high value of 2.46.

The October MMI contract traded at a discount to cash value throughout this period except around 12:25, 12:35 and 12:50. The November MMI contract traded at premiums to cash value which exceeded theoretical value for most of this period. Around 12:05, 12:20 and 12:30, the November MMI contract, however, traded either below or close to theoretical value.

All four of the arbitrage sell programs and one buy program were entered by 12:35. No additional programs were entered from 12:35 to 1:00. The buy arbitrage program involved the purchase of 229,000 shares of stock. Three of the sell programs were executed with SPZ contracts with the other program using MMI futures. Total program selling comprised 24% of NYSE volume in S&P stocks from 12:30 to 12:40 during

^{54/} All but one of the arbitrage sell programs were executed with SPZ futures. In addition, 650,000 shares of stock were sold short in two of these programs.

^{55/} An additional 20,000 shares were sold in a non-arbitrage program in this period.

which time the DJIA lost 8 points. No sell programs were entered from 12:40 to 1:00, and the DJIA recovered 0.7 of a point to 2323.1.

6. 1:00 to 2:00

Portfolio insurance related sales involved at least 1017 SPZ contracts from 1:00 to 1:30, constituting 13.6% of total volume. The SPZ contract traded at premiums to cash throughout this period except briefly around 1:26 and 1:56. The value of SPZ premiums, however, never exceeded 2.5 points during this period and at times were as low as 0.4 points over cash.

The October MMI contract traded alternatively at discounts to cash and premiums in excess of theoretical value during this period. The contract traded at discounts to cash between 1:00 and 1:15, 1:20 and 1:30, and 1:45 and 1:55. The November MMI contract traded at premiums exceeding theoretical value at all times except from 1:00 to 1:10 and 1:25 when the value of the futures contract traded at or below theoretical value.

Index arbitrage program trading was active during this period, hitting the NYSE in several waves. Three MMI arbitrage sell programs were entered between 1:02 and 1:05, for a total of 124,000 shares when DJIA began its downturn from 2323.1. An additional four sell programs were entered between 1:06 and 1:09, involving the sale of 439,350 shares. No index arbitrage programs were entered between 1:10 and 1:20, during which time, the DJIA remained essentially unchanged. Nine arbitrage sell programs and one substitution program were entered between 1:26 and 1:32, for a total of 3,094,579 shares or 51.7% of NYSE volume in S&P stocks between 1:30 and 1:40. ^{56/} Program selling continued, with an additional four arbitrage sell programs, a substitution program, a portfolio insurance program and four non-arbitrage programs entered from 1:42 to 1:55. ^{57/} Total program selling comprised 14% of S&P stock volume from 1:40 to 1:50 and 21% from 1:50 to 2:00. Overall, from 1:30 and 2:00, the DJIA declined an additional 29 points to 2270.2.

7. 2:00 to 2:30

Portfolio insurance related sales involved at least 1395 SPZ futures from 2:00 to 2:30, comprising 9.9% of SPZ volume. The SPZ contract traded at premiums exceeding theoretical value during most of this period except at 2:30 when it traded almost one point below theoretical value. The October MMI contract traded at a discount to cash except around 2:05 and 2:15. The November MMI contract traded at premiums which exceeded theoretical value except from 1:15 to 1:20 when it fell to a small discount to cash.

Eleven index arbitrage buy programs and eight sell programs were executed during this period. A total of 424,000 shares of stock were purchased in these buy programs all of which established new arbitrage positions. A total of 1,488,010 shares of stock were sold as part of the sell programs. The sell programs were executed with SPZ,

^{56/} One MMI arbitrage sell program for 44,000 shares was entered at 1:24.

^{57/} One index arbitrage buy program involving the purchase of 280,000 shares of stock also was executed during this period.

FNCI, MMI and OEX contracts. The DJIA recovered 38.2 points during this period from 2270.2 to 2308.4 but stock purchased in index arbitrage buy programs only accounted for approximately one percent of total NYSE volume during this period.

8. 2:30 to 3:00

Portfolio insurance related sales of at least 693 SPZ futures constituted 8% of total volume between 2:30 and 3:00. The SPZ contract traded at brief discounts to cash around 2:32 and 3:00 but otherwise traded at premium values from 0.14 to 1.74.

The October MMI contract traded at premiums greater than theoretical value from 2:35 to 2:50 and at discounts to cash value at all other times. The November MMI contract traded at premiums greater than theoretical value throughout this period.

The DJIA lost approximately 11 points during this period. Seven index arbitrage sell programs and two buy programs were executed during this period. The buy programs were entered at 2:43 and 2:47, and involved total purchases of 80,000 shares of stock. The sell programs were entered between 2:26 and 2:54 (five against SPZ contracts and two against MMI contracts). Total program selling comprised 22% of NYSE volume in S&P stocks from 2:30 to 2:40, rose to 37% from 2:40 to 2:50, and receded to 21% from 2:50 to 3:00.

9. 3:00 to 3:30

Portfolio insurers only sold 309 SPZ contracts, or 2.8 percent of SPZ trading during this period. The SPZ contract traded at premiums exceeding theoretical value only around 3:15. The remainder of the time the contract either traded at premiums below theoretical value or at discounts to cash. The October MMI contract traded at a discount to cash from 3:00 to 3:05 and at premiums exceeding theoretical value during the remainder of this period. The November MMI contract traded at premium values which exceeded its theoretical value throughout the period.

Another series of arbitrage sell programs, with fewer non-arbitrage programs, hit the NYSE during this period. Total program selling comprised 29% of S&P stock volume from 3:00 to 3:10, rising to 44% from 3:10 to 3:20 (when the DJIA fell 23 points to 2274.9, then receding to 19% from 3:20 to 3:30. 58/

10. 3:30 to Close

Portfolio insurance related sales of 1510 SPZ contracts comprised 7.6% percent of total SPZ volume during this period. The SPZ contract traded at discounts to cash from 3:34 to 3:53 and briefly at a premium greater than theoretical value at 3:55 but by 4:00, the SPZ contract again was trading at a discount to cash value.

The October MMI contract traded at both substantial discounts and premiums to theoretical value over this period. The November MMI contract traded at a discount to cash value from 3:40 to 3:50 and by 4:00.

58/ Three buy programs executed in this period comprised total purchases of 124,000 shares of stock and sales of 79 MMI contracts. Two of these programs were entered at 3:11 and one at 3:13.

NYSE volume was heavy during this period with more than 53 million shares of stock traded. Arbitrage-related sales of stock were heaviest as the DJIA dropped over 50 points from 3:30 to 3:50, and abated somewhat as the market recovered points thereafter. Specifically, 650,000 shares were sold by arbitrage programs from 3:30 to 3:40; 5.7 million shares (and an additional 900,000 shares for substitution programs) were sold from 3:40 to 3:50; and 3 million shares (and 1.1 million shares for substitution programs) were sold from 3:50 to the close. In addition, the discount in the futures around 3:30 also apparently caused at least some portfolio insurance users to sell stocks instead of the normally cheaper futures. The Division has identified 1.7 million shares of stock sold as part of portfolio insurance strategies during this period. Total program selling comprised 25% of S&P stock volume from 3:30 to 3:40 and hit a daily high of 68% from 3:40 to 3:50.

OCTOBER 19

TRADING CHRONOLOGY FOR OCTOBER 19

On Monday, October 19, 1987, the nation's securities and index futures markets suffered their worst decline in history. The negative investor sentiment created over the previous week was reflected in a broad-based sell off throughout the day on the 19th, and developed into near panic selling by the end of the trading session.

On the NYSE, massive sell orders inundated specialists and shattered records set just the week before. Daily volume of 608 million shares almost doubled the October 16 record, and the 16th's record 108 point drop in the DJIA was exceeded in the first hour of trading. For the day on the 19th, the DJIA sustained a 22.6% loss, falling 508.32 points to close at 1,738.40. The NYSE composite index declined by 19.2%. The sell-off was so widespread that declining issues led advancing issues by an unprecedented 40-to-1 margin.

This heavy sell pressure was not confined to the NYSE. On the Amex, volume surged to 35.4 million shares, and the exchange's composite index plunged to 282.5, a drop of 41 points or 12.7%. Similarly, the NASDAQ composite index dropped 46 points to close at 360.2, a loss of 11.35%, on volume of 222.9 million shares.

In the derivative markets, the sell-off was equally devastating. The CME's market in the SPZ futures plunged 80.75 points to close at 201.50. This 28.6% decline in the SPZ futures outpaced even the 22.6% drop in the DJIA. The MMI futures declined 23.70% and the most popular index option for retail investors, the CBOE's S&P 100 index ("OEX") contract, experienced a loss of 21% of the value of the underlying index. 59/

I. Summary of Market Movements

The markets' turmoil was evidenced first in heavy selling on foreign markets prior to the opening of trading in the U.S. On the Tokyo Exchange, the Nikkei index closed down 2.35%, and selling gained momentum during the trading session in the London market, with the Financial Times - Stock Exchange 100 Share Index ("FT-SE 100" index) closing down 10.84%.

This heavy sell pressure was evidenced first in U.S. in the index futures markets. On the CME, the SPZ futures opened at 261.50, down 20.75 points from Friday's close. In the stock markets, large sell order imbalances at the NYSE overwhelmed specialists, delaying openings for a number of bellwether stocks, making calculations of most major stock indexes next to impossible. By 10:00, 95 S&P stocks, representing 30% of the index value, were still not open. By 10:30, 11 of the 30 stocks in the DJIA were still closed. While some calculations using prices for stocks already opened showed a 94 point drop in the DJIA by around 10:30, the actual decline was probably closer to 200 points. The markets stabilized somewhat by 11:00, and the SPZ discount receded to a slight premium to cash while the DJIA recovered over 60 points by noon. However, the SPZ discount reappeared and prices on the NYSE deteriorated somewhat between 12:00 and 1:00, and again between 1:30 and 2:15. Finally, a 51 point rally around 2:15 to 2:45 was followed by the SPZ discount spiking to approximately 19 points after 2:50 while a precipitous 252 point plunge in the DJIA resulted in it closing at 1738.40.

59/ Because the October contracts in the MMI futures (and options) expired on October 16, the decline discussed above refers to the November contracts.

Until about 11:00 to 11:30 on the 19th, the difficulty in obtaining firm stock prices and the resulting unreliability of index valuations made trading in the derivative markets chaotic at best. Although the SPZ futures appeared to have opened at over a 20 point discount to cash, most market professionals indicate that they recognized that the actual discount was considerably less because of the number of NYSE stocks which had not opened. Nevertheless, as demonstrated by Tables 2-1 and 2-2, the SPZ discount throughout the remainder of the day was of a different nature than during the week before, with the October 19 discount being chronic and much larger than the prior week's. ^{60/} While the volatility of the markets on that day made any comparison of futures and stock prices difficult, the trading strategies of market professionals on the 19th clearly were based upon the assumption that there was a significant (if indeterminate) discount in the futures market. As a result, significant numbers of index arbitrage programs were effected throughout the day. In addition, as discussed below, many users of portfolio insurance strategies shifted from futures transactions to directly liquidating their stock portfolios.

II. Breakdown of Trading

It is obviously not possible to reconstruct all selling which occurred on October 19. The data received by the staff indicates that the selling on the NYSE was broad based, with institutions accounting for approximately 50.7%, retail public 33.3% and

^{60/} It has been widely noted that the apparent substantial discounts in the futures market on October 19 and 20 were more apparent than real once the number of delayed openings are taken into account. In an effort to evaluate this concern, the Commission's Directorate of Economic and Policy Analysis ("DEPA") analyzed the "reported" S&P 500 value in half-hour increments during October 19 and 20 in comparison to two implied S&P 500 values, i.e., S&P 500A recomputed the S&P 500 value assuming that halted stocks declined in value equal to those stocks which had opened and S&P 500B recomputed the S&P 500 value using the value at which the halted stocks actually did open. See Tables 2-1 and 2-2. These charts demonstrate that between 9:30 and 11:30 on October 19 the "reported" S&P 500 value overstated the degree of the discount. For example, at 10:00 the "reported" S&P 500 value was 273.17, although the SPZ was trading at 261.50. If, however, the reported value is adjusted for the 95 stocks which were not yet opened (representing 38% of the S&P 500) the adjusted S&P 500 value was 259.88. By 11:30 the "reported" value (263.85) had achieved approximate parity with the SPZ (265.50) and the adjusted value (263.33) was roughly equal to the "reported" value, with only 1.8% of the S&P value (12 stocks) not yet open. Thus, from 11:30 on (when all the SPZ 500 stocks were open) the SPZ discounts were real and substantial. Indeed, by 1:30 the SPZ was trading at a 22 point discount to cash. The persistence of these discounts is highlighted by activity on October 20. At 9:30 the SPZ opened at 225.00, by 11:30 it had declined 15.1% to 192, a 30 point discount to cash, even adjusted for the 38 S&P 500 stocks (11.4%) which had not opened. This is not to say that, for purposes of arbitrage trading, the difference between the "reported" and actual S&P value was insignificant on the 19th. Indeed, such differences, in conjunction with wide bid/ask spreads in the futures markets, did impair the ability to effect arbitrage transactions.

proprietary trading 16.0% of the total activity surveyed. ^{61/} The most consistent source of selling pressure throughout the day also was from institutional accounts, whether for portfolio insurance, mutual fund liquidations, margin liquidations, and selling by foreign accounts. In particular, this institutional selling, when combined with index arbitrage-related selling, almost certainly accounts for the vast majority of opening volume on the NYSE. This early institutional selling, in turn, appears to have developed as a direct result of the market decline of October 14-16.

The most significant factors during the afternoon market downturn appears to have been the convergence of stock selling from index arbitrage and portfolio insurance strategies around 1:30 to 2:00, and continued selling from portfolio insurance strategies thereafter. While the Division's review is unable to provide the same level of specificity for trading in the final hour of the October 19 trading session, it appears that continued institutional selling, combined with the near exhaustion of market-making capacity on the securities and futures markets and the uncertainty created by the number of DOT orders lacking "fill" reports, ^{62/} all contributed to the panic selling before the close.

The following sections describe several of the factors which appear to have been significant in the market decline on the 19th.

A. Portfolio Insurance

First, portfolio insurance related futures selling was significant throughout the trading day, accounting for at least 16.7% of total SPZ volume. Specifically, while sell pressure directly attributable to portfolio insurance strategies which we have been able to identify represented only 5.6% of SPZ volume from 9:30 to 10:00, it grew to 32% from 10:30 to 11:00, and 25% from 12:00 to 1:00. While futures selling from portfolio insurance providers was not particularly concentrated, this persistent sell pressure appears to have "overhung" the market throughout the day, making a sustained price recovery in the futures difficult. ^{63/} In addition, significant stock selling pressure hit the NYSE periodically on the 19th in "programs" as part of portfolio insurance strategies. As discussed above, portfolio insurance strategies generally employ sales of futures contracts as the preferred vehicle to reduce equity exposure in a declining stock market because of the futures normally lower transaction costs. Some strategies, however, provide for the alternative of reducing equity through stock sales, either in lieu of futures transactions or as a supplement, if this alternative appears more efficient. The chaotic conditions on the futures and securities markets on the close on

^{61/} The Division was able to use the trading information submitted by 20 of the most active broker-dealers during the October market break to account for approximately 378.3 million shares of selling (62.2% of NYSE volume) on October 19. A substantial component not accounted for by these numbers is trading activity by specialists. The percentages of institutional, retail, and proprietary selling cited above and throughout the Chapter and Chronologies are derived from this sampling of broker-dealer data (cross-checked against audit trail data).

^{62/} See Chapter Three.

^{63/} The daily graphs in Appendix D show the relationship between portfolio insurance futures selling and total SPZ volume on the CME throughout the trading session.

October 16 and the opening on October 19 evidently influenced some users of these strategies to implement this alternative. ^{64/} The Division identified one major pension fund that sold 27.3 million shares on October 19 to supplement its futures sales (the fund also sold a total of approximately 7,000 SPZ contracts on the 16th and 19th). This selling hit the Exchange floor throughout the day (after 10:30) as 2 million share programs. In fact, had market conditions permitted, the fund's insurance strategy would have indicated sales of at least an additional 27 million shares in the final hours of the 19th. ^{65/} Overall, the Division's review found that at least 39 million shares of institutional selling hitting the NYSE floor as programs, in fact, were attributable to portfolio insurance strategies -- and that this form of selling was at least as significant (in terms of aggregate sell pressure) as selling programs from index arbitrage strategies.^{66/}

B. Other Futures-Related Trading

The Division's findings concerning the significant level of portfolio insurance futures selling on the 19th is consistent with the CME's analysis of this activity. Overall, the CME found that most of the selling in the SPZ futures on October 19 was institutional in nature. While there was a considerable amount of activity by floor members and more speculative accounts, ^{67/} this encompassed both buying and selling and, as over the week of the 12th, resulted in most of these accounts maintaining more or less flat positions.

C. Index Arbitrage and Substitution

The discounts between the price for the SPZ futures on the CME and the underlying S&P stocks on the NYSE also brought in significant sell arbitrage programs.

^{64/} The money managers interviewed by the Division indicated that they recognized at the time that the apparent "discount" in the futures markets on the morning of the 19th was at least partially a function of the failure of many S&P stocks to have opened on the NYSE. Nevertheless, this situation influenced their decision to employ stock sales as a prudent supplement to futures transactions.

^{65/} Instead, this program was halted shortly after 2:00 on the 19th. Market conditions, however, permitted the sale of an additional 9.9 million shares on the NYSE on October 20.

^{66/} In combination with index arbitrage and other programs identified, the Division has been able to account for approximately 98.9% of the 79.7 million shares of sell volume routed to the NYSE through DOT by the List system on the 19th. Of the total of 89 million shares of program selling on the 19th identified by the Division (including volume sent through DOT with proprietary systems other than List or sent by phone to the NYSE floor) 77.5 million shares (87%) were sold either as part of portfolio insurance strategies or index arbitrage. The remaining 13% of program selling consists of additional institutional activity.

^{67/} For example, on October 19 one large speculative account bought almost 5,000 SPZ futures, considering them underpriced. The CME's analysis shows that speculators were both buyers and sellers of futures on the 19th and 20th. See CME Preliminary Report, chart of change in positions of large traders, following p. 28.

Overall arbitrage programs accounted for selling of approximately 37.6 million shares (8.8% of NYSE volume in S&P stocks) on October 19. Of the total arbitrage-related selling on the NYSE, 68/ 9.4 million shares (25%) were sold short, 69/ and 19 million shares (50%) of the 37.6 million shares were sold for customer accounts, including 2.8 million shares sold as index substitution. 70/

While the aggregate amount of arbitrage-related selling was smaller on a percentage basis than during October 14-16, arbitrage programs may have played a significant role in the market decline. Because the discounts which appear during market downturns are calculated and acted upon almost simultaneously by a number of well-capitalized firms and some large institutional investors, arbitrage programs often hit the market as highly concentrated selling pressure which may further speed the drop stock prices.

The periodic sell pressure from portfolio insurance related programs and more concentrated arbitrage sell programs sometimes hit the NYSE simultaneously. Total program selling reached extremely high levels during several market downturns on October 19, accounting for 61% of S&P stock volume from 9:30 to 9:40, 63.4% from 1:10 to 1:20, and over 60% during two intervals between 1:30 to 2:00.

D. Mutual Fund Redemptions

The Investment Company Institute ("ICI") conducted a survey of its members' redemption experience and trading activity during the market break. While the data indicated that redemptions increased on October 16 and 19, only approximately 2% of equity fund shares were redeemed on these days and at most funds redemptions were met from available cash reserves. However, a significant amount of selling involved the liquidations of one major mutual fund complex. This complex sold a total of 25.8 million shares on the day, with orders to sell 17.5 million shares entered before 10:00. 71/ The ICI survey indicates that most mutual funds maintained a sufficient cash

68/ The only London EFP reported on the 19th also contributed to concentrated arbitrage selling at the opening. That EFP was for 3.25 million shares, which a customer sold short to a major U.S. broker-dealer prior to the NYSE opening. This broker-dealer then sold this position (viewing it as a long position) as part of an index arbitrage program on the NYSE opening.

69/ An additional 3.3 million shares were sold short for two customer accounts as a hedge for short index futures and options positions which were "frozen" pending liquidation.

70/ See Tables D-4 and D-5.

71/ Unlike most program orders, which are sent to the NYSE floor in concentrated packages via the exchange's automated order-routing systems, this fund expected the firms handling the orders to "work the orders" in segments to maximize the prices received to raise cash for redemptions. The impact on stock prices of these sell orders, therefore, is more difficult to quantify for selected 10 minute or 30 minute intervals than is the case for program orders. For example, the fund estimates that slightly less than one-half of its sales entered before 10:00 were executed before 10:00. In addition, the fund has represented that the level of its

balance to absorb redemptions occurring over the weekend. This major fund, however, had a policy of being fully invested and, therefore, was forced to effect substantial sales to respond to weekend redemptions as well as contributed additional redemptions on Monday. Data regarding other funds on that day indicated that they were, in the aggregate, net buyers. 72/

E. Margin Calls

Relatively little selling occurred throughout the day as a result of forced liquidations of customer margin accounts. As discussed in detail in Chapter Five, the staff's survey of the 28 most active firms indicates that the responding firms sold at most around 7 million shares (1% of NYSE volume) 73/ on October 19 as liquidations to meet unpaid customer margin calls. It appears reasonable, however, to assume that a significant amount of customer stock positions were sold by customers (as opposed to firms) in order to raise cash for both securities and futures margin calls, although the level of this selling could not be quantified by the firms contacted by the Division. While we are not able to pinpoint the distribution of those sales throughout the day, the staff believes that it is likely that many of those sales occurred at or near the opening of trading.

F. Foreign Selling

Finally, a number of persons interviewed by the staff from the firms' institutional sales and block trading desks indicated that they believed there was substantial foreign selling in the morning of October 19. Although a few firms indicated that there was significant selling by Japanese investors, most firms stressed that the bulk of foreign selling came from European investors, a trend which supposedly had begun earlier in the

trading on the 19th, under 4.5% of total NYSE volume, was not aberrational since the fund's transactions constituted roughly 3.6% of NYSE volume in October 1987 and ranged up to 4.4% in July 1987. Nevertheless, the magnitude of this fund's sell orders on the 19th and the fact that most of this activity was concentrated on the sell-side indicate that it did play a significant role for the day.

72/ See Letter to David S. Ruder, SEC Chairman, from David Silver, ICI President, dated November 24, 1987. More detailed fund information was separately sent to the Division. The Commission staff conducted limited inspections of 52 non-ICI member funds and found that the redemption and portfolio sales activities of these funds were generally less, percentage-wise, than that reported by the ICI for its member funds.

73/ Firms reported that margin liquidations on the 19th totaled \$293 million, but could not determine which types of stocks were sold in these liquidations. Accordingly, the Division is unable to determine what percentage of margin liquidations were NYSE stocks. Even if the assumption was made that all of this \$293 million involved NYSE stocks, and a \$40 per share price is used, this translates to 7.3 million shares.

month and accelerated on the 19th and 20th. ^{74/} Quantifying the amount of such foreign selling is extremely difficult because much of the activity is settled through U.S. banks, and, therefore, can not be easily distinguished from activity by U.S. institutions. Nevertheless, through examining settlement information from the Depository Trust Company ("DTC"), the staff identified four major sell programs in U.S. stocks through foreign banks totalling over 9 million shares.

Perhaps as significant as any foreign selling during October 19, was the drying up of foreign buying interest. Traders at one major firm indicated that buying interest from Japan had been a significant support to the market in 1987. On October 19, however, they indicated that any Japanese buying interest entirely disappeared.

III. Timing and Magnitude of Index-Related Trading

The following section of the chronology provides a detailed account of the interaction of the various types of index-related trading strategies during key periods of the October 19 trading session.

A. Open to 10:00

As indicated above, heavy sell pressure on the CME caused the SPZ to open down over 20 points. Of this sell pressure, the Division has identified orders for at least 319 SPZ contracts as part of portfolio insurance strategies, and an additional 767 SPZ contracts were sold between 9:30 and 10:00 by portfolio insurers. These portfolio insurance sales of 1086 SPZ contracts constituted 5.6% of total SPZ volume during this period.

The apparent discount of over 10 points between the SPZ contract and the cash value of the index (and an over 11 point discount to the index's theoretical value) continued through 10:00, creating a theoretical opportunity for sell arbitrage. ^{75/} The Division identified 10 arbitrage sell programs during this period involving the sale of 4.8 million shares. ^{76/} The Division also identified ten sell programs which did not involve arbitrage. These additional programs accounted for over 3.5 million shares of selling, including at least 300,000 shares sold as part of portfolio insurance strategies. Total program selling comprised approximately 36% percent of total NYSE volume from the Opening to 9:40 -- or over 61% of NYSE volume in S&P stocks.

^{74/} In a news account, a trader indicated that the level of selling by both Japanese and European investors required pre-clearance by his firm. See Smith, Swartz & Anders, Black Monday, What Really Ignited the Market's Collapse After Its Long Climb, Wall St. J., Dec. 16, 1987, at 20.

^{75/} Other stock index futures also opened at discounts to cash value. During the period from 9:30 to 10:00, SPZ contracts continued to trade at more than a 10 point discount to cash value while the discount in the Major Market Index ("MMI") futures contract increased to more than 16 points.

^{76/} Six of these programs involved short sales of 2,061,400 shares.

B. 10:00 to 10:30

The heavy sell pressure continued on the CME. The Division identified at least 2002 SPZ futures sold as part of portfolio insurance strategies between 10:00 and 10:30, or 13% of total SPZ volume. During this time the discount on SPZ contracts had increased to 18 points, receding to 12 points by 10:30. 77/ In response to these continuing discounts, 13 arbitrage sell programs, totaling over 8 million shares, were executed during this period. 78/ These programs comprised 37% of NYSE volume in S&P stocks from 10:00 to 10:10, and 33% from 10:10 to 10:20.

C. 10:30 to 11:00

Users of portfolio insurance strategies sold at least 3317 SPZ contracts, with these sales of SPZ contracts fairly evenly distributed throughout this period. Portfolio insurance sales equalled 32% of SPZ volume in this half hour. The continued existence of substantial discounts to cash value which existed in the major stock index futures contracts at 10:30 brought in four additional index arbitrage sell programs for 2.1 million shares of stock. 79/ Also during this period, the portfolio insurance related sell programs discussed above began to hit the NYSE, with one program sending "waves" of sell orders of over 2 million shares each for S&P stocks. Two such waves hit between 10:30 and 11:00. Thus, total program selling constituted over 35% of S&P stock volume from 10:30 to 10:40 and 20% from 10:40 to 10:50.

D. 11:00 to 11:50

Portfolio insurance selling involved at least 3151 SPZ contracts, or 22% of SPZ volume from 11:00 to 11:30. 80/ Discounts in the SPZ reappeared during this period with the contract trading from premiums above theoretical value at 11:00 to a 3 point discount at 11:50. Similarly, during this period, the MMI November contracts moved from a 17 point discount at 10:30 to a 3 to 5 point premium. As a result, 13 buy arbitrage programs were executed during this period, eleven using MMI contracts of these premium values, one using SPZ contracts, and one using KVL contracts. The total amount of stock purchased as part of these programs equalled 2.1 million shares. Volume on the NYSE during this period was particularly heavy with over 93 million shares traded. Program purchases comprised 2.3% of total NYSE volume and 3.1% of S&P stock volume.

77/ MMI and KVL contracts also traded at increased discounts to cash values during this period although no portfolio insurance sales were effected in either of these contracts during this period. The MMI traded at an average discount to cash of approximately 17 points and KVL recovered from a 17 point discount to cash value at 10:20 to a 10 point discount.

78/ In two of these programs, 1,473,179 shares of stock were sold short.

79/ In addition, three buy programs were executed using MMI contracts as MMI recovered from a 17 point discount to cash value to a 3 to 5 point premium. The MMI buy programs were entered from 10:54 to 10:55 consisting, in total, of the purchase of 280,000 shares of stock.

80/ Portfolio insurance providers sold an additional 290 SPZ contracts from 11:30 to 11:49.

E. 11:50 to 12:00

From 11:50 to 12:00, users of portfolio insurance strategies sold at least 120 SPZ contracts and an additional 868 contracts at 12:00. The SPZ moved to a discount which by 12:00 exceeded 8 points. 81/ The reappearance of discounts resulted in arbitrage sell programs for approximately 900,000 shares and 2 million shares of selling for portfolio insurance strategies. With an additional 600,000 shares sold in non-arbitrage programs, total program selling constituted over 30% of NYSE volume in S&P stocks between 11:50 and 12:00.

F. 12:00 to 1:00

Portfolio insurance strategies sold at least 2695 SPZ contracts (45.1% of total SPZ volume for this period) from 12:00 to 12:30, during which the SPZ contract remained at an average 5 point discount to cash value. 82/ At least 1100 SPZ contracts (11.9% of total SPZ volume) were sold as part of portfolio insurance strategies between 12:30 and 1:00. The discount to cash value continued to exist in the SPZ contract during this period, although, by 1:00, SPZ was trading at less than a four point discount to cash value. 83/ As a result of the continuing discounts, sell arbitrage programs were executed throughout this period. This selling involved approximately 7 million shares. In addition, approximately 9 million shares of stock were sold in portfolio insurance strategies. Total program selling ranged from a low of 13% of S&P stock volume between 12:30 and 12:40 to a high of 46% between 12:50 and 1:00.

G. 1:00 to 1:30

Portfolio insurance related sales of at least 1868 SPZ contracts comprised 17% of the total SPZ volume from 1:00 to 1:30. Although the SPZ discount initially receded to less than 5 points, it increased to more than 10 points by 1:30. 84/ As a result, arbitrage programs sold around 4.3 million shares, with 492,100 additional shares sold as index substitution. Finally, over 4 million shares were sold as part of portfolio insurance strategies. Total program selling in this half hour rose from 12% of S&P

81/ The MMI contract alternated between small discounts and premiums to cash from 11:30 to 11:50, thereafter trading at an increasing discount to cash value which by 12:00 was approximately 5.00 points.

82/ The KVL and the NYF contracts also traded at consistent discounts to cash value throughout this period although no portfolio insurance sales were executed with these contracts. In contrast, the MMI contract briefly traded at a premium to cash value from 12:05 to 12:15 before falling to a discount by 12:30. No portfolio insurance strategies were implemented using MMI contracts during this period.

83/ In contrast, MMI traded at a slight premium to cash value from 12:50 to 1:00, although the MMI contract traded at a discount to cash value from 12:30 to 12:50.

84/ The discount to cash value in all of the other stock index futures contracts, with the exception of KVL, moved in a manner similar to the SPZ contract during this period.

stock volume between 1:00 and 1:10 to 63% between 1:10 and 1:20, and receded to 46% from 1:20 to 1:30.

H. 1:30 to 2:00

The Division identified sales of at least 2239 SPZ futures (17% of total volume) from portfolio insurance strategies during this period, when the SPZ discount to cash increased to more than 17 points. 85/ Stock selling from arbitrage and substitution programs involved 2.5 million shares and one million shares, respectively. An additional 8.9 million shares were sold as part of portfolio insurance strategies. Total program selling comprised 61% of S&P stock volume from 1:30 to 1:40 and 60% from 1:50 to 2:00.

I. 2:00 to 2:30

Portfolio insurance related sales involved at least 2069 SPZ contracts (21% of total SPZ volume) during this period. Despite portfolio insurance selling, the discount to cash value in SPZ contracts declined to less than 15 points by 2:30 from more than 17 points. In contrast, however, the discount for the MMI futures, in which no portfolio insurance selling was identified, declined to approximately 5 points by 2:30 from over 10 points. Arbitrage-related stock selling abated to less than 800,000 shares, comprising only 5.8% of S&P stock volume from 2:00 to 2:30.

J. 2:30 to 3:00

At least 2179 SPZ futures (23% of total volume) were sold in portfolio insurance strategies during this period. The discount in the SPZ contract had receded to less than 8 points by 2:35 but thereafter steadily increased, trading at a discount in excess of 19 points by 3:00. 86/ Arbitrage and substitution programs sold approximately 1.6 million shares between 2:30 and 3:00, 87/ with an additional 1.7 million shares sold in non-arbitrage programs. 88/ Total program selling rose to 24% of NYSE volume in S&P stocks from 2:50 to 3:00.

K. 3:00 to 3:30

At least 971 SPZ contracts (8.6% of total volume) were sold in portfolio insurance strategies during this period, when the discount in both MMI and SPZ contracts declined by more than 5 points. Arbitrage and substitution programs sold approximately 1.5 million shares and 630,000 shares, respectively, in this half hour. Portfolio insurance strategies sold an additional 1.6 million shares, and other programs sold around 300,000 shares. Volume on the NYSE was particularly heavy during this period (46 million shares in total, 33 million shares for S&P stocks), with total program selling comprising only 12% of S&P stock volume.

85/ Discounts on other stock index futures contracts also increased over this period.

86/ The MMI contract briefly traded at a small premium but by 2:40 was trading at a discount to cash value of approximately 10 points.

87/ Of these sales, 886,000 shares were sold short.

88/ Of these sales, 650,000 shares were sold short.

L. 3:30 to Close

The Division identified at least 2637 SPZ futures sold as part of portfolio insurance strategies from 3:30 to 4:00 and 633 SPZ contracts from 4:00 to 4:15, comprising 15.9% of total SPZ volume during this 45 minute period. The discount in the SPZ contract declined by approximately 8 points by 3:55, closing the day at a 6 point discount to cash value. ^{89/} Arbitrage programs sold approximately 1.3 million shares from 3:30 to the NYSE close. Much more significant, over 3 million shares were sold as part of portfolio insurance strategies and 4.3 million shares were sold in other programs -- including 2.6 million shares sold short. These short sales evidently were involuntary customer sales to hedge long index futures and options positions in "frozen accounts" for futures/options traders. NYSE volume during this period was extraordinarily heavy with 63 million shares traded. Total program selling constituted over 36% of S&P stock volume from 3:30 to 3:40 and almost 32% from 3:40 to 3:50.

^{89/} In contrast, the discount on MMI contracts continued to increase after 3:30 falling to a 34 point discount to cash value by 3:50. By 4:00, the discount on the MMI November contract receded by 24 points closing the day at a discount to cash value of less than 10 points.

OCTOBER 20

TRADING CHRONOLOGY FOR OCTOBER 20

Tuesday, October 20, 1987, saw a continuation of the extraordinarily high volume and volatility of Monday. Unlike October 19 however, price movements resemble a roller coaster demonstrating both tremendous nervousness on the part of market participants and the exhaustion of market-making capacity on virtually all stock and derivative markets. As a result the securities and futures markets reached a point, around mid-day, when heavy sell pressure almost overwhelmed market-making capacity in both the securities and futures markets. As a result, trading in a large number of NYSE securities were halted and most derivative markets ceased trading. Around this time, however, the convergence of a number of factors, including news of pending corporate buy-backs of stocks and assurances of sources of liquidity for NYSE specialists, as well as the dissipation of stock selling and the return of intangible bullish investment sentiment, resulted in a remarkable market recovery. The DJIA gained around 118 points (6.8%) from 12:20 to 1:00, maintaining a 102.27 point (5.88%) recovery for the day, closing at 1,841.01 on record NYSE volume of 613.7 million shares.^{90/} This recovery, however, did not extend to the Amex and NASDAQ markets, which closed down 8.64% and 9%, respectively.

I. Summary of Market Movements

The bearish investor sentiment of the 19th continued to be evident in trading on major foreign markets: the Tokyo Nikkei index closed down 14.90% and the London FT-SE 100 index closed down 12.22%. Notwithstanding downward trends in the foreign markets, prices on both the leading U.S. index futures market (the CME) and securities market (the NYSE) opened sharply higher. The SPZ futures on the CME opened up 23.50 points at 225, and quickly rose another 16 points to 241 by 9:53, trading at a premium to the index stocks of up to 10 points. Trading on the NYSE began with the DJIA rising to 1,935.7, up 197.30 by 10:28.

Heavy sell pressure on the CME, however, caused SPZ prices to decline, trading by about 10:00 at a slight discount to cash as the DJIA peaked. Despite the relatively low level of index arbitrage, ^{91/} the DJIA fell 227 points by 12:21. As discussed in more detail in Chapter IV of the Study, this renewed sell pressure severely strained market-making capacity on the NYSE. By 12:30, trading had been halted due to order imbalances in 145 NYSE stocks (including 77 stocks in the S&P 500, representing 24.6% of the index value), and the NYSE Chairman informed the Chairman of the Commission that he was considering closing the Exchange. Meanwhile, the combination of continued heavy sell pressure on the CME ^{92/} and halts in trading for such a significant number of S&P stocks caused the CME to halt SPZ trading. Options and futures exchanges

^{90/} This volume figure, which is larger than the often cited volume of 608,120,000 shares, is derived from NYSE audit trail tapes.

^{91/} The Division's review indicates that the voluntary restrictions placed by the NYSE on member firms' use of the Exchange's automated order-routing systems for both proprietary and customer index-arbitrage program trading resulted in these strategies playing negligible roles on this day.

^{92/} The SPZ had fallen 57 points from its early peak to 183.00 by 12:15.

halted trading all other index futures and options at this time with the exception of the MMI traded on the Chicago Board of trade ("CBT").

During an interval of about 20 minutes, beginning at approximately 12:30, the MMI Futures staged an extraordinary 90 point rally, rising from a discount of about 60 points to a 12 point premium. At that time the DJIA recovered 126.2 points to 1834.9 by 1:12.^{93/} While the rise in the MMI may have had a psychological impact on stock prices it appears to have had no direct effect on trading on the NYSE. During that time period only one small arbitrage program was effected employing the MMI.

When the CME then re-opened, the rally on the NYSE faded, with the DJIA falling back 80 points in 27 minutes. The SPZ traded at a discount to cash of more than 16 points, increasing quickly to over 31 points with the onset of the decline in stock prices. Shortly after 2:00, the DJIA staged a third rally of nearly 170 points to 1,920.3 by 3:55, but declined about 80 points to 1,841.01 at the close, up 102.27 points for the day.

II. Breakdown of Trading

A. Portfolio Insurance

Overall, it appears that portfolio insurance futures and stock selling played a significant role on the 20th in dampening price recoveries in both markets. In particular, sell pressure on the CME from portfolio insurance strategies reached its highest level for the October Market Break accounting for at least 28,265 contracts, or 25.5% of total SPZ volume on October 20. This portfolio insurance appears to have been a substantial factor in moving the SPZ price to a discount to cash value a number of times during the trading day. For example while the SPZ opened at a substantial premium to fair value, that premium was dramatically reversed to a slight discount by approximately 10:00. During this period, portfolio insurance strategies accounted for net sales of 4887 contracts, or roughly 25% of SPZ volume during this period. Portfolio insurance strategies accounted for an additional 2,719 net sales of SPZ contracts between 10:00 and 10:30 as the discount to the cash value increased in excess of 16 points and the DJIA began its plunge from the high of 1935.70. For the next hour, while the DJIA declined by over 170 points, portfolio insurance accounted for in excess of 34% of SPZ sell volume.

In addition, the portfolio insurance stock selling which had reached 39.9 million shares on the 19th continued on October 20, but at a reduced level, totaling 10.5 million shares or 1.7% of NYSE volume and 2.4% of S&P volume on the 20th.

^{93/} As discussed in detail in Chapter Three of the Study, the Division's analysis of index-related trading during this period does not provide any direct evidence to support press allegations that MMI futures were used to manipulate the prices for bellwether NYSE stocks to turn the market around. It is not possible to quantify the effect on market psychology, however, of the price rise experienced at that moment of time in the MMI index.

B. Index Arbitrage

Prior to the opening of trading on October 20, the NYSE requested that its members refrain from using the DOT LIST processing feature to route index arbitrage programs to the NYSE floor. On October 21, the NYSE also requested that firms refrain from effecting proprietary arbitrage programs. As a result, the index futures, and stock markets were effectively decoupled and relatively little index arbitrage was effected the remainder of the week. ^{94/} Given the relatively low level of index arbitrage reported to the Division, ^{95/} it does not appear that arbitrage, itself, was instrumental in transmitting futures price movements to the equity market on the 20th.^{96/} It may well be that the effect of futures prices on the stock market on this day was more a matter of "market psychology", causing NYSE specialists to reflexively drop prices to eliminate discounts because of their belief that surges of selling would follow any discount. Indeed, in light of the continuing stock liquidations of portfolio insurers and likely additional institutional selling shifted from the futures to the stock market such a response remained understandable.

C. Margin Calls

The level of firm liquidations of customer stock positions to meet outstanding margin calls increased from a value of \$292.6 million on October 19 to \$425.8 million on the 20th. At most, this would account for approximately 10.5 million shares of selling (1.7% of NYSE volume). ^{97/} As on the 19th, however, it is reasonable to assume that customers also voluntarily sold a significant amount of stock on October 20 to raise cash for margin calls.

D. Other Trading

The Division's review of trading on the 20th, unlike the analysis of the 19th, has not identified dominant sources of selling pressure during the mid-morning market downturn. Instead, this selling appears to have been broad-based along the lines of October 19, with the largest segment of selling still derived from institutional accounts (45% on the 20th, as opposed to 50.7% on the 19th) and only slightly higher levels of selling from retail and proprietary accounts (37.4% retail, 17.5% proprietary on the 20th

^{94/} Effective on November 3, the NYSE permitted programs entered for customer or proprietary accounts to be routed through the DOT system if entered prior to the opening; on November 6, the NYSE announced that commencing November 9, 1987, members firms would be allowed to use DOT to execute orders for program trades throughout the day.

^{95/} This low level of arbitrage is consistent with the results of the NYSE's monitoring of "program" orders sent through the Exchange's automated order-routing systems.

^{96/} No EFPs were reported for October 20.

^{97/} As noted in the discussion of October 19, this maximum number of shares assumes that all selling involved NYSE (versus Amex and NASDAQ) stocks -- an assumption which is almost certainly unrealistic.

versus 33.3% retail, 16.0% proprietary on the 19th). ^{98/} This selling may have sought to take advantage of the morning's price recovery as an opportunity for liquidations prior to another market drop.

Similarly, the trading information available to the Division does not highlight any particular sources for the resurgence of buying interest that precipitated the mid-day market recovery on the NYSE. Again, this buying appears to have come from all types of accounts (45.9% institutional, 38.1% retail, and 16.0% proprietary). Nor does it appear that buying by corporate issuers on the 20th (although announced for the near future) accounts for a significant segment of this buying interest. Our survey of issuers in the S&P index with outstanding repurchase programs indicates that those issuers only accounted for 21.94 million shares or 3.57% of buying on the NYSE (or 5.14% of volume in S&P stocks). We can not discount, however, the psychological significance of announcements of issuer repurchase programs during October 20. For example, during the critical period between 11:30 and 1:00 that day, 8 issuers in the S&P 500 index announced repurchase programs. ^{99/}

III. Timing and Magnitude of Index-Related Trading

The following section of the chronology provides a detailed breakdown of the interaction of the various types of index-related trading on October 20.

A. Open to 10:00

The Division identified portfolio insurance related sales of at least 4,885 SPZ futures contracts (26% of total volume) from 9:30 to 10:00. The SPZ contracts opened at a premium to the cash value of the index, but by 10:00 prices had declined to the point that the SPZ contracts were trading at approximately cash value. The MMI futures similarly opened at a premium to the cash value of the index which by 10:00 also had declined to cash value even though no portfolio insurance strategies were executed in the MMI during this period. The existence of premiums in MMI and SPZ did not trigger any index arbitrage buy programs, nor were previously established sell programs closed during this period. Moreover, the erosion of premiums in these contracts between 9:30 and 10:00 did not trigger additional sell arbitrage programs nor were pre-existing buy programs closed during this period. Only one index arbitrage sell program involving the short sale of 165,800 shares was executed at the opening. During this period, the DJIA rose from a value of 1738.4 to 1855.4, for a gain of 117 points. Index arbitrage trading accounted for 0.3% of total NYSE volume during this period.

B. 10:00 to 10:30

Portfolio insurance related sales involved at least 2621 SPZ contracts (25% of total volume) during this period. The SPZ contract fell to a discount to cash which by

^{98/} The sampling of broker-dealer data used for these percentages accounted for 386 million shares (63% of NYSE volume).

^{99/} For a more complete discussion of issuer repurchase programs, see Chapter Six.

10:30 was in excess of 16 points. 100/ Two index arbitrage programs sold less than 400,000 shares (including 96,000 shares sold short) during this period, accounting for only 0.8% of NYSE volume in S&P stocks.

C. 10:30 to 11:00

The Division identified portfolio insurance related sales of at least 3084 SPZ contracts (24% of total volume) during this period. Discounts to cash values continued to exist in all major stock index futures contracts over this period. The discount in the SPZ and MMI contracts exceeded 30 points over this period while the NYF contract traded at a discount to cash value in excess of 12 points and the KVL contract traded at more than a 25 point discount to cash. Despite these substantial discounts to cash value in SPZ and MMI contracts, relatively few index arbitrage sell programs were executed. Seven index arbitrage sell programs for less than 900,000 shares were executed during this period as discounts to cash value of SPZ and MMI contracts increased to more than 30 points. An additional 1.1 million shares were sold as part of non-arbitrage programs. Total program selling constituted 4.3% of NYSE volume in S&P stocks for this period.

D. 11:00 to 11:30

Sales of SPZ contracts in portfolio insurance strategies involved at least 4162 SPZ contracts (39% of total volume). All of the major stock index futures contracts remained at substantial discounts to cash values during this period. The SPZ contract traded at a discount in the range of 25 to 40 points below cash value over this period. Similarly, the MMI contract traded at more than a 29 point discount to cash value. NYF contracts traded at discounts in the range of 12 to 20 points below cash value during this period. Despite the existence of substantial discounts in all of the major stock index futures contracts, only about 200,000 shares were sold in arbitrage programs from 11:00 to 11:30 (including approximately 60,000 shares sold short). The Division, however, identified program sales of approximately 6.3 million shares as part of portfolio insurance strategies, and almost 900,000 shares sold as other programs. Total program selling, therefore, comprised almost 17% of S&P stock volume from 11:00 to 11:30 (and almost 29% from 11:20 to 11:30).

E. 11:30 to 12:00

Portfolio insurance related sales involved at least 2061 SPZ contracts (23% of total volume) from 11:30 to 12:00. As in prior periods, however, portfolio insurance strategies also involved purchases of futures -- in this case, 1,337 SPZ contracts. Net sales for this period related to portfolio insurance strategies equalled 724 contracts. From 11:30 to 11:55, discounts on SPZ and KVL declined to 20 points on the SPZ contract and 10 points on the KVL. The discount on the MMI contract, however, never improved during this period, trading at 29 points below the cash value of the index. Further improvements in the value of SPZ and KVL contracts failed to materialize, with the SPZ and KVL contracts trading at 38 and 20 point discounts to cash value,

100/ MMI contracts and NYF futures also traded at significant discount to cash value during this period despite the fact that no portfolio insurance sales were executed with either of these stock index futures contracts during this period.

respectively, by 12:00. Arbitrage programs sold only approximately 480,000 shares during this period, constituting 1.8% of S&P stock volume during this period.

F. 12:00 to 12:30

Users of portfolio insurance strategies sold at least 287 SPZ contracts, amounting to 7% of total SPZ volume for this period. The CME halted trading at 12:13 until 1:05. Prior to this halt, the SPZ contract consistently traded at a 30 point discount to the cash value of the index. Discounts in the MMI and KVL contracts increased until 12:20, with the discount on the MMI contract equal to an unprecedented 59 points. By 12:30, however, both the MMI and the KVL contracts had recovered with the MMI contract trading at a 30 point discount to cash value and the KVL contract trading at a discount which was less than 10 points. No index arbitrage program trades were reported during this period. The DJIA continued to decline, falling to a value of 1710.7 by 12:15. An intra-day low of 1708.7 was reached at 12:21, but by 12:29 the value of the index had recovered to a value of 1714.4. Total volume on the NYSE over this period equalled 38,281,530 shares of stock.

G. 12:30 to 1:00

Trading in the SPZ futures was suspended during this time. The MMI contract traded erratically during this period. At 12:30, MMI contracts were trading at a discount to cash value slightly in excess of 30 points. By 12:40, MMI contracts were trading at the cash value of the index, thereafter trading at a 10 to 12 point premium to 12:50. By 1:00, however, discounts in the MMI reappeared trading at approximately 10 point discounts to cash value to 1:00. A detailed discussion of the CFTC staff's findings regarding trading in the MMI futures during this period and related allegations of possible market manipulation is provided in Chapter Three of the Study. The brief existence of a premium to cash value in the MMI futures from 12:40 to 12:50 resulted in only one index arbitrage program purchasing 40,000 shares of stock and the sale of 25 MMI contracts entered at 12:49 -- constituting less than one-tenth of one percent of NYSE volume from 12:30 to 1:00.

H. 1:00 to 1:30

At least 1,166 SPZ futures were sold in portfolio insurance strategies from the reopening of trading at 1:05 to 1:30, accounting for 16% of total volume. The SPZ contract remained at a discount to the cash although the size of the discount decreased to less than 20 points by 1:30. The MMI contract continued to trade erratically, trading at a 29 point discount to cash by 1:20, but by 1:30 trading approximately at cash value. No index arbitrage programs were executed in this half hour.

I. 1:30 to 2:00

Portfolio insurance related sales of at least 3591 SPZ futures comprised 36% of total volume. The SPZ futures continued to trade at a discount to cash value, with the discount diminishing from approximately 18 points at 1:30 to 10 points by 2:00. The MMI contract traded at a premium from 1:45 to 1:55, falling thereafter to approximately a 10 point discount at 2:00. KVL futures traded at a premium to cash value during this period exceeding 9 points by 1:50. Three index arbitrage buy programs were executed in this half-hour, two using MMI contracts and one using the KVL. The KVL arbitrage program was entered at approximately 1:30, consisting of purchases of 1,129,800 shares

of stock and sales of 196 KVL contracts. The MMI index arbitrage buy programs were entered at 1:39 and 1:54, both consisting of purchases of 40,000 shares of stock and sales of 25 MMI contracts. Total arbitrage-related trading accounted for 4% of NYSE volume.

J. 2:00 to 3:30

Users of portfolio insurance strategies sold at least 2732 SPZ futures (42% of total volume) from 2:00 to 2:30, 963 contracts (16% of total volume) from 2:30 to 3:00, and 1477 contracts (27% of total volume) from 3:00 to 3:30. The SPZ contract traded at a discount to cash value in the range of 4 to 11 points from 2:00 to 2:55 increasing by 3:00 to approximately 15 points. The SPZ contract remained at a 15 point discount to cash value until 3:30. The MMI contract, however, traded much closer to the cash value of the index over this period alternating between small discounts and premiums to the cash value of the index. MMI traded at premiums from 2:05 to 2:20, from 2:40 to 2:55 and from 3:20 to 3:25, and at discounts to cash value from 2:00 to 2:05, from 2:20 to 2:40, from 3:00 to 3:20 and from 3:25 to 3:30. Only two index arbitrage buy programs were executed over this entire period. In the aggregate, these programs consisted of the purchase of 128,000 shares of stock and the sale of 80 MMI contracts. One program was entered at 2:44 and the other at 2:55. The DJIA rose from 1751.7 at 2:10 to 1803.2 by 2:30. From 2:30 to 3:00 the DJIA rose an additional 78.6 points from 1803.2 to 1881.8 and by 3:29, the DJIA had gained an additional 32.9 points to 1914.7. NYSE volume from 2:30 to 3:00 equalled 33,276,440 shares of stock. Index arbitrage-related volume, therefore, amounted to less than one half of one percent of total volume from 2:30 to 3:00, and even a smaller percentage of total NYSE over this entire period. No arbitrage-related selling was reported for 2:00 to 3:30 but over 1.6 million shares were sold as part of portfolio insurance strategies, with 1.1 million of this selling constituting almost 22% of S&P stock volume from 2:10 to 2:20.

K. 3:30 to Close

Portfolio insurance sales of 1202 SPZ futures comprised 11% of total volume during this period. Over this period, the SPZ contract sold at a discount to cash value of approximately 15 points or more, closing for the day at a discount in excess of 20 points. The MMI contract also traded at a discount to cash value during this period that by 4:00 exceeded 10 points. MMI closed the day, however, at a small discount to cash value of approximately 3 to 5 points. Five sell arbitrage programs were executed during this period, all using MMI contracts despite the fact that larger discounts to cash value were present in the SPZ. These programs in the aggregate consisted of sales of 648,000 shares of stock. Over a million shares, however, were sold in non-arbitrage programs. Total program selling comprised only 6.0% of S&P stock volume from 3:30 to the close.

APPENDIX B

CHRONOLOGIES OF INDEX-RELATED TRADING ON NYSE

The attached charts provide a chronology of index-related trading on the New York Stock Exchange during the October Market Break. In addition, index-related trading effected on the London market appears at the end of each day's chronology. An explanation of the chart headings are as follows:

1. Time - Time of order entry (Eastern Time)
2. Principal - (firm proprietary)
Agent - (customer)
3. Strategy:
 - AO - Arbitrage (opening)
 - AC - Arbitrage (closing)
 - SB - Substitution (treated as arbitrage)
 - AD - Adjustments of Portfolio Hedges
(treated as arbitrage)
 - EFPP - Exchanges for Physical
(London Market)
 - PI - Portfolio Insurance Stock Transaction
 - OS - Other Strategies
4. Order entry method for stocks:
 - Automated (DOT system)
 - Manual (phoning orders to floor)
5. B - Buy
S - Sell
SS - Sell Short
6. Number of shares of stock (exact)
7. Dollar amount (millions of dollars)
8. Index Products:
 - SPZ - S&P 500 Futures
 - MMI - Major Market Index Futures
 - KVL - Kansas City Value Line Futures
 - NYF - NYSE Composite Index Option
 - OEX - S&P 100 Index Option

There are various other derivative products which account for a very small amount of program trading. If no derivative contract was involved, "NA" or "Not Applicable" appears in this column. If this column is blank, either the transactions involved a fractional adjustment to an

arbitrage position (too small to involve a full future contract) or the exact number of contracts involved is unavailable.

9. Number of derivative contracts used in an arbitrage program.

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 6, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	PRINCIPAL	AC	AUTOMATED	S	437,750	22.2	SPZ	140
09:30 AM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.8	MMI	14
09:30 AM	PRINCIPAL	OS	AUTOMATED	B	16,700	0.7	NA	0
09:30 AM	PRINCIPAL	OS	AUTOMATED	S	9,700	0.4	NA	0
09:33 AM	PRINCIPAL	OS	AUTOMATED	SS	65,098	0.2	NA	0
09:33 AM	PRINCIPAL	OS	AUTOMATED	B	40,301	0.8	NA	0
09:34 AM	PRINCIPAL	AC	MANUAL	S	400,700	20.0	SPZ	130
09:36 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	17.0	SPZ	104
09:36 AM	AGENT	AC	AUTOMATED	S	309,700	15.7	SPZ	100
09:36 AM	PRINCIPAL	AC	AUTOMATED	S	123,000	8.4	SPZ	60
09:40 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	25
09:41 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.6	MMI	28
09:42 AM	PRINCIPAL	OS	AUTOMATED	SS	247,900	4.9	NA	0
09:42 AM	AGENT	OS	AUTOMATED	B	75,000	5.0	NA	0
09:43 AM	PRINCIPAL	AO	AUTOMATED	B	20,000	2.7	MMI	13
09:49 AM	PRINCIPAL	AO	AUTOMATED	B	20,000	2.7	MMI	13
09:56 AM	PRINCIPAL	AC	AUTOMATED	S	106,150	5.3	SPZ	30
09:58 AM	AGENT	AC	AUTOMATED	S	196,800	9.4	SPZ	58
10:02 AM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.8	MMI	14
10:03 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	25
10:05 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	17.0	SPZ	104
10:09 AM	AGENT	OS	AUTOMATED	B	60,000	4.0	NA	0
10:14 AM	PRINCIPAL	OS	AUTOMATED	B	104,800	5.7	NA	0
10:15 AM	PRINCIPAL	OS	AUTOMATED	B	114,700	4.2	NA	0
10:20 AM	AGENT	AC	AUTOMATED	S	262,484	13.1	SPZ	81
10:20 AM	PRINCIPAL	AC	AUTOMATED	S	208,600	8.4	SPZ	50

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
10:21 AM	AGENT	AC	AUTOMATED	S	198,300	9.5	SPZ	56
10:27 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	25
10:28 AM	AGENT	AC	AUTOMATED	S	309,700	15.7	SPZ	100
10:28 AM	PRINCIPAL	AC	AUTOMATED	S	279,200	13.5	SPZ	85
10:30 AM	AGENT	OS	AUTOMATED	S	280,000	21.0	NA	0
10:30 AM	PRINCIPAL	AC	AUTOMATED	S	222,300	10.9	SPZ	60
10:30 AM	PRINCIPAL	AC	AUTOMATED	S	212,900	10.0	SPZ	68
10:33 AM	PRINCIPAL	AC	AUTOMATED	S	518,200	28.0	SPZ	165
10:33 AM	PRINCIPAL	AC	AUTOMATED	S	39,800	4.3	SPZ	30
10:37 AM	PRINCIPAL	AO	AUTOMATED	B	9,900	1.0	MMI	8
10:41 AM	PRINCIPAL	AO	AUTOMATED	B	14,300	1.4	MMI	11
10:42 AM	PRINCIPAL	AO	AUTOMATED	B	20,000	2.7	MMI	13
10:45 AM	PRINCIPAL	OS	AUTOMATED	B	30,000	1.8	FNC	94
10:48 AM	PRINCIPAL	AO	AUTOMATED	B	19,800	1.1	MMI	9
11:01 AM	PRINCIPAL	AC	MANUAL	S	544,900	27.7	SPZ	175
11:04 AM	PRINCIPAL	AC	AUTOMATED	S	124,700	6.0	SPZ	38
11:04 AM	PRINCIPAL	AC	AUTOMATED	S	83,200	4.0	SPZ	30
11:08 AM	PRINCIPAL	AO	AUTOMATED	B	24,200	2.4	MMI	19
11:08 AM	AGENT	OS	AUTOMATED	B	22,000	1.8	NA	0
11:22 AM	PRINCIPAL	AO	AUTOMATED	B	39,800	4.3	SPZ	30
11:34 AM	PRINCIPAL	AC	AUTOMATED	S	235,800	13.6	SPZ	85
11:34 AM	PRINCIPAL	AC	AUTOMATED	S	24,200	2.4	MMI	19
11:35 AM	PRINCIPAL	AC	MANUAL	S	200,900	10.0	SPZ	62
11:36 AM	PRINCIPAL	AC	AUTOMATED	S	100,000	7.5	MMI	25
11:45 AM	AGENT	AC	AUTOMATED	S	45,000	1.7	SPZ	10
11:46 AM	AGENT	AC	AUTOMATED	S	3,300	0.2	SPZ	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
12:07 PM	AGENT	AC	AUTOMATED	S	45,000	1.7	SPZ	10
12:11 PM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	25
12:17 PM	AGENT	OS	AUTOMATED	B	35,000	1.0	NA	0
12:18 PM	PRINCIPAL	AC	AUTOMATED	S	60,100	2.3	SPZ	15
12:19 PM	AGENT	OS	AUTOMATED	S	50,000	4.9	NA	0
12:19 PM	PRINCIPAL	AC	AUTOMATED	S	9,900	1.0	MMI	8
12:23 PM	AGENT	AC	AUTOMATED	S	45,000	1.7	SPZ	10
12:29 PM	PRINCIPAL	AO	AUTOMATED	B	9,900	1.0	MMI	8
12:31 PM	PRINCIPAL	OS	AUTOMATED	B	159,650	5.1	NA	0
12:39 PM	PRINCIPAL	AO	AUTOMATED	B	9,900	1.0	MMI	8
12:41 PM	PRINCIPAL	AO	AUTOMATED	B	14,300	1.4	MMI	11
12:44 PM	AGENT	OS	AUTOMATED	B	200,000	16.0	NA	0
12:54 PM	AGENT	OS	AUTOMATED	B	12,600	0.5	NA	0
01:04 PM	PRINCIPAL	AO	AUTOMATED	B	175,450	10.5	OEX	332
01:07 PM	AGENT	AC	AUTOMATED	S	45,000	1.6	SPZ	10
01:19 PM	AGENT	AC	AUTOMATED	S	45,000	1.6	SPZ	10
01:19 PM	PRINCIPAL	AO	AUTOMATED	B	19,800	1.1	MMI	9
01:22 PM	PRINCIPAL	OS	AUTOMATED	B	107,000	5.7	NA	0
01:23 PM	PRINCIPAL	OS	AUTOMATED	B	114,700	4.2	NA	0
01:57 PM	AGENT	AC	AUTOMATED	S	45,000	1.6	SPZ	10
02:01 PM	PRINCIPAL	AC	MANUAL	S	200,900	10.0	SPZ	62
02:01 PM	PRINCIPAL	AC	AUTOMATED	S	58,650	1.9	SPZ	10
02:03 PM	AGENT	OS	AUTOMATED	S	661,600	32.0	NA	0
02:03 PM	PRINCIPAL	AC	AUTOMATED	S	319,000	17.6	SPZ	115
02:03 PM	PRINCIPAL	AC	AUTOMATED	S	289,000	13.0	KVL	114
02:04 PM	PRINCIPAL	AC	AUTOMATED	S	218,300	10.7	KVL	60

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
02:19 PM	AGENT	OS	AUTOMATED	B	170,800	6.6	NA	0
02:23 PM	AGENT	AC	AUTOMATED	S	45,000	1.6	SPZ	10
02:25 PM	PRINCIPAL	AC	AUTOMATED	S	24,200	2.4	MMI	19
02:26 PM	PRINCIPAL	AC	AUTOMATED	S	437,750	21.9	SPZ	140
02:49 PM	PRINCIPAL	AO	MANUAL	B	22,000	1.8	MMI	14
02:55 PM	AGENT	AC	AUTOMATED	S	45,000	1.6	SPZ	10
02:59 PM	PRINCIPAL	AC	AUTOMATED	S	60,100	2.3	SPZ	15
03:24 PM	PRINCIPAL	AC	AUTOMATED	S	289,300	14.7	SPZ	91
03:24 PM	PRINCIPAL	AC	AUTOMATED	S	58,650	1.9	SPZ	10
03:24 PM	AGENT	AC	AUTOMATED	S	45,000	1.6	SPZ	10
03:26 PM	AGENT	OS	AUTOMATED	S	531,300	20.0	NA	0
03:26 PM	PRINCIPAL	AC	MANUAL	S	200,900	10.0	SPZ	62
03:27 PM	PRINCIPAL	AC	AUTOMATED	S	518,200	28.0	SPZ	165
03:27 PM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	25
03:31 PM	PRINCIPAL	AC	AUTOMATED	S	19,800	1.1	MMI	9
03:32 PM	PRINCIPAL	AC	AUTOMATED	S	435,653	17.0	NYF	200
03:32 PM	PRINCIPAL	AC	AUTOMATED	S	200,900	10.0	SPZ	62
03:32 PM	PRINCIPAL	AC	MANUAL	S	661,600	32.0	NA	0
03:40 PM	AGENT	OS	AUTOMATED	S	437,750	21.8	SPZ	140
03:40 PM	PRINCIPAL	AC	AUTOMATED	S	311,700	6.9	SPZ	40
03:40 PM	PRINCIPAL	AC	AUTOMATED	S	212,900	10.0	SPZ	67
03:41 PM	PRINCIPAL	AC	AUTOMATED	S	95,000	5.0	SPZ	30
03:41 PM	AGENT	AC	AUTOMATED	S	1,340,000	27.0	KVL	194
03:42 PM	PRINCIPAL	AC	AUTOMATED	S	309,700	15.4	SPZ	100
03:42 PM	AGENT	AC	AUTOMATED	S	66,000	4.0	NA	0
03:42 PM	AGENT	OS	AUTOMATED	S	620,000	31.9	SPZ	200
03:43 PM	PRINCIPAL	AC	AUTOMATED	S				

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
03:44 PM	PRINCIPAL	AC	AUTOMATED	S	200,300	9.9	SPZ	60
03:46 PM	AGENT	OS	AUTOMATED	S	661,600	32.0	NA	0
03:48 PM	AGENT	AC	AUTOMATED	S	309,700	15.4	SPZ	100
03:48 PM	AGENT	OS	AUTOMATED	B	89,500	4.8	NA	0
03:48 PM	PRINCIPAL	AC	AUTOMATED	S	44,000	3.5	MMI	28
03:49 PM	AGENT	OS	AUTOMATED	S	16,650	0.6	NA	0
03:50 PM	PRINCIPAL	AC	MANUAL	S	200,900	10.0	SPZ	62
03:51 PM	AGENT	OS	AUTOMATED	S	33,000	2.0	NA	0
03:52 PM	AGENT	AC	AUTOMATED	S	45,300	1.7	SPZ	10
03:53 PM	AGENT	OS	AUTOMATED	S	661,600	32.0	NA	0
03:53 PM	PRINCIPAL	AC	AUTOMATED	S	620,000	31.9	SPZ	200
03:53 PM	PRINCIPAL	OS	AUTOMATED	S	238,100	9.8	NA	0
03:55 PM	PRINCIPAL	AC	MANUAL	S	401,800	20.0	SPZ	124
03:55 PM	PRINCIPAL	AC	AUTOMATED	S	156,200	9.3	OEX	300
03:56 PM	PRINCIPAL	AC	AUTOMATED	S	229,150	13.4	SPZ	90
03:57 PM	PRINCIPAL	AC	AUTOMATED	S	620,000	31.9	SPZ	200
03:59 PM	PRINCIPAL	AC	AUTOMATED	S	100,000	7.5	MMI	25

PROGRAMS EXECUTED "ALL DAY"

PRINCIPAL	OS	AUTOMATED	B	1,180,000	81.6	SPZ	520
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COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 6, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX	NO. OF PRODUCT CONTRACTS
	PRINCIPAL	AO	AUTOMATED	B	160,000	12.8	MMI	102
	PRINCIPAL	AC	AUTOMATED	S	160,000	12.8	MMI	102

LONDON MARKET

AGENT PRINCIPAL	EFP EFP	MANUAL MANUAL	SS B	1,240,000 1,240,000	64.0 64.0	SPZ SPZ	400 400
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COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 14, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	PRINCIPAL	AO	AUTOMATED	SS	248,000	14.0	SPZ	93
09:30 AM	PRINCIPAL	AC	AUTOMATED	S	287,000	13.0	SPZ	83
09:30 AM	PRINCIPAL	AC	AUTOMATED	S	125,000	5.0	SPZ	31
09:30 AM	AGENT	OS	AUTOMATED	S	55,100	2.7	NA	0
09:30 AM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.7	MMI	20
09:30 AM	PRINCIPAL	AC	AUTOMATED	S	66,000	5.1	MMI	0
09:32 AM	PRINCIPAL	AC	MANUAL	B	40,000	3.0	MMI	25
09:33 AM	PRINCIPAL	AC	AUTOMATED	S	444,000	21.2	SPZ	140
09:34 AM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	25
09:38 AM	PRINCIPAL	AC	MANUAL	B	40,000	3.0	MMI	25
09:44 AM	AGENT	OS	AUTOMATED	S	10,000	0.8	NA	0
09:44 AM	PRINCIPAL	OS	AUTOMATED	B	19,800	0.7	NA	0
09:45 AM	PRINCIPAL	AC	AUTOMATED	S	220,300	10.3	SPZ	70
09:48 AM	AGENT	OS	AUTOMATED	B	6,000	0.2	NA	0
09:52 AM	PRINCIPAL	AC	MANUAL	B	40,000	3.0	MMI	25
09:54 AM	PRINCIPAL	AC	AUTOMATED	S	287,000	13.0	SPZ	83
09:56 AM	PRINCIPAL	AC	AUTOMATED	S	9,900	0.9	MMI	8
09:57 AM	AGENT	AC	AUTOMATED	S	309,100	15.0	SPZ	99
09:57 AM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	25
09:58 AM	PRINCIPAL	AO	AUTOMATED	SS	382,000	16.5	SPZ	104
09:58 AM	PRINCIPAL	AC	AUTOMATED	S	287,000	13.0	SPZ	83
09:58 AM	PRINCIPAL	AC	AUTOMATED	S	163,900	7.7	SPZ	50
09:58 AM	PRINCIPAL	AO	AUTOMATED	SS	248,000	14.0	SPZ	93
09:58 AM	PRINCIPAL	AC	AUTOMATED	S	319,400	16.9	SPZ	115
09:59 AM	PRINCIPAL	AC	AUTOMATED	S	287,000	13.0	SPZ	83
09:59 AM	PRINCIPAL	AC	AUTOMATED	S	125,000	5.0	SPZ	31

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
10:00 AM	PRINCIPAL	AO	AUTOMATED	B	9,900	0.9	MMI	8
10:14 AM	PRINCIPAL	AC	AUTOMATED	S	24,200	2.3	MMI	19
10:20 AM	AGENT	AC	AUTOMATED	S	309,100	15.0	SPZ	99
10:20 AM	AGENT	SB	AUTOMATED	S	231,393	11.0	SPZ	69
10:23 AM	PRINCIPAL	AC	AUTOMATED	S	123,600	4.2	SPZ	25
10:26 AM	PRINCIPAL	AO	AUTOMATED	SS	248,000	14.0	SPZ	93
10:33 AM	PRINCIPAL	AO	AUTOMATED	SS	212,900	10.0	SPZ	67
10:38 AM	PRINCIPAL	AO	AUTOMATED	SS	395,000	16.4	SPZ	104
10:39 AM	AGENT	AC	AUTOMATED	S	309,100	15.0	SPZ	99
10:44 AM	AGENT	AO	AUTOMATED	S	600,000	24.0	SPZ	185
11:13 AM	PRINCIPAL	AO	AUTOMATED	SS	248,000	14.0	SPZ	93
11:14 AM	AGENT	AC	AUTOMATED	S	309,100	15.0	SPZ	99
11:24 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	25
11:28 AM	AGENT	OS	AUTOMATED	B	54,000	2.5	NA	0
11:33 AM	PRINCIPAL	AO	AUTOMATED	SS	362,000	16.3	SPZ	104
11:52 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	20.0	SPZ	135
11:52 AM	PRINCIPAL	AO	AUTOMATED	SS	395,000	16.4	SPZ	104
11:58 AM	PRINCIPAL	AO	AUTOMATED	SS	443,000	20.0	SPZ	135
12:11 PM	PRINCIPAL	AO	AUTOMATED	B	24,200	2.3	MMI	19
12:13 PM	PRINCIPAL	AO	AUTOMATED	B	20,000	1.3	MMI	12
12:14 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	5
12:39 PM	AGENT	OS	AUTOMATED	S	10,000	0.8	NA	0
12:40 PM	PRINCIPAL	AC	MANUAL	S	200,100	10.0	SPZ	62
12:43 PM	PRINCIPAL	AO	AUTOMATED	SS	248,000	14.0	SPZ	93
12:44 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.7	MMI	5
12:47 PM	PRINCIPAL	AC	AUTOMATED	S	157,900	7.5	SPZ	50

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
			ENTRY METHOD						
12:47 PM	AGENT	AO	AUTOMATED		S	600,000	24.0	SPZ	185
12:48 PM	PRINCIPAL	AO	AUTOMATED		B	40,000	3.0	MMI	25
12:52 PM	PRINCIPAL	AC	AUTOMATED		S	9,900	0.9	MMI	8
12:52 PM	PRINCIPAL	AO	AUTOMATED		SS	54,500	2.8	KVL	5
12:54 PM	AGENT	AO	AUTOMATED		S	580,000	22.0	SPZ	144
12:55 PM	PRINCIPAL	AC	AUTOMATED		S	444,000	21.1	SPZ	140
12:57 PM	AGENT	OS	AUTOMATED		B	190,000	10.0	NA	0
12:57 PM	PRINCIPAL	AC	MANUAL		S	200,100	10.0	SPZ	62
12:57 PM	AGENT	SB	AUTOMATED		S	245,855	12.0	SPZ	75
12:58 PM	PRINCIPAL	AC	AUTOMATED		S	219,700	10.2	SPZ	70
12:58 PM	PRINCIPAL	AO	AUTOMATED		B	40,000	3.0	MMI	25
01:00 PM	AGENT	AO	AUTOMATED		S	580,000	22.0	SPZ	144
01:01 PM	AGENT	AC	AUTOMATED		S	309,100	15.0	SPZ	99
01:02 PM	PRINCIPAL	AC	AUTOMATED		S	167,400	7.6	SPZ	50
01:03 PM	AGENT	AO	AUTOMATED		S	560,000	28.0	SPZ	189
01:03 PM	PRINCIPAL	AO	AUTOMATED		B	9,900	0.9	MMI	8
01:04 PM	PRINCIPAL	AO	AUTOMATED		B	89,500	5.0	OEX	165
01:07 PM	PRINCIPAL	AC	AUTOMATED		S	40,000	3.0	MMI	25
01:09 PM	PRINCIPAL	AC	AUTOMATED		S	40,000	3.0	MMI	25
01:10 PM	PRINCIPAL	AC	MANUAL		S	200,100	10.0	SPZ	62
01:10 PM	PRINCIPAL	AC	AUTOMATED		S	44,000	3.4	MMI	28
01:10 PM	PRINCIPAL	AC	AUTOMATED		S	229,000	12.9	SPZ	90
01:12 PM	PRINCIPAL	AC	AUTOMATED		S	40,000	3.0	MMI	25
01:13 PM	AGENT	AC	AUTOMATED		S	384,490	14.8	SPZ	93
01:13 PM	AGENT	AC	AUTOMATED		S	614,700	20.7	SPZ	99
01:13 PM	PRINCIPAL	AC	AUTOMATED		S	151,000	6.1	SPZ	40

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
01:13 PM	AGENT	AC	AUTOMATED	S	199,400	12.5	SPZ	93
01:14 PM	AGENT	AO	AUTOMATED	S	580,000	22.0	SPZ	144
01:14 PM	PRINCIPAL	AO	AUTOMATED	SS	533,267	9.2	XOC	
01:14 PM	PRINCIPAL	AC	AUTOMATED	B	212,900	10.0	SPZ	68
01:33 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.7	MMI	14
01:35 PM	PRINCIPAL	AC	AUTOMATED	S	134,400	5.5	YXZ	60
01:36 PM	PRINCIPAL	AC	AUTOMATED	S	63,900	1.9	SPZ	10
01:50 PM	PRINCIPAL	AC	AUTOMATED	S	9,900	0.9	MMI	8
01:51 PM	PRINCIPAL	AO	AUTOMATED	SS	248,000	14.0	SPZ	93
01:51 PM	PRINCIPAL	AC	AUTOMATED	S	14,300	1.4	MMI	11
01:54 PM	PRINCIPAL	AC	AUTOMATED	S	126,100	5.3	YXZ	60
01:57 PM	AGENT	AO	AUTOMATED	S	580,000	22.0	SPZ	165
02:05 PM	PRINCIPAL	AC	AUTOMATED	S	139,200	5.5	YXZ	60
02:11 PM	PRINCIPAL	AC	AUTOMATED	S	218,200	10.1	SPZ	70
02:13 PM	PRINCIPAL	AC	AUTOMATED	S	133,100	5.2	YXZ	60
02:13 PM	PRINCIPAL	AC	AUTOMATED	S	137,600	5.4	YXZ	60
02:24 PM	PRINCIPAL	AO	AUTOMATED	SS	248,000	14.0	SPZ	93
02:27 PM	PRINCIPAL	AO	AUTOMATED	SS	395,000	16.4	SPZ	104
02:30 PM	AGENT	AO	AUTOMATED	S	800,000	36.0	SPZ	240
02:31 PM	PRINCIPAL	AO	AUTOMATED	SS	382,000	16.5	SPZ	104
02:33 PM	PRINCIPAL	AC	AUTOMATED	S	129,700	5.2	YXZ	60
02:36 PM	AGENT	AO	AUTOMATED	S	800,000	36.0	SPZ	240
02:38 PM	PRINCIPAL	AC	MANUAL	S	200,100	10.0	SPZ	62
02:40 PM	PRINCIPAL	AC	AUTOMATED	S	19,800	1.1	MMI	9
02:41 PM	AGENT	AO	AUTOMATED	S	800,000	36.0	SPZ	240
02:41 PM	PRINCIPAL	AC	AUTOMATED	S	129,300	5.3	YXZ	60

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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)		INDEX PRODUCT	NO. OF CONTRACTS
			ENTRY METHOD							
02:44 PM	PRINCIPAL	AO	AUTOMATED		B	20,000	1.3		MMI	13
02:46 PM	PRINCIPAL	AO	AUTOMATED		B	44,000	3.4		MMI	28
02:47 PM	AGENT	OS	AUTOMATED		S	10,000	0.8		NA	0
02:48 PM	PRINCIPAL	AC	MANUAL		B	40,000	3.0		MMI	25
02:48 PM	PRINCIPAL	AO	AUTOMATED		B	20,000	1.3		MMI	13
02:50 PM	AGENT	OS	AUTOMATED		B	54,000	2.5		NA	0
02:58 PM	AGENT	SB	AUTOMATED		S	476,200	24.0		SPZ	148
03:04 PM	AGENT	OS	AUTOMATED		S	3,400	0.3		NA	0
03:04 PM	PRINCIPAL	AC	MANUAL		B	40,000	3.0		MMI	25
03:06 PM	AGENT	OS	AUTOMATED		B	54,000	2.5		NA	0
03:07 PM	PRINCIPAL	AC	AUTOMATED		S	129,700	5.5		YXZ	60
03:08 PM	PRINCIPAL	AC	MANUAL		S	40,000	3.0		MMI	25
03:08 PM	PRINCIPAL	AC	AUTOMATED		S	156,200	8.9		OEX	300
03:09 PM	PRINCIPAL	AC	AUTOMATED		S	76,200	4.4		OEX	150
03:12 PM	AGENT	AO	AUTOMATED		S	800,000	36.0		SPZ	240
03:16 PM	AGENT	PI	AUTOMATED		S	168,700	9.3		NA	0
03:23 PM	PRINCIPAL	AC	MANUAL		S	40,000	3.0		MMI	25
03:30 PM	PRINCIPAL	AC	AUTOMATED		S	44,000	3.4		MMI	28
03:30 PM	PRINCIPAL	AC	MANUAL		S	200,100	10.0		SPZ	62
03:31 PM	PRINCIPAL	AC	MANUAL		S	40,000	3.0		MMI	25
03:32 PM	PRINCIPAL	AC	AUTOMATED		S	40,000	3.0		MMI	25
03:32 PM	AGENT	AO	AUTOMATED		S	580,000	22.0		SPZ	144
03:32 PM	PRINCIPAL	AO	AUTOMATED		SS	248,000	14.0		SPZ	93
03:34 PM	AGENT	SB	AUTOMATED		S	476,200	24.0		SPX	148
03:34 PM	AGENT	AO	AUTOMATED		S	580,000	22.0		SPZ	144
03:40 PM	AGENT	OS	AUTOMATED		B	17,000	5.0		SPX	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
03:40 PM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.4	MMI	28
03:42 PM	AGENT	OS	AUTOMATED	B	31,000	1.0	NA	0
03:43 PM	AGENT	AC	AUTOMATED	S	36,000	1.7	SPZ	67
03:43 PM	AGENT	OS	AUTOMATED	B	176,400	4.9	OS	0
03:50 PM	AGENT	OS	AUTOMATED	B	54,000	2.5	NA	0
03:52 PM	PRINCIPAL	AO	AUTOMATED	S	44,000	3.4	MMI	28
03:57 PM	AGENT	AO	AUTOMATED	S	800,000	36.0	SPZ	240
04:00 PM	AGENT	OS	MANUAL	S	320,250	7.4	NA	0

PROGRAMS EXECUTED "ALL DAY"

PRINCIPAL	OS	AUTOMATED	S	1,480,000	113.0	NA	2315
PRINCIPAL	AC	AUTOMATED	S	680,000	50.0	MMI	426
PRINCIPAL	AO	AUTOMATED	B	440,000	33.0	MMI	275
AGENT	OS	MANUAL	B	205,000	42.5	NA	0

LONDON MARKET

08:51 AM	PRINCIPAL	AO	MANUAL	SS	972,300	46.0	SPZ	297
08:51 AM	AGENT	AO	MANUAL	B	648,200	31.0	SPZ	198

COMPOSITE CHRONOLOGY
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
08:51 AM	AGENT	AO	MANUAL	B	972,300	46.0	SPZ	297
08:51 AM	PRINCIPAL	AO	MANUAL	SS	648,200	31.0	SPZ	198
04:26 PM	PRINCIPAL	EFP	MANUAL	B	744,996	36.9	SPZ	243
04:26 PM	AGENT	EFP	MANUAL	S	788,106	36.8	SPZ	243
04:27 PM	AGENT	EFP	MANUAL	S	245,855	12.0	SPZ	76
04:27 PM	PRINCIPAL	EFP	MANUAL	B	249,367	11.7	SPZ	76

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	PRINCIPAL	AO	AUTOMATED	S	650,000	30.0	MMI	250
09:30 AM	AGENT	OS	AUTOMATED	B	650,000	30.0	NA	0
09:30 AM	PRINCIPAL	AO	AUTOMATED	S	650,000	30.0	MMI	250
09:30 AM	AGENT	OS	AUTOMATED	B	341,800	19.0	NA	0
09:30 AM	PRINCIPAL	AC	AUTOMATED	S	239,242	11.2	SPZ	76
09:30 AM	AGENT	OS	AUTOMATED	S	213,500	10.6	NA	0
09:30 AM	PRINCIPAL	AO	AUTOMATED	S	212,900	10.0	SPZ	68
09:30 AM	PRINCIPAL	AO	AUTOMATED	SS	126,000	7.0	OEX	514
09:30 AM	AGENT	OS	AUTOMATED	S	85,000	5.5	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	85,000	5.5	NA	0
09:30 AM	PRINCIPAL	AO	AUTOMATED	SS	53,900	1.7	SPZ	7
09:30 AM	PRINCIPAL	AO	AUTOMATED	SS	46,300	1.2	SPZ	5
09:30 AM	AGENT	OS	AUTOMATED	B	40,000	3.0	NA	0
09:30 AM	PRINCIPAL	OS	AUTOMATED	S	1,900	0.1	NA	0
09:31 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	16.0	SPZ	104
09:32 AM	PRINCIPAL	AC	AUTOMATED	S	252,690	11.8	SPZ	81
09:33 AM	PRINCIPAL	AO	AUTOMATED	SS	250,000	13.0	SPZ	93
09:34 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
09:37 AM	AGENT	PI	AUTOMATED	S	283,000	13.3	NA	0
09:38 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
09:38 AM	PRINCIPAL	AO	MANUAL	B	40,000	3.0	MMI	26
09:39 AM	PRINCIPAL	AO	AUTOMATED	SS	1,073,879	17.0	KVL	149
09:41 AM	PRINCIPAL	AC	AUTOMATED	S	129,200	5.2	YXZ	60
09:41 AM	PRINCIPAL	AO	MANUAL	B	40,000	3.0	MMI	26
09:46 AM	AGENT	OS	MANUAL	B	997,000	4.4	NA	0
09:46 AM	AGENT	OS	AUTOMATED	B	47,500	3.5	KVL	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 15, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
			ENTRY METHOD						
09:47 AM	PRINCIPAL	AC	AUTOMATED		S	650,000	30.0	SPZ	200
09:48 AM	PRINCIPAL	AO	AUTOMATED		B	30,000	1.8	FNC	
09:49 AM	PRINCIPAL	AO	MANUAL		B	40,000	3.0	MMI	26
09:52 AM	PRINCIPAL	AO	AUTOMATED		B	30,000	1.8	FNC	
09:52 AM	PRINCIPAL	AO	AUTOMATED		B	9,900	0.9	MMI	8
09:54 AM	AGENT	OS	AUTOMATED		B	100,000	7.5	NA	0
09:55 AM	PRINCIPAL	AC	AUTOMATED		S	9,900	0.9	MMI	8
09:57 AM	PRINCIPAL	AC	AUTOMATED		S	40,000	3.0	MMI	25
10:01 AM	PRINCIPAL	AC	AUTOMATED		S	650,000	30.0	SPZ	200
10:01 AM	PRINCIPAL	AO	AUTOMATED		SS	177,900	1.4	XOC	0
10:02 AM	PRINCIPAL	AO	AUTOMATED		B	174,950	9.7	OEX	
10:02 AM	PRINCIPAL	AO	AUTOMATED		B	89,500	5.0	OEX	165
10:04 AM	PRINCIPAL	AC	AUTOMATED		S	40,000	3.0	MMI	25
10:04 AM	PRINCIPAL	AC	MANUAL		S	40,000	3.0	MMI	25
10:04 AM	PRINCIPAL	AC	AUTOMATED		S	9,900	0.9	MMI	8
10:06 AM	PRINCIPAL	AO	AUTOMATED		SS	400,000	16.0	SPZ	104
10:07 AM	AGENT	OS	AUTOMATED		S	300,000	13.5	NA	0
10:09 AM	AGENT	AC	AUTOMATED		S	309,100	14.0	SPZ	99
10:09 AM	PRINCIPAL	AO	AUTOMATED		B	40,000	3.0	MMI	25
10:09 AM	AGENT	AO	AUTOMATED		B	17,000	1.0	OEX	0
10:09 AM	PRINCIPAL	AO	AUTOMATED		B	9,900	0.9	MMI	8
10:10 AM	AGENT	SB	AUTOMATED		S	632,200	30.0	SPZ	205
10:10 AM	PRINCIPAL	AO	AUTOMATED		B	44,000	3.3	MMI	28
10:10 AM	PRINCIPAL	AO	MANUAL		B	40,000	3.0	MMI	26
10:11 AM	AGENT	AC	AUTOMATED		S	91,850	3.4	KVL	35
10:11 AM	PRINCIPAL	AO	AUTOMATED		B	89,500	5.0	OEX	165

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
10:11 AM	PRINCIPAL	AO	AUTOMATED	B	20,000	1.3	MMI	13
10:14 AM	PRINCIPAL	AO	AUTOMATED	B	221,700	10.1	SPZ	70
10:14 AM	AGENT	OS	AUTOMATED	B	47,500	3.5	NA	0
10:18 AM	AGENT	AO	AUTOMATED	B	17,000	1.0	OEX	0
10:18 AM	AGENT	AO	AUTOMATED	B	17,000	1.0	OEX	0
10:35 AM	PRINCIPAL	AO	AUTOMATED	B	174,950	9.7	OEX	295
10:35 AM	AGENT	OS	AUTOMATED	S	13,200	0.5	NA	0
10:49 AM	PRINCIPAL	AO	AUTOMATED	B	174,950	9.8	OEX	295
10:52 AM	PRINCIPAL	AC	AUTOMATED	B	272,400	12.6	SPZ	84
10:53 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.3	MMI	28
10:55 AM	AGENT	OS	AUTOMATED	B	76,400	3.4	NA	0
11:00 AM	AGENT	OS	AUTOMATED	B	73,400	4.3	NA	0
11:01 AM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	14
11:04 AM	PRINCIPAL	AO	AUTOMATED	B	380,100	18.8	SPZ	130
11:04 AM	PRINCIPAL	AO	AUTOMATED	B	158,300	8.8	OEX	299
11:05 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.4	MMI	28
11:06 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	5.6	NA	0
11:09 AM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	14
11:19 AM	AGENT	OS	AUTOMATED	S	65,100	3.1	NA	0
11:21 AM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.7	MMI	14
11:24 AM	AGENT	OS	AUTOMATED	S	40,000	3.0	NA	0
11:25 AM	AGENT	PI	AUTOMATED	S	179,900	9.4	NA	0
11:28 AM	PRINCIPAL	AO	AUTOMATED	SS	250,000	13.0	SPZ	93
11:30 AM	AGENT	OS	AUTOMATED	S	40,000	3.0	NA	0
11:47 AM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	14
11:50 AM	PRINCIPAL	AO	AUTOMATED	B	158,300	8.8	OEX	299

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
11:59 AM	PRINCIPAL	AO	AUTOMATED	B	167,400	7.6	SPZ	50
12:00 PM	PRINCIPAL	AC	AUTOMATED	B	214,200	7.9	SPZ	17
12:03 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	14
12:05 PM	AGENT	AO	AUTOMATED	B	614,700	29.0	SPZ	198
12:10 PM	PRINCIPAL	AC	AUTOMATED	B	126,700	8.3	SPZ	16
12:13 PM	PRINCIPAL	AO	AUTOMATED	B	50,400	4.3	OEX	166
12:15 PM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.4	MMI	28
12:17 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	SPZ	14
12:22 PM	PRINCIPAL	AO	AUTOMATED	B	20,000	1.3	MMI	13
12:26 PM	PRINCIPAL	OS	AUTOMATED	B	154,700	5.9	NA	0
12:34 PM	PRINCIPAL	OS	AUTOMATED	B	130,700	7.4	NA	0
12:47 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.7	MMI	14
12:52 PM	PRINCIPAL	AC	AUTOMATED	S	66,000	5.0	MMI	42
12:56 PM	PRINCIPAL	AC	MANUAL	S	40,000	3.0	MMI	25
01:00 PM	AGENT	OS	AUTOMATED	B	65,400	4.2	NA	0
01:03 PM	PRINCIPAL	AC	AUTOMATED	B	95,300	5.7	XII	187
01:05 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	14
01:06 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	SPZ	14
01:14 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	0
01:16 PM	PRINCIPAL	AC	AUTOMATED	S	130,300	5.5	YXZ	60
01:19 PM	PRINCIPAL	AC	AUTOMATED	S	44,000	3.3	MMI	28
01:28 PM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	25
01:29 PM	AGENT	AC	AUTOMATED	S	309,100	14.0	SPZ	99
01:35 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.7	MMI	14
01:38 PM	PRINCIPAL	AC	AUTOMATED	S	380,100	18.7	SPZ	130
01:39 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.6	MMI	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX	NO. OF PRODUCT CONTRACTS
01:40 PM	AGENT	AC	AUTOMATED	S	309,100	14.0	SPZ	99
01:40 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.6	MMI	14
01:41 PM	PRINCIPAL	AC	AUTOMATED	S	30,000	1.8	FNC	
01:44 PM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	25
01:44 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.6	MMI	14
01:48 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	0
01:49 PM	PRINCIPAL	AO	AUTOMATED	SS	250,000	13.0	SPZ	93
01:55 PM	PRINCIPAL	AC	AUTOMATED	B	137,400	7.0	OEX	514
01:57 PM	PRINCIPAL	AO	AUTOMATED	B	158,300	8.8	OEX	299
01:57 PM	PRINCIPAL	AO	AUTOMATED	B	124,550		OEX	
01:58 PM	PRINCIPAL	AC	AUTOMATED	S	130,000	5.2	YXZ	60
02:03 PM	PRINCIPAL	AO	AUTOMATED	B	50,400	4.3	OEX	
02:05 PM	PRINCIPAL	AC	AUTOMATED	B	137,400	7.0	OEX	514
02:06 PM	PRINCIPAL	AO	AUTOMATED	B	39,700	4.0	SPZ	30
02:09 PM	AGENT	OS	AUTOMATED	B	15,206	0.5	NA	0
02:09 PM	AGENT	OS	AUTOMATED	S	5,526	0.2	NA	0
02:11 PM	AGENT	PI	AUTOMATED	S	36,400	1.8	NA	0
02:13 PM	AGENT	OS	AUTOMATED	B	196,600	3.9	NA	0
02:13 PM	AGENT	OS	AUTOMATED	S	108,259	2.3	NA	0
02:18 PM	PRINCIPAL	AO	AUTOMATED	B	83,200	3.8	SPZ	30
02:18 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.7	MMI	14
02:20 PM	AGENT	OS	AUTOMATED	B	650,000	30.0	NA	0
02:20 PM	AGENT	AO	AUTOMATED	B	204,700	10.3	SPZ	67
02:21 PM	AGENT	OS	AUTOMATED	B	650,000	30.0	NA	0
02:21 PM	PRINCIPAL	AO	AUTOMATED	B	137,400	7.3	OEX	514
02:24 PM	PRINCIPAL	AO	MANUAL	B	200,900	10.0	SPZ	62

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
02:27 PM	AGENT	OS	AUTOMATED	B	650,000	30.0	NA	0
02:32 PM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	25
02:32 PM	PRINCIPAL	AC	AUTOMATED	S	39,700	3.9	SPZ	30
02:32 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.6	MMI	14
02:33 PM	PRINCIPAL	AC	AUTOMATED	S	168,300	7.5	SPZ	50
02:53 PM	PRINCIPAL	AO	AUTOMATED	B	20,000	1.3	MMI	13
03:06 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.7	MMI	14
03:08 PM	PRINCIPAL	AC	AUTOMATED	S	83,200	3.8	SPZ	30
03:11 PM	AGENT	OS	AUTOMATED	B	115,800	6.9	NA	0
03:13 PM	PRINCIPAL	AO	MANUAL	B	40,000	3.0	MMI	26
03:15 PM	AGENT	OS	AUTOMATED	S	575,842	26.5	NA	0
03:15 PM	PRINCIPAL	AO	AUTOMATED	B	39,700	4.0	SPZ	30
03:21 PM	PRINCIPAL	AC	AUTOMATED	S	128,500	5.1	YXZ	60
03:31 PM	PRINCIPAL	AC	AUTOMATED	S	165,100	7.3	SPZ	50
03:33 PM	AGENT	OS	AUTOMATED	S	217,000	12.5	NA	0
03:33 PM	PRINCIPAL	AC	AUTOMATED	S	39,700	3.9	SPZ	30
03:34 PM	PRINCIPAL	AC	AUTOMATED	S	380,100	18.6	SPZ	130
03:34 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.6	MMI	14
03:41 PM	AGENT	AC	AUTOMATED	S	309,100	14.0	SPZ	99
03:41 PM	PRINCIPAL	AC	AUTOMATED	S	204,971	11.7	SPZ	81
03:42 PM	PRINCIPAL	A	AUTOMATED	S	280,000	15.0	MMI	107
03:42 PM	PRINCIPAL	AC	MANUAL	B	200,900	10.0	SPZ	62
03:43 PM	PRINCIPAL	AO	AUTOMATED	SS	1,073,089	17.0	KVL	149
03:43 PM	PRINCIPAL	AC	AUTOMATED	S	128,300	5.2	YXZ	60
03:45 PM	AGENT	AC	AUTOMATED	S	309,100	14.0	SPZ	99
03:46 PM	AGENT	AC	AUTOMATED	S	309,100	14.0	SPZ	99

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
03:46 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.6	MMI	14
03:47 PM	PRINCIPAL	AC	AUTOMATED	S	132,000	5.2	YXZ	60
03:48 PM	AGENT	OS	AUTOMATED	S	561,400	27.0	NA	0
03:48 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.6	MMI	16
03:48 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.6	MMI	14
03:49 PM	AGENT	AO	AUTOMATED	S	660,000	30.0	SPZ	200
03:50 PM	AGENT	OS	AUTOMATED	B	2,400	0.1	NA	0
03:51 PM	AGENT	OS	AUTOMATED	S	575,842	26.5	NA	0
03:54 PM	AGENT	OS	AUTOMATED	S	300,000	13.5	NA	0
03:56 PM	PRINCIPAL	AC	MANUAL	S	40,000	3.0	MMI	25
03:57 PM	AGENT	AO	AUTOMATED	S	660,000	30.0	SPZ	200
03:57 PM	AGENT	OS	AUTOMATED	S	300,000	13.5	NA	0
03:57 PM	AGENT	OS	AUTOMATED	S	142,000	7.1	NA	0
03:57 PM	PRINCIPAL	AO	AUTOMATED	B	30,000	1.8	FNC	

PROGRAMS EXECUTED "ALL DAY"

PRINCIPAL	AO	AUTOMATED	B	740,000	56.0	MMI	464
PRINCIPAL	OS	AUTOMATED	S	660,000	50.0	NA	0

LONDON MARKET

AGENT	AO	MANUAL	SS	650,000	30.0	SPZ	200
AGENT	AO	MANUAL	SS	650,000	30.0	SPZ	200

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
	AGENT	AO	MANUAL	B	648,200	30.0	SPZ	198
	AGENT	AO	MANUAL	SS	2,600,000	120.0	SPZ	800
	PRINCIPAL	AO	MANUAL	B	3,900,000	180.0	SPZ	1200
	PRINCIPAL	AO	MANUAL	SS	1,944,600	90.0	SPZ	594
	AGENT	AO	MANUAL	B	1,944,600	90.0	SPZ	594
	PRINCIPAL	AO	MANUAL	SS	648,200	30.0	SPZ	198
	PRINCIPAL	AD	MANUAL	S	2,631,500	100.0	SPZ	596

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	PRINCIPAL	AO	AUTOMATED	SS	7,700	0.1	SPZ	
09:30 AM	PRINCIPAL	AO	AUTOMATED	SS	212,900	10.0	SPZ	67
09:30 AM	AGENT	PI	AUTOMATED	S	309,500	14.8	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	1,147,055	53.0	NA	0
09:30 AM	PRINCIPAL	AO	AUTOMATED	SS	1,065,689	16.0	KVL	130
09:34 AM	PRINCIPAL	AO	AUTOMATED	SS	87,100	0.4	XOC	0
09:35 AM	AGENT	OS	AUTOMATED	S	600	0.0	NA	0
09:35 AM	AGENT	OS	AUTOMATED	S	10,400	0.4	NA	0
09:35 AM	AGENT	OS	AUTOMATED	S	159,350	8.0	NA	0
09:35 AM	AGENT	OS	AUTOMATED	S	23,650	1.0	NA	0
09:35 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	25
09:39 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	26
09:41 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	26
09:41 AM	PRINCIPAL	AO	MANUAL	B	40,000	2.9	MMI	25
09:45 AM	PRINCIPAL	AC	AUTOMATED	S	219,600	9.8	SPZ	70
09:47 AM	AGENT	AC	AUTOMATED	S	309,100	14.0	SPZ	99
09:48 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
09:50 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	15.0	SPZ	104
09:50 AM	AGENT	PI	AUTOMATED	S	53,300	2.6	NA	0
09:50 AM	AGENT	AC	AUTOMATED	S	309,100	14.0	SPZ	99
09:51 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
09:52 AM	PRINCIPAL	AO	AUTOMATED	SS	250,000	13.0	SPZ	93
09:53 AM	PRINCIPAL	AC	AUTOMATED	S	182,933	9.3	SPZ	68
09:53 AM	PRINCIPAL	AC	MANUAL	S	40,000	2.9	MMI	25
09:54 AM	PRINCIPAL	OS	AUTOMATED	B	209,200	9.0	SPZ	0
09:56 AM	PRINCIPAL	AO	AUTOMATED	B	20,000	1.5	MMI	13

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
09:57 AM	PRINCIPAL	OS	AUTOMATED	B	208,800	9.0	SPZ	0
09:58 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.3	MMI	28
10:04 AM	PRINCIPAL	OS	AUTOMATED	B	208,500	9.0	SPZ	0
10:11 AM	PRINCIPAL	AC	AUTOMATED	S	20,000	1.5	MMI	13
10:12 AM	PRINCIPAL	AC	AUTOMATED	S	44,000	3.3	MMI	28
10:15 AM	PRINCIPAL	OS	AUTOMATED	B	208,400	9.0	SPZ	0
10:16 AM	AGENT	OS	AUTOMATED	B	37,600	1.6	NA	0
10:17 AM	AGENT	OS	AUTOMATED	B	15,000	0.7	NA	0
10:18 AM	AGENT	SB	AUTOMATED	S	1,294,900	29.9	SPZ	205
10:18 AM	AGENT	OS	AUTOMATED	B	11,600	0.5	NA	0
10:20 AM	AGENT	PI	AUTOMATED	S	104,000	4.8	NA	0
10:23 AM	PRINCIPAL	AC	AUTOMATED	S	89,500	4.7	OEX	165
10:24 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	15.0	SPZ	104
10:28 AM	AGENT	OS	AUTOMATED	S	142,000	7.1	SPZ	0
10:30 AM	AGENT	PI	AUTOMATED	S	293,700	13.8	NA	0
10:30 AM	AGENT	PI	AUTOMATED	S	283,000	13.1	NA	0
10:30 AM	PRINCIPAL	AC	AUTOMATED	S	174,950	9.6	OEX	664
10:35 AM	PRINCIPAL	AC	AUTOMATED	S	174,950	9.6	OEX	664
10:36 AM	PRINCIPAL	AO	MANUAL	B	40,000	2.9	MMI	25
10:38 AM	AGENT	OS	AUTOMATED	B	51,300	2.9	NA	0
10:56 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.3	MMI	28
11:02 AM	PRINCIPAL	AO	AUTOMATED	B	9,900	0.9	MMI	8
11:13 AM	PRINCIPAL	AO	AUTOMATED	SS	250,000	13.0	SPZ	95
11:13 AM	AGENT	AC	AUTOMATED	S	614,700	28.5	SPZ	198
11:14 AM	PRINCIPAL	AC	AUTOMATED	S	9,900	0.9	MXV	8
11:17 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	15.0	SPZ	90

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
			ENTRY METHOD	SELL					
11:20 AM	AGENT	SB	AUTOMATED	S	1,294,900	29.4	SPZ		205
11:20 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ		200
11:23 AM	AGENT	OS	AUTOMATED	S	20,000	1.5	NA		0
11:25 AM	AGENT	SB	AUTOMATED	S	476,200	24.0	SPZ		148
11:25 AM	PRINCIPAL	AO	AUTOMATED	B	49,200	2.8	OEX		100
11:26 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ		200
11:27 AM	PRINCIPAL	AC	AUTOMATED	S	105,781	3.5	SPZ		18
11:27 AM	AGENT	OS	AUTOMATED	S	142,000	7.0	SPZ		0
11:27 AM	AGENT	OS	AUTOMATED	B	32,500	4.0	NA		0
11:28 AM	AGENT	PI	AUTOMATED	S	104,000	4.7	NA		0
11:29 AM	PRINCIPAL	AO	MANUAL	B	40,000	2.9	MMI		25
11:29 AM	AGENT	OS	AUTOMATED	B	50,000	8.0	NA		0
11:34 AM	AGENT	AC	AUTOMATED	S	17,000	1.0	OEX		0
11:38 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.2	MMI		28
11:38 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI		25
11:39 AM	PRINCIPAL	AC	AUTOMATED	B	285,400	12.7	SPZ		53
11:48 AM	PRINCIPAL	AC	AUTOMATED	B	212,900	10.0	SPZ		68
11:48 AM	AGENT	OS	AUTOMATED	B	107,600	5.0	NA		0
11:51 AM	AGENT	OS	AUTOMATED	B	3,300	0.2	NA		0
11:51 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	3.2	MMI		28
11:55 AM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI		25
12:00 PM	PRINCIPAL	OS	AUTOMATED	B	280,000	15.0	NA		0
12:01 PM	PRINCIPAL	AO	AUTOMATED	B	229,000	12.4	SPZ		90
12:07 PM	AGENT	AC	AUTOMATED	S	90,500	4.1	SPZ		28
12:09 PM	PRINCIPAL	AO	AUTOMATED	S	88,000	6.5	MMI		56
12:33 PM	AGENT	AC	AUTOMATED	S	614,700	28.2	SPZ		198

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
12:35 PM	PRINCIPAL	AC	AUTOMATED	S	229,000	12.3	SPZ	90
12:35 PM	PRINCIPAL	OS	AUTOMATED	S	280,000	15.0	NA	0
01:02 PM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	26
01:04 PM	PRINCIPAL	AC	AUTOMATED	S	44,000	3.2	MMI	28
01:05 PM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	26
01:06 PM	PRINCIPAL	AC	MANUAL	S	40,000	2.9	MMI	25
01:06 PM	AGENT	AO	AUTOMATED	S	315,350	14.1	SPZ	100
01:07 PM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	0
01:09 PM	PRINCIPAL	AC	AUTOMATED	S	44,000	3.2	MMI	28
01:24 PM	PRINCIPAL	AO	AUTOMATED	S	44,000	3.2	MMI	28
01:26 PM	AGENT	AC	AUTOMATED	S	17,000	1.0	OEX	
01:26 PM	PRINCIPAL	AC	AUTOMATED	S	40,000	3.0	MMI	0
01:26 PM	AGENT	SB	AUTOMATED	S	476,200	24.0	SPZ	148
01:27 PM	AGENT	AC	AUTOMATED	S	17,000	1.0	OEX	
01:28 PM	PRINCIPAL	AC	AUTOMATED	S	30,000	1.8	FNC	0
01:28 PM	AGENT	AC	AUTOMATED	S	455,400	20.4	SPZ	144
01:28 PM	PRINCIPAL	AC	AUTOMATED	S	22,000	1.6	MMI	14
01:28 PM	PRINCIPAL	AO	AUTOMATED	SS	1,073,179	17.0	KVL	130
01:29 PM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	NA	0
01:29 PM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
01:31 PM	AGENT	OS	AUTOMATED	S	5,000	0.4	NA	0
01:32 PM	AGENT	AO	AUTOMATED	S	313,800	14.1	SPZ	100
01:33 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.6	MMI	14
01:35 PM	PRINCIPAL	AO	AUTOMATED	B	22,000	1.6	MMI	14
01:36 PM	PRINCIPAL	OS	AUTOMATED	B	280,000	15.0	NA	0
01:42 PM	PRINCIPAL	AC	AUTOMATED	S	44,000	3.2	MMI	28

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
			ENTRY METHOD						
01:44 PM	PRINCIPAL	AC	AUTOMATED		S	650,000	30.0	SPZ	200
01:47 PM	AGENT	OS	AUTOMATED		S	5,000	0.4	NA	0
01:49 PM	AGENT	PI	AUTOMATED		S	283,000	12.7	NA	0
01:50 PM	PRINCIPAL	OS	AUTOMATED		S	280,000	15.0	NA	0
01:50 PM	AGENT	SB	AUTOMATED		S	622,300	29.0	SPZ	198
01:51 PM	AGENT	OS	AUTOMATED		S	80,000	3.4	NA	0
01:51 PM	PRINCIPAL	AC	AUTOMATED		S	22,000	1.6	MMI	14
01:51 PM	PRINCIPAL	AC	AUTOMATED		S	650,000	30.0	SPZ	200
01:55 PM	AGENT	OS	AUTOMATED		S	160,000	5.0	NA	0
01:56 PM	PRINCIPAL	AC	AUTOMATED		S	30,000	1.8	FNC	0
01:56 PM	PRINCIPAL	AC	AUTOMATED		S	44,000	3.2	SPZ	28
01:57 PM	PRINCIPAL	AC	AUTOMATED		S	238,010	8.8	YXZ	109
01:58 PM	PRINCIPAL	AC	AUTOMATED		S	650,000	30.0	SPZ	200
01:58 PM	AGENT	AO	AUTOMATED		S	313,800	14.1	SPZ	100
02:04 PM	PRINCIPAL	AO	MANUAL		B	40,000	2.9	MMI	25
02:05 PM	PRINCIPAL	AO	AUTOMATED		B	40,000	3.0	MMI	25
02:06 PM	PRINCIPAL	AO	AUTOMATED		B	30,000	1.8	FNC	0
02:08 PM	PRINCIPAL	AO	AUTOMATED		B	30,000	1.8	FNC	0
02:11 PM	PRINCIPAL	AO	AUTOMATED		B	40,000	3.0	MMI	26
02:12 PM	AGENT	OS	AUTOMATED		S	1,050,000	46.3	NA	0
02:12 PM	AGENT	OS	AUTOMATED		B	120,000	5.0	NA	0
02:16 PM	PRINCIPAL	AO	AUTOMATED		B	40,000	3.0	MMI	26
02:17 PM	PRINCIPAL	AO	MANUAL		B	40,000	2.9	MMI	25
02:17 PM	PRINCIPAL	AO	AUTOMATED		B	40,000	3.0	MMI	25
02:17 PM	PRINCIPAL	AC	AUTOMATED		S	50,400	2.7	OEX	100
02:18 PM	PRINCIPAL	AO	AUTOMATED		B	40,000	3.0	MMI	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT		SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
				BUY	SELL				
02:18 PM	PRINCIPAL	AO	AUTOMATED	B		40,000	3.0	MMI	0
02:18 PM	PRINCIPAL	AC	AUTOMATED	S		52,300	2.7	OEX	100
02:19 PM	PRINCIPAL	AO	AUTOMATED	N		22,000	1.6	MMI	14
02:20 PM	PRINCIPAL	AO	AUTOMATED	B		44,000	3.2	MMI	28
02:23 PM	PRINCIPAL	AC	AUTOMATED	S		87,500	4.7	OEX	165
02:26 PM	PRINCIPAL	AC	AUTOMATED	S		44,000	3.2	MMI	28
02:28 PM	PRINCIPAL	AO	AUTOMATED	SS		212,900	10.0	SPZ	67
02:31 PM	PRINCIPAL	AC	AUTOMATED	S		650,000	30.0	SPZ	200
02:35 PM	AGENT	AO	AUTOMATED	S		550,000	26.0	SPZ	187
02:41 PM	AGENT	AC	AUTOMATED	S		619,100	27.9	SPZ	200
02:41 PM	AGENT	OS	AUTOMATED	S		500,000	18.0	NA	0
02:41 PM	AGENT	AO	AUTOMATED	S		315,350	14.1	SPZ	100
02:43 PM	PRINCIPAL	AO	AUTOMATED	B		40,000	7.0	MMI	25
02:46 PM	AGENT	OS	AUTOMATED	S		11,200	0.4	NA	0
02:47 PM	PRINCIPAL	AO	AUTOMATED	B		40,000	7.0	MMI	25
02:48 PM	AGENT	OS	AUTOMATED	S		10,500	0.4	NA	0
02:50 PM	AGENT	OS	AUTOMATED	S		180,500	2.8	NA	0
02:54 PM	PRINCIPAL	AC	AUTOMATED	S		40,000	3.0	MMI	0
02:54 PM	AGENT	PI	AUTOMATED	S		650,000	30.0	NA	0
02:58 PM	PRINCIPAL	AC	AUTOMATED	S		40,000	3.0	MMI	0
03:00 PM	AGENT	OS	AUTOMATED	S		180,500	2.8	NA	0
03:00 PM	AGENT	AO	AUTOMATED	S		550,000	26.0	SPZ	187
03:02 PM	PRINCIPAL	AC	AUTOMATED	S		40,000	3.0	MMI	0
03:02 PM	PRINCIPAL	AC	AUTOMATED	S		40,000	3.0	MMI	0
03:03 PM	AGENT	AC	AUTOMATED	S		477,100	21.2	SPZ	153
03:03 PM	AGENT	AC	AUTOMATED	S		614,700	27.8	SPZ	198

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT		STRATEGY	ORDER ENTRY METHOD		BUY/SELL/ SHORT SELL		SHARES	DOLLAR AMOUNT (MILLIONS)		INDEX PRODUCT	NO. OF CONTRACTS
03:04 PM	PRINCIPAL		AC	AUTOMATED		S		40,000	3.0	MMI		26
03:06 PM	AGENT		OS	AUTOMATED		B		134,400	2.7	NA		0
03:07 PM	PRINCIPAL		AO	AUTOMATED		SS		1,073,179	17.0	KVL		130
03:08 PM	PRINCIPAL		AC	AUTOMATED		S		40,000	3.0	NA		0
03:08 PM	AGENT		AO	AUTOMATED		S		615,000	25.0	SPZ		185
03:09 PM	AGENT		OS	AUTOMATED		S		91,667	1.4	NA		0
03:11 PM	PRINCIPAL		AO	MANUAL		B		40,000	2.9	MMI		26
03:11 PM	PRINCIPAL		AO	AUTOMATED		B		40,000	3.0	MMI		25
03:13 PM	PRINCIPAL		AO	AUTOMATED		B		44,000	3.2	MMI		28
03:20 PM	AGENT		AO	AUTOMATED		S		315,700	13.9	SPZ		100
03:22 PM	AGENT		PI	AUTOMATED		S		650,000	30.0	NA		0
03:23 PM	AGENT		OS	AUTOMATED		S		180,500	2.8	NA		0
03:26 PM	AGENT		AO	AUTOMATED		S		650,000	28.0	SPZ		200
03:26 PM	PRINCIPAL		AO	AUTOMATED		B		40,000	3.0	MMI		25
03:27 PM	AGENT		OS	AUTOMATED		B		32,500	4.0	NA		0
03:27 PM	AGENT		OS	AUTOMATED		S		6,300	0.4	NA		0
03:28 PM	AGENT		OS	AUTOMATED		B		36,000	0.8	NA		0
03:28 PM	AGENT		OS	AUTOMATED		B		176,600	8.6	NA		0
03:31 PM	PRINCIPAL		AO	AUTOMATED		B		20,000	1.7	MMI		13
03:35 PM	AGENT		PI	AUTOMATED		S		1,193,700	52.1	SPZ		93
03:36 PM	PRINCIPAL		AC	AUTOMATED		S		829,125	41.0	OEX		1494
03:37 PM	AGENT		AO	AUTOMATED		S		650,000	35.0	SPZ		240
03:38 PM	AGENT		OS	AUTOMATED		S		80,000	3.4	NA		0
03:38 PM	AGENT		SB	AUTOMATED		S		217,925	9.7	SPZ		69
03:38 PM	PRINCIPAL		AC	AUTOMATED		S		270,700	14.5	OEX		1028
03:39 PM	AGENT		PI	AUTOMATED		S		517,800	23.2	SPZ		44

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
			ENTRY METHOD	ENTRY METHOD					
03:39 PM	AGENT	AO	AUTOMATED		S	500,000	24.0	SPZ	165
03:40 PM	AGENT	OS	AUTOMATED		S	10,400	0.4	NA	0
03:40 PM	AGENT	OS	AUTOMATED		S	23,650	1.0	NA	0
03:40 PM	AGENT	OS	AUTOMATED		S	600	0.0	NA	0
03:40 PM	AGENT	OS	AUTOMATED		S	159,350	8.0	NA	0
03:40 PM	AGENT	AO	AUTOMATED		S	650,000	35.0	SPZ	240
03:40 PM	AGENT	AO	AUTOMATED		S	313,800	14.0	SPZ	100
03:41 PM	AGENT	OS	AUTOMATED		S	180,500	2.8	NA	0
03:41 PM	PRINCIPAL	AC	MANUAL		S	40,000	2.9	MMI	25
03:41 PM	AGENT	AO	AUTOMATED		S	313,800	14.0	SPZ	100
03:42 PM	AGENT	SB	AUTOMATED		S	217,925	9.7	SPZ	69
03:42 PM	AGENT	AO	AUTOMATED		S	650,000	28.0	SPZ	200
03:43 PM	AGENT	AC	AUTOMATED		S	455,200	19.9	SPZ	144
03:43 PM	PRINCIPAL	AC	AUTOMATED		S	44,000	3.1	MMI	28
03:45 PM	PRINCIPAL	AC	MANUAL		S	960,000	33.0	MMI	624
03:45 PM	AGENT	SB	AUTOMATED		S	476,000	24.0	SPZ	148
03:46 PM	PRINCIPAL	AC	MANUAL		S	40,000	2.9	MMI	25
03:46 PM	AGENT	AO	AUTOMATED		S	315,700	13.9	SPZ	100
03:50 PM	AGENT	OS	AUTOMATED		S	80,000	3.4	NA	0
03:50 PM	AGENT	AC	AUTOMATED		S	329,200	6.9	SPZ	71
03:55 PM	AGENT	AC	AUTOMATED		S	32,554	1.6	SPZ	11
03:59 PM	PRINCIPAL	AC	AUTOMATED		S	88,000	6.2	MMI	56
04:00 PM	PRINCIPAL	AC	AUTOMATED		S	180,000	10.8	FNC	564
04:00 PM	PRINCIPAL	AC	AUTOMATED		S	1,163,500	61.7	OEX	0
04:00 PM	PRINCIPAL	AC	AUTOMATED		S	30,000	1.8	FNC	94
04:00 PM	PRINCIPAL	AC	AUTOMATED		S	89,500	4.7	OEX	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 16, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
04:00 PM	PRINCIPAL	AC	MANUAL	S	41,800	3.0	MMI	25
04:00 PM	PRINCIPAL	AC	MANUAL	S	791,500	40.9	OEX	1495
04:00 PM	AGENT	SB	AUTOMATED	S	550,000	26.0	NSX	0
04:00 PM	AGENT	SB	AUTOMATED	S	550,000	26.0	NSX	0
04:00 PM	AGENT	OS	MANUAL	S	680,000	47.8	NA	0
04:00 PM	PRINCIPAL	AC	MANUAL	B	2,240,000	140.0	MMI	0
04:00 PM	PRINCIPAL	AC	MANUAL	B	591,150	70.0	OEX	0
04:00 PM	AGENT	OS	MANUAL	S	560,000	45.0	NA	0
04:00 PM	AGENT	OS	MANUAL	S	640,000	39.3	NA	0

PROGRAMS EXECUTED "ALL DAY"

PRINCIPAL	AO	AUTOMATED	B	320,000	24.0	MMI	200
PRINCIPAL	AC	AUTOMATED	S	240,000	18.0	MMI	150

LONDON MARKET

PRINCIPAL	EFP	MANUAL	B	5,850,000	270.0	SPZ	1800
AGENT	EFP	MANUAL	SS	1,300,000	60.0	SPZ	400
PRINCIPAL	AD	MANUAL	S	1,052,600	40.0	SPZ	264
AGENT	EFP	MANUAL	SS	3,250,000	150.0	SPZ	1000
AGENT	EFP	MANUAL	SS	1,300,000	60.0	SPZ	400
PRINCIPAL	AD	MANUAL	B	1,684,200	64.0	NA	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 19, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	PRINCIPAL	AC	AUTOMATED	S	700,000	30.0	SPZ	200
09:30 AM	AGENT	OS	MANUAL	S	388,000	16.3	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	222,000	9.6	NA	0
09:30 AM	AGENT	OS	MANUAL	S	387,400	16.9	NA	0
09:30 AM	AGENT	PI	AUTOMATED	S	279,900	11.2	NA	0
09:30 AM	AGENT	PI	AUTOMATED	S	32,900	1.2	NA	0
09:30 AM	AGENT	OS	MANUAL	S	387,400	16.6	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	463,100	21.1	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	522,600	21.2	NA	0
09:31 AM	PRINCIPAL	AO	AUTOMATED	SS	357,900	18.6	SPZ	140
09:32 AM	AGENT	OS	AUTOMATED	S	495,400	20.1	NA	0
09:32 AM	PRINCIPAL	AO	AUTOMATED	SS	725,000	9.0	KVL	35
09:40 AM	AGENT	OS	AUTOMATED	S	501,800	20.2	NA	0
09:41 AM	PRINCIPAL	AO	AUTOMATED	SS	13,500	0.4	SPZ	
09:41 AM	PRINCIPAL	AO	AUTOMATED	SS	380,100	18.3	SPZ	140
09:46 AM	PRINCIPAL	AC	AUTOMATED	S	700,000	30.0	SPZ	200
09:48 AM	PRINCIPAL	AO	AUTOMATED	SS	212,900	10.0	SPZ	67
09:49 AM	PRINCIPAL	AC	AUTOMATED	S	700,000	30.0	SPZ	200
09:52 AM	PRINCIPAL	AO	AUTOMATED	SS	372,000	18.0	SPZ	140
09:54 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
09:56 AM	PRINCIPAL	AO	AUTOMATED	SS	1,073,179	18.0	KVL	70
09:57 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
10:00 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
10:01 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
10:05 AM	PRINCIPAL	AC	AUTOMATED	S	650,000	30.0	SPZ	200
10:07 AM	AGENT	AO	AUTOMATED	S	615,000	24.0	SPZ	185
10:08 AM	AGENT	AO	AUTOMATED	S	650,000	30.0	SPZ	200

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
10:09 AM	AGENT	AO	AUTOMATED	S	650,000	30.0	SPZ	200
10:10 AM	AGENT	AO	AUTOMATED	S	650,000	30.0	SPZ	200
10:12 AM	AGENT	AO	AUTOMATED	S	650,000	30.0	SPZ	200
10:12 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	12.0	SPZ	104
10:18 AM	AGENT	AO	AUTOMATED	S	650,000	30.0	SPZ	200
10:24 AM	AGENT	AO	AUTOMATED	S	471,000	18.0	SPZ	144
10:29 AM	PRINCIPAL	AO	AUTOMATED	SS	400,000	12.0	SPZ	104
10:33 AM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA	0
10:34 AM	AGENT	AO	AUTOMATED	S	650,000	30.0	SPZ	200
10:35 AM	AGENT	PI	AUTOMATED	S	650,000	30.0	NA	0
10:45 AM	AGENT	AO	AUTOMATED	S	615,000	24.0	SPZ	190
10:46 AM	AGENT	PI	AUTOMATED	S	650,000	30.0	NA	0
10:47 AM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA	0
10:48 AM	AGENT	AC	AUTOMATED	S	471,500	18.4	SPZ	153
10:54 AM	PRINCIPAL	AO	AUTOMATED	B	100,000	6.8	MMI	65
10:54 AM	PRINCIPAL	AO	MANUAL	B	80,000	5.8	MMI	51
10:55 AM	PRINCIPAL	AO	AUTOMATED	B	100,000	6.8	MMI	65
10:59 AM	PRINCIPAL	AO	AUTOMATED	B	100,000	6.8	MMI	
11:00 AM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA	0
11:00 AM	AGENT	OS	AUTOMATED	B	220,400	8.4	SPZ	70
11:04 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	2.8	MMI	28
11:04 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	2.8	MMI	28
11:04 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	2.8	MMI	28
11:05 AM	PRINCIPAL	AO	MANUAL	B	80,000	5.8	MMI	51
11:08 AM	AGENT	OS	AUTOMATED	S	503,000	20.3	NA	0
11:09 AM	PRINCIPAL	AO	MANUAL	B	80,000	5.8	MMI	51
11:15 AM	PRINCIPAL	AO	MANUAL	B	44,000	2.9	MMI	28

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
11:15 AM	PRINCIPAL	AO	AUTOMATED	B	44,000	2.9	MMI	28
11:19 AM	PRINCIPAL	AC	AUTOMATED	B	1,127,679	18.0	KVL	140
11:20 AM	PRINCIPAL	AO	AUTOMATED	B	100,000	6.8	MMI	
11:22 AM	AGENT	PI	AUTOMATED	S	411,700	19.3	NA	0
11:24 AM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA	0
11:28 AM	PRINCIPAL	AC	AUTOMATED	B	212,900	10.0	SPZ	67
11:34 AM	PRINCIPAL	AO	MANUAL	B	88,000	5.9	MMI	56
11:39 AM	PRINCIPAL	OS	AUTOMATED	B	43,640	0.9	NA	0
11:41 AM	PRINCIPAL	AO	AUTOMATED	B	100,000	6.8	MMI	65
11:47 AM	AGENT	OS	AUTOMATED	S	600,000	30.0	NA	0
11:52 AM	PRINCIPAL	AC	AUTOMATED	S	100,000	6.8	MMI	65
11:54 AM	AGENT	AO	AUTOMATED	S	780,000	31.0	SPZ	240
11:55 AM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA	0
11:57 AM	AGENT	PI	AUTOMATED	S	498,500	20.5	NA	0
11:58 AM	AGENT	AO	AUTOMATED	S	780,000	31.0	SPZ	240
11:59 AM	PRINCIPAL	AC	AUTOMATED	S	100,000	6.8	MMI	65
11:59 AM	PRINCIPAL	AC	AUTOMATED	S	168,400	6.6	SPZ	50
12:00 PM	PRINCIPAL	AO	AUTOMATED	B	165,000	6.4	SPZ	50
12:01 PM	AGENT	AO	AUTOMATED	S	550,000	28.0	SPZ	185
12:07 PM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA	0
12:09 PM	AGENT	AO	AUTOMATED	S	550,000	28.0	SPZ	185
12:14 PM	AGENT	PI	AUTOMATED	S	204,400	8.9	NA	0
12:16 PM	AGENT	AO	AUTOMATED	S	780,000	31.0	SPZ	240
12:17 PM	AGENT	SB	AUTOMATED	S	479,130	21.0	SPZ	150
12:19 PM	AGENT	OS	AUTOMATED	S	600,000	30.0	NA	0
12:21 PM	PRINCIPAL	AC	MANUAL	S	40,000	2.9	MMI	25
12:22 PM	PRINCIPAL	AO	AUTOMATED	SS	250,000	10.0	SPZ	93

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 19, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
12:24 PM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA	0
12:26 PM	PRINCIPAL	AO	AUTOMATED	SS	347,720	17.0	SPZ	25
12:27 PM	PRINCIPAL	AO	AUTOMATED	SS	400,000	12.0	SPZ	104
12:30 PM	PRINCIPAL	AO	AUTOMATED	SS	347,330	17.0	SPZ	50
12:36 PM	PRINCIPAL	AC	MANUAL	S	40,000	2.9	MMI	26
12:36 PM	AGENT	PI	AUTOMATED	S	650,000	30.0	NA	0
12:37 PM	AGENT	PI	AUTOMATED	S	504,300	25.0	NA	0
12:40 PM	PRINCIPAL	AC	AUTOMATED	S	165,800	6.4	SPZ	50
12:40 PM	PRINCIPAL	AO	AUTOMATED	SS	250,000	10.0	SPZ	93
12:41 PM	PRINCIPAL	AC	AUTOMATED	S	44,000	2.8	MMI	28
12:41 PM	PRINCIPAL	AC	MANUAL	S	88,000	5.7	MMI	56
12:42 PM	AGENT	PI	AUTOMATED	S	146,100	5.9	NA	0
12:43 PM	AGENT	AO	AUTOMATED	S	550,000	28.0	SPZ	187
12:49 PM	PRINCIPAL	AC	MANUAL	S	88,000	5.6	MMI	56
12:50 PM	AGENT	AC	AUTOMATED	S	169,900	6.8	SPZ	51
12:50 PM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA	0
12:52 PM	AGENT	OS	AUTOMATED	S	24,000	1.0	NA	0
12:52 PM	AGENT	PI	AUTOMATED	S	375,000	13.0	NA	0
12:52 PM	AGENT	AO	AUTOMATED	S	297,200	11.6	SPZ	100
12:53 PM	AGENT	AO	AUTOMATED	S	297,200	11.6	SPZ	100
12:53 PM	PRINCIPAL	AO	AUTOMATED	SS	250,000	10.0	SPZ	93
12:55 PM	AGENT	PI	AUTOMATED	S	629,700	25.0	NA	0
01:00 PM	PRINCIPAL	AO	AUTOMATED	SS	250,000	10.0	SPZ	93
01:00 PM	PRINCIPAL	AO	AUTOMATED	B	40,000	3.0	MMI	25
01:02 PM	AGENT	AC	AUTOMATED	S	169,900	6.8	SPZ	51
01:03 PM	AGENT	OS	AUTOMATED	B	26,000	1.1	NA	0
01:04 PM	AGENT	AO	AUTOMATED	S	550,000	28.0	SPZ	187

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 19, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX	NO. OF PRODUCT CONTRACTS
			ENTRY METHOD	SELL					
01:06 PM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA		0
01:09 PM	AGENT	AO	AUTOMATED	S	298,500	11.6	SPZ		100
01:10 PM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA		0
01:11 PM	AGENT	AO	AUTOMATED	S	298,500	11.6	SPZ		100
01:13 PM	PRINCIPAL	AO	MANUAL	B	44,000	2.8	MMI		28
01:17 PM	AGENT	AO	AUTOMATED	S	550,000	28.0	SPZ		187
01:18 PM	PRINCIPAL	AO	AUTOMATED	SS	400,000	12.0	SPZ		104
01:18 PM	PRINCIPAL	AC	MANUAL	S	40,000	2.9	MMI		25
01:20 PM	AGENT	AC	AUTOMATED	S	169,500	6.8	SPZ		51
01:20 PM	AGENT	AO	AUTOMATED	S	550,000	28.0	SPZ		187
01:22 PM	AGENT	SB	AUTOMATED	S	492,100	25.0	SPZ		152
01:23 PM	PRINCIPAL	AC	MANUAL	S	40,000	2.9	MMI		26
01:23 PM	PRINCIPAL	AO	AUTOMATED	SS	400,000	12.0	SPZ		104
01:24 PM	AGENT	PI	AUTOMATED	S	93,300	5.0	NA		0
01:24 PM	AGENT	AO	AUTOMATED	S	281,050	10.8	SPZ		100
01:25 PM	AGENT	AO	AUTOMATED	S	281,050	10.8	SPZ		100
01:28 PM	AGENT	PI	AUTOMATED	S	2,005,400	100.0	NA		0
01:29 PM	PRINCIPAL	AC	AUTOMATED	S	44,000	2.8	MMI		28
01:29 PM	PRINCIPAL	AC	AUTOMATED	S	44,000	2.8	MMI		28
01:29 PM	PRINCIPAL	AC	MANUAL	S	40,000	2.9	MMI		25
01:30 PM	PRINCIPAL	AC	MANUAL	S	80,000	5.8	MMI		51
01:31 PM	AGENT	AO	AUTOMATED	S	471,000	18.0	SPZ		144
01:31 PM	AGENT	PI	AUTOMATED	S	318,700	15.0	NA		0
01:32 PM	AGENT	AO	AUTOMATED	S	100,000	3.0	SPZ		29
01:32 PM	AGENT	AC	AUTOMATED	S	324,500	6.1	SPZ		81
01:32 PM	AGENT	AC	MANUAL	S	45,800	3.0	MMI		
01:32 PM	AGENT	PI	AUTOMATED	S	650,000	30.0	NA		0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 19, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT		SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
				BUY	SELL				
01:33 PM	PRINCIPAL	AO	AUTOMATED	SS		250,000	10.0	SPZ	93
01:33 PM	AGENT	SB	AUTOMATED	S		508,800	19.3	SPZ	155
01:34 PM	AGENT	OS	AUTOMATED	B		10,000	0.6	NA	0
01:35 PM	AGENT	PI	AUTOMATED	S		2,005,400	100.0	NA	0
01:35 PM	AGENT	AC	AUTOMATED	S		164,500	6.4	SPZ	51
01:36 PM	AGENT	PI	AUTOMATED	S		583,600	22.4	NA	0
01:42 PM	PRINCIPAL	AC	MANUAL	S		80,000	5.8	MMI	51
01:45 PM	PRINCIPAL	AC	AUTOMATED	S		40,000	2.7	MMI	26
01:45 PM	AGENT	AC	AUTOMATED	S		125,500	4.6	SPZ	51
01:45 PM	AGENT	PI	AUTOMATED	S		413,800	15.3	NA	0
01:46 PM	PRINCIPAL	AC	AUTOMATED	S		29,100	1.3	OEX	100
01:47 PM	AGENT	PI	AUTOMATED	S		144,000	5.7	NA	0
01:47 PM	PRINCIPAL	AC	AUTOMATED	S		40,000	3.0	MMI	26
01:48 PM	PRINCIPAL	AC	AUTOMATED	S		100,000	6.8	MMI	65
01:49 PM	PRINCIPAL	AO	AUTOMATED	SS		443,000	20.0	SPZ	135
01:51 PM	AGENT	SB	AUTOMATED	S		489,200	25.0	SPZ	152
01:51 PM	AGENT	PI	AUTOMATED	S		338,642	12.6	NA	0
01:53 PM	AGENT	AC	AUTOMATED	S		115,200	4.3	SPZ	51
01:53 PM	AGENT	OS	AUTOMATED	S		110,635	4.0	NA	0
01:54 PM	AGENT	PI	AUTOMATED	S		2,005,400	100.0	NA	0
01:55 PM	AGENT	PI	AUTOMATED	S		418,700	15.2	NA	0
01:56 PM	PRINCIPAL	OS	AUTOMATED	B		26,400	0.6	NA	0
01:57 PM	PRINCIPAL	AC	AUTOMATED	S		40,000	2.7	NA	
01:57 PM	PRINCIPAL	AC	AUTOMATED	S		20,000	1.4	MMI	13
01:59 PM	PRINCIPAL	AO	AUTOMATED	SS		104,100	3.7	SPZ	50
02:00 PM	AGENT	PI	AUTOMATED	S		318,800	15.0	NA	0
02:00 PM	AGENT	PI	AUTOMATED	S		422,900	14.6	NA	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 19, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
			ENTRY METHOD	SELL					
02:02 PM	PRINCIPAL	AC	MANUAL	S	120,000	7.7	MMI		76
02:02 PM	AGENT	OS	AUTOMATED	B	10,000	0.6	NA		0
02:06 PM	AGENT	OS	AUTOMATED	S	110,635	4.0	NA		0
02:13 PM	PRINCIPAL	AO	AUTOMATED	SS	347,720	18.0	SPZ		50
02:23 PM	AGENT	AC	AUTOMATED	S	131,100	4.8	SPZ		51
02:30 PM	AGENT	PI	AUTOMATED	S	310,000	13.1	NA		0
02:35 PM	PRINCIPAL	AO	AUTOMATED	SS	443,000	20.0	SPZ		135
02:35 PM	PRINCIPAL	AO	AUTOMATED	B	100,000	6.8	MMI		
02:41 PM	AGENT	SB	AUTOMATED	S	217,925	8.2	SPZ		69
02:44 PM	PRINCIPAL	AC	MANUAL	S	80,000	5.8	MMI		50
02:45 PM	AGENT	AC	AUTOMATED	S	137,200	5.2	SPZ		51
02:46 PM	PRINCIPAL	AC	AUTOMATED	S	100,000	6.8	MMI		65
02:47 PM	PRINCIPAL	AO	AUTOMATED	SS	443,000	20.0	SPZ		135
02:48 PM	AGENT	OS	AUTOMATED	SS	650,000	22.0	NA		0
02:50 PM	PRINCIPAL	AC	MANUAL	S	80,000	5.8	MMI		50
02:52 PM	AGENT	OS	AUTOMATED	S	1,088,921	39.7	NA		0
02:54 PM	PRINCIPAL	AC	AUTOMATED	S	100,000	6.8	MMI		
02:56 PM	PRINCIPAL	AC	MANUAL	S	120,000	5.8	MMI		76
02:57 PM	AGENT	PI	AUTOMATED	S	177,500	7.1	NA		0
02:58 PM	AGENT	AC	AUTOMATED	S	146,400	5.4	SPZ		51
03:00 PM	PRINCIPAL	AC	MANUAL	S	80,000	5.8	MMI		50
03:01 PM	AGENT	SB	AUTOMATED	S	634,400	25.0	SPZ		200
03:04 PM	PRINCIPAL	AC	MANUAL	S	80,000	5.8	MMI		50
03:04 PM	AGENT	PI	AUTOMATED	S	444,700	16.3	NA		0
03:07 PM	AGENT	OS	AUTOMATED	S	221,270	8.0	NA		0
03:08 PM	AGENT	OS	AUTOMATED	S	33,000	1.7	NA		0
03:09 PM	PRINCIPAL	AO	AUTOMATED	SS	347,720	18.0	SPZ		25

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER		BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
			ENTRY METHOD						
03:10 PM	PRINCIPAL	AC	MANUAL		S	80,000	5.8	MMI	50
03:15 PM	AGENT	PI	AUTOMATED		S	565,500	20.4	NA	0
03:17 PM	PRINCIPAL	AC	MANUAL		S	80,000	5.8	MMI	50
03:19 PM	AGENT	AC	AUTOMATED		S	114,000	3.6	KVL	
03:19 PM	AGENT	AC	AUTOMATED		S	387,000	6.6	KVL	
03:21 PM	AGENT	PI	AUTOMATED		S	454,200	16.5	NA	0
03:21 PM	PRINCIPAL	AC	MANUAL		S	80,000	5.8	MMI	50
03:22 PM	AGENT	OS	AUTOMATED		B	9,000	7.0	NA	0
03:26 PM	PRINCIPAL	AO	AUTOMATED		SS	212,900	10.0	SPZ	68
03:26 PM	AGENT	PI	AUTOMATED		S	586,900	20.9	NA	0
03:29 PM	AGENT	PI	AUTOMATED		S	450,500	16.4	NA	0
03:30 PM	PRINCIPAL	AO	AUTOMATED		SS	22,000	1.3	MMI	14
03:31 PM	PRINCIPAL	OS	AUTOMATED		B	43,640	0.9	NA	0
03:33 PM	AGENT	OS	AUTOMATED		S	169,000	5.9	NA	0
03:33 PM	AGENT	OS	AUTOMATED		S	879,600	31.7	NA	0
03:33 PM	AGENT	OS	AUTOMATED		SS	1,300,000	44.0	NA	0
03:37 PM	AGENT	OS	AUTOMATED		S	504,300	25.0	NA	0
03:37 PM	AGENT	PI	AUTOMATED		S	566,900	20.2	NA	0
03:40 PM	AGENT	OS	AUTOMATED		SS	1,300,000	44.0	NA	0
03:40 PM	PRINCIPAL	AC	MANUAL		S	80,000	5.8	MMI	50
03:42 PM	AGENT	PI	AUTOMATED		S	438,700	15.7	NA	0
03:44 PM	PRINCIPAL	AC	MANUAL		S	80,000	5.8	MMI	50
03:45 PM	AGENT	OS	AUTOMATED		S	202,500	7.0	NA	0
03:45 PM	AGENT	PI	AUTOMATED		S	556,600	19.6	NA	0
03:48 PM	PRINCIPAL	AC	MANUAL		S	80,000	5.8	MMI	50
03:50 PM	AGENT	OS	AUTOMATED		S	22,100	1.2	NA	0
03:51 PM	AGENT	PI	AUTOMATED		S	561,000	19.6	NA	0

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
04:00 PM	PRINCIPAL	AC	MANUAL	S	587,300	35.0	SPZ	215
04:00 PM	PRINCIPAL	AC	MANUAL	S	200,000	14.5	MMI	125

PROGRAMS EXECUTED "ALL DAY"

AGENT	OS	MANUAL	S	30,000	1.1	NA	0
AGENT	OS	MANUAL	S	16,500	0.5	NA	0
AGENT	OS	MANUAL	S	20,100	0.6	NA	0
AGENT	OS	MANUAL	S	19,500	0.6	NA	0
AGENT	OS	MANUAL	S	20,900	0.7	NA	0
PRINCIPAL	AC	AUTOMATED	S	200,000	13.0	MMI	125
PRINCIPAL	AO	AUTOMATED	B	120,000	8.0	MMI	75

LONDON MARKET

AGENT	AO	MANUAL	SS	1,300,000	60.0	SPZ	400
AGENT	AO	MANUAL	SS	1,950,000	90.0	SPZ	600
PRINCIPAL	AO	MANUAL	B	3,250,000	150.0	SPZ	1000
PRINCIPAL	AD	MANUAL	S	2,401,000	96.0	NA	965

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
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TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	AGENT	OS	AUTOMATED	SS	25,700	1.0	NA	0
09:30 AM	AGENT	OS	AUTOMATED	SS	290,100	10.0	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	60,400	3.5	NA	0
09:30 AM	AGENT	OS	AUTOMATED	SS	251,900	8.0	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	33,000	1.7	NA	0
09:30 AM	PRINCIPAL	OS	AUTOMATED	B	40,000	3.0	NA	0
09:30 AM	AGENT	PI	AUTOMATED	S	142,702	5.8	NA	0
09:30 AM	AGENT	PI	AUTOMATED	S	271,875	10.6	NA	0
09:30 AM	AGENT	PI	AUTOMATED	S	83,516	3.2	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	197,910	7.3	NA	0
09:30 AM	AGENT	OS	AUTOMATED	S	650,000	24.0	NA	0
09:30 AM	AGENT	OS	MANUAL	S	348,870	30.0	NA	0
09:30 AM	PRINCIPAL	AO	AUTOMATED	SS	165,800	8.0	KVL	10
10:00 AM	AGENT	AD	MANUAL	S	283,800	9.6	SPZ	80
10:04 AM	AGENT	OS	AUTOMATED	B	146,500	5.8	NA	0
10:06 AM	AGENT	OS	AUTOMATED	B	147,200	5.8	NA	0
10:23 AM	PRINCIPAL	AO	MANUAL	SS	96,000	4.6	MMI	60
10:26 AM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50
10:28 AM	AGENT	OS	MANUAL	S	625,000	31.0	NA	0
10:31 AM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50
10:32 AM	PRINCIPAL	AO	AUTOMATED	SS	150,000	5.0	SPZ	40
10:37 AM	PRINCIPAL	AO	MANUAL	SS	332,400	11.4	SPZ	100
10:37 AM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50
10:40 AM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50
10:44 AM	AGENT	OS	AUTOMATED	SS	500,000	20.0	NA	0
10:53 AM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 20, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
11:00 AM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50
11:10 AM	AGENT	PI	MANUAL	S	2,100,000	75.0	NA	0
11:12 AM	PRINCIPAL	AO	MANUAL	SS	60,000	3.4	MMI	38
11:12 AM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50
11:15 AM	AGENT	OS	AUTOMATED	SS	650,000	22.0	NA	0
11:20 AM	AGENT	PI	MANUAL	S	4,200,000	150.0	NA	0
11:22 AM	AGENT	OS	AUTOMATED	SS	250,000	10.0	NA	0
11:27 AM	AGENT	AC	MANUAL	S	30,000	1.7	MMI	0
11:28 AM	PRINCIPAL	AO	MANUAL	SS	230,150	9.3	SPZ	90
11:43 AM	PRINCIPAL	AO	MANUAL	SS	151,601	5.6	SPZ	40
11:52 AM	PRINCIPAL	AO	MANUAL	SS	64,100	1.8	SPZ	10
12:37 PM	AGENT	OS	AUTOMATED	B	316,900	7.0	NA	0
12:49 PM	PRINCIPAL	AO	MANUAL	B	40,000	2.3	MMI	25
01:11 PM	AGENT	OS	AUTOMATED	SS	650,000	22.0	NA	0
01:30 PM	AGENT	PI	MANUAL	S	2,100,000	75.0	NA	0
01:30 PM	PRINCIPAL	AC	MANUAL	B	1,129,800	18.0	KVL	196
01:39 PM	PRINCIPAL	AO	MANUAL	B	40,000	2.3	MMI	25
01:50 PM	AGENT	OS	MANUAL	S	348,870	30.0	NA	0
01:54 PM	PRINCIPAL	AO	MANUAL	B	40,000	2.3	MMI	25
02:00 PM	AGENT	PI	MANUAL	S	1,063,000	38.0	NA	0
02:15 PM	AGENT	OS	MANUAL	S	2,198,200	70.2	NA	0
02:33 PM	AGENT	OS	MANUAL	S	348,870	30.0	NA	0
02:35 PM	AGENT	OS	MANUAL	S	348,870	30.0	NA	0
02:40 PM	AGENT	PI	MANUAL	S	530,000	20.0	NA	0
02:44 PM	PRINCIPAL	AO	MANUAL	B	64,000	3.6	MMI	40
02:55 PM	PRINCIPAL	AO	MANUAL	B	64,000	3.6	MMI	40

COMPOSITE CHRONOLOGY
Index-Related Trading on NYSE
October 20, 1987

TIME INITIATED	PRINCIPAL/ AGENT	STRATEGY	ORDER ENTRY METHOD	BUY/SELL/ SHORT SELL	SHARES	DOLLAR AMOUNT (MILLIONS)	INDEX PRODUCT	NO. OF CONTRACTS
03:20 PM	AGENT	OS	MANUAL	S	348,870	30.0	NA	0
03:31 PM	PRINCIPAL	AO	MANUAL	S	64,000	3.8	MMI	40
03:31 PM	AGENT	OS	MANUAL	B	400,000	21.0	NA	0
03:39 PM	PRINCIPAL	AC	MANUAL	S	64,000	3.8	MMI	40
03:42 PM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50
03:44 PM	AGENT	OS	MANUAL	S	850,000	45.0	NA	0
03:45 PM	AGENT	OS	MANUAL	S	152,300	5.3	NA	0
03:54 PM	PRINCIPAL	AC	MANUAL	S	80,000	4.6	MMI	50
04:00 PM	PRINCIPAL	AC	MANUAL	S	360,000	20.7	MMI	225

PROGRAMS EXECUTED "ALL DAY"

AGENT	OS	SB	OS	AUTOMATED	S	5,900	0.2	NA	0
AGENT				AUTOMATED	S	551,100	20.5	SPZ	189
AGENT				AUTOMATED	S	1,234,000	60.0	NA	0

LONDON MARKET

AGENT	OS	AD	MANUAL	S	2,615,939	7.4	NA	0
PRINCIPAL			MANUAL	S <td>23,249,700</td> <td>843.0</td> <td>SPZ</td> <td>7415</td>	23,249,700	843.0	SPZ	7415

APPENDIX C

**CHRONOLOGIES OF
PORTFOLIO INSURANCE SELLING
ON CME**

The attached charts provide a chronology of portfolio insurance selling on the Chicago Mercantile Exchange ("CME") during the October Market Break. An explanation of the chart headings are as follows:

1. Time - Time of order entry (Eastern Time)
2. P/A - P - Principal (firm proprietary)
A - Agent (customer)
3. Strategy:
PI - Portfolio Insurance
4. SPZ - S&P 500 Futures (Dec.)
5. Number of contracts sold

COMPOSITE CHRONOLOGY				
Portfolio Insurance Related Selling on CME				
OCTOBER 6, 1987				
TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
11:57 AM	AGENT	PI	SPZ	33
02:30 PM	AGENT	PI	SPZ	35
03:48 PM	AGENT	PI	SPZ	8
03:52 PM	AGENT	PI	SPZ	20
03:53 PM	AGENT	PI	SPZ	21
03:55 PM	AGENT	PI	SPZ	9
03:55 PM	AGENT	PI	SPZ	29
03:55 PM	AGENT	PI	SPZ	25
03:56 PM	AGENT	PI	SPZ	1
			TOTAL	181

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 14, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
09:38 AM	AGENT	PI	SPZ	40
10:00 AM	AGENT	PI	SPZ	20
10:00 AM	AGENT	PI	SPZ	14
10:07 AM	AGENT	PI	SPZ	1
10:29 AM	AGENT	PI	SPZ	3
10:59 AM	AGENT	PI	SPZ	1
11:50 AM	AGENT	PI	SPZ	11
12:00 PM	AGENT	PI	SPZ	50
12:04 PM	AGENT	PI	SPZ	10
12:14 PM	AGENT	PI	SPZ	7
12:48 PM	AGENT	PI	SPZ	20
12:50 PM	AGENT	PI	SPZ	20
12:58 PM	AGENT	PI	SPZ	24
01:00 PM	AGENT	PI	SPZ	3
01:00 PM	AGENT	PI	SPZ	2
01:10 PM	AGENT	PI	SPZ	10
01:10 PM	AGENT	PI	SPZ	2
01:10 PM	AGENT	PI	SPZ	10
01:10 PM	AGENT	PI	SPZ	7
01:20 PM	AGENT	PI	SPZ	10
01:20 PM	AGENT	PI	SPZ	20
01:20 PM	AGENT	PI	SPZ	91
01:20 PM	AGENT	PI	SPZ	40
01:20 PM	AGENT	PI	SPZ	40
01:20 PM	AGENT	PI	SPZ	40
01:20 PM	AGENT	PI	SPZ	80
01:20 PM	AGENT	PI	SPZ	50

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 14, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
01:20 PM	AGENT	PI	SPZ	9
01:28 PM	AGENT	PI	SPZ	23
01:33 PM	AGENT	PI	SPZ	10
01:34 PM	AGENT	PI	SPZ	12
01:36 PM	AGENT	PI	SPZ	10
01:37 PM	AGENT	PI	SPZ	10
01:38 PM	AGENT	PI	SPZ	10
01:38 PM	AGENT	PI	SPZ	10
01:40 PM	AGENT	PI	SPZ	12
01:40 PM	AGENT	PI	SPZ	30
02:00 PM	AGENT	PI	SPZ	2
02:03 PM	AGENT	PI	SPZ	35
02:05 PM	AGENT	PI	SPZ	11
02:10 PM	AGENT	PI	SPZ	20
02:12 PM	AGENT	PI	SPZ	1
02:40 PM	AGENT	PI	SPZ	15
02:40 PM	AGENT	PI	SPZ	10
02:40 PM	AGENT	PI	SPZ	20
02:40 PM	AGENT	PI	SPZ	50
02:40 PM	AGENT	PI	SPZ	10
02:49 PM	AGENT	PI	SPZ	20
02:50 PM	AGENT	PI	SPZ	30
02:50 PM	AGENT	PI	SPZ	12
02:54 PM	AGENT	PI	SPZ	15
02:55 PM	AGENT	PI	SPZ	10
02:56 PM	AGENT	PI	SPZ	10
02:57 PM	AGENT	PI	SPZ	10

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 14, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
03:03 PM	AGENT	PI	SPZ	50
03:04 PM	AGENT	PI	SPZ	50
03:12 PM	AGENT	PI	SPZ	25
03:20 PM	AGENT	PI	SPZ	320
03:27 PM	AGENT	PI	SPZ	85
03:30 PM	AGENT	PI	SPZ	3
03:40 PM	AGENT	PI	SPZ	2
03:44 PM	AGENT	PI	SPZ	30
03:45 PM	AGENT	PI	SPZ	32
	AGENT	PI	SPZ	58
	AGENT	PI	SPZ	18
	AGENT	PI	SPZ	16
		TOTAL		1,732

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 15, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	AGENT	PI	SPZ	24
09:30 AM	AGENT	PI	SPZ	25
09:30 AM	AGENT	PI	SPZ	100
09:30 AM	AGENT	PI	SPZ	100
09:31 AM	AGENT	PI	SPZ	1
09:32 AM	AGENT	PI	SPZ	100
09:36 AM	AGENT	PI	SPZ	100
09:39 AM	AGENT	PI	SPZ	100
09:42 AM	AGENT	PI	SPZ	28
09:44 AM	AGENT	PI	SPZ	22
09:45 AM	AGENT	PI	SPZ	30
09:45 AM	AGENT	PI	SPZ	100
09:46 AM	AGENT	PI	SPZ	30
09:47 AM	AGENT	PI	SPZ	50
09:47 AM	AGENT	PI	SPZ	19
09:48 AM	AGENT	PI	SPZ	40
09:50 AM	AGENT	PI	SPZ	46
09:50 AM	AGENT	PI	SPZ	69
09:50 AM	AGENT	PI	SPZ	30
09:50 AM	AGENT	PI	SPZ	36
09:50 AM	AGENT	PI	SPZ	30
09:50 AM	AGENT	PI	SPZ	3
09:54 AM	AGENT	PI	SPZ	30
09:54 AM	AGENT	PI	SPZ	100
09:56 AM	AGENT	PI	SPZ	28
09:59 AM	AGENT	PI	SPZ	27
10:00 AM	AGENT	PI	SPZ	18

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 15, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:00 AM	AGENT	PI	SPZ	17
10:00 AM	AGENT	PI	SPZ	20
10:04 AM	AGENT	PI	SPZ	20
10:06 AM	AGENT	PI	SPZ	50
10:07 AM	AGENT	PI	SPZ	20
10:10 AM	AGENT	PI	SPZ	20
10:10 AM	AGENT	PI	SPZ	30
10:10 AM	AGENT	PI	SPZ	28
10:10 AM	AGENT	PI	SPZ	14
10:10 AM	AGENT	PI	SPZ	20
10:10 AM	AGENT	PI	SPZ	10
10:10 AM	AGENT	PI	SPZ	18
10:10 AM	AGENT	PI	SPZ	14
10:10 AM	AGENT	PI	SPZ	16
10:10 AM	AGENT	PI	SPZ	16
10:10 AM	AGENT	PI	SPZ	100
10:11 AM	AGENT	PI	SPZ	100
10:12 AM	AGENT	PI	SPZ	20
10:12 AM	AGENT	PI	SPZ	20
10:13 AM	AGENT	PI	SPZ	5
10:16 AM	AGENT	PI	SPZ	2
10:19 AM	AGENT	PI	SPZ	16
10:20 AM	AGENT	PI	SPZ	35
10:20 AM	AGENT	PI	SPZ	10
10:20 AM	AGENT	PI	SPZ	30
10:20 AM	AGENT	PI	SPZ	20
10:20 AM	AGENT	PI	SPZ	32

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 15, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:20 AM	AGENT	PI	SPZ	35
10:22 AM	AGENT	PI	SPZ	9
10:30 AM	AGENT	PI	SPZ	47
10:30 AM	AGENT	PI	SPZ	10
10:30 AM	AGENT	PI	SPZ	20
10:30 AM	AGENT	PI	SPZ	5
10:40 AM	AGENT	PI	SPZ	18
10:40 AM	AGENT	PI	SPZ	2
10:40 AM	AGENT	PI	SPZ	36
10:40 AM	AGENT	PI	SPZ	4
10:40 AM	AGENT	PI	SPZ	20
10:40 AM	AGENT	PI	SPZ	30
10:46 AM	AGENT	PI	SPZ	20
10:46 AM	AGENT	PI	SPZ	51
10:46 AM	AGENT	PI	SPZ	10
10:47 AM	AGENT	PI	SPZ	12
10:48 AM	AGENT	PI	SPZ	10
10:49 AM	AGENT	PI	SPZ	10
10:50 AM	AGENT	PI	SPZ	17
10:50 AM	AGENT	PI	SPZ	7
10:51 AM	AGENT	PI	SPZ	10
10:52 AM	AGENT	PI	SPZ	10
10:53 AM	AGENT	PI	SPZ	10
10:54 AM	AGENT	PI	SPZ	10
10:56 AM	AGENT	PI	SPZ	10
11:01 AM	AGENT	PI	SPZ	10
11:02 AM	AGENT	PI	SPZ	10

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 15, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
11:22 AM	AGENT	PI	SPZ	100
11:46 AM	AGENT	PI	SPZ	100
11:50 AM	AGENT	PI	SPZ	4
11:51 AM	AGENT	PI	SPZ	100
01:50 PM	AGENT	PI	SPZ	12
02:10 PM	AGENT	PI	SPZ	5
03:00 PM	AGENT	PI	SPZ	83
03:13 PM	AGENT	PI	SPZ	4
03:56 PM	AGENT	PI	SPZ	29
03:59 PM	AGENT	PI	SPZ	20
03:59 PM	AGENT	PI	SPZ	3
03:59 PM	AGENT	PI	SPZ	3
04:00 PM	AGENT	PI	SPZ	124
04:00 PM	AGENT	PI	SPZ	10
04:00 PM	AGENT	PI	SPZ	50
04:00 PM	AGENT	PI	SPZ	115
04:00 PM	AGENT	PI	SPZ	90
04:00 PM	AGENT	PI	SPZ	21
04:02 PM	AGENT	PI	SPZ	50
04:04 PM	AGENT	PI	SPZ	10
04:06 PM	AGENT	PI	SPZ	50
04:06 PM	AGENT	PI	SPZ	18
	AGENT	PI	SPZ	16
	AGENT	PI	SPZ	75
	AGENT	PI	SPZ	58
	AGENT	PI	SPZ	27
			TOTAL	3,609

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	AGENT	PI	SPZ	40
09:30 AM	AGENT	PI	SPZ	20
09:40 AM	AGENT	PI	SPZ	40
09:40 AM	AGENT	PI	SPZ	160
09:50 AM	AGENT	PI	SPZ	31
09:50 AM	AGENT	PI	SPZ	10
09:50 AM	AGENT	PI	SPZ	100
09:50 AM	AGENT	PI	SPZ	17
09:51 AM	AGENT	PI	SPZ	10
09:53 AM	AGENT	PI	SPZ	10
09:53 AM	AGENT	PI	SPZ	10
09:54 AM	AGENT	PI	SPZ	10
09:56 AM	AGENT	PI	SPZ	10
09:57 AM	AGENT	PI	SPZ	10
09:58 AM	AGENT	PI	SPZ	1
09:58 AM	AGENT	PI	SPZ	22
10:00 AM	AGENT	PI	SPZ	50
10:04 AM	AGENT	PI	SPZ	10
10:07 AM	AGENT	PI	SPZ	9
10:07 AM	AGENT	PI	SPZ	3
10:13 AM	AGENT	PI	SPZ	10
10:14 AM	AGENT	PI	SPZ	10
10:14 AM	AGENT	PI	SPZ	10
10:15 AM	AGENT	PI	SPZ	10
10:15 AM	AGENT	PI	SPZ	10
10:16 AM	AGENT	PI	SPZ	10
10:17 AM	AGENT	PI	SPZ	10

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:18 AM	AGENT	PI	SPZ	10
10:22 AM	AGENT	PI	SPZ	20
10:25 AM	AGENT	PI	SPZ	46
10:26 AM	AGENT	PI	SPZ	10
10:27 AM	AGENT	PI	SPZ	15
10:27 AM	AGENT	PI	SPZ	25
10:29 AM	AGENT	PI	SPZ	25
10:29 AM	AGENT	PI	SPZ	25
10:30 AM	AGENT	PI	SPZ	5
10:30 AM	AGENT	PI	SPZ	6
10:30 AM	AGENT	PI	SPZ	196
10:30 AM	AGENT	PI	SPZ	42
10:30 AM	AGENT	PI	SPZ	30
10:30 AM	AGENT	PI	SPZ	25
10:37 AM	AGENT	PI	SPZ	142
10:40 AM	AGENT	PI	SPZ	36
10:40 AM	AGENT	PI	SPZ	90
10:40 AM	AGENT	PI	SPZ	27
10:44 AM	AGENT	PI	SPZ	9
10:50 AM	AGENT	PI	SPZ	31
10:50 AM	AGENT	PI	SPZ	2
10:55 AM	AGENT	PI	SPZ	7
10:55 AM	AGENT	PI	SPZ	31
11:00 AM	AGENT	PI	SPZ	50
11:01 AM	AGENT	PI	SPZ	25
11:08 AM	AGENT	PI	SPZ	50
11:10 AM	AGENT	PI	SPZ	8

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
11:17 AM	AGENT	PI	SPZ	45
11:20 AM	AGENT	PI	SPZ	30
11:20 AM	AGENT	PI	SPZ	5
11:20 AM	AGENT	PI	SPZ	60
11:20 AM	AGENT	PI	SPZ	22
11:27 AM	AGENT	PI	SPZ	53
11:30 AM	AGENT	PI	SPZ	150
11:36 AM	AGENT	PI	SPZ	7
11:39 AM	AGENT	PI	SPZ	31
11:40 AM	AGENT	PI	SPZ	50
11:40 AM	AGENT	PI	SPZ	31
11:41 AM	AGENT	PI	SPZ	50
11:42 AM	AGENT	PI	SPZ	50
11:43 AM	AGENT	PI	SPZ	50
11:46 AM	AGENT	PI	SPZ	25
11:48 AM	AGENT	PI	SPZ	9
11:49 AM	AGENT	PI	SPZ	2
11:50 AM	AGENT	PI	SPZ	31
11:52 AM	AGENT	PI	SPZ	25
11:55 AM	AGENT	PI	SPZ	25
11:56 AM	AGENT	PI	SPZ	25
11:57 AM	AGENT	PI	SPZ	100
11:58 AM	AGENT	PI	SPZ	8
11:58 AM	AGENT	PI	SPZ	50
12:00 PM	AGENT	PI	SPZ	3
12:00 PM	AGENT	PI	SPZ	15
12:00 PM	AGENT	PI	SPZ	20

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
12:00 PM	AGENT	PI	SPZ	20
12:00 PM	AGENT	PI	SPZ	30
12:00 PM	AGENT	PI	SPZ	50
12:00 PM	AGENT	PI	SPZ	25
12:00 PM	AGENT	PI	SPZ	16
12:00 PM	AGENT	PI	SPZ	4
12:00 PM	AGENT	PI	SPZ	3
12:00 PM	AGENT	PI	SPZ	30
12:04 PM	AGENT	PI	SPZ	29
12:04 PM	AGENT	PI	SPZ	20
12:08 PM	AGENT	PI	SPZ	28
12:10 PM	AGENT	PI	SPZ	20
12:10 PM	AGENT	PI	SPZ	20
12:10 PM	AGENT	PI	SPZ	50
12:10 PM	AGENT	PI	SPZ	25
12:10 PM	AGENT	PI	SPZ	10
12:15 PM	AGENT	PI	SPZ	24
12:29 PM	AGENT	PI	SPZ	34
12:40 PM	AGENT	PI	SPZ	2
12:48 PM	AGENT	PI	SPZ	8
12:56 PM	AGENT	PI	SPZ	55
01:00 PM	AGENT	PI	SPZ	31
01:04 PM	AGENT	PI	SPZ	9
01:07 PM	AGENT	PI	SPZ	50
01:10 PM	AGENT	PI	SPZ	25
01:17 PM	AGENT	PI	SPZ	50
01:20 PM	AGENT	PI	SPZ	5

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
01:20 PM	AGENT	PI	SPZ	15
01:20 PM	AGENT	PI	SPZ	63
01:20 PM	AGENT	PI	SPZ	100
01:20 PM	AGENT	PI	SPZ	5
01:20 PM	AGENT	PI	SPZ	35
01:20 PM	AGENT	PI	SPZ	248
01:20 PM	AGENT	PI	SPZ	50
01:20 PM	AGENT	PI	SPZ	25
01:20 PM	AGENT	PI	SPZ	50
01:20 PM	AGENT	PI	SPZ	23
01:20 PM	AGENT	PI	SPZ	50
01:26 PM	AGENT	PI	SPZ	83
01:28 PM	AGENT	PI	SPZ	100
01:30 PM	AGENT	PI	SPZ	37
01:30 PM	AGENT	PI	SPZ	20
01:30 PM	AGENT	PI	SPZ	14
01:30 PM	AGENT	PI	SPZ	140
01:30 PM	AGENT	PI	SPZ	1
01:32 PM	AGENT	PI	SPZ	27
01:37 PM	AGENT	PI	SPZ	4
01:39 PM	AGENT	PI	SPZ	2
01:40 PM	AGENT	PI	SPZ	10
01:40 PM	AGENT	PI	SPZ	23
01:40 PM	AGENT	PI	SPZ	22
01:40 PM	AGENT	PI	SPZ	7
01:49 PM	AGENT	PI	SPZ	50
01:49 PM	AGENT	PI	SPZ	2

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
01:50 PM	AGENT	PI	SPZ	126
01:51 PM	AGENT	PI	SPZ	50
01:54 PM	AGENT	PI	SPZ	3
01:57 PM	AGENT	PI	SPZ	100
02:00 PM	AGENT	PI	SPZ	2
02:00 PM	AGENT	PI	SPZ	5
02:00 PM	AGENT	PI	SPZ	4
02:00 PM	AGENT	PI	SPZ	45
02:00 PM	AGENT	PI	SPZ	25
02:00 PM	AGENT	PI	SPZ	20
02:00 PM	AGENT	PI	SPZ	129
02:04 PM	AGENT	PI	SPZ	9
02:05 PM	AGENT	PI	SPZ	25
02:07 PM	AGENT	PI	SPZ	20
02:08 PM	AGENT	PI	SPZ	40
02:09 PM	AGENT	PI	SPZ	40
02:09 PM	AGENT	PI	SPZ	50
02:10 PM	AGENT	PI	SPZ	62
02:10 PM	AGENT	PI	SPZ	100
02:10 PM	AGENT	PI	SPZ	50
02:10 PM	AGENT	PI	SPZ	20
02:10 PM	AGENT	PI	SPZ	51
02:10 PM	AGENT	PI	SPZ	40
02:12 PM	AGENT	PI	SPZ	50
02:12 PM	AGENT	PI	SPZ	50
02:13 PM	AGENT	PI	SPZ	50
02:14 PM	AGENT	PI	SPZ	50

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/		STRATEGY	INDEX		NO. OF
	AGENT	AGENT		PRODUCT	CONTRACTS	
02:16 PM	AGENT	AGENT	PI	SPZ	SPZ	100
02:16 PM	AGENT	AGENT	PI	SPZ	SPZ	100
02:18 PM	AGENT	AGENT	PI	SPZ	SPZ	28
02:20 PM	AGENT	AGENT	PI	SPZ	SPZ	3
02:20 PM	AGENT	AGENT	PI	SPZ	SPZ	35
02:20 PM	AGENT	AGENT	PI	SPZ	SPZ	5
02:20 PM	AGENT	AGENT	PI	SPZ	SPZ	1
02:20 PM	AGENT	AGENT	PI	SPZ	SPZ	100
02:20 PM	AGENT	AGENT	PI	SPZ	SPZ	18
02:20 PM	AGENT	AGENT	PI	SPZ	SPZ	68
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	100
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	50
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	50
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	1
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	10
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	30
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	50
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	100
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	13
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	3
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	50
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	9
02:30 PM	AGENT	AGENT	PI	SPZ	SPZ	40
02:35 PM	AGENT	AGENT	PI	SPZ	SPZ	4
02:40 PM	AGENT	AGENT	PI	SPZ	SPZ	10
02:40 PM	AGENT	AGENT	PI	SPZ	SPZ	20
02:40 PM	AGENT	AGENT	PI	SPZ	SPZ	20

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
02:40 PM	AGENT	PI	SPZ	20
02:40 PM	AGENT	PI	SPZ	13
02:45 PM	AGENT	PI	SPZ	50
02:47 PM	AGENT	PI	SPZ	50
03:01 PM	AGENT	PI	SPZ	3
03:12 PM	AGENT	PI	SPZ	50
03:16 PM	AGENT	PI	SPZ	14
03:20 PM	AGENT	PI	SPZ	242
03:35 PM	AGENT	PI	SPZ	93
03:36 PM	AGENT	PI	SPZ	100
03:39 PM	AGENT	PI	SPZ	44
03:40 PM	AGENT	PI	SPZ	13
03:40 PM	AGENT	PI	SPZ	29
03:40 PM	AGENT	PI	SPZ	7
03:40 PM	AGENT	PI	SPZ	20
03:40 PM	AGENT	PI	SPZ	40
03:40 PM	AGENT	PI	SPZ	20
03:40 PM	AGENT	PI	SPZ	23
03:40 PM	AGENT	PI	SPZ	50
03:40 PM	AGENT	PI	SPZ	9
03:40 PM	AGENT	PI	SPZ	1
03:50 PM	AGENT	PI	SPZ	20
03:50 PM	AGENT	PI	SPZ	4
03:50 PM	AGENT	PI	SPZ	16
03:50 PM	AGENT	PI	SPZ	10
03:50 PM	AGENT	PI	SPZ	18
04:00 PM	AGENT	PI	SPZ	40

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
04:00 PM	AGENT	PI	SPZ	20
04:00 PM	AGENT	PI	SPZ	18
04:00 PM	AGENT	PI	SPZ	28
04:00 PM	AGENT	PI	SPZ	41
04:00 PM	AGENT	PI	SPZ	15
04:00 PM	AGENT	PI	SPZ	40
04:00 PM	AGENT	PI	SPZ	3
04:00 PM	AGENT	PI	SPZ	9
04:00 PM	AGENT	PI	SPZ	27
04:00 PM	AGENT	PI	SPZ	37
04:00 PM	AGENT	PI	SPZ	10
04:00 PM	AGENT	PI	SPZ	20
04:00 PM	AGENT	PI	SPZ	15
04:00 PM	AGENT	PI	SPZ	40
04:00 PM	AGENT	PI	SPZ	10
04:00 PM	AGENT	PI	SPZ	150
04:00 PM	AGENT	PI	SPZ	77
04:00 PM	AGENT	PI	SPZ	45
04:00 PM	AGENT	PI	SPZ	106
04:00 PM	AGENT	PI	SPZ	42
04:00 PM	AGENT	PI	SPZ	8
04:00 PM	AGENT	PI	SPZ	176
04:00 PM	AGENT	PI	SPZ	155
04:00 PM	AGENT	PI	SPZ	170
04:00 PM	AGENT	PI	SPZ	3
04:00 PM	AGENT	PI	SPZ	11
04:00 PM	AGENT	PI	SPZ	66

COMPOSITE CHRONOLOGY
 Portfolio Insurance Related Selling on CME
 OCTOBER 16, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
=====	AGENT	PI	SPZ	30
		TOTAL		9,087

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
09:30 AM	AGENT	PI	SPZ	58
09:30 AM	AGENT	PI	SPZ	100
09:30 AM	AGENT	PI	SPZ	82
09:30 AM	AGENT	PI	SPZ	13
09:30 AM	AGENT	PI	SPZ	5
09:30 AM	AGENT	PI	SPZ	61
09:33 AM	AGENT	PI	SPZ	9
09:35 AM	AGENT	PI	SPZ	100
09:35 AM	AGENT	PI	SPZ	76
09:45 AM	AGENT	PI	SPZ	100
09:48 AM	AGENT	PI	SPZ	18
09:48 AM	AGENT	PI	SPZ	5
09:48 AM	AGENT	PI	SPZ	50
09:50 AM	AGENT	PI	SPZ	3
09:50 AM	AGENT	PI	SPZ	80
09:50 AM	AGENT	PI	SPZ	61
09:50 AM	AGENT	PI	SPZ	120
09:50 AM	AGENT	PI	SPZ	10
09:50 AM	AGENT	PI	SPZ	15
09:50 AM	AGENT	PI	SPZ	10
09:50 AM	AGENT	PI	SPZ	20
09:50 AM	AGENT	PI	SPZ	90
10:00 AM	AGENT	PI	SPZ	7
10:00 AM	AGENT	PI	SPZ	50
10:00 AM	AGENT	PI	SPZ	5
10:00 AM	AGENT	PI	SPZ	24
10:00 AM	AGENT	PI	SPZ	10

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:00 AM	AGENT	PI	SPZ	10
10:00 AM	AGENT	PI	SPZ	76
10:03 AM	AGENT	PI	SPZ	2
10:03 AM	AGENT	PI	SPZ	2
10:04 AM	AGENT	PI	SPZ	100
10:04 AM	AGENT	PI	SPZ	50
10:06 AM	AGENT	PI	SPZ	2
10:08 AM	AGENT	PI	SPZ	100
10:09 AM	AGENT	PI	SPZ	100
10:10 AM	AGENT	PI	SPZ	35
10:10 AM	AGENT	PI	SPZ	6
10:10 AM	AGENT	PI	SPZ	19
10:10 AM	AGENT	PI	SPZ	5
10:10 AM	AGENT	PI	SPZ	15
10:10 AM	AGENT	PI	SPZ	100
10:10 AM	AGENT	PI	SPZ	20
10:10 AM	AGENT	PI	SPZ	25
10:10 AM	AGENT	PI	SPZ	18
10:10 AM	AGENT	PI	SPZ	50
10:10 AM	AGENT	PI	SPZ	3
10:14 AM	AGENT	PI	SPZ	100
10:17 AM	AGENT	PI	SPZ	100
10:18 AM	AGENT	PI	SPZ	53
10:20 AM	AGENT	PI	SPZ	643
10:20 AM	AGENT	PI	SPZ	100
10:20 AM	AGENT	PI	SPZ	5
10:20 AM	AGENT	PI	SPZ	60

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:20 AM	AGENT	PI	SPZ	100
10:20 AM	AGENT	PI	SPZ	7
10:30 AM	AGENT	PI	SPZ	15
10:30 AM	AGENT	PI	SPZ	250
10:30 AM	AGENT	PI	SPZ	17
10:30 AM	AGENT	PI	SPZ	55
10:30 AM	AGENT	PI	SPZ	25
10:30 AM	AGENT	PI	SPZ	9
10:30 AM	AGENT	PI	SPZ	42
10:30 AM	AGENT	PI	SPZ	100
10:30 AM	AGENT	PI	SPZ	42
10:30 AM	AGENT	PI	SPZ	43
10:30 AM	AGENT	PI	SPZ	64
10:30 AM	AGENT	PI	SPZ	380
10:30 AM	AGENT	PI	SPZ	20
10:30 AM	AGENT	PI	SPZ	50
10:30 AM	AGENT	PI	SPZ	25
10:30 AM	AGENT	PI	SPZ	55
10:34 AM	AGENT	PI	SPZ	3
10:35 AM	AGENT	PI	SPZ	2
10:40 AM	AGENT	PI	SPZ	12
10:40 AM	AGENT	PI	SPZ	106
10:40 AM	AGENT	PI	SPZ	26
10:40 AM	AGENT	PI	SPZ	154
10:40 AM	AGENT	PI	SPZ	140
10:40 AM	AGENT	PI	SPZ	9
10:40 AM	AGENT	PI	SPZ	300

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:40 AM	AGENT	PI	SPZ	25
10:40 AM	AGENT	PI	SPZ	63
10:40 AM	AGENT	PI	SPZ	14
10:40 AM	AGENT	PI	SPZ	38
10:40 AM	AGENT	PI	SPZ	55
10:40 AM	AGENT	PI	SPZ	68
10:40 AM	AGENT	PI	SPZ	11
10:40 AM	AGENT	PI	SPZ	14
10:40 AM	AGENT	PI	SPZ	11
10:40 AM	AGENT	PI	SPZ	80
10:40 AM	AGENT	PI	SPZ	152
10:40 AM	AGENT	PI	SPZ	45
10:40 AM	AGENT	PI	SPZ	3
10:40 AM	AGENT	PI	SPZ	27
10:40 AM	AGENT	PI	SPZ	2
10:48 AM	AGENT	PI	SPZ	53
10:50 AM	AGENT	PI	SPZ	40
10:50 AM	AGENT	PI	SPZ	45
10:50 AM	AGENT	PI	SPZ	176
10:50 AM	AGENT	PI	SPZ	206
10:50 AM	AGENT	PI	SPZ	24
10:50 AM	AGENT	PI	SPZ	25
10:50 AM	AGENT	PI	SPZ	25
10:57 AM	AGENT	PI	SPZ	10
10:57 AM	AGENT	PI	SPZ	8
10:57 AM	AGENT	PI	SPZ	10
10:58 AM	AGENT	PI	SPZ	34

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:59 AM	AGENT	PI	SPZ	9
10:59 AM	AGENT	PI	SPZ	100
11:00 AM	AGENT	PI	SPZ	72
11:00 AM	AGENT	PI	SPZ	140
11:00 AM	AGENT	PI	SPZ	450
11:00 AM	AGENT	PI	SPZ	17
11:00 AM	AGENT	PI	SPZ	18
11:00 AM	AGENT	PI	SPZ	1
11:01 AM	AGENT	PI	SPZ	100
11:04 AM	AGENT	PI	SPZ	20
11:05 AM	AGENT	PI	SPZ	100
11:08 AM	AGENT	PI	SPZ	3
11:09 AM	AGENT	PI	SPZ	250
11:10 AM	AGENT	PI	SPZ	200
11:10 AM	AGENT	PI	SPZ	50
11:11 AM	AGENT	PI	SPZ	30
11:11 AM	AGENT	PI	SPZ	50
11:16 AM	AGENT	PI	SPZ	50
11:17 AM	AGENT	PI	SPZ	50
11:18 AM	AGENT	PI	SPZ	50
11:19 AM	AGENT	PI	SPZ	19
11:20 AM	AGENT	PI	SPZ	57
11:20 AM	AGENT	PI	SPZ	895
11:20 AM	AGENT	PI	SPZ	50
11:20 AM	AGENT	PI	SPZ	50
11:20 AM	AGENT	PI	SPZ	50
11:26 AM	AGENT	PI	SPZ	100

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
11:26 AM	AGENT	PI	SPZ	20
11:27 AM	AGENT	PI	SPZ	93
11:27 AM	AGENT	PI	SPZ	66
11:27 AM	AGENT	PI	SPZ	100
11:30 AM	AGENT	PI	SPZ	75
11:30 AM	AGENT	PI	SPZ	15
11:49 AM	AGENT	PI	SPZ	200
11:50 AM	AGENT	PI	SPZ	120
12:00 PM	AGENT	PI	SPZ	695
12:00 PM	AGENT	PI	SPZ	100
12:00 PM	AGENT	PI	SPZ	20
12:00 PM	AGENT	PI	SPZ	52
12:09 PM	AGENT	PI	SPZ	200
12:09 PM	AGENT	PI	SPZ	100
12:10 PM	AGENT	PI	SPZ	839
12:10 PM	AGENT	PI	SPZ	118
12:16 PM	AGENT	PI	SPZ	20
12:20 PM	AGENT	PI	SPZ	350
12:20 PM	AGENT	PI	SPZ	200
12:33 PM	AGENT	PI	SPZ	200
12:44 PM	AGENT	PI	SPZ	200
12:50 PM	AGENT	PI	SPZ	50
12:50 PM	AGENT	PI	SPZ	50
12:54 PM	AGENT	PI	SPZ	50
12:54 PM	AGENT	PI	SPZ	150
12:55 PM	AGENT	PI	SPZ	50
12:56 PM	AGENT	PI	SPZ	200

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
12:56 PM	AGENT	PI	SPZ	100
12:57 PM	AGENT	PI	SPZ	50
01:00 PM	AGENT	PI	SPZ	100
01:00 PM	AGENT	PI	SPZ	21
01:00 PM	AGENT	PI	SPZ	89
01:00 PM	AGENT	PI	SPZ	79
01:00 PM	AGENT	PI	SPZ	50
01:00 PM	AGENT	PI	SPZ	3
01:00 PM	AGENT	PI	SPZ	18
01:00 PM	AGENT	PI	SPZ	2
01:00 PM	AGENT	PI	SPZ	100
01:00 PM	AGENT	PI	SPZ	30
01:00 PM	AGENT	PI	SPZ	100
01:00 PM	AGENT	PI	SPZ	100
01:00 PM	AGENT	PI	SPZ	30
01:00 PM	AGENT	PI	SPZ	30
01:00 PM	AGENT	PI	SPZ	100
01:02 PM	AGENT	PI	SPZ	50
01:04 PM	AGENT	PI	SPZ	100
01:05 PM	AGENT	PI	SPZ	51
01:08 PM	AGENT	PI	SPZ	93
01:10 PM	AGENT	PI	SPZ	25
01:10 PM	AGENT	PI	SPZ	50
01:10 PM	AGENT	PI	SPZ	41
01:10 PM	AGENT	PI	SPZ	25
01:10 PM	AGENT	PI	SPZ	19
01:10 PM	AGENT	PI	SPZ	8

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
01:10 PM	AGENT	PI	SPZ	50
01:10 PM	AGENT	PI	SPZ	10
01:10 PM	AGENT	PI	SPZ	10
01:13 PM	AGENT	PI	SPZ	100
01:20 PM	AGENT	PI	SPZ	82
01:22 PM	AGENT	PI	SPZ	100
01:28 PM	AGENT	PI	SPZ	200
01:29 PM	AGENT	PI	SPZ	2
01:30 PM	AGENT	PI	SPZ	700
01:30 PM	AGENT	PI	SPZ	102
01:30 PM	AGENT	PI	SPZ	81
01:30 PM	AGENT	PI	SPZ	50
01:30 PM	AGENT	PI	SPZ	10
01:30 PM	AGENT	PI	SPZ	29
01:30 PM	AGENT	PI	SPZ	19
01:30 PM	AGENT	PI	SPZ	18
01:30 PM	AGENT	PI	SPZ	15
01:30 PM	AGENT	PI	SPZ	10
01:30 PM	AGENT	PI	SPZ	5
01:35 PM	AGENT	PI	SPZ	1
01:38 PM	AGENT	PI	SPZ	100
01:40 PM	AGENT	PI	SPZ	8
01:40 PM	AGENT	PI	SPZ	7
01:40 PM	AGENT	PI	SPZ	30
01:40 PM	AGENT	PI	SPZ	70
01:40 PM	AGENT	PI	SPZ	50
01:40 PM	AGENT	PI	SPZ	100

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/		INDEX	NO. OF
	AGENT	STRATEGY	PRODUCT	CONTRACTS
01:40 PM	AGENT	PI	SPZ	40
01:40 PM	AGENT	PI	SPZ	50
01:45 PM	AGENT	PI	SPZ	156
01:47 PM	AGENT	PI	SPZ	200
01:48 PM	AGENT	PI	SPZ	4
01:50 PM	AGENT	PI	SPZ	95
01:50 PM	AGENT	PI	SPZ	5
01:51 PM	AGENT	PI	SPZ	50
01:51 PM	AGENT	PI	SPZ	12
01:51 PM	AGENT	PI	SPZ	20
01:53 PM	AGENT	PI	SPZ	2
01:55 PM	AGENT	PI	SPZ	200
02:00 PM	AGENT	PI	SPZ	100
02:00 PM	AGENT	PI	SPZ	30
02:00 PM	AGENT	PI	SPZ	100
02:00 PM	AGENT	PI	SPZ	355
02:00 PM	AGENT	PI	SPZ	93
02:00 PM	AGENT	PI	SPZ	96
02:00 PM	AGENT	PI	SPZ	226
02:02 PM	AGENT	PI	SPZ	100
02:06 PM	AGENT	PI	SPZ	5
02:07 PM	AGENT	PI	SPZ	11
02:07 PM	AGENT	PI	SPZ	5
02:08 PM	AGENT	PI	SPZ	100
02:10 PM	AGENT	PI	SPZ	20
02:13 PM	AGENT	PI	SPZ	7
02:14 PM	AGENT	PI	SPZ	6

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
02:14 PM	AGENT	PI	SPZ	100
02:17 PM	AGENT	PI	SPZ	100
02:18 PM	AGENT	PI	SPZ	100
02:19 PM	AGENT	PI	SPZ	200
02:20 PM	AGENT	PI	SPZ	140
02:20 PM	AGENT	PI	SPZ	25
02:20 PM	AGENT	PI	SPZ	50
02:22 PM	AGENT	PI	SPZ	100
02:30 PM	AGENT	PI	SPZ	155
02:30 PM	AGENT	PI	SPZ	20
02:30 PM	AGENT	PI	SPZ	100
02:30 PM	AGENT	PI	SPZ	55
02:30 PM	AGENT	PI	SPZ	100
02:30 PM	AGENT	PI	SPZ	8
02:30 PM	AGENT	PI	SPZ	25
02:30 PM	AGENT	PI	SPZ	7
02:30 PM	AGENT	PI	SPZ	214
02:30 PM	AGENT	PI	SPZ	56
02:30 PM	AGENT	PI	SPZ	138
02:30 PM	AGENT	PI	SPZ	13
02:30 PM	AGENT	PI	SPZ	40
02:30 PM	AGENT	PI	SPZ	45
02:30 PM	AGENT	PI	SPZ	40
02:30 PM	AGENT	PI	SPZ	30
02:30 PM	AGENT	PI	SPZ	85
02:30 PM	AGENT	PI	SPZ	10
02:30 PM	AGENT	PI	SPZ	50

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
02:30 PM	AGENT	PI	SPZ	100
02:30 PM	AGENT	PI	SPZ	80
02:36 PM	AGENT	PI	SPZ	100
02:39 PM	AGENT	PI	SPZ	100
02:40 PM	AGENT	PI	SPZ	20
02:40 PM	AGENT	PI	SPZ	5
02:40 PM	AGENT	PI	SPZ	30
02:40 PM	AGENT	PI	SPZ	100
02:40 PM	AGENT	PI	SPZ	13
02:40 PM	AGENT	PI	SPZ	20
02:40 PM	AGENT	PI	SPZ	72
02:40 PM	AGENT	PI	SPZ	72
02:40 PM	AGENT	PI	SPZ	30
02:40 PM	AGENT	PI	SPZ	7
02:40 PM	AGENT	PI	SPZ	25
02:40 PM	AGENT	PI	SPZ	25
02:40 PM	AGENT	PI	SPZ	25
02:40 PM	AGENT	PI	SPZ	4
02:40 PM	AGENT	PI	SPZ	100
02:40 PM	AGENT	PI	SPZ	60
02:50 PM	AGENT	PI	SPZ	100
03:00 PM	AGENT	PI	SPZ	39
03:00 PM	AGENT	PI	SPZ	86
03:00 PM	AGENT	PI	SPZ	14
03:00 PM	AGENT	PI	SPZ	31
03:00 PM	AGENT	PI	SPZ	10
03:00 PM	AGENT	PI	SPZ	13

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
03:00 PM	AGENT	PI	SPZ	170
03:00 PM	AGENT	PI	SPZ	12
03:00 PM	AGENT	PI	SPZ	30
03:00 PM	AGENT	PI	SPZ	50
03:00 PM	AGENT	PI	SPZ	72
03:07 PM	AGENT	PI	SPZ	70
03:07 PM	AGENT	PI	SPZ	30
03:08 PM	AGENT	PI	SPZ	5
03:15 PM	AGENT	PI	SPZ	4
03:17 PM	AGENT	PI	SPZ	10
03:20 PM	AGENT	PI	SPZ	10
03:20 PM	AGENT	PI	SPZ	10
03:20 PM	AGENT	PI	SPZ	90
03:20 PM	AGENT	PI	SPZ	58
03:20 PM	AGENT	PI	SPZ	25
03:20 PM	AGENT	PI	SPZ	30
03:24 PM	AGENT	PI	SPZ	2
03:30 PM	AGENT	PI	SPZ	140
03:30 PM	AGENT	PI	SPZ	15
03:30 PM	AGENT	PI	SPZ	3
03:30 PM	AGENT	PI	SPZ	5
03:30 PM	AGENT	PI	SPZ	7
03:30 PM	AGENT	PI	SPZ	5
03:30 PM	AGENT	PI	SPZ	75
03:30 PM	AGENT	PI	SPZ	5
03:30 PM	AGENT	PI	SPZ	8
03:30 PM	AGENT	PI	SPZ	91

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
03:30 PM	AGENT	PI	SPZ	5
03:30 PM	AGENT	PI	SPZ	15
03:30 PM	AGENT	PI	SPZ	1
03:30 PM	AGENT	PI	SPZ	32
03:30 PM	AGENT	PI	SPZ	1
03:30 PM	AGENT	PI	SPZ	20
03:30 PM	AGENT	PI	SPZ	50
03:30 PM	AGENT	PI	SPZ	30
03:30 PM	AGENT	PI	SPZ	170
03:30 PM	AGENT	PI	SPZ	30
03 30 PM	AGENT	PI	SPZ	15
03:30 PM	AGENT	PI	SPZ	25
03:30 PM	AGENT	PI	SPZ	100
03:36 PM	AGENT	PI	SPZ	90
03:40 PM	AGENT	PI	SPZ	25
03:40 PM	AGENT	PI	SPZ	103
03:40 PM	AGENT	PI	SPZ	25
03:41 PM	AGENT	PI	SPZ	3
03:42 PM	AGENT	PI	SPZ	100
03:50 PM	AGENT	PI	SPZ	75
03:50 PM	AGENT	PI	SPZ	25
03:50 PM	AGENT	PI	SPZ	25
03:50 PM	AGENT	PI	SPZ	25
03:50 PM	AGENT	PI	SPZ	50
03:50 PM	AGENT	PI	SPZ	12
03:50 PM	AGENT	PI	SPZ	13
03:50 PM	AGENT	PI	SPZ	14

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
03:50 PM	AGENT	PI	SPZ	12
03:50 PM	AGENT	PI	SPZ	24
03:50 PM	AGENT	PI	SPZ	50
03:50 PM	AGENT	PI	SPZ	8
03:50 PM	AGENT	PI	SPZ	12
03:50 PM	AGENT	PI	SPZ	40
03:50 PM	AGENT	PI	SPZ	2
03:50 PM	AGENT	PI	SPZ	320
03:50 PM	AGENT	PI	SPZ	4
03:50 PM	AGENT	PI	SPZ	8
03:50 PM	AGENT	PI	SPZ	35
03:50 PM	AGENT	PI	SPZ	50
03:50 PM	AGENT	PI	SPZ	100
03:50 PM	AGENT	PI	SPZ	50
03:50 PM	AGENT	PI	SPZ	10
03:50 PM	AGENT	PI	SPZ	4
03:50 PM	AGENT	PI	SPZ	93
03:52 PM	AGENT	PI	SPZ	11
03:53 PM	AGENT	PI	SPZ	3
03:55 PM	AGENT	PI	SPZ	150
03:57 PM	AGENT	PI	SPZ	112
03:58 PM	AGENT	PI	SPZ	100
03:59 PM	AGENT	PI	SPZ	6
04:00 PM	AGENT	PI	SPZ	48
04:00 PM	AGENT	PI	SPZ	175
04:00 PM	AGENT	PI	SPZ	40
04:00 PM	AGENT	PI	SPZ	12

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 19, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
04:00 PM	AGENT	PI	SPZ	20
04:00 PM	AGENT	PI	SPZ	10
04:00 PM	AGENT	PI	SPZ	20
04:10 PM	AGENT	PI	SPZ	25
04:10 PM	AGENT	PI	SPZ	40
04:10 PM	AGENT	PI	SPZ	155
04:10 PM	AGENT	PI	SPZ	12
04:15 PM	AGENT	PI	SPZ	49
04:15 PM	AGENT	PI	SPZ	27
04:15 PM	AGENT	PI	SPZ	1
		TOTAL		26,357

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 20, 1987

TIME	PRINCIPAL/		STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
	AGENT				
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	1000
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	200
09:30 AM	AGENT		PI	SPZ	200
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	200
09:30 AM	AGENT		PI	SPZ	336
09:30 AM	AGENT		PI	SPZ	10
09:30 AM	AGENT		PI	SPZ	13
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	50
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	20
09:30 AM	AGENT		PI	SPZ	100
09:30 AM	AGENT		PI	SPZ	150
09:30 AM	AGENT		PI	SPZ	200
09:33 AM	AGENT		PI	SPZ	59
09:34 AM	AGENT		PI	SPZ	300
09:35 AM	AGENT		PI	SPZ	195
09:35 AM	AGENT		PI	SPZ	100
09:43 AM	AGENT		PI	SPZ	100
09:47 AM	AGENT		PI	SPZ	100

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 20, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
09:49 AM	AGENT	PI	SPZ	100
09:49 AM	AGENT	PI	SPZ	45
09:50 AM	AGENT	PI	SPZ	100
09:50 AM	AGENT	PI	SPZ	107
09:52 AM	AGENT	PI	SPZ	100
09:52 AM	AGENT	PI	SPZ	200
09:57 AM	AGENT	PI	SPZ	2
10:00 AM	AGENT	PI	SPZ	100
10:00 AM	AGENT	PI	SPZ	1220
10:01 AM	AGENT	PI	SPZ	20
10:03 AM	AGENT	PI	SPZ	269
10:08 AM	AGENT	PI	SPZ	100
10:12 AM	AGENT	PI	SPZ	44
10:12 AM	AGENT	PI	SPZ	50
10:16 AM	AGENT	PI	SPZ	200
10:18 AM	AGENT	PI	SPZ	25
10:18 AM	AGENT	PI	SPZ	39
10:19 AM	AGENT	PI	SPZ	25
10:19 AM	AGENT	PI	SPZ	100
10:20 AM	AGENT	PI	SPZ	100
10:20 AM	AGENT	PI	SPZ	100
10:20 AM	AGENT	PI	SPZ	124
10:20 AM	AGENT	PI	SPZ	43
10:20 AM	AGENT	PI	SPZ	60
10:27 AM	AGENT	PI	SPZ	100
10:30 AM	AGENT	PI	SPZ	100
10:30 AM	AGENT	PI	SPZ	200

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 20, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:30 AM	AGENT	PI	SPZ	7
10:30 AM	AGENT	PI	SPZ	100
10:30 AM	AGENT	PI	SPZ	40
10:30 AM	AGENT	PI	SPZ	50
10:31 AM	AGENT	PI	SPZ	17
10:31 AM	AGENT	PI	SPZ	146
10:33 AM	AGENT	PI	SPZ	200
10:40 AM	AGENT	PI	SPZ	20
10:40 AM	AGENT	PI	SPZ	250
10:40 AM	AGENT	PI	SPZ	50
10:40 AM	AGENT	PI	SPZ	9
10:44 AM	AGENT	PI	SPZ	100
10:44 AM	AGENT	PI	SPZ	50
10:45 AM	AGENT	PI	SPZ	200
10:46 AM	AGENT	PI	SPZ	100
10:50 AM	AGENT	PI	SPZ	150
10:50 AM	AGENT	PI	SPZ	200
10:50 AM	AGENT	PI	SPZ	16
10:50 AM	AGENT	PI	SPZ	100
10:50 AM	AGENT	PI	SPZ	50
10:50 AM	AGENT	PI	SPZ	100
10:50 AM	AGENT	PI	SPZ	135
10:50 AM	AGENT	PI	SPZ	24
10:50 AM	AGENT	PI	SPZ	10
10:51 AM	AGENT	PI	SPZ	60
10:51 AM	AGENT	PI	SPZ	400
10:55 AM	AGENT	PI	SPZ	100

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 20, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
10:56 AM	AGENT	PI	SPZ	400
10:59 AM	AGENT	PI	SPZ	100
11:00 AM	AGENT	PI	SPZ	200
11:00 AM	AGENT	PI	SPZ	52
11:00 AM	AGENT	PI	SPZ	618
11:00 AM	AGENT	PI	SPZ	243
11:00 AM	AGENT	PI	SPZ	289
11:00 AM	AGENT	PI	SPZ	160
11:00 AM	AGENT	PI	SPZ	100
11:00 AM	AGENT	PI	SPZ	83
11:00 AM	AGENT	PI	SPZ	50
11:00 AM	AGENT	PI	SPZ	10
11:00 AM	AGENT	PI	SPZ	12
11:00 AM	AGENT	PI	SPZ	20
11:00 AM	AGENT	PI	SPZ	25
11:01 AM	AGENT	PI	SPZ	100
11:02 AM	AGENT	PI	SPZ	130
11:04 AM	AGENT	PI	SPZ	500
11:10 AM	AGENT	PI	SPZ	50
11:10 AM	AGENT	PI	SPZ	50
11:10 AM	AGENT	PI	SPZ	40
11:13 AM	AGENT	PI	SPZ	300
11:17 AM	AGENT	PI	SPZ	100
11:20 AM	AGENT	PI	SPZ	100
11:20 AM	AGENT	PI	SPZ	100
11:21 AM	AGENT	PI	SPZ	30
11:22 AM	AGENT	PI	SPZ	200

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 20, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
11:23 AM	AGENT	PI	SPZ	100
11:28 AM	AGENT	PI	SPZ	100
11:30 AM	AGENT	PI	SPZ	600
11:30 AM	AGENT	PI	SPZ	450
11:30 AM	AGENT	PI	SPZ	54
11:30 AM	AGENT	PI	SPZ	60
11:30 AM	AGENT	PI	SPZ	62
11:30 AM	AGENT	PI	SPZ	75
11:33 AM	AGENT	PI	SPZ	50
11:41 AM	AGENT	PI	SPZ	200
11:46 AM	AGENT	PI	SPZ	100
11:47 AM	AGENT	PI	SPZ	170
11:50 AM	AGENT	PI	SPZ	40
11:55 AM	AGENT	PI	SPZ	100
11:59 AM	AGENT	PI	SPZ	100
12:00 PM	AGENT	PI	SPZ	34
12:01 PM	AGENT	PI	SPZ	87
12:03 PM	AGENT	PI	SPZ	100
01:04 PM	AGENT	PI	SPZ	150
01:04 PM	AGENT	PI	SPZ	49
01:04 PM	AGENT	PI	SPZ	34
01:04 PM	AGENT	PI	SPZ	38
01:04 PM	AGENT	PI	SPZ	50
01:04 PM	AGENT	PI	SPZ	25
01:04 PM	AGENT	PI	SPZ	100
01:04 PM	AGENT	PI	SPZ	100
01:07 PM	AGENT	PI	SPZ	50

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 20, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
01:10 PM	AGENT	PI	SPZ	200
01:14 PM	AGENT	PI	SPZ	100
01:20 PM	AGENT	PI	SPZ	100
01:20 PM	AGENT	PI	SPZ	20
01:24 PM	AGENT	PI	SPZ	100
01:25 PM	AGENT	PI	SPZ	50
01:26 PM	AGENT	PI	SPZ	100
01:26 PM	AGENT	PI	SPZ	50
01:27 PM	AGENT	PI	SPZ	100
01:27 PM	AGENT	PI	SPZ	100
01:28 PM	AGENT	PI	SPZ	100
01:30 PM	AGENT	PI	SPZ	69
01:35 PM	AGENT	PI	SPZ	100
01:35 PM	AGENT	PI	SPZ	100
01:36 PM	AGENT	PI	SPZ	150
01:37 PM	AGENT	PI	SPZ	200
01:40 PM	AGENT	PI	SPZ	100
01:40 PM	AGENT	PI	SPZ	200
01:40 PM	AGENT	PI	SPZ	50
01:40 PM	AGENT	PI	SPZ	12
01:44 PM	AGENT	PI	SPZ	100
01:45 PM	AGENT	PI	SPZ	200
01:46 PM	AGENT	PI	SPZ	200
01:47 PM	AGENT	PI	SPZ	215
01:47 PM	AGENT	PI	SPZ	400
01:48 PM	AGENT	PI	SPZ	400
01:48 PM	AGENT	PI	SPZ	200

COMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 20, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
01:49 PM	AGENT	PI	SPZ	150
01:50 PM	AGENT	PI	SPZ	20
01:50 PM	AGENT	PI	SPZ	75
01:51 PM	AGENT	PI	SPZ	100
01:54 PM	AGENT	PI	SPZ	100
01:56 PM	AGENT	PI	SPZ	100
02:00 PM	AGENT	PI	SPZ	400
02:02 PM	AGENT	PI	SPZ	100
02:04 PM	AGENT	PI	SPZ	200
02:04 PM	AGENT	PI	SPZ	100
02:06 PM	AGENT	PI	SPZ	1000
02:14 PM	AGENT	PI	SPZ	500
02:20 PM	AGENT	PI	SPZ	132
02:21 PM	AGENT	PI	SPZ	200
02:26 PM	AGENT	PI	SPZ	53
02:32 PM	AGENT	PI	SPZ	100
02:39 PM	AGENT	PI	SPZ	75
02:43 PM	AGENT	PI	SPZ	100
02:46 PM	AGENT	PI	SPZ	75
02:46 PM	AGENT	PI	SPZ	100
02:48 PM	AGENT	PI	SPZ	200
02:50 PM	AGENT	PI	SPZ	20
02:53 PM	AGENT	PI	SPZ	240
02:57 PM	AGENT	PI	SPZ	100
02:57 PM	AGENT	PI	SPZ	50
03:00 PM	AGENT	PI	SPZ	8
03:00 PM	AGENT	PI	SPZ	9

CCOMPOSITE CHRONOLOGY
Portfolio Insurance Related Selling on CME
OCTOBER 20, 1987

TIME	PRINCIPAL/ AGENT	STRATEGY	INDEX PRODUCT	NO. OF CONTRACTS
03:00 PM	AGENT	PI	SPZ	50
03:06 PM	AGENT	PI	SPZ	10
03:09 PM	AGENT	PI	SF	100
03:12 PM	AGENT	PI	SPZ	100
03:16 PM	AGENT	PI	SPZ	300
03:20 PM	AGENT	PI	SPZ	400
03:20 PM	AGENT	PI	SPZ	50
03:25 PM	AGENT	PI	SPZ	300
03:32 PM	AGENT	PI	SPZ	300
03:32 PM	AGENT	PI	SPZ	2
03:36 PM	AGENT	PI	SPZ	100
03:38 PM	AGENT	PI	SPZ	100
03:43 PM	AGENT	PI	SPZ	100
03:46 PM	AGENT	PI	SPZ	100
03:49 PM	AGENT	PI	SPZ	300
04:04 PM	AGENT	PI	SPZ	200
TOTAL				28,265

APPENDIX D

**TABLES OF
MARKET PRICE
MOVEMENTS**

TABLE D-1
WEEK OF OCTOBER 5, 1987

U.S. INDEXES

	10/5	10/6	10/7	10/8	10/9
<u>DJIA</u>					
Close	2640.18	2548.63	2551.08	2516.64	2482.21
Change	-0.81	-91.55	+2.45	-34.44	-34.43
%	-0.03	-3.47	+0.10	-1.35	-1.37
<u>S&P 500</u>					
Close	328.08	319.22	318.54	314.16	311.07
Change	+0.01	-8.86	-0.68	-4.38	-3.09
%	0.0	-2.70	-0.21	-1.38	-0.98
<u>NYSE Composite</u>					
Close	183.44	178.98	178.55	176.32	174.64
Change	+0.01	-4.46	-0.43	-2.23	-1.68
%	+0.01	-2.43	-0.24	-1.25	-0.95
<u>Amex Composite</u>					
Close	359.33	355.44	352.55	348.93	346.81
Change	-.04	-3.89	-2.89	-3.62	-2.12
%	-.01	-01.08	-0.81	-1.03	-0.61
<u>NASDAQ Composite</u>					
Close	453.63	447.51	444.64	440.03	438.43
Change	+2.02	-6.12	-2.87	-4.61	-1.60
%	+0.45	-1.35	-0.64	-1.04	-0.36

FOREIGN INDEXES

<u>London FT-SE 100</u>					
Close	2385.8	2367.9	2359.8	2375.5	2366.5
Change	+3.6	-17.9	-8.1	+15.7	-9.0
%	+0.15	-0.75	-0.34	+0.67	-0.38
<u>Tokyo Nikkei</u>					
Close	26018.3	26089.0	25952.3	26286.8	26338.8
Change	+11.7	+70.7	-136.7	+334.5	+52.0
%	+0.05	+0.27	-0.52	+1.29	+0.20

INDEX FUTURES

S&P 500					
Index Futures					
(Dec.) ("SPZ")					
Close	330.80	319.85	320.65	315.80	312.20
Change	-0.55	-10.95	+0.80	-4.85	-3.60
%	-0.17	-3.31	+0.25	-1.51	-1.14

TABLE D-2
WEEK OF OCTOBER 12, 1987

U.S. INDEXES

	10/12	10/13	10/14	10/15	10/16
<u>DJIA</u>					
Close	2471.44	2508.16	2412.70	2355.09	2246.74
Change	-10.77	+36.72	-95.46	-57.61	-108.35
%	-0.43	+1.49	-3.81	-2.39	-4.60
<u>S&P 500</u>					
Close	309.39	314.52	305.23	298.08	282.70
Change	-1.68	+5.13	-9.29	-7.15	-15.38
%	-0.54	+1.66	-2.95	-2.34	-5.16
<u>NYSE Composite</u>					
Close	173.52	176.02	171.26	167.45	159.13
Change	-1.12	+2.50	-4.76	-3.81	-8.32
%	-0.64	+1.44	-2.70	-2.22	-4.97
<u>Amex Composite</u>					
Close	343.57	344.62	340.72	335.80	323.55
Change	-3.24	+1.05	-3.90	-4.92	-12.25
%	-0.93	+0.31	-1.13	-1.44	-3.65
<u>NASDAQ Composite</u>					
Close	433.04	434.81	428.28	422.51	406.33
Change	-5.39	+1.77	-6.53	-5.77	-16.18
%	-1.23	+0.41	-1.50	-1.35	-3.83

FOREIGN INDEXES

<u>London FT-SE 100</u>					
Close	2338.5	2350.2	2322.9	2301.9	
Change	-28.0	+11.7	-27.3	-21.0	closed
%	-1.18	+0.50	-1.16	-0.90	
<u>Tokyo Nikkei</u>					
Close	26284.6	26400.6	26646.4	26428.2	26366.7
Change	-54.1	+116.0	+245.8	-218.2	-61.5
%	-0.21	+0.44	+0.93	-0.82	-0.23

INDEX FUTURES

S&P 500					
Index Futures					
(Dec.) ("SPZ")					
Close	311.60	315.65	305.00	298.25	282.25
Change	-0.60	+4.05	-10.65	-6.75	-16.00
%	-0.19	+1.30	-3.37	-2.21	-5.36

TABLE D-3
WEEK OF OCTOBER 19, 1987

U.S. INDEXES

	10/19	10/20	10/21	10/22	10/23
<u>DJIA</u>					
Close	1738.41	1841.01	2027.85	1950.43	1950.76
Change	-508.32	+102.27	+186.84	-77.42	+0.33
%	-22.62	+5.88	+10.15	-3.82	+0.02
<u>S&P 500</u>					
Close	225.06	236.83	258.38	248.25	248.22
Change	-57.64	+11.99	+21.55	-10.14	-0.03
%	-20.39	+5.33	+9.10	-3.92	-0.12
<u>NYSE Composite</u>					
Close	128.62	133.04	145.02	139.45	139.22
Change	-30.51	+4.69	+11.98	-5.57	-0.23
%	-19.17	+3.65	+9.00	-3.84	-0.16
<u>Amex Composite</u>					
Close	282.50	258.16	281.97	269.02	264.21
Change	-41.05	-24.34	+23.81	-12.95	-4.81
%	-12.69	-8.62	+9.22	-4.59	-1.79
<u>NASDAQ Composite</u>					
Close	360.21	327.79	351.86	336.13	328.45
Change	-46.12	-32.42	+24.07	-15.73	-7.68
%	-11.35	-9.00	+7.34	-4.47	-2.28

FOREIGN INDEXES

<u>London FT-SE 100</u>					
Close	2052.3	1801.6	1943.8	1833.1	1795.2
Change	-249.60	-250.7	+142.2	-110.7	-38.0
%	-10.84	-12.22	+7.89	-5.70	-2.07
<u>Tokyo Nikkei</u>					
Close	25746.6	21910.1	23947.4	24404.4	23201.2
Change	-620.2	-3836.5	+2037.3	+457.0	-1203.2
%	-2.35	-14.90	+9.30	+1.91	-4.93

INDEX FUTURES

S&P 500					
Index Futures					
(Dec.) ("SPZ")					
Close	201.50	216.25	258.25	244.50	241.00
Change	-80.75	+14.75	+42.00	-13.75	-3.50
%	-28.61	+7.32	+19.42	-5.32	-1.43

**TABLES OF
ARBITRAGE
ACTIVITY**

TABLE D-4

COMPARISON OF ARBITRAGE LONG SELLS/SHORT SELLS

<u>Date</u>	<u>Total Arbitrage Stock Sales (Million of Shares)</u>	<u>No. of Programs</u>	<u>Arbitrage Short Sales (Million of Shares)</u>	<u>No. of Programs</u>	<u>% of Arbitrage Shares Sold</u>
OCT. 6	16.2	72	0.8	2	4.9%
OCT. 14	27.4	103	5.9	19	21.6%
OCT. 15	15.8	66	4.1	11	26.0%
OCT. 16	37.2	115	5.4	12	14.6%
OCT. 19	37.6	120	9.4	27	25.1%
OCT. 20	3.3	23	1.3	8	37.6%

TABLE D-5

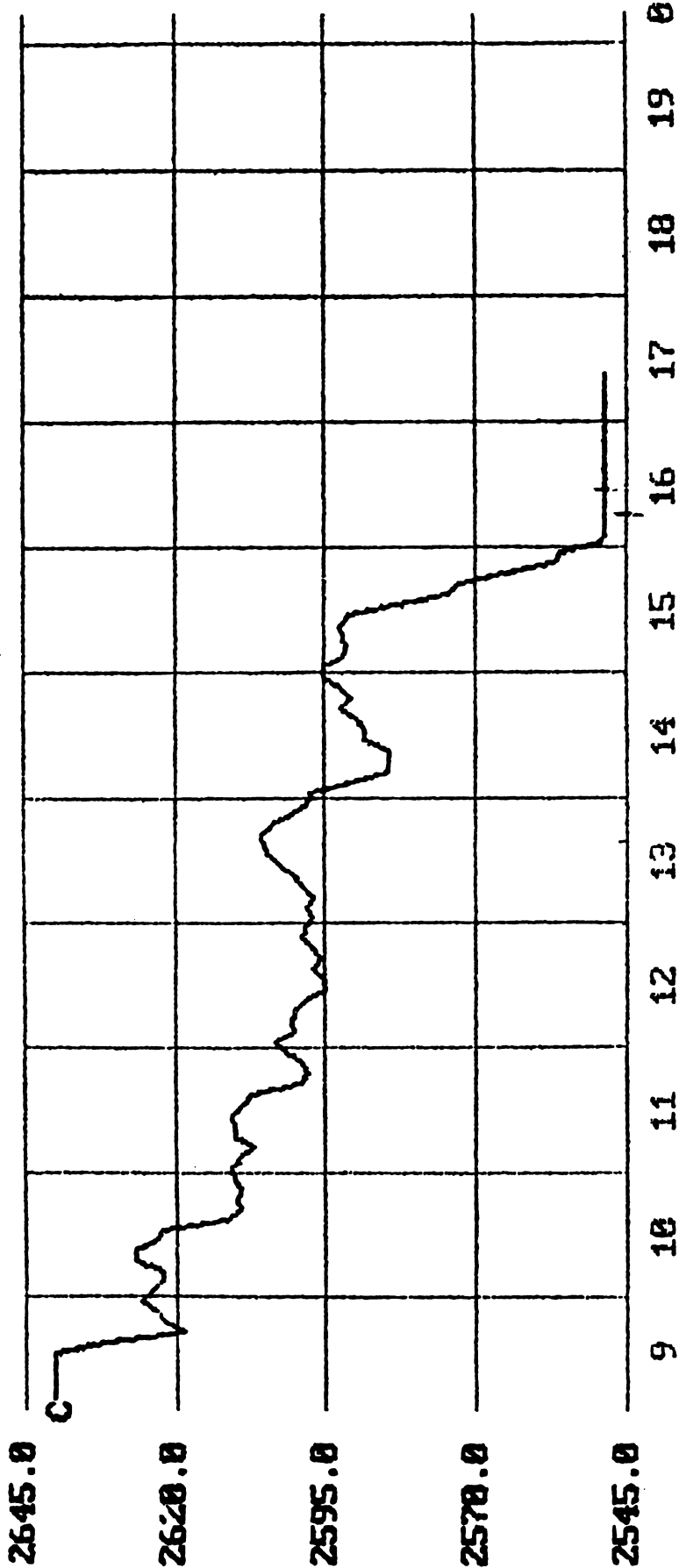
COMPARISON OF PROPRIETARY/CUSTOMER SELL ARBITRAGE

<u>Date</u>	<u>Total Arbitrage Stock Sales (Millions of Shares)</u>	<u>No. of Programs</u>	<u>Customer Arbitrage */ Sales (Millions of Shares)</u>	<u>No. of Programs</u>	<u>% of Shares Sold</u>
OCT. 6	16.2	72	2.4	19	15.0%
OCT. 14	27.4	103	13.4	27	49.0%
OCT. 15	15.8	66	3.9	10	24.7%
OCT. 16	37.2	115	18.5	41	49.6%
OCT. 19	37.6	120	19.1	46	50.7%
OCT. 20	3.3	23	0.9	3	26.0%

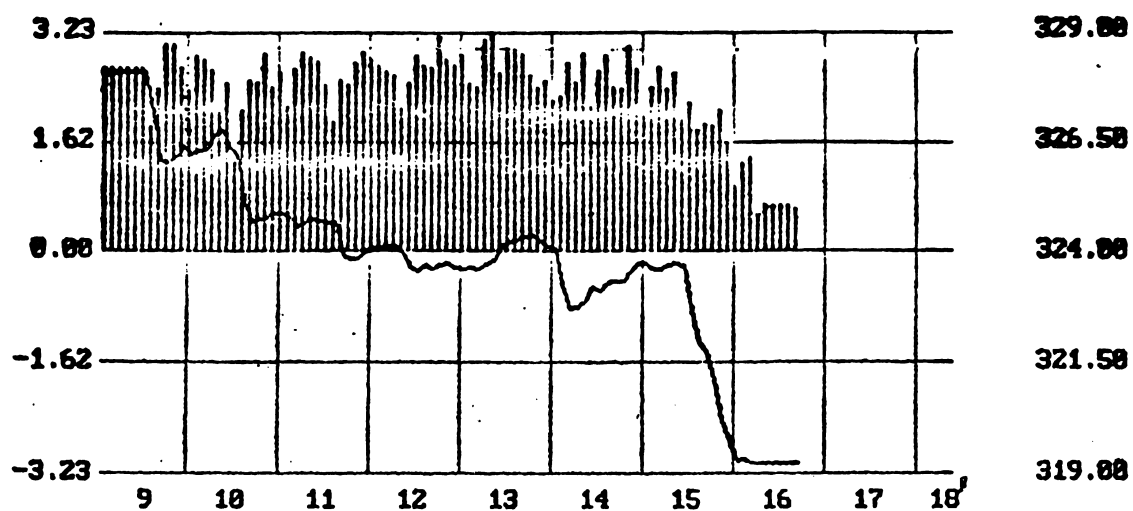
*/ Includes index substitution

OCTOBER 6

DOW JONES INDUSTRIAL AVERAGE



TRADE DATE: OCTOBER 6, 1987
FOUR-MINUTE DATA
SOURCE: BRIDGE INFORMATION SERVICES, INC.



TRADE DATE: OCTOBER 6, 1987

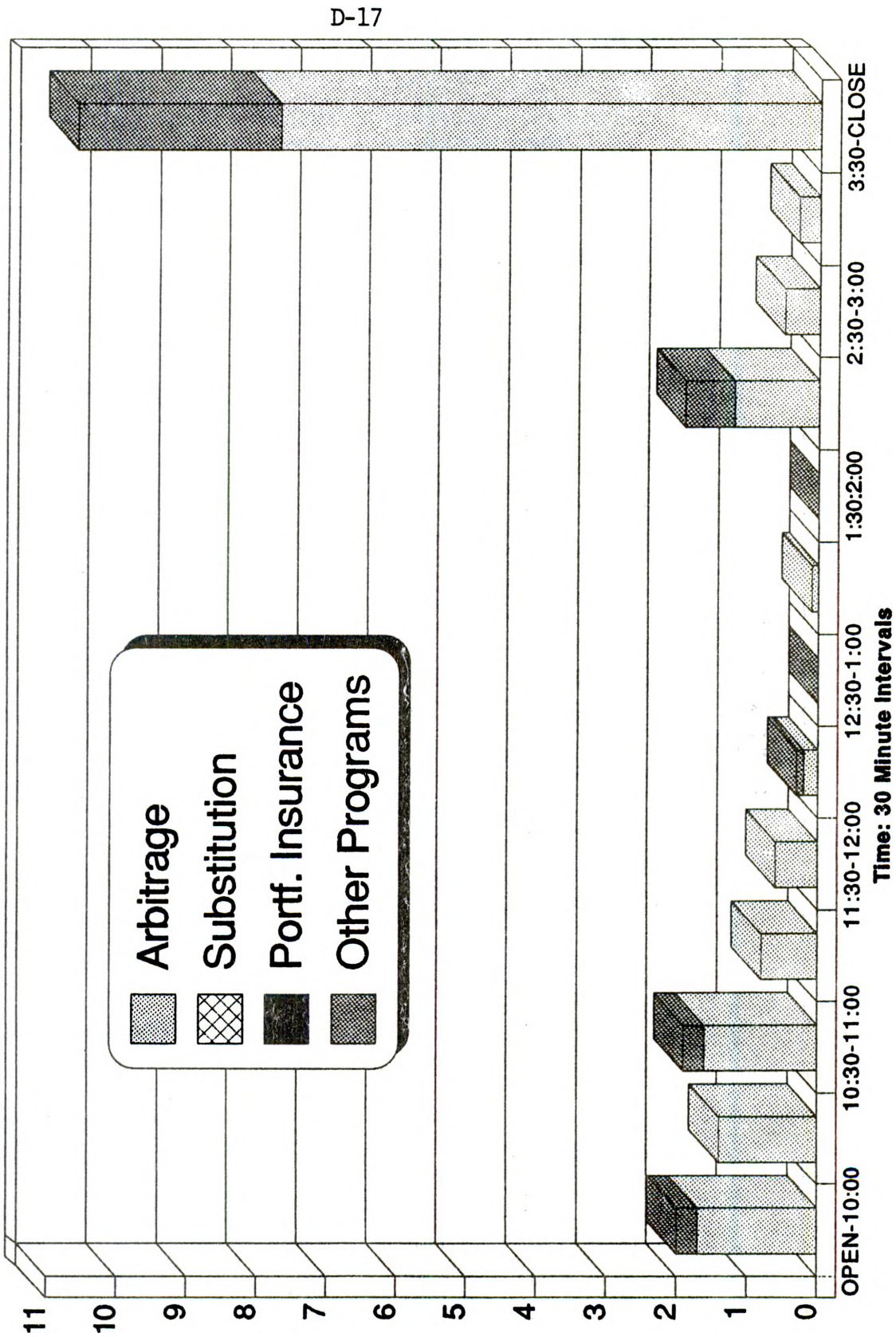
S&P 500 STOCK INDEX FUTURES (DEC) - "SPZ"
 BAR GRAPH/LEFT SCALE: FUTURES PREMIUM/DISCOUNT
 LINE GRAPH/RIGHT SCALE: CASH (STOCK) PRICES
 FOUR-MINUTE DATA
 SOURCE: BRIDGE INFORMATION SERVICES, INC.

THIRTY MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE October 6, 1987										
Time	NYSE Volume	S&P Volume	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume	
OPEN-10:00	26.2	18.7	1.7	0	0	0.3	2.0	7.6	10.7	
10:00-10:30	14.1	9.9	1.4	0	0	0	1.4	9.9	14.1	
10:30-11:00	18.0	13.2	1.6	0	0	0.2	1.9	10.6	14.3	
11:00-11:30	11.5	7.8	0.7	0	0	0	0.8	7.0	10.3	
11:30-12:00	11.3	7.9	0.6	0	0	0	0.6	5.3	7.6	
12:00-12:30	9.5	6.8	0.2	0	0	.06	0.2	2.1	2.9	
12:30-1:00	7.2	5.0	0	0	0	0	0	0	0	
1:00-1:30	7.4	5.2	.09	0	0	0	.08	1.2	1.7	
1:30-2:00	6.5	4.5	0	0	0	0	0	0	0	
2:00-2:30	12.1	8.6	1.2	0	0	0.7	1.9	15.7	22.1	
2:30-3:00	8.6	5.8	0.5	0	0	0	0.5	5.8	8.6	
3:00-3:30	11.0	8.4	0.5	0	0	0	0.5	2.7	3.6	
3:30-Close	31.7	25.6	7.7	0	0	2.8	10.5	33.1	41.0	
ALL DAY			0.2	0	0	0	0.2			
TOTAL	175.1	127.7	16.1	0	0	4.2	20.3	11.6	15.9	
Time — Order execution times were estimated by adding 5 minute execution periods to order entry times. Volume — All volume figures are in millions of shares. S&P Volume — NYSE volume in S&P Stocks. Index Arbitrage — Includes designated arbitrage (customer or proprietary) plus “adjustments to hedges” if structured as arbitrage. Rounding — Some figures are not arithmetic totals due to rounding.										

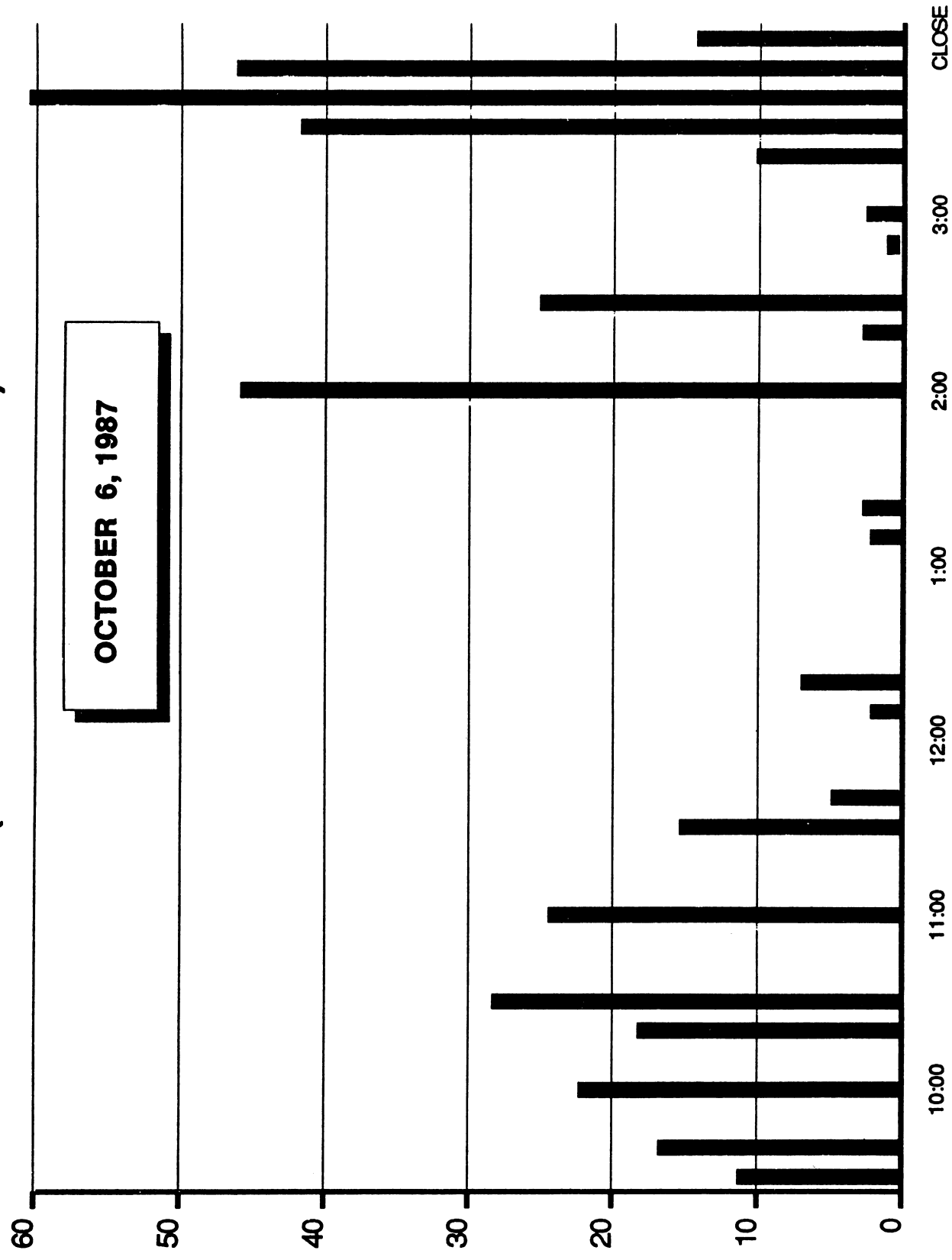
TEN MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE October 6, 1987							
Time	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-9:40	0.9	0	0	0.07	0.9	8.1	11.3
9:40-9:50	0.8	0	0	0.2	1.1	12.1	16.8
9:50-10:00	0	0	0	0	0	0	0
10:00-10:10	0.7	0	0	0	0.7	15.5	22.3
10:10-10:20	0	0	0	0	0	0	0
10:20-10:30	0.7	0	0	0	0.7	13.1	18.2
10:30-10:40	1.6	0	0	0.2	1.9	22.0	28.3
10:40-10:50	0	0	0	0	0	0	0
10:50-11:00	0	0	0	0	0	0	0
11:00-11:10	0.8	0	0	0	0.8	17.2	24.5
11:10-11:20	0	0	0	0	0	0	0
11:20-11:30	0	0	0	0	0	0	0
11:30-11:40	0.5	0	0	0	0.5	11.2	15.4
11:40-11:50	0.1	0	0	0	0.1	3.6	5.4
11:50-12:00	.03	0	0	0	.03	0.1	0.1
12:00-12:10	0	0	0	0	0	0	0
12:10-12:20	0.04	0	0	0	0.04	1.5	2.2
12:20-12:30	0.1	0	0	.06	0.2	5.2	7.0
12:30-12:40	0	0	0	0	0	0	0
12:40-12:50	0	0	0	0	0	0	0
12:50-1:00	0	0	0	0	0	0	0
1:00-1:10	0	0	0	0	0	0	0
1:10-1:20	0.04	0	0	0	0.04	1.8	2.3
1:20-1:30	0.04	0	0	0	0.04	1.9	2.8
1:30-1:40	0	0	0	0	0	0	0
1:40-1:50	0	0	0	0	0	0	0
1:50-2:00	0	0	0	0	0	0	0
2:00-2:10	1.1	0	0	0.7	1.8	36.5	45.9
2:10-2:20	0	0	0	0	0	0	0
2:20-2:30	.07	0	0	0	0.07	2.1	2.9
2:30-2:40	0.4	0	0	0	0.4	17.1	25.1
2:40-2:50	0	0	0	0	0	0	0
2:50-3:00	.04	0	0	0	.04	1.3	1.8
3:00-3:10	.06	0	0	0	.06	1.8	2.6
3:10-3:20	0	0	0	0	0	0	0
3:20-3:30	0.4	0	0	0	0.4	8.3	10.2
3:30-3:40	1.4	0	0	0.5	1.9	33.0	41.8
3:40-3:50	3.5	0	0	0.7	4.3	45.0	60.5
3:50-4:00	1.8	0	0	1.6	3.2	37.3	46.2
4:00-CLOSE	0.9	0	0	0	0.9	13.2	14.4
ALL DAY	0.2	0	0	0	0.2	0	0
TOTAL	16.1	0	0	4.2	20.3	11.6	15.9

**Thirty Minute Breakdown of Index-Related
Selling on NYSE
(October 6, 1987)**

Millions of Shares



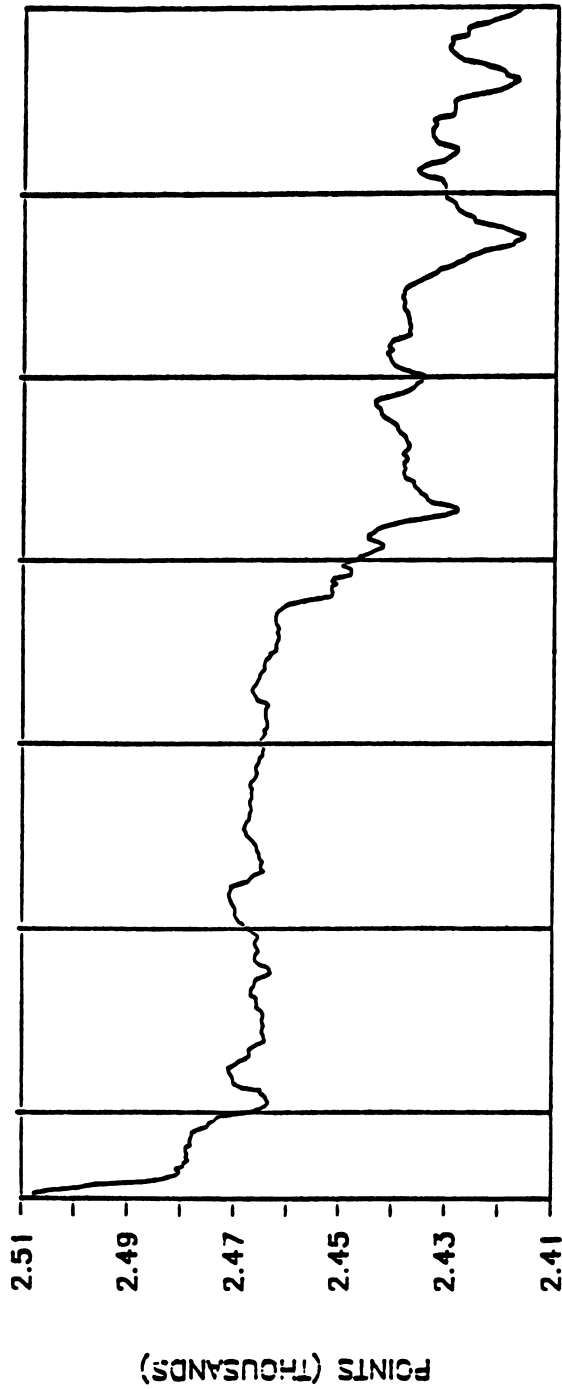
Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)



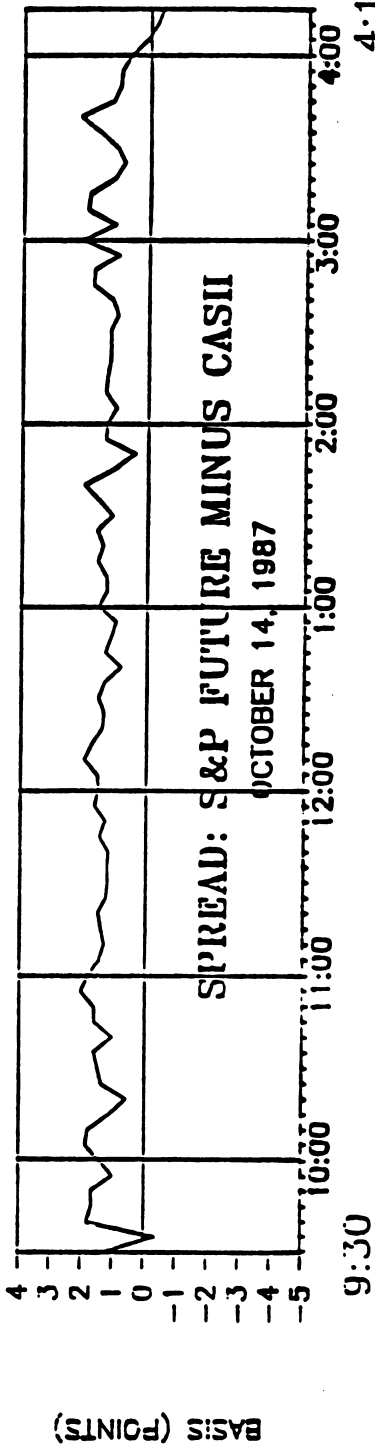
OCTOBER 14

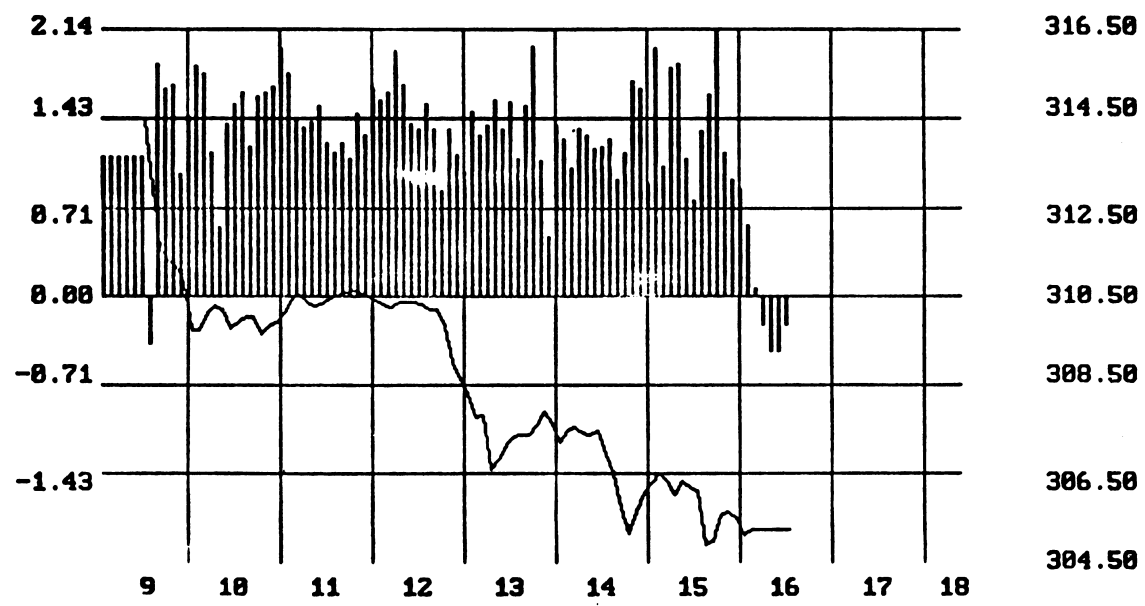
DOW JONES IND. AVG.

OCTOBER 14, 1987: MINUTE BY MINUTE



SOURCE: NEW YORK STOCK EXCHANGE





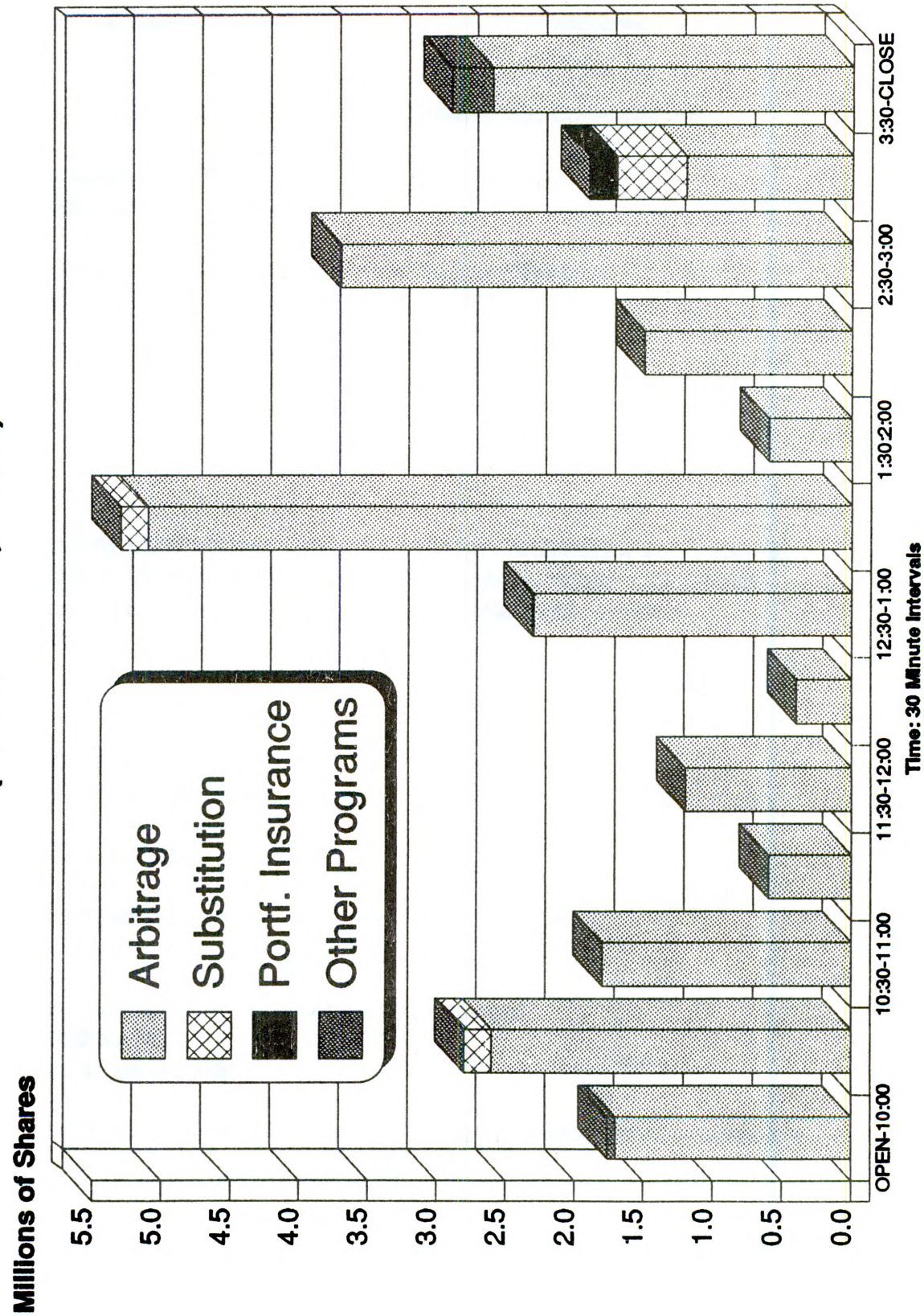
TRADE DATE: OCTOBER 14, 1987

S&P 500 STOCK INDEX FUTURES (DEC) - "SPZ"
 BAR GRAPH/LEFT SCALE: FUTURES PREMIUM/DISCOUNT
 LINE GRAPH/RIGHT SCALE: CASH (STOCK) PRICES
 FOUR-MINUTE DATA
 SOURCE: BRIDGE INFORMATION SERVICES, INC.

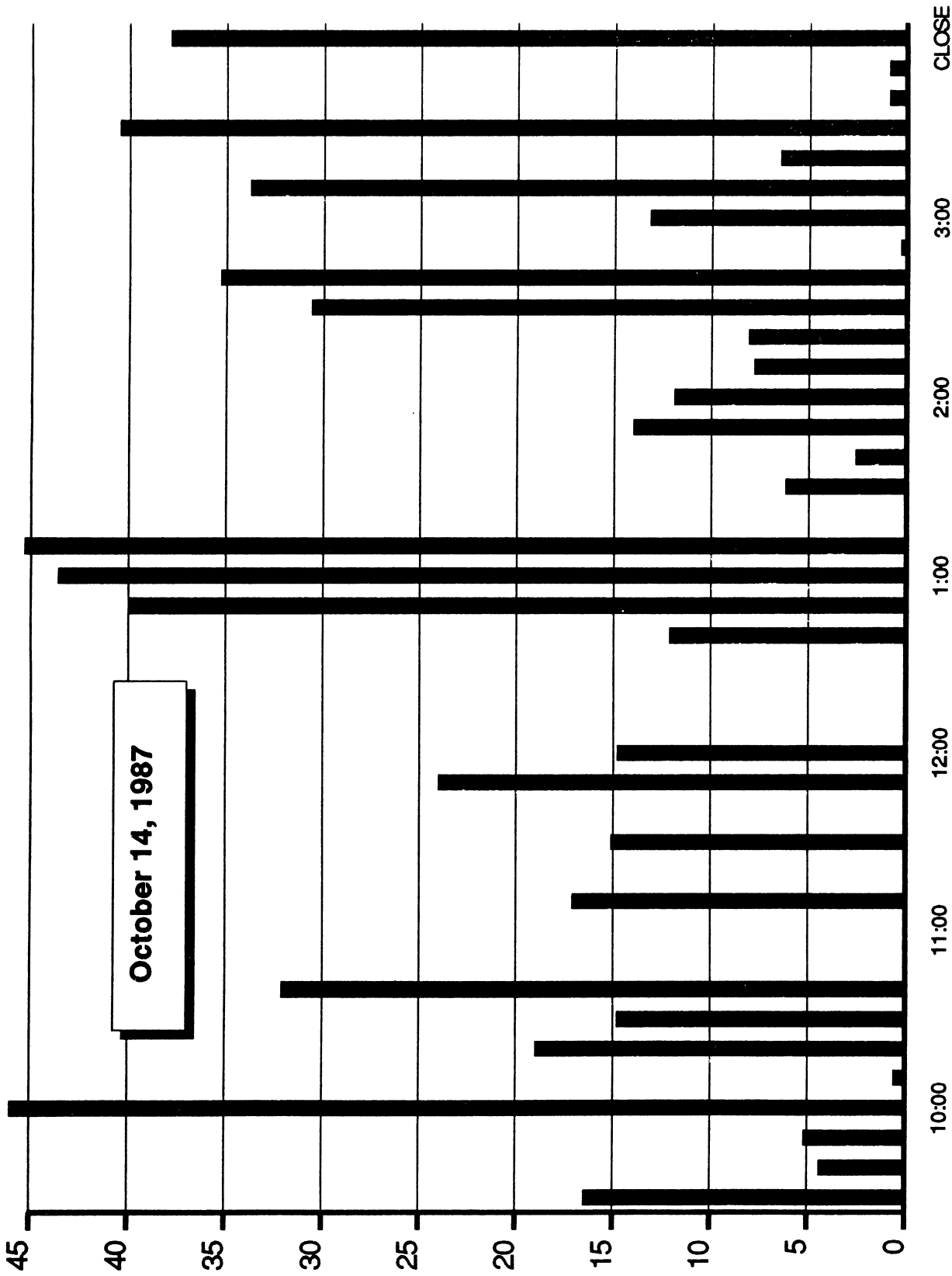
THIRTY MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE October 14, 1987									
Time	NYSE Volume	S&P Volume	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-10:00	25.0	18.5	1.7	0	0	0.06	1.8	7.2	9.7
10:00-10:30	16.1	12.0	2.6	0.2	0	0	2.9	17.7	23.8
10:30-11:00	13.6	9.7	1.8	0	0	0	1.8	12.9	18.2
11:00-11:30	12.7	9.0	0.6	0	0	0	0.6	4.3	6.1
11:30-12:00	11.9	8.0	1.2	0	0	0	1.2	9.7	14.4
12:00-12:30	11.3	7.5	0.4	0	0	0	0.4	3.9	5.8
12:30-1:00	14.2	10.6	2.3	0	0	0.01	2.3	16.4	21.9
1:00-1:30	19.0	14.6	5.1	0.2	0	0	5.3	28.0	36.5
1:30-2:00	10.7	7.8	0.6	0	0	0	0.6	5.8	7.8
2:00-2:30	18.4	15.3	1.5	0	0	0	1.5	7.9	9.5
2:30-3:00	19.2	14.6	3.7	0	0	0.01	3.7	19.1	25.1
3:00-3:30	14.2	10.4	1.2	0.5	0.2	0.003	1.9	13.3	18.3
3:30-Close	23.5	17.0	2.6	0.5	0	0.3	3.4	14.5	20.0
ALL DAY			0.7	0	0	1.5	2.2		
TOTAL	210.0	155.0	26.0	1.4	0.2	2.0	29.4	14.0	19.0
Time — Order execution times were estimated by adding 5 minute execution periods to order entry times. Volume — All volume figures are in millions of shares. S&P Volume — NYSE volume in S&P Stocks. Index Arbitrage — Includes designated arbitrage (customer or proprietary) plus “adjustments to hedges” if structured as arbitrage. Rounding — Some figures are not arithmetic totals due to rounding.									

TEN MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE October 14, 1987							
Time	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	%of S&P Volume
OPEN-9:40	1.2	0	0	.06	1.3	11.9	16.5
9:40-9:50	0.2	0	0	.01	0.2	3.2	4.4
9:50-10:00	0.3	0	0	0	0.3	4.1	5.2
10:00-10:10	2.2	0	0	0	2.2	36.1	45.8
10:10-10:20	0.02	0	0	0	.02	0.5	0.6
10:20-10:30	0.4	0.2	0	0	0.7	13.4	19.0
10:30-10:40	0.5	0	0	0	0.5	10.2	14.8
10:40-10:50	1.3	0	0	0	1.3	24.5	32.1
10:50-11:00	0	0	0	0	0	0	0
11:00-11:10	0	0	0	0	0	0	0
11:10-11:20	0.6	0	0	0	0.6	11.9	17.1
11:20-11:30	0	0	0	0	0	0	0
11:30-11:40	0.4	0	0	0	0.4	10.4	15.1
11:40-11:50	0	0	0	0	0	0	0
11:50-12:00	0.8	0	0	0	0.8	16.8	24.0
12:00-12:10	0.4	0	0	0	0.4	10.6	14.8
12:10-12:20	0	0	0	0	0	0	0
12:20-12:30	0	0	0	0	0	0	0
12:30-12:40	0	0	0	0	0	0	0
12:40-12:50	0.5	0	0	.01	0.5	8.7	12.1
12:50-1:00	1.8	0	0	0	1.8	32.0	40.0
1:00-1:10	2.0	0.2	0	0	2.3	34.9	43.6
1:10-1:20	3.1	0	0	0	3.1	36.3	45.3
1:20-1:30	0	0	0	0	0	0	0
1:30-1:40	0.2	0	0	0	0.2	4.5	6.2
1:40-1:50	.06	0	0	0	0.06	1.9	2.6
1:50-2:00	0.4	0	0	0	0.4	10.2	14.0
2:00-2:10	0.7	0	0	0	0.7	10.4	11.9
2:10-2:20	0.5	0	0	0	0.5	6.6	7.8
2:20-2:30	0.2	0	0	0	0.2	6.1	8.1
2:30-2:40	1.7	0	0	0	1.7	24.3	31.6
2:40-2:50	1.9	0	0	0	1.9	26.6	35.3
2:50-3:00	0	0	0	.01	.01	0.2	0.3
3:00-3:10	0	0.5	0	.0034	0.5	10.5	13.2
3:10-3:20	1.2	0	0	0	1.2	23.4	33.8
3:20-3:30	.04	0	0.2	0	0.21	4.7	6.5
3:30-3:40	1.7	0.5	0	0	2.2	30.6	40.5
3:40-3:50	.04	0	0	0	.04	0.6	0.9
3:50-4:00	.04	0	0	0	.04	0.7	0.9
4:00-CLOSE	0.8	0	0	0.3	1.1	25.5	37.9
ALL DAY	0.7	0	0	1.5	2.2		
TOTAL	26.0	1.4	0.2	2.0	29.4	14.0	19.0

**Thirty Minute Breakdown of Index-Related
Selling on NYSE
(October 14, 1987)**



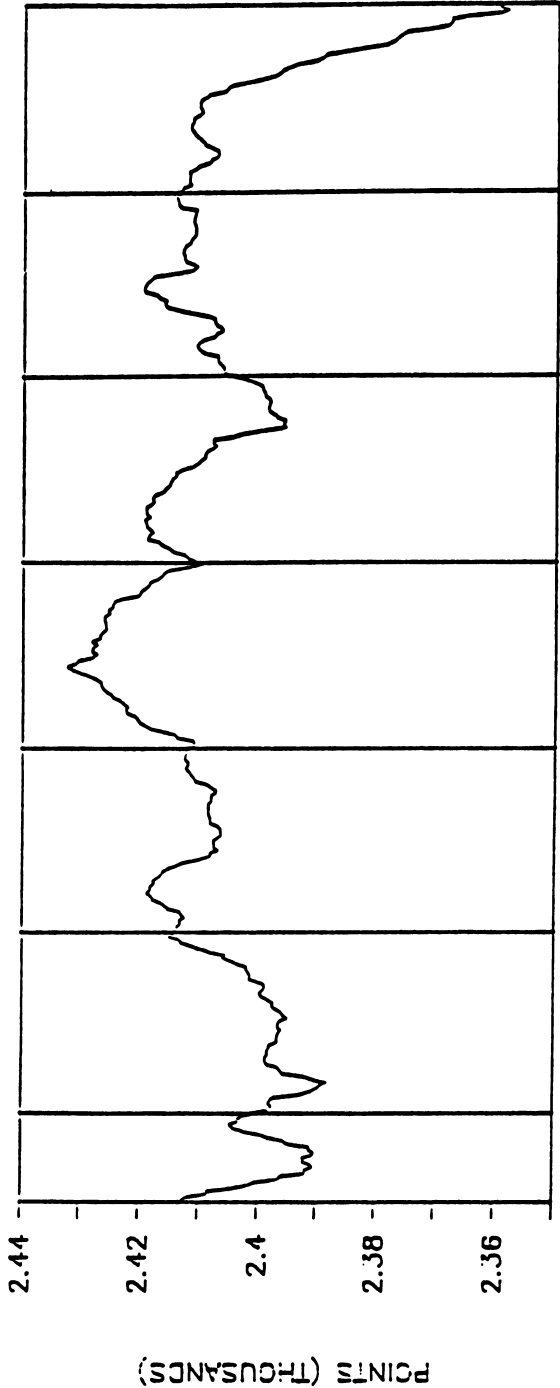
**Total Program Selling on NYSE as % of Volume in S&P Stocks
(10 Minute Intervals)**



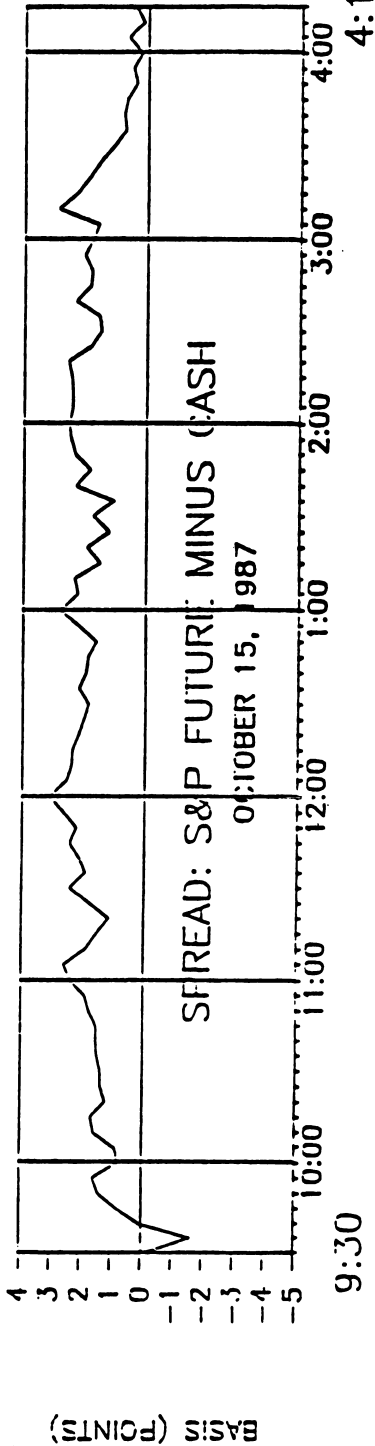
OCTOBER 15

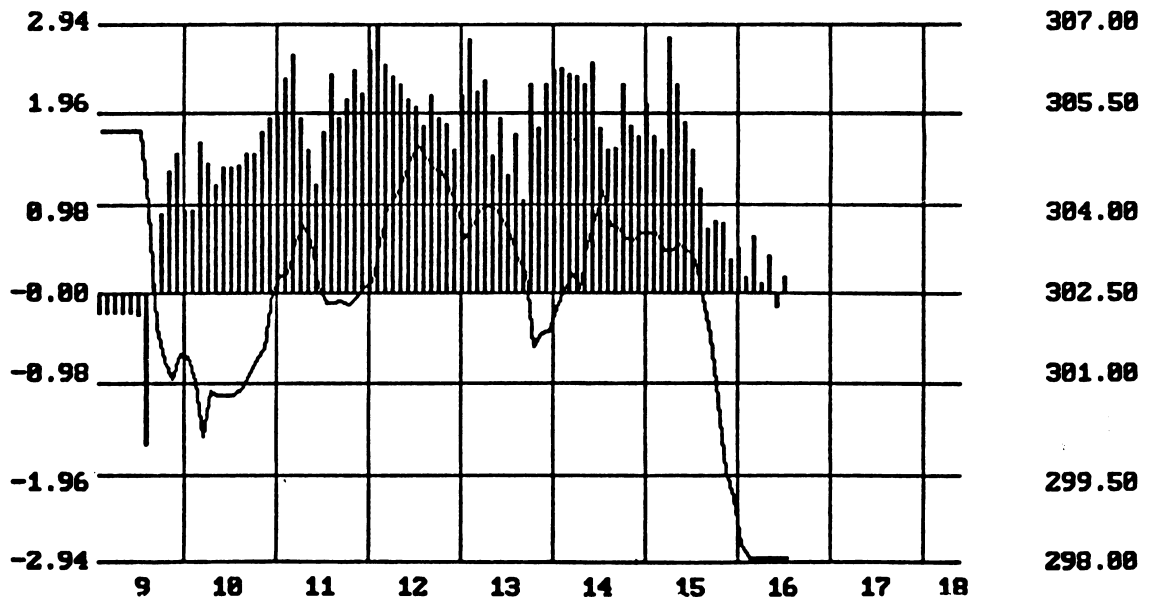
DOW JONES IND. AVG.

OCTOBER 15, 1987: MINUTE BY MINUTE



SOURCE: NEW YORK STOCK EXCHANGE





TRADE DATE: OCTOBER 15, 1987

S&P 500 STOCK INDEX FUTURES (DEC) - "SPZ"
 BAR GRAPH/LEFT SCALE: FUTURES PREMIUM/DISCOUNT
 LINE GRAPH/RIGHT SCALE: CASH (STOCK) PRICES
 FOUR-MINUTE DATA
 SOURCE: BRIDGE INFORMATION SERVICES, INC.

THIRTY MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE

October 15, 1987

Time	NYSE Volume	S&P Volume	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-10:00	48.5	33.4	6.0	0	0.3	0.4	6.7	13.8	20
10:00-10:30	28.5	21.3	1.8	0.6	0	0.3	2.7	9.5	12.7
10:30-11:00	23.9	15.9	0	0	0	.01	.01	.04	0.06
11:00-11:30	22.5	14.1	.02	0	0.2	0.1	0.3	1.3	2.1
11:30-12:00	15.2	11.4	0.2	0	0	.04	0.2	1.3	1.8
12:00-12:30	20.4	14.7	0	0	0	0	0	0	0
12:30-1:00	16.3	8.5	.09	0	0	0	.09	0.5	1
1:00-1:30	8.0	5.6	0.2	0	0	0	0.2	2.5	3.6
1:30-2:00	20.0	11.1	1.4	0	0	0	1.4	7	12.6
2:00-2:30	13.8	9.6	0.1	0	.04	0.1	0.2	1.4	2.1
2:30-3:00	8.3	5.3	0.3	0	0	0	0.3	3.6	5.7
3:00-3:30	10.9	8.1	0.2	0	0	0.6	0.8	7.3	9.9
3:30-Close	30.0	23.1	4.7	0	0	2.1	6.8	22.7	29.4
ALL DAY									
TOTAL	266.3	182.1	14.84	.6	.54	3.65	19.7	7.4	10.8

Time — Order execution times were estimated by adding 5 minute execution periods to order entry times.

Volume — All volume figures are in millions of shares.

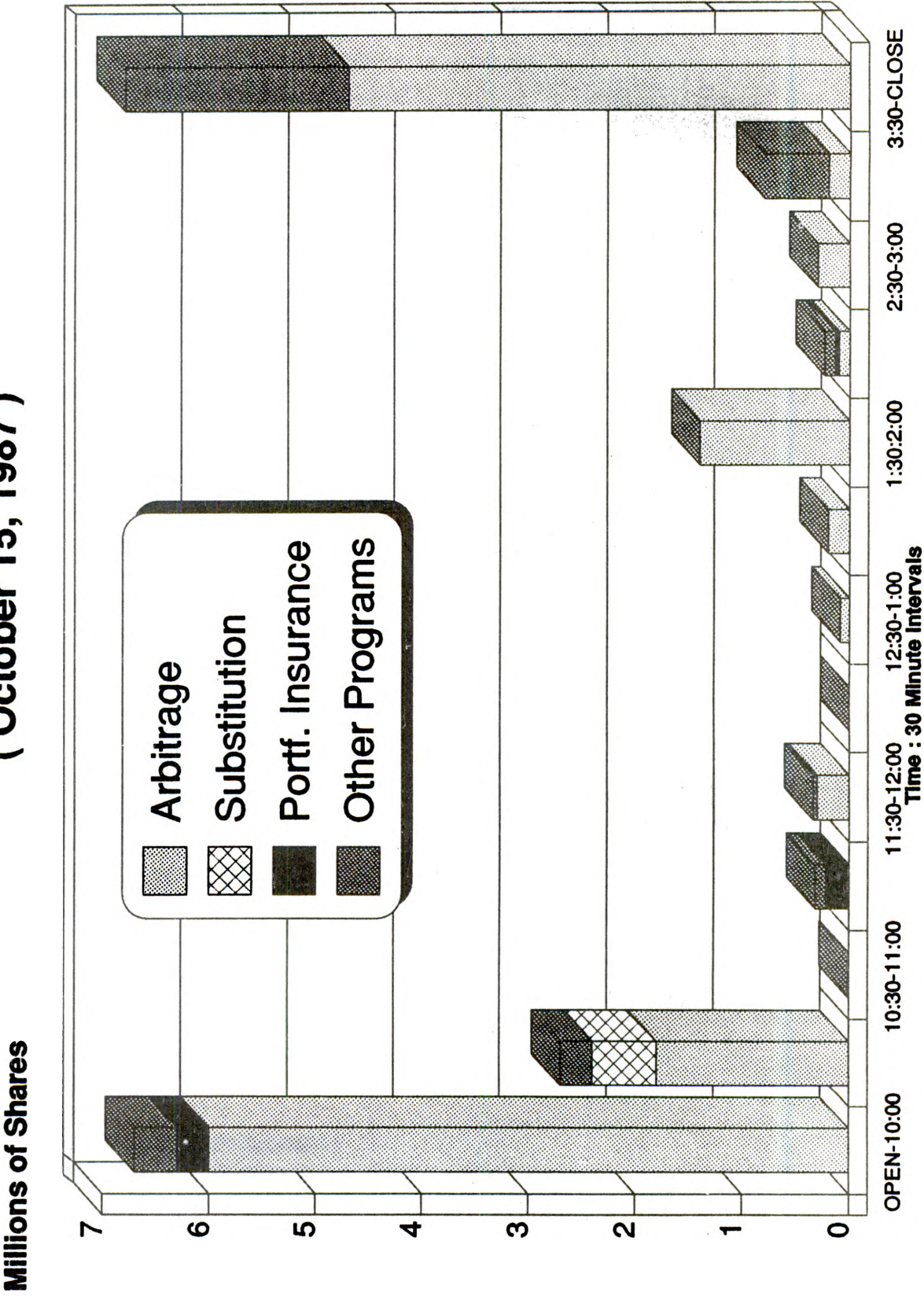
S&P Volume — NYSE volume in S&P Stocks.

Index Arbitrage — Includes designated arbitrage (customer or proprietary) plus "adjustments to hedges" if structured as arbitrage.

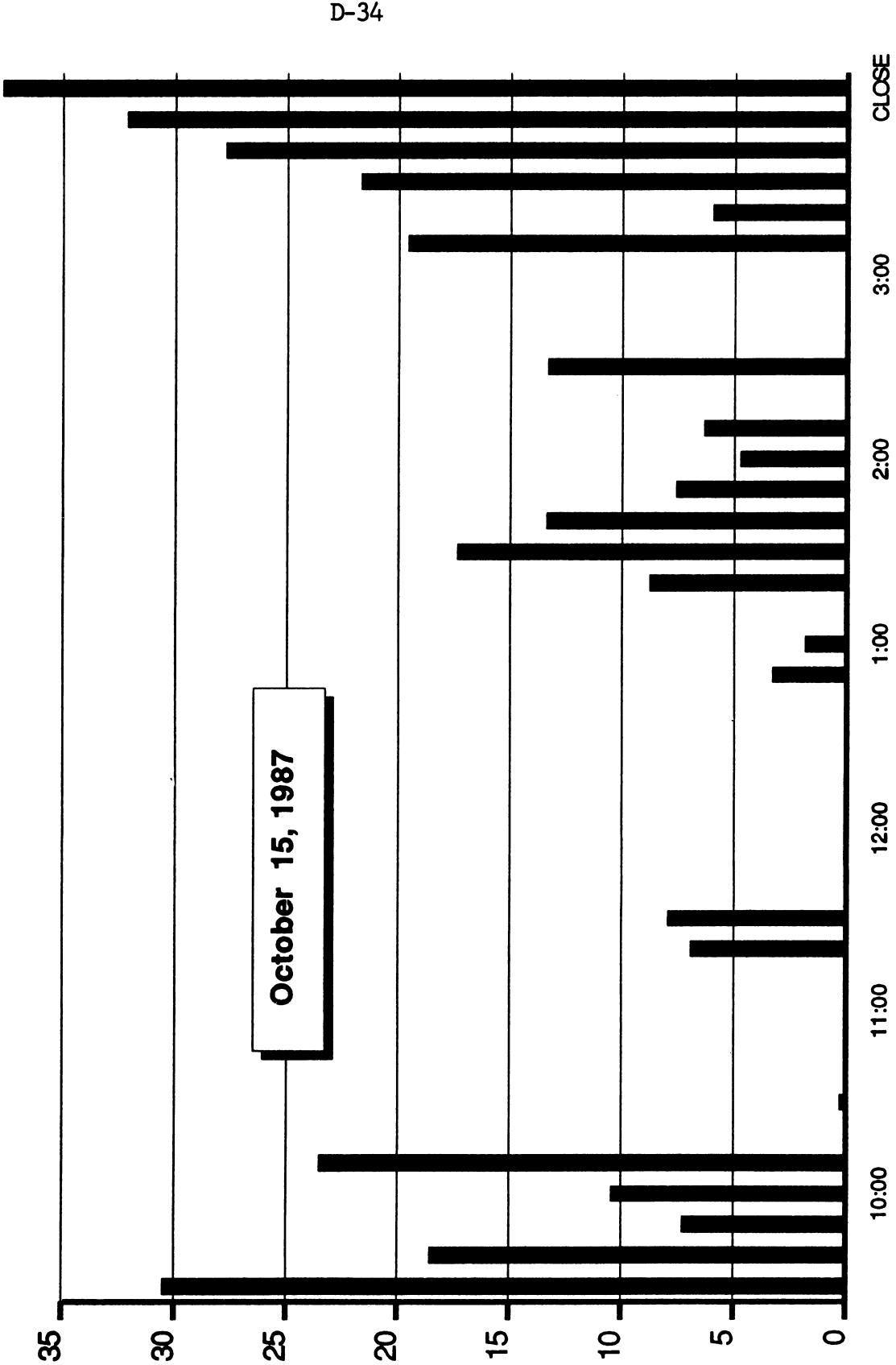
Rounding — Some figures are not arithmetic totals due to rounding.

TEN MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE October 15, 1987							
Time	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	%of S&P Volume
OPEN-9:40	3.5	0	0	0.4	3.9	22.2	30.5
9:40-9:50	1.9	0	0.3	0	2.1	13.2	18.3
9:50-10:00	0.7	0	0	0	0.7	4.7	7.7
10:00-10:10	1.0	0	0	0	1.0	8.8	10.9
10:10-10:20	0.8	0.6	0	.01	1.7	16.2	23.0
10:20-10:30	0	0	0	0	0	0.0	0
10:30-10:40	0	0	0	.01	.01	.14	.24
10:40-10:50	0	0	0	0	0	0	0
10:50-11:00	0	0	0	0	0	0	0
11:00-11:10	0	0	0	0	0	0	0
11:10-11:20	0	0	0	0	0	0	0
11:20-11:30	.02	0	0.2	0.1	0.3	4.6	6.8
11:30-11:40	0.2	0	0	.04	0.2	3.8	5.3
11:40-11:50	0	0	0	0	0	0	0
11:50-12:00	0	0	0	0	0	0	0
12:00-12:10	0	0	0	0	0	0	0
12:10-12:20	0	0	0	0	0	0	0
12:20-12:30	0	0	0	0	0	0	0
12:30-12:40	0	0	0	0	0	0	0
12:40-12:50	0	0	0	0	0	0	0
12:50-1:00	.09	0	0	0	.09	1.5	3.3
1:00-1:10	.04	0	0	0	.04	1.4	1.8
1:10-1:20	0	0	0	0	0	0	0
1:20-1:30	0.2	0	0	0	0.2	7.1	10.0
1:30-1:40	0.4	0	0	0	0.4	5.3	19.0
1:40-1:50	0.8	0	0	.04	0.8	10.5	14.0
1:50-2:00	0.2	0	0	0	0.2	4.2	6.1
2:00-2:10	0.1	0	0	0	0.1	2.1	3.7
2:10-2:20	0	0	.04	0.1	0.1	2.9	4.2
2:20-2:30	0	0	0	0	0	0	0
2:30-2:40	0.3	0	0	0	0.3	9.4	15.0
2:40-2:50	0	0	0	0	0	0	0
2:50-3:00	0	0	0	0	0	0	0
3:00-3:10	0	0	0	0	0	0	0
3:10-3:20	0.1	0	0	0.6	0.7	15.9	20.0
3:20-3:30	0.1	0	0	0	0.1	3.0	4.8
3:30-3:40	0.6	0	0	0.2	0.8	16.0	21.1
3:40-3:50	2.3	0	0	0	2.3	21.9	27.7
3:50-4:00	1.1	0	0	1.4	2.6	25.0	32.5
4:00-CLOSE	0.7	0	0	0.4	1.1	27.5	37.7
ALL DAY							
TOTAL	14.84	.6	.54	3.65	19.7	7.4	10.8

**Thirty Minute Breakdown of Index-Related
Selling on NYSE
(October 15, 1987)**

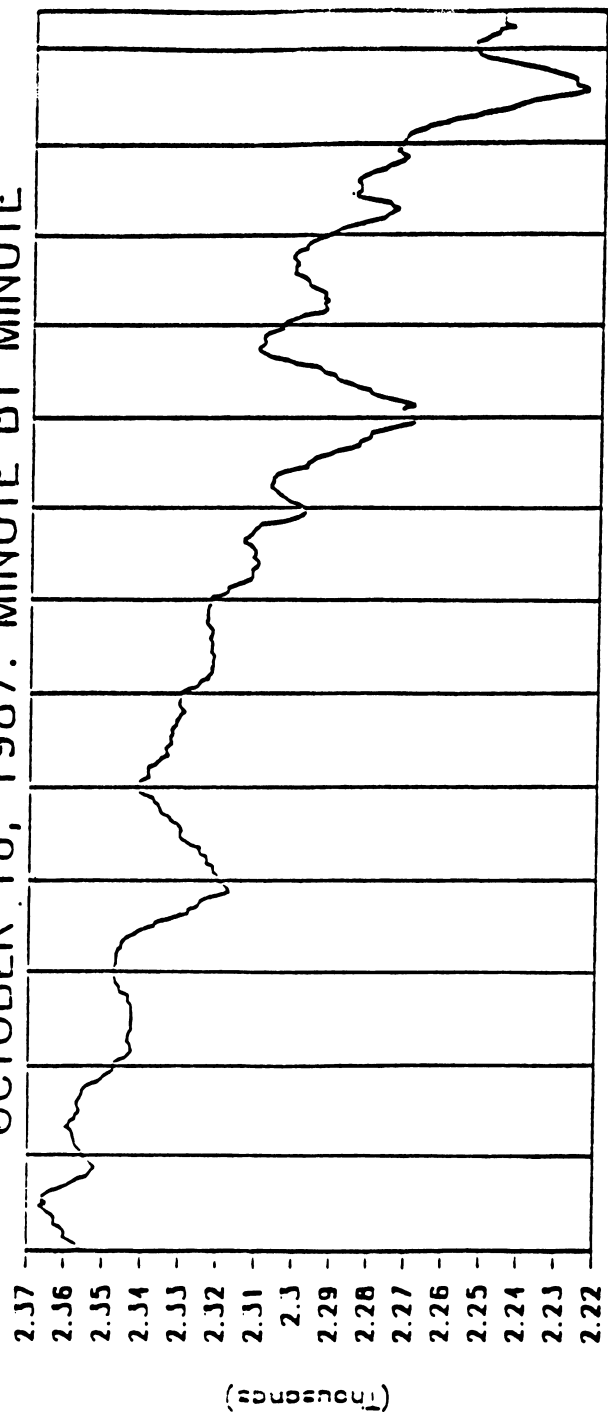


**Total Program Selling on NYSE as % of Volume in S&P Stocks
(10 Minute Intervals)**

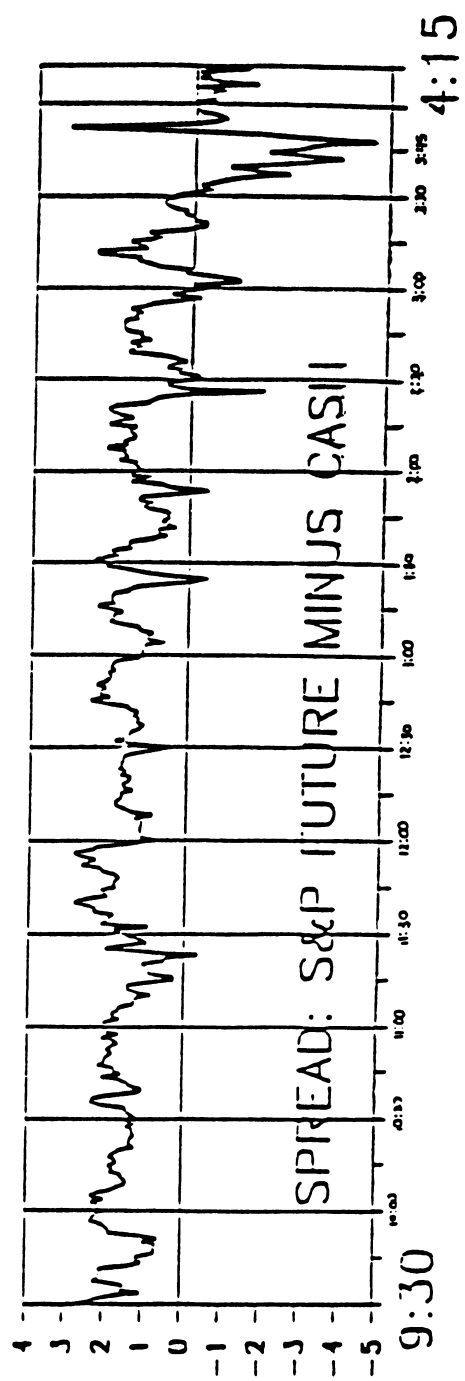


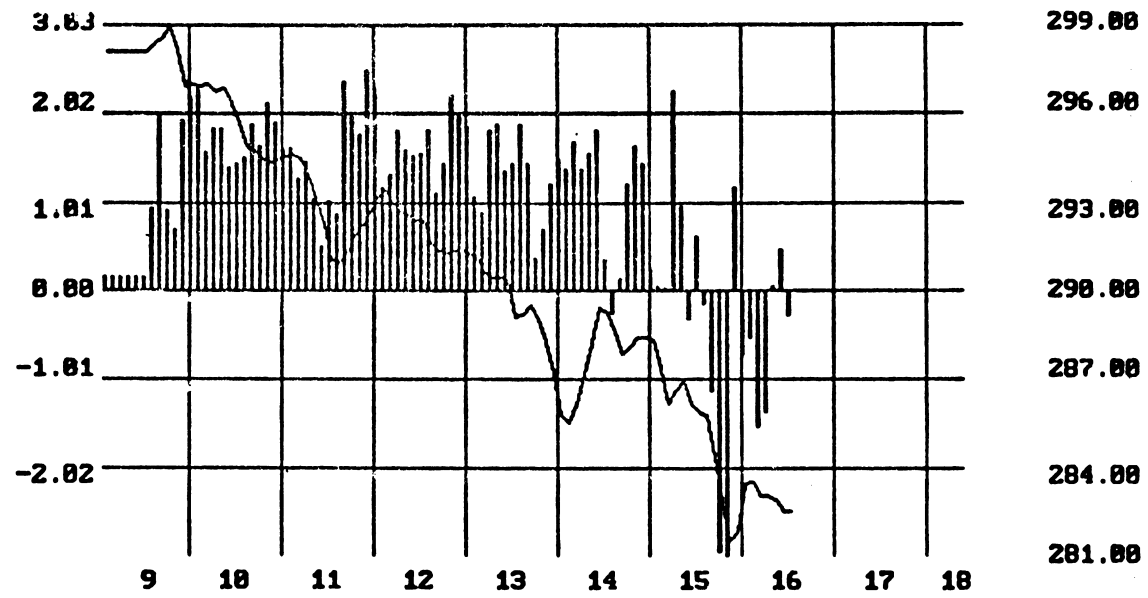
OCTOBER 16

DOW JONES IND. AVG.
OCTOBER 16, 1987: MINUTE BY MINUTE



SOURCE: NEW YORK STOCK EXCHANGE





TRADE DATE: OCTOBER 16, 1987

S&P 500 STOCK INDEX FUTURES (DEC) - "SPZ"
 BAR GRAPH/LEFT SCALE: FUTURES PREMIUM/DISCOUNT
 LINE GRAPH/RIGHT SCALE: CASH (STOCK) PRICES
 FOUR-MINUTE DATA
 SOURCE: BRIDGE INFORMATION SERVICES, INC.

THIRTY MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE

October 16, 1987

Time	NYSE Volume	S&P Volume	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-10:00	39.3	28.5	4.4	0	0.4	1.3	6.1	15.5	21.4
10:00-10:30	24.4	17.2	0.6	1.3	0.1	0	2.0	8.2	11.6
10:30-11:00	23.7	17.2	0.3	0	0.6	0.1	1.1	4.6	6.4
11:00-11:30	26.6	19.5	2.0	1.8	0	0.02	3.8	14.3	19.5
11:30-12:00	26.4	17.9	0.8	0	0.1	0.1	1.0	3.8	5.6
12:00-12:30	15.0	10.4	0.2	0	0	0	0.2	1.3	1.9
12:30-1:00	14.9	9.8	0.8	0	0	0.3	1.1	7.4	11.2
1:00-1:30	17.9	12.8	0.5	0	0	0	0.5	2.8	3.9
1:30-2:00	29.0	20.9	4.0	1.1	0.3	0.5	5.9	20.3	28.2
2:00-2:30	30.0	21.8	1.5	0	0	1.1	2.6	8.7	11.9
2:30-3:00	20.8	15.0	2.4	0	0.7	0.7	3.8	18.3	25.3
3:00-3:30	23.0	17.0	3.8	0	0.7	0.5	5.0	21.7	29.4
3:30-Close	53.6	43.0	9.5	2.0	1.7	2.5	15.7	29.3	36.5
ALL DAY			0.2	0	0	0	0.2		
TOTAL	344.1	251.0	31.0	6.2	4.6	7.1	49.0	14.2	19.5

Time — Order execution times were estimated by adding 5 minute execution periods to order entry times.

Volume — All volume figures are in millions of shares.

S&P Volume — NYSE volume in S&P Stocks.

Index Arbitrage — Includes designated arbitrage (customer or proprietary) plus "adjustments to hedges" if structured as arbitrage.

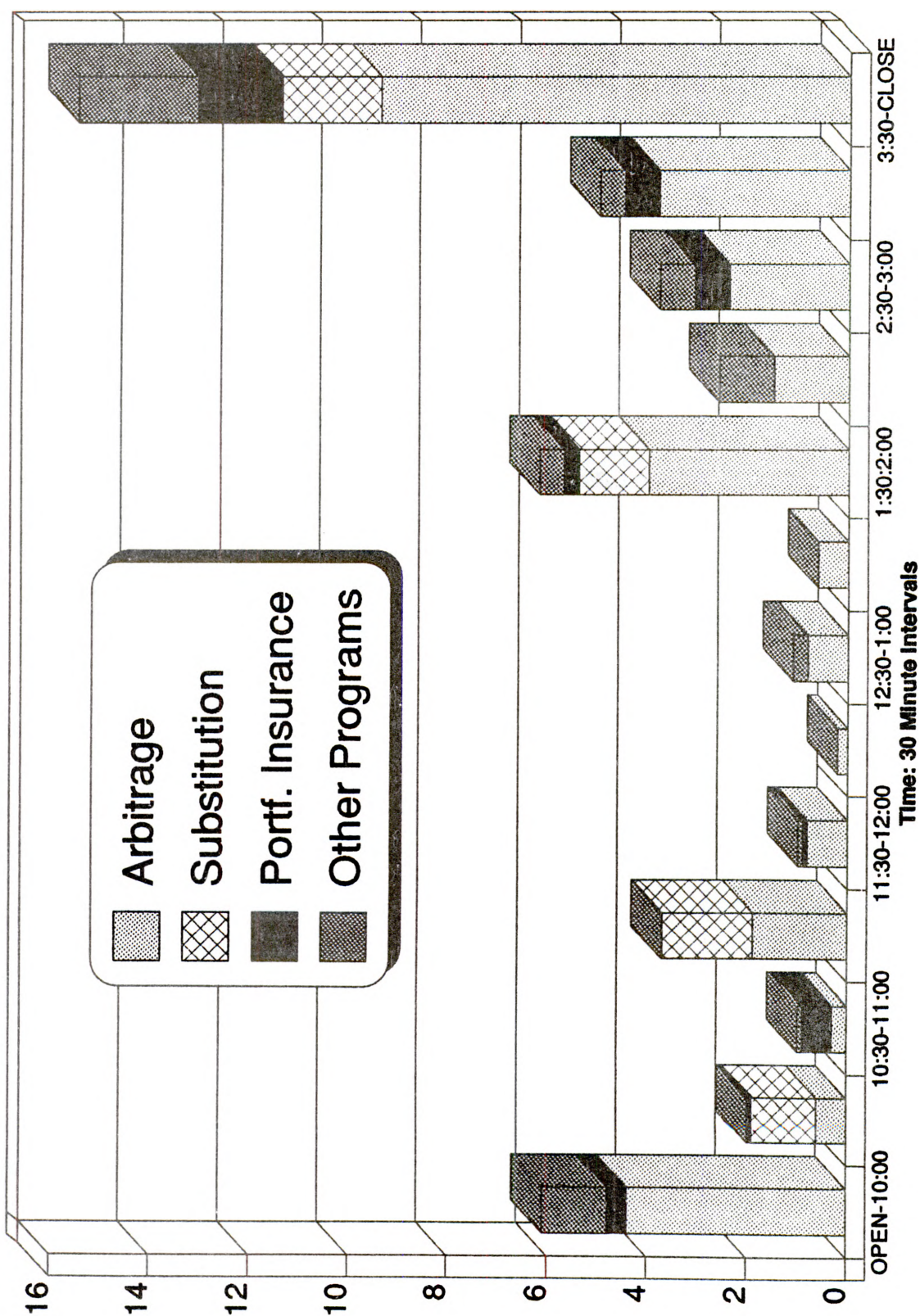
Rounding — Some figures are not arithmetic totals due to rounding.

TEN MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE
October 16, 1987

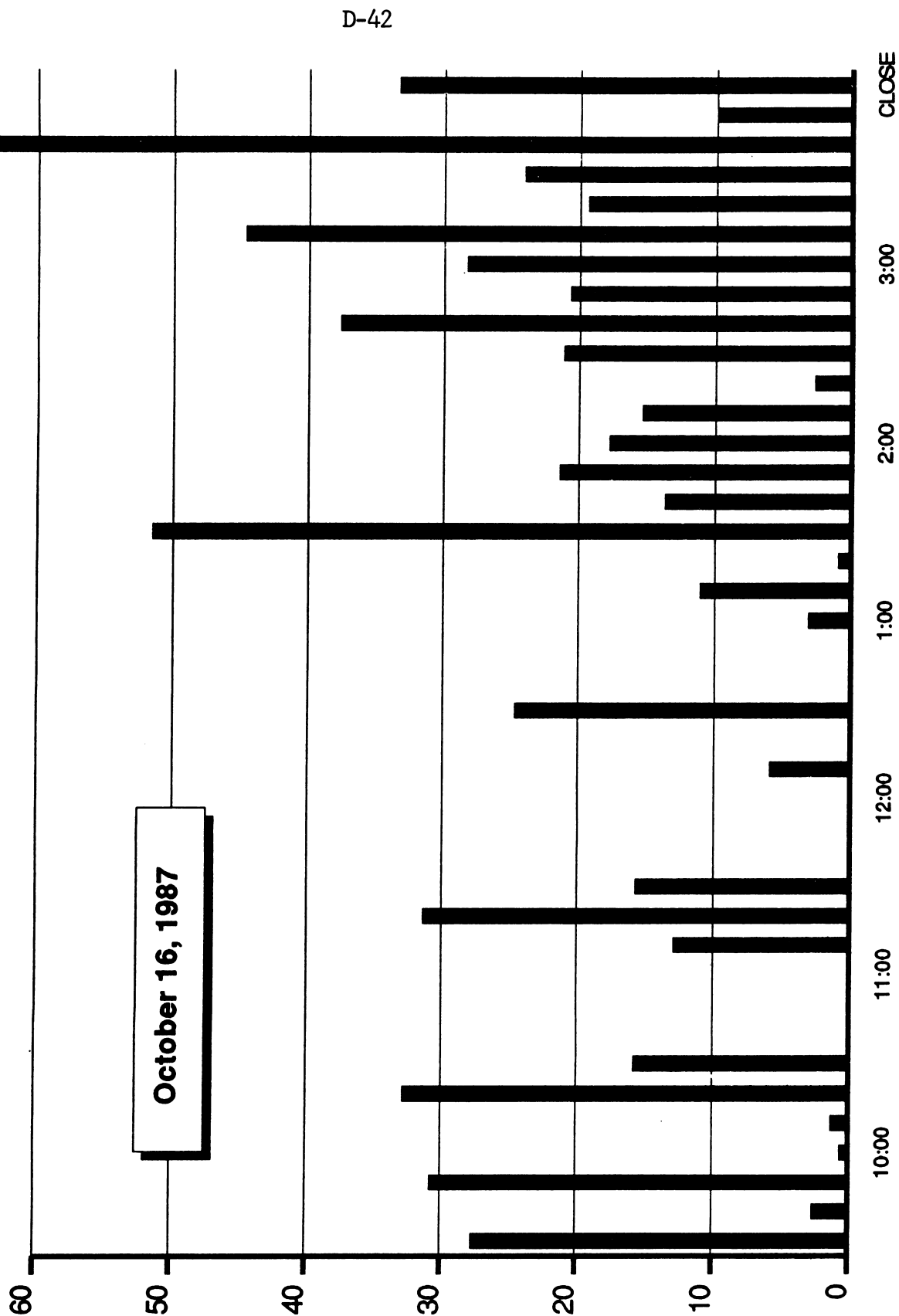
Time	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-9:40	1.4	0	0.3	1.3	3.0	18.3	27.5
9:40-9:50	0.2	0	0	0	0.2	1.8	2.4
9:50-10:00	2.8	0	0.05	0	2.9	24.6	31.5
10:00-10:10	0	0	0	0	0	0	0
10:10-10:20	0.1	0	0	0	0.1	1.3	2.0
10:20-10:30	0.5	1.3	0.1	0	1.9	24.1	32.8
10:30-10:40	0.3	0	0.6	0.1	1.1	12.2	16.2
10:40-10:50	0	0	0	0	0	0	0
10:50-11:00	0	0	0	0	0	0	0
11:00-11:10	0	0	0	0	0	0	0
11:10-11:20	0.9	0	0	0	0.9	10.5	13.2
11:20-11:30	1.1	1.8	0	0.02	2.9	24.0	31.9
11:30-11:40	0.8	0	0.1	0.1	1.0	9.9	15.4
11:40-11:50	0	0	0	0	0	0	0
11:50-12:00	0	0	0	0	0	0	0
12:00-12:10	0	0	0	0	0	0	0
12:10-12:20	0.2	0	0	0	0.2	4.4	6.7
12:20-12:30	0	0	0	0	0	0	0
12:30-12:40	0.8	0	0	0.3	1.1	17.7	23.9
12:40-12:50	0	0	0	0	0	0	0
12:50-1:00	0	0	0	0	0	0	0
1:00-1:10	0.1	0	0	0	0.1	1.9	2.5
1:10-1:20	0.4	0	0	0	0.4	6.8	10.0
1:20-1:30	0.04	0	0	0	0.04	0.6	0.8
1:30-1:40	2.6	0.5	0	0.005	3.1	35.2	51.7
1:40-1:50	0.7	0	0	0	0.7	10.0	13.7
1:50-2:00	0.7	0.6	0.3	0.5	2.1	16.0	21.4
2:00-2:10	1.3	0	0	0	1.3	12.9	18.1
2:10-2:20	0	0	0	1.1	1.1	11.6	16.2
2:20-2:30	0.2	0	0	0	0.2	2.0	2.6
2:30-2:40	1.5	0	0	0	1.5	16.1	21.7
2:40-2:50	0.9	0	0	0.5	1.4	25.0	36.8
2:50-3:00	0.04	0	0.7	0.2	0.9	15.5	20.9
3:00-3:10	1.8	0	0	0.2	2.0	22.0	28.6
3:10-3:20	1.7	0	0	0.1	1.8	31.6	43.9
3:20-3:30	0.3	0	0.7	0.2	1.1	13.6	18.6
3:30-3:40	0.7	0	1.2	0.006	1.9	19.4	24.7
3:40-3:50	5.7	0.9	0.5	0.5	7.6	52.1	67.9
3:50-4:00	0.7	0	0	0.08	0.8	7.0	10.0
4:00-CLOSE	2.4	1.1	0	1.9	5.4	30.5	33.5
ALL DAY	0.2	0	0	0	0.2		
TOTAL	31.0	6.2	4.6	7.1	49.0	14.2	19.5

Thirty Minute Breakdown of Index-Related Selling on NYSE Selling on NYSE (October 16, 1987)

Millions of Shares

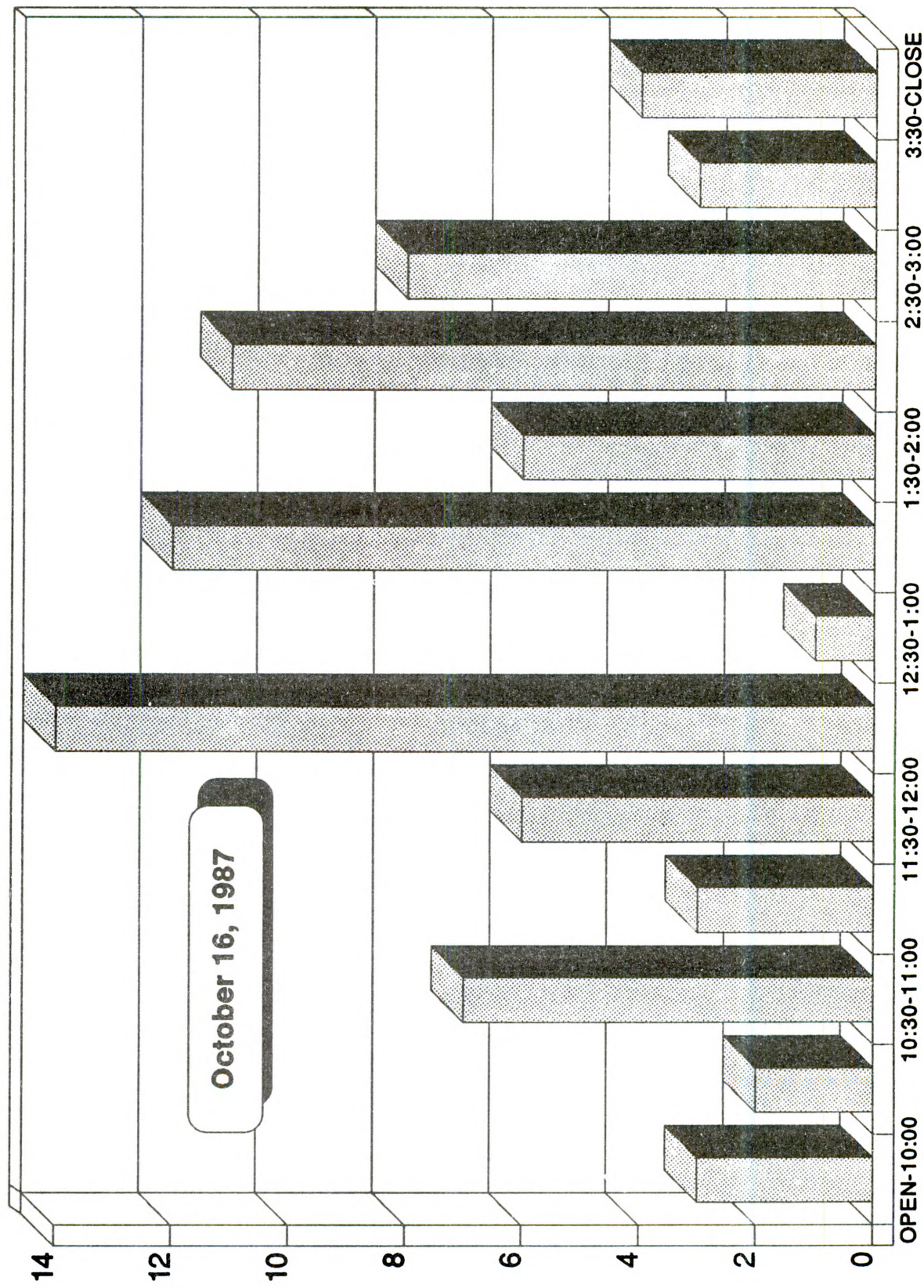


Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)



Portfolio Insurance Futures Selling Percentage of CME Volume

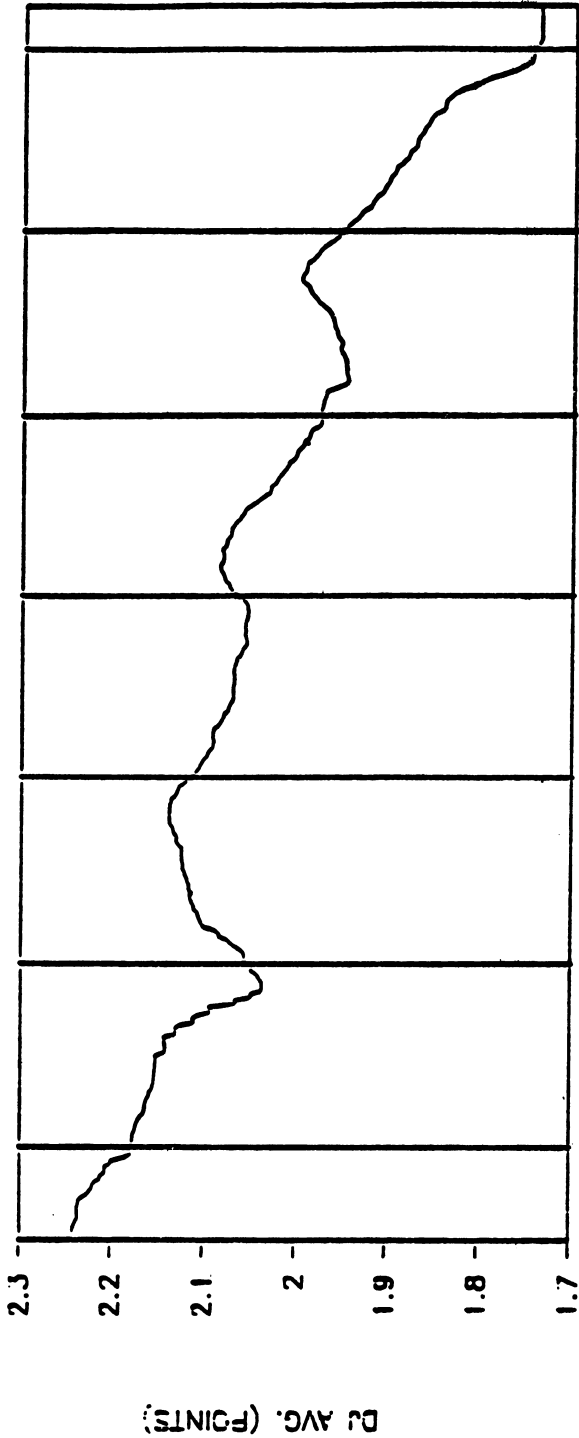
Percentage of
Total Volume



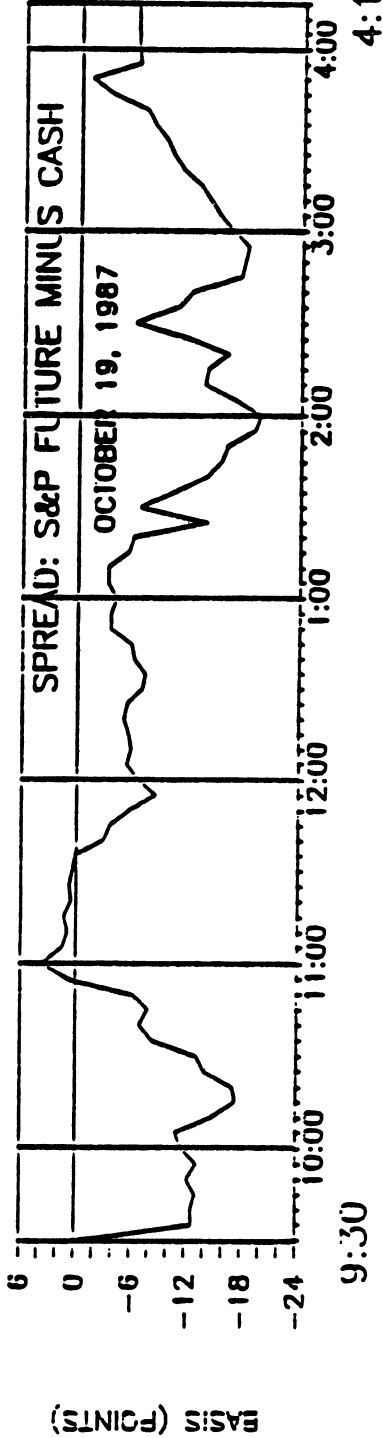
OCTOBER 19

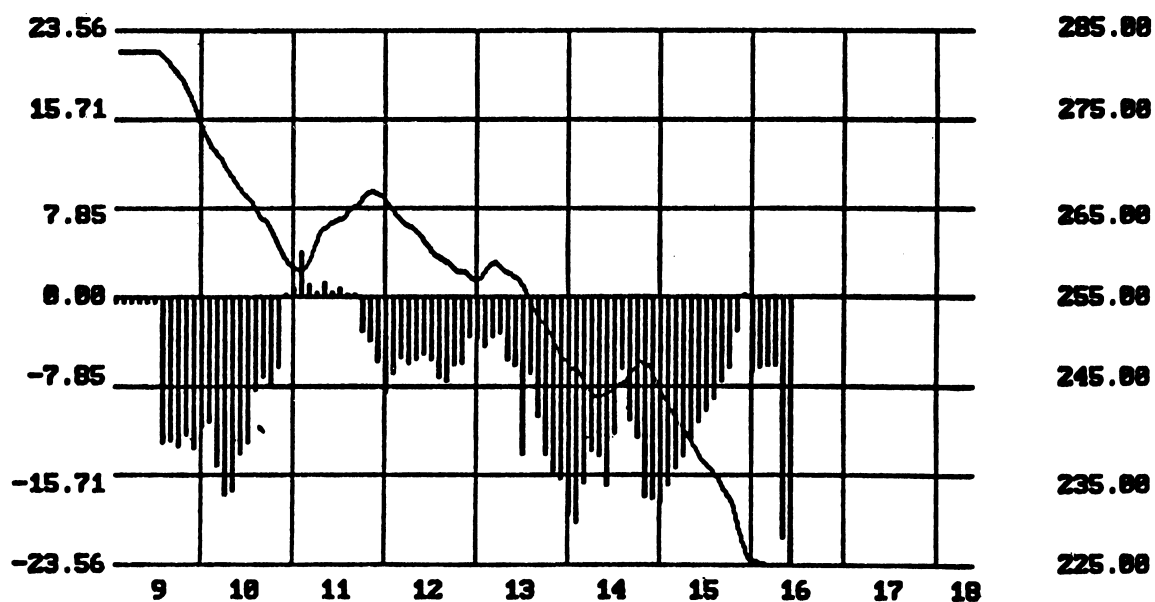
DOW JONES IND. AVG.

OCTOBER 19, 1987: MINUTE BY MINUTE



SOURCE: NEW YORK STOCK EXCHANGE





TRADE DATE: OCTOBER 19, 1987

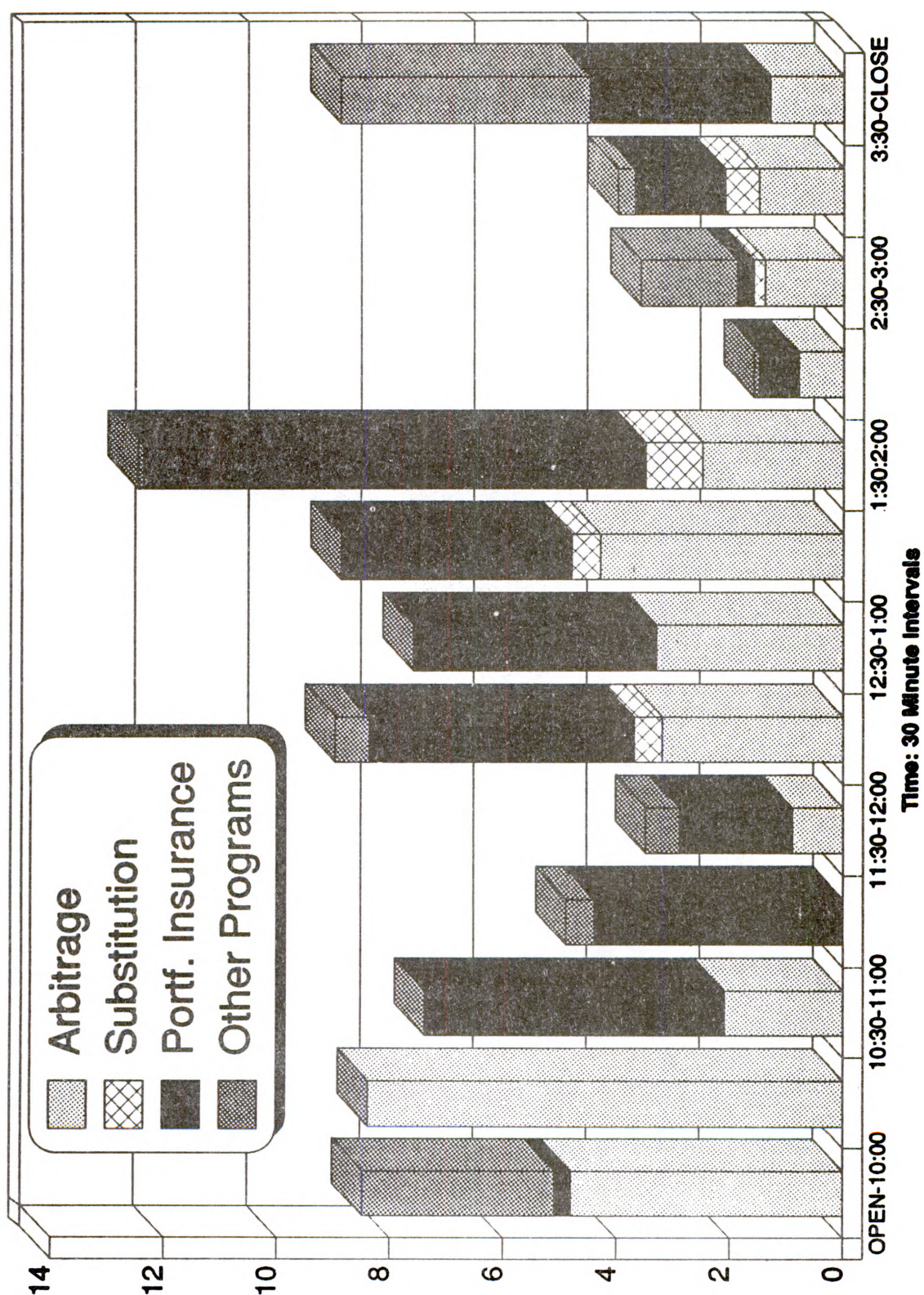
S&P 500 STOCK INDEX FUTURES (DEC) - "SPZ
 BAR GRAPH/LEFT SCALE: FUTURES PREMIUM/DISCOUNT
 LINE GRAPH/RIGHT SCALE: CASH (STOCK) PRICES
 FOUR-MINUTE DATA
 SOURCE: BRIDGE INFORMATION SERVICES, INC.

THIRTY MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE October 19, 1987									
Time	NYSE Volume	S&P Volume	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-10:00	51.1	33.9	4.8	0	0.3	3.4	8.5	16.6	25.1
10:00-10:30	47.0	31.0	8.4	0	0	0	8.4	17.9	27.0
10:30-11:00	55.9	41.7	2.1	0	5.3	0	7.4	13.3	17.9
11:00-11:30	60.7	46.8	0	0	4.4	0.5	4.9	8.1	10.5
11:30-12:00	47.5	32.9	0.9	0	2.0	0.6	3.5	7.3	10.6
12:00-12:30	40.4	30.4	3.2	0.5	4.7	0.6	9.0	22.3	29.6
12:30-1:00	40.8	25.6	3.3	0	4.3	0.02	7.7	18.8	30.0
1:00-1:30	36.7	22.7	4.3	0.5	4.1	0	8.9	24.3	39.0
1:30-2:00	45.7	28.7	2.5	1.0	8.9	0.1	12.5	27.4	43.7
2:00-2:30	36.4	28.0	0.8	0	0.7	0.1	1.6	4.4	5.8
2:30-3:00	36.7	24.9	1.4	0.2	0.3	1.7	3.7	9.9	14.6
3:00-3:30	46.3	33.0	1.5	0.6	1.6	0.3	4.0	8.7	12.3
3:30-Close	63.2	43.4	1.3	0	3.2	4.4	8.8	13.9	20.3
ALL DAY			0.2	0	0	0.1	0.3		
TOTAL	608.3	423.0	34.7	2.8	39.9	11.8	89.0	14.7	21.1
Time — Order execution times were estimated by adding 5 minute execution periods to order entry times. Volume — All volume figures are in millions of shares. S&P Volume — NYSE volume in S&P Stocks. Index Arbitrage — Includes designated arbitrage (customer or proprietary) plus “adjustments to hedges” if structured as arbitrage. Rounding — Some figures are not arithmetic totals due to rounding.									

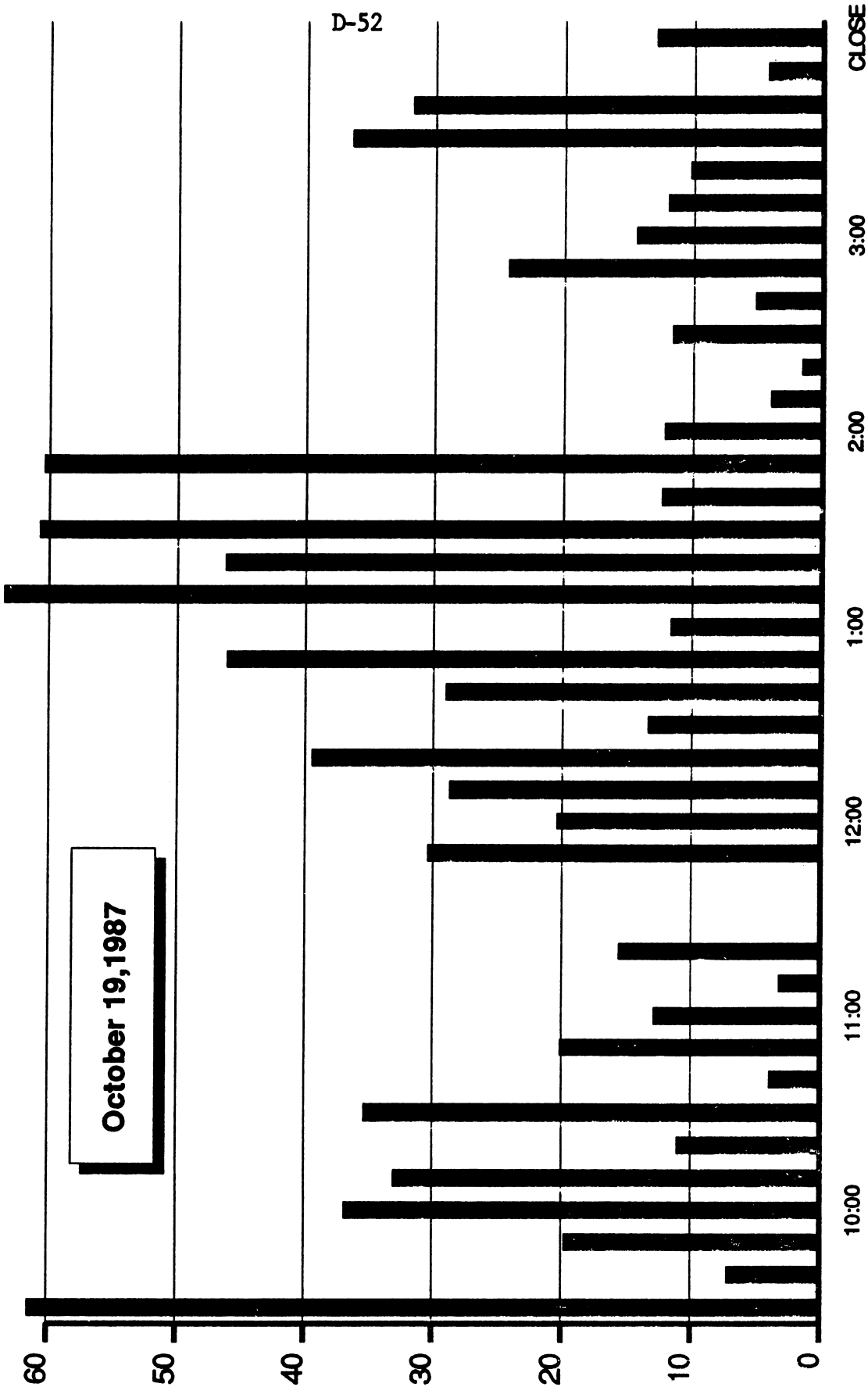
TEN MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE October 19, 1987							
Time	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-9:40	1.8	0	0.3	2.9	5.0	36.4	61.5
9:40-9:50	0.4	0	0	0.5	0.9	4.9	7.2
9:50-10:00	2.6	0	0	0	2.6	14.0	19.8
10:00-10:10	3.7	0	0	0	3.7	22.9	36.9
10:10-10:20	3.6	0	0	0	3.6	22.7	33.0
10:20-10:30	1.1	0	0	0	1.1	7.5	11.1
10:30-10:40	1.1	0	2.7	0	3.7	24.7	35.4
10:40-10:50	0.6	0	0	0	0.6	3.0	3.9
10:50-11:00	0.5	0	2.7	0	3.1	15.5	20.1
11:00-11:10	0	0	2.0	0	2.0	10.0	12.8
11:10-11:20	0	0	0	0.5	0.5	2.5	3.2
11:20-11:30	0	0	2.4	0	2.4	12.0	15.6
11:30-11:40	0	0	0	0	0	0	0
11:40-11:50	0	0	0	0	0	0	0
11:50-12:00	0.9	0	2.0	0.6	3.5	23.9	30.4
12:00-12:10	1.6	0	0.5	0	2.1	14.9	20.3
12:10-12:20	0.6	0	2.2	0	2.8	21.4	28.8
12:20-12:30	1.1	0.5	2.0	0.6	4.2	30.9	39.5
12:30-12:40	1.1	0	0	0	1.1	7.2	13.3
12:40-12:50	1.1	0	1.3	0	2.4	20.7	29.1
12:50-1:00	1.1	0	3.0	0.02	4.1	29.9	46.1
1:00-1:10	1.0	0	0	0	1.0	6.6	11.6
1:10-1:20	0.6		4.0	0	4.6	35.9	63.4
1:20-1:30	2.7	0.5	0.1	0	3.3	35.5	46.3
1:30-1:40	1.6	0.5	5.0	0	7.1	39.9	60.7
1:40-1:50	0.2	0	1.0	0	1.2	9.0	12.4
1:50-2:00	0.7	0.5	2.9	0.1	4.2	29.7	60.4
2:00-2:10	0.3	0	0.7	0	1.0	8.6	12.2
2:10-2:20	0.3	0	0	0.1	0.5	3.7	4.0
2:20-2:30	0.1	0	0	0	0.1	1.1	1.6
2:30-2:40	0.4	0	0.3	0	0.8	7.8	11.6
2:40-2:50	0.2	0.2	0	0	0.4	3.7	5.2
2:50-3:00	0.7	0	0	1.7	2.5	16.1	24.3
3:00-3:10	0.4	0.6	0.6	0	1.7	10.7	14.4
3:10-3:20	0.4	0	0.6	0.3	1.2	8.7	12.0
3:20-3:30	0.7	0	0.5	0	1.1	6.9	10.3
3:30-3:40	0.2	0	1.0	2.3	3.6	24.1	36.5
3:40-3:50	0.2	0	1.6	2.0	3.7	22.5	31.8
3:50-4:00	0.1	0	0.6	0	0.7	3.0	4.3
4:00-CLOSE	0.8	0	0	0	0.8	8.4	12.5
ALL DAY	0.2	0	0	0.1	0.3		
TOTAL	34.7	2.8	39.9	11.8	89.3	14.7	21.1

Thirty Minute Breakdown of Index-Related Selling on NYSE (October 19, 1987)

Millions of Shares

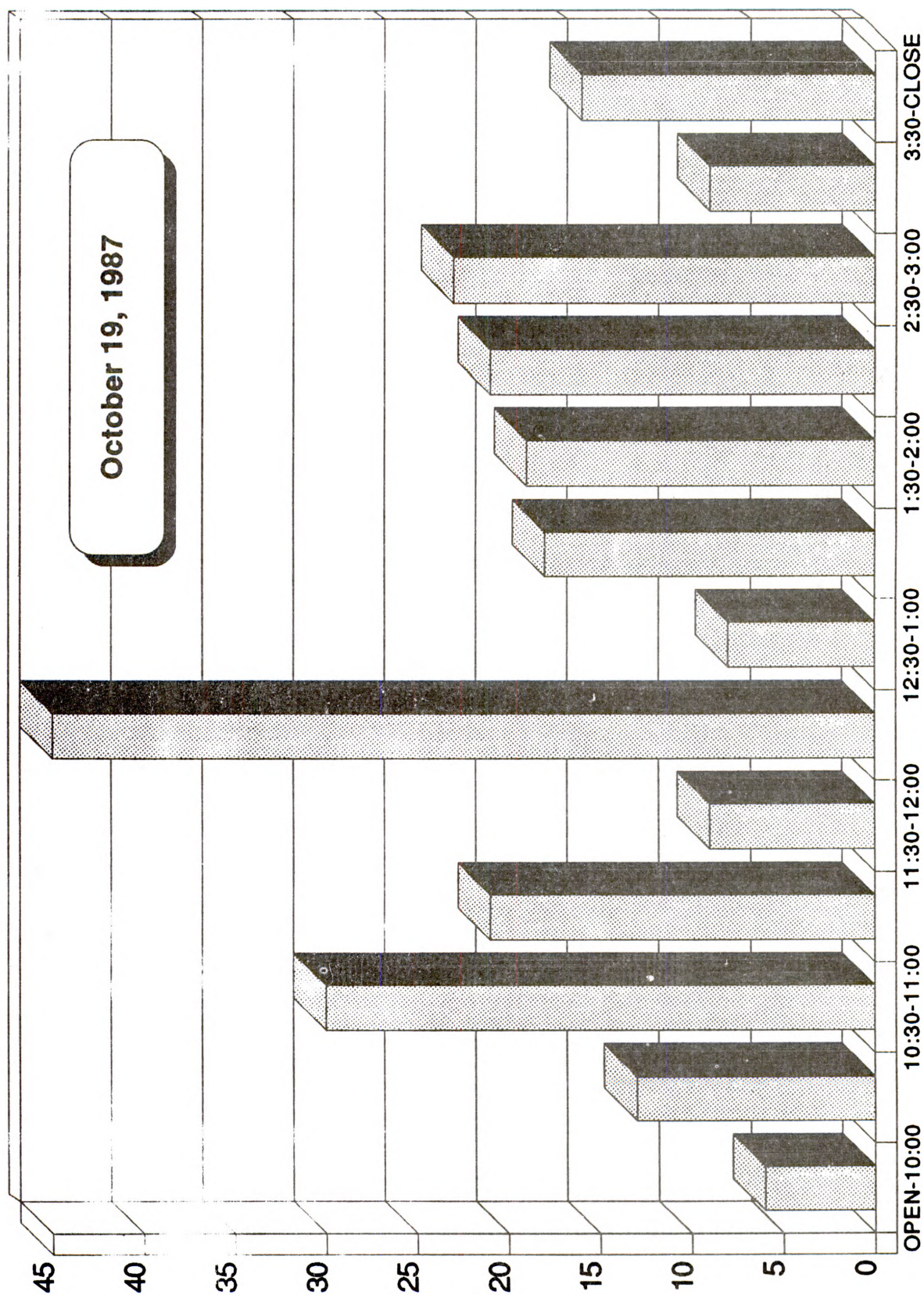


**Total Program Selling on NYSE as % of Volume in S&P Stocks
(10 Minute Intervals)**



Portfolio Insurance Futures Selling Percentage of CME Volume

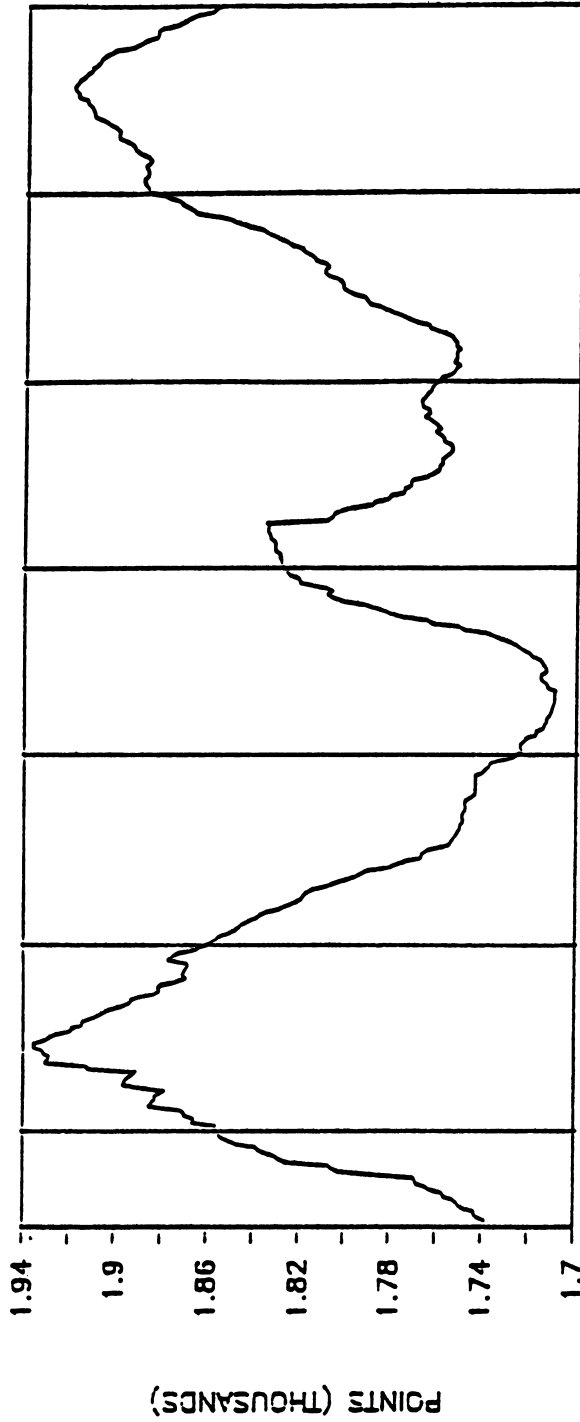
Percentage of
Total Volume



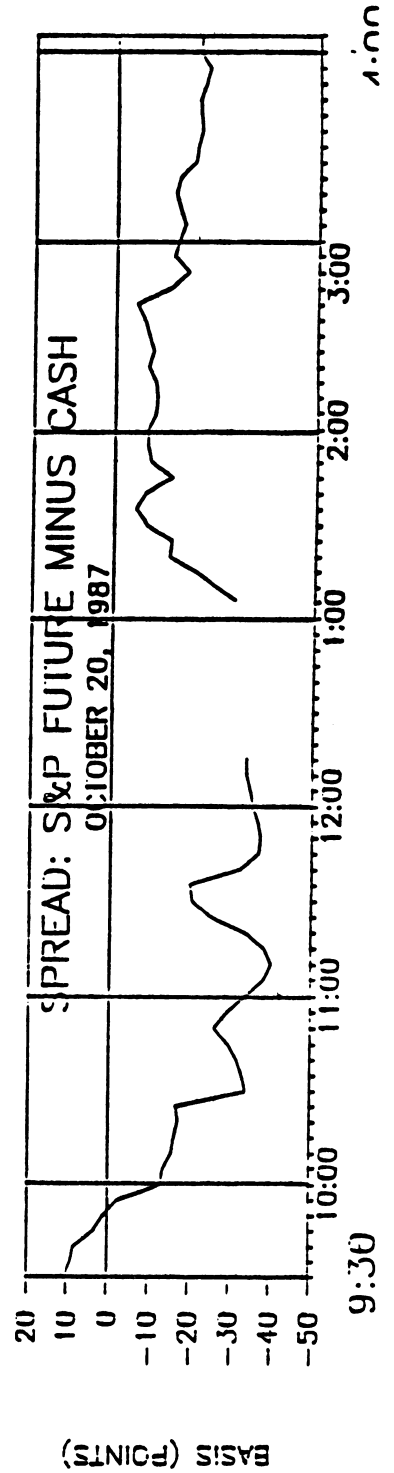
OCTOBER 20

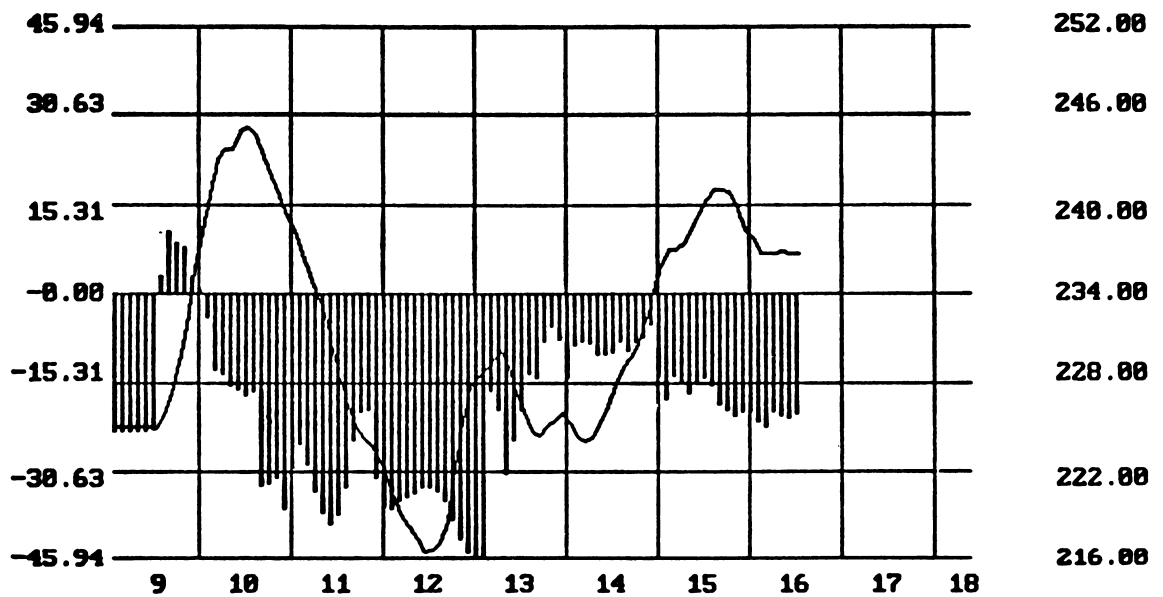
DOW JONES INDUSTRIAL AVERAGE

OCTOBER 20, 1987: MINUTE BY MINUTE



SOURCE: NEW YORK STOCK EXCHANGE





TRADE DATE: OCTOBER 20, 1987

S&P 500 STOCK INDEX FUTURES (DEC) - "SPZ"
 BAR GRAPH/LEFT SCALE: FUTURES PREMIUM/DISCOUNT
 LINE GRAPH/RIGHT SCALE: CASH (STOCK) PRICES
 FOUR-MINUTE DATA
 SOURCE: BRIDGE INFORMATION SERVICES, INC.

THIRTY MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE

October 20, 1987

Time	NYSE Volume	S&P Volume	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-10:00	62.6	41.2	0.2	0	0.5	1.9	2.6	4.2	6.3
10:00-10:30	73.2	52.7	0.4	0	0	0	0.4	0.5	0.8
10:30-11:00	63.9	46.3	0.9	0	0	1.1	2.0	3.1	4.3
11:00-11:30	60.6	44.0	0.2	0	6.3	0.9	7.4	12.2	16.8
11:30-12:00	52.0	32.5	0.6	0	0	0	0.6	1.5	1.8
12:00-12:30	38.3	24.6	0	0	0	0	0	0.0	0.0
12:30-1:00	46.7	34.4	0	0	0	0	0	0.0	0.0
1:00-1:30	39.6	28.7	0	0	0	0.7	0.7	1.8	2.4
1:30-2:00	30.5	21.7	0	0	2.1	0.3	2.4	7.9	11.1
2:00-2:30	30.5	21.5	0	0	1.1	2.2	3.3	10.8	15.4
2:30-3:00	33.3	23.7	0	0	0.5	0.7	1.2	3.6	5.1
3:00-3:30	39.5	26.8	0	0	0	0.3	0.3	0.8	1.1
3:30-Close	43.1	28.4	.67	0	0	1.0	1.7	3.9	6.0
ALL DAY			0	0.6	0	1.2	1.8		
TOTAL	613.7	426.7	2.97	0.6	10.5	10.3	24.4	4.0	5.7

Time — Order execution times were estimated by adding 5 minute execution periods to order entry times.

Volume — All volume figures are in millions of shares.

S&P Volume — NYSE volume in S&P Stocks.

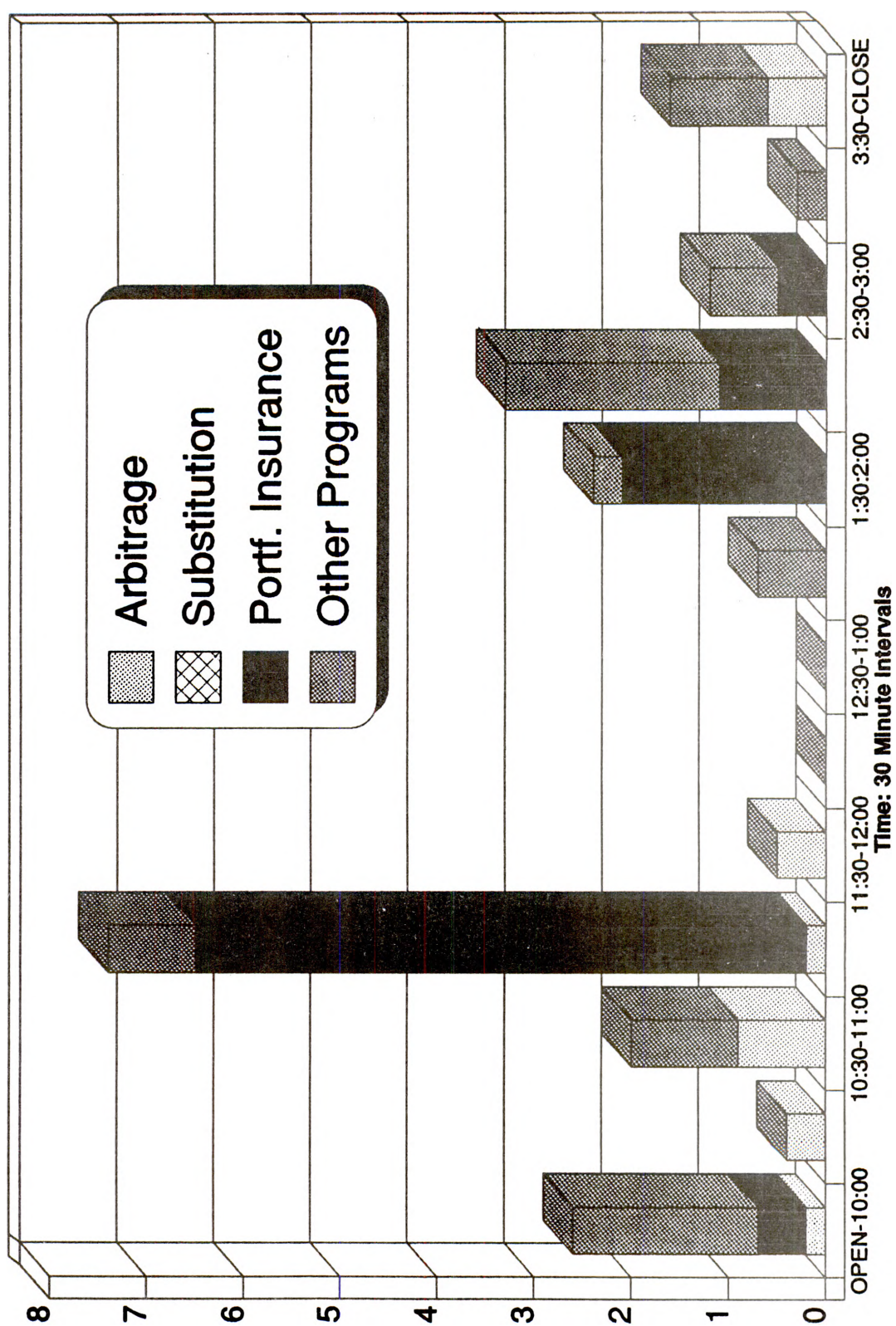
Index Arbitrage — Includes designated arbitrage (customer or proprietary) plus "adjustments to hedges" if structured as arbitrage.

Rounding — Some figures are not arithmetic totals due to rounding.

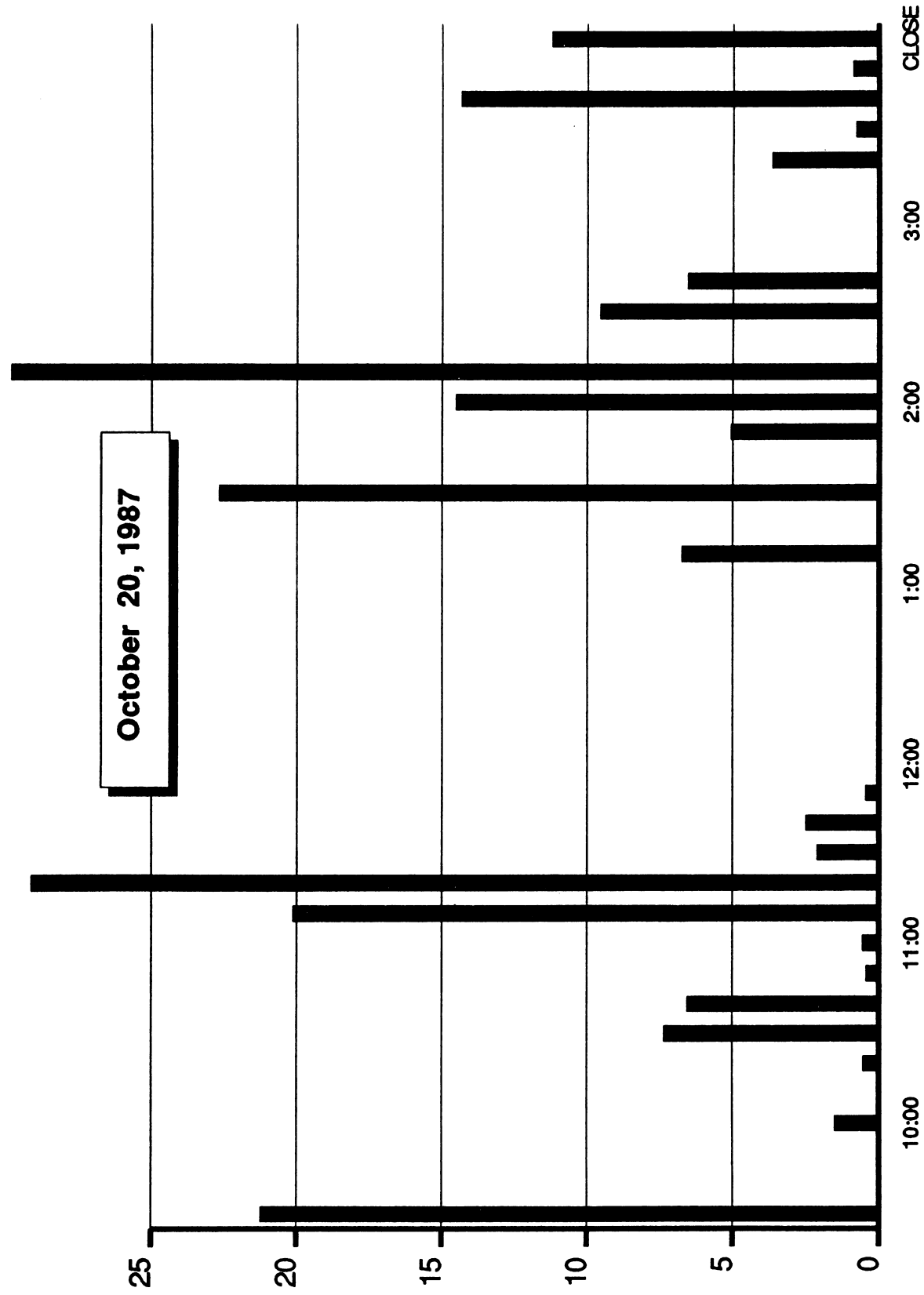
TEN MINUTE BREAKDOWN OF INDEX-RELATED SELLING ON NYSE October 20, 1987							
Time	Index Arbitrage	Index Substitution	Portfolio Insurance	Other Programs	Total Program Selling	% of NYSE Volume	% of S&P Volume
OPEN-9:40	0.2	0	0.5	1.9	2.6	13.7	21.8
9:40-9:50	0	0	0	0	0	0	0
9:50-10:00	0	0	0	0	0	0	0
10:00-10:10	0.3	0	0	0	0.3	1.2	1.6
10:10-10:20	0	0	0	0	0	0	0
10:20-10:30	0.1	0	0	0	0.1	0.4	0.6
10:30-10:40	0.3	0	0	0.6	0.9	5.0	7.1
10:40-10:50	0.5	0	0	0.5	1.0	4.8	6.6
10:50-11:00	0.1	0	0	0	0.1	0.4	0.5
11:00-11:10	0.1	0	0	0	0.1	0.5	0.7
11:10-11:20	0.1	0	2.1	0.7	2.9	14.1	20.3
11:20-11:30	0	0	4.2	0.2	4.4	21.7	28.8
11:30-11:40	0.3	0	0	0	0.3	1.7	2.4
11:40-11:50	0.2	0	0	0	0.2	1.0	3.3
11:50-12:00	.07	0	0	0	0.1	0.7	0.7
12:00-12:10	0	0	0	0	0	0	0
12:10-12:20	0	0	0	0	0	0	0
12:20-12:30	0	0	0	0	0	0	0
12:30-12:40	0	0	0	0	0	0	0
12:40-12:50	0	0	0	0	0	0	0
12:50-1:00	0	0	0	0	0	0	0
1:00-1:10	0	0	0	0	0	0	0
1:10-1:20	0	0	0	0.7	0.7	5.2	7.3
1:20-1:30	0	0	0	0	0	0	0
1:30-1:40	0	0	2.1	0	2.1	16.4	22.6
1:40-1:50	0	0	0	0	0	0	0
1:50-2:00	0	0	0	0.3	0.3	3.1	4.3
2:00-2:10	0	0	1.1	0	1.1	10.4	15.1
2:10-2:20	0	0	0	2.2	2.2	21.0	29.7
2:20-2:30	0	0	0	0	0	0	0
2:30-2:40	0	0	0	0.7	0.7	6.7	9.6
2:40-2:50	0	0	0.5	0	0.5	4.5	6.2
2:50-3:00	0	0	0	0	0	0	0
3:00-3:10	0	0	0	0	0	0	0
3:10-3:20	0	0	0	0	0	0	0
3:20-3:30	0	0	0	0.3	0.3	2.2	3.2
3:30-3:40	.07	0	0	0	0.1	0.9	1.2
3:40-3:50	0.1	0	0	1.0	1.1	9.4	13.7
3:50-4:00	0.1	0	0	0	0.1	0.7	1.1
4:00-CLOSE	0.4	0	0	0	0.4	7.3	12.1
ALL DAY	0	0.6	0	1.2	1.8		
TOTAL	2.3	0.6	10.4	10.3	24.4	4.0	5.7

Thirty Minute Breakdown of Index-Related Selling on NYSE (October 20, 1987)

Millions of Shares

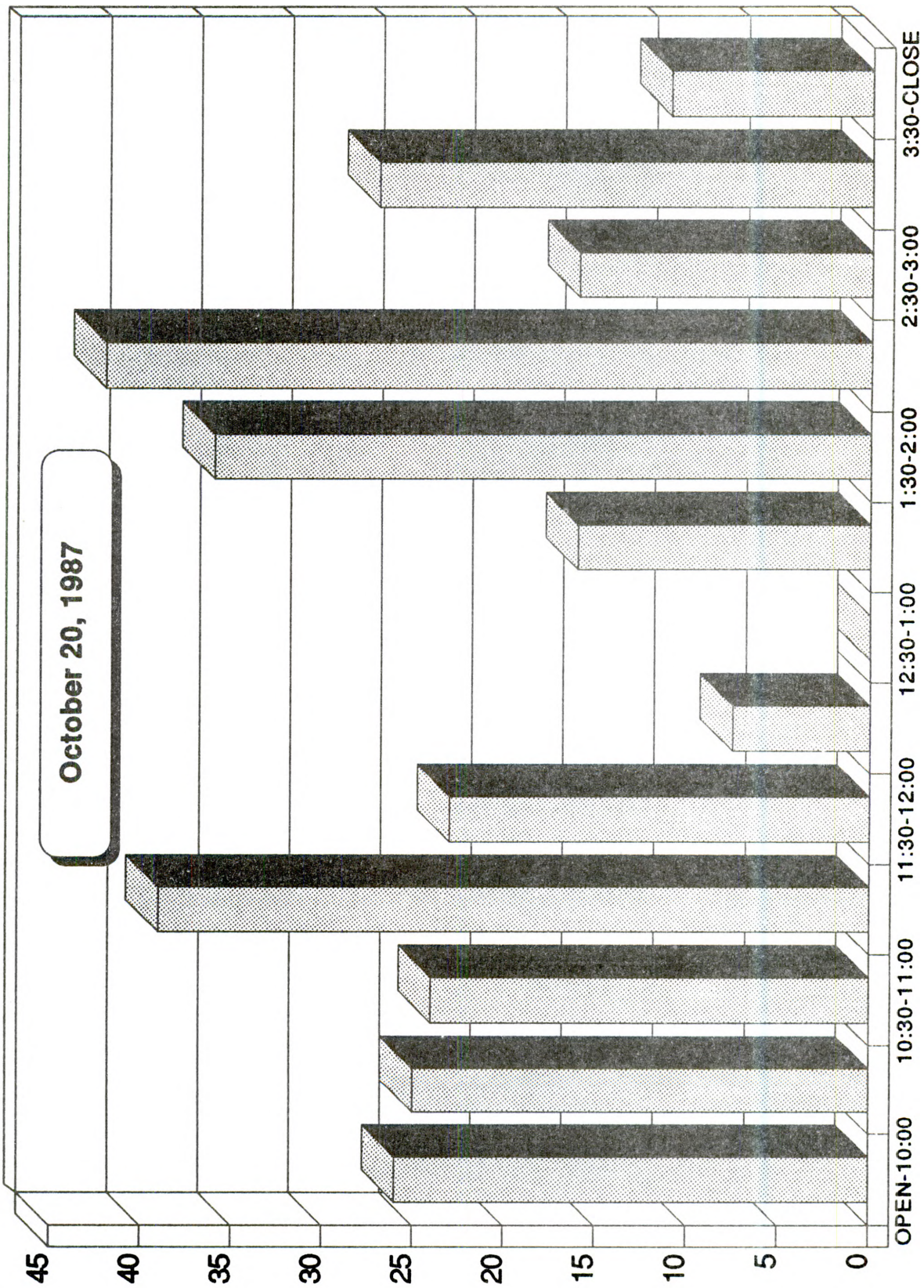


**Total Program Selling on NYSE as % of Volume in S&P Stocks
(10 Minute Intervals)**



Portfolio Insurance Futures Selling Percentage of CME Volume

Percentage of
Total Volume



APPENDIX E

**INFORMATION REQUESTS
TO
BROKER-DEALERS**



DIVISION OF
MARKET REGULATION

E-3
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

October 30, 1987

Dear

We greatly appreciate the assistance already provided by members of your firm, particularly your trading staff, in compiling preliminary aggregate data on the recent market break. As we indicated in our earlier phone conversations, it is necessary for the Securities and Exchange Commission ("SEC") and the Commodity Futures Trading Commission ("CFTC") to reconstruct accurately the trading of the major firms over the last few weeks, and that, to accomplish this, more detailed trading information must be compiled. Because this reconstruction may require information from various operational units in each firm, we are asking the firms' compliance or legal staff to coordinate the collection and submission to the SEC and CFTC of this data. For your convenience, we are designating the SEC as the central collection point for this information.

In particular, we request that your firm provide the following breakdown of index-related trading for October 6, 1987, October 14, and each subsequent trade date up to one day prior to submission of these data. We request that these data be submitted either by telecopier or by overnight mail to be received by the SEC no later than November 10, 1987.

Index Arbitrage or "Substitution"

For each program, please indicate:

1. Proprietary or Customer Designation
 - Indicate the identity of the customer only if the customer is a broker-dealer or is affiliated with a broker-dealer.
-

2. Designation of the basic strategy employed
 - Opening arbitrage
 - Closing arbitrage
 - Substitution
3. Time the stock side of the program was entered (within 10 minutes)
4. Buy/Sell/Sell-short indications for the stock orders
5. Order entry method
 - List
 - Other automated systems
 - By phone to the NYSE
 - A combination of the above
 - Other
6. The market to which the stock orders were directed
 - NYSE
 - Other exchanges, foreign or domestic
 - Third Market
7. The identity and entry time for any futures or options contracts for the program
8. The size of the program broken down into the following categories:
 - Approximate dollar size
 - Approximate share size
 - Number of futures or options contracts

"Straight" Buy or Sell Programs

Please provide the same information for each buy or sell program:

Items 1-6 above

Item 7, if futures or options were used.

Item 8, including number of futures or options contracts, if appropriate.

Portfolio Insurance

1. The futures or options contracts used
2. Time the futures or options contract orders were entered (within 10 minutes).
3. Number of futures or options contracts purchased or sold (with indications of whether these increased or decreased short or long positions)
4. If any stock orders were used, please provide
 - Approximate dollar size and number of shares
 - Time of entry (within 10 minutes)
 - Buy/sell/sell-short designation
 - Entry method
 - The market to which the stock orders were directed

If there is a discrepancy between the total number of futures contracts bought or sold for proprietary or customer accounts and the change in futures or options positions routinely reported to the exchanges, please explain this discrepancy.

While we recognize that it may be difficult for the firms to identify some customers' basic strategy in entering program orders, this information is essential for our review. Therefore, if your firm is unable to obtain this information from any customer by November 6, 1987, we request that the following information for each such account be telecopied to the SEC by 12:00 p.m. on November 6:

1. The name, address, and contact person (with telephone number) for the account.
2. A listing of each program for each trade date providing:
 - Time of entry of stock orders
 - Buy/sell/sell short designation
 - Entry method
 - Market to which the orders were directed
 - Size of order
 - Approximate dollar and share size
 - Identity and number of futures or options contracts used, including time the futures orders were entered.

If there are any questions regarding this data request, please contact John Mielke for the CFTC at (202) 254-3310 or

E-6

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Alton Harvey for the SEC at (202) 272-2970. The SEC's telecopier number is (202) 272-7050 or 7051.

Sincerely,



Richard G. Ketchum
Director
Division of Market Regulation
SEC



Paula A. Tosini
Director
Division of Economic Analysis
CFTC



DIVISION OF
MARKET REGULATION

E-7

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 12, 1987

Dear

The Division of Market Regulation ("Division") is conducting a review of trading, operational, and financial conditions during the October market break. In order to complete this review, which will include a reconstruction of market conditions during the key market moves, we will need detailed information concerning trading, financial and operational capability during October 1987. Because the data requested involves various parts of the firm, we would appreciate having one department or office, preferably the compliance officers or legal staff, coordinate the firm's responses to the following items. We request that your response be submitted by telecopier 1/ or by overnight mail to be received by the SEC no later than the dates specified for each of the following subsections. A Division contact person for questions also is provided for each subsection.

I. Trading (Response due November 23, 1987 -- Contact Alton Harvey at (202) 272-2970)

1. For each trade date in October 1987, please provide aggregate daily figures for purchases and sales (in thousands of shares of stocks and approximate dollar value of shares traded) for the following categories. Please provide separate figures for:

- (1) NYSE-listed stocks; (2) Amex-listed stocks;
- (3) National Market System ("NMS") NASDAQ stocks; and
- (4) non-NMS NASDAQ stocks.

1/ The SEC's telecopier number is (202) 272-7050 or 7051.

Page Two

Proprietary

- Index Arbitrage
- Risk Arbitrage
- Equity Trading (including block-positioning)
or Market-Making
- Other

Agency

- Retail
- Institutional

2. For each trade date in October 1987, please provide aggregate daily figures (in numbers of contracts and approximate dollar value) for purchases and sales for the above categories (if applicable) involving futures or options on the following indexes: Standard & Poor's ("S&P") 500, S&P 100, Amex Major Market, NYSE Composite, and Kansas City Value Line (collectively, derivative index products).
3. For trade dates October 16, 19, and 20, please provide figures (in number of contracts, thousands of shares and the dollar value of shares traded) for purchases and sales of NYSE-listed stocks and derivative index products for the above categories by hour bracket in which orders were executed (e.g., 9:00-10:00, 10:00-11:00, etc.) 2/

Separate Response due December 7, 1987

4. Please provide the same hourly breakdown for purchases and sales on October 16, 19, and 20 of: (1) Amex-listed; (2) NMS NASDAQ; and (3) non-NMS NASDAQ.

2/ If time of execution can not be provided, please provide orders by hour bracket in which orders were entered.

Page Three

II. Operations (Response due November 30, 1987 -- Contact Jonathan Kallman at (202) 272-2402)

1. For each of the following items, please indicate an average number prior to the trading period October 14-30, e.g., the average figures for September 1987. 3/
2. For each of the trade dates October 14 through October 30, please provide the following data for NYSE, Amex and NASDAQ activity (by market place): (1) number of trade sides you reported; (2) number of trade sides reported to you on trade date contract sheets; (3) number of reported trade sides compared on T+1; (4) number of uncomparing trade sides on T+1; (5) number of advisories submitted to you on T+1; (6) number of uncomparing trade sides resolved on each of T+2, T+3, T+4, T+5; (7) number of reported trade sides not resolved as of settlement data; and (8) number of trade sides not resolved as of your most recent calculations. Please provide approximate dollar values for questions (7) and (8).
3. For each business day from October 14 through November 6, please provide figures for the following: dollar value of CNS settlement obligation of your firm (debit or credit), dollar value of your net mark-to-the-market payment or receipt, and dollar value of CNS fails to receive and fails to deliver.
4. For each of the trade dates October 14 through October 30, please provide the following data concerning institutional trades processed through the Institutional Delivery ("ID") system: (1) number of trades reported to the ID system on trade date, T+1, T+2, T+3, after T+3; (2) number of trades

3/ We believe that most of these data requests can be answered by reference to your clearing agency reports, e.g., NSCC contract sheets and settlement reports, DTC ID reports. If you cannot provide exact figures, make your best approximation and indicate that those figures are approximate. Finally, if information we have requested is unavailable or extremely difficult to obtain, please provide what information you can obtain and the reasons why remaining information is unavailable.

Page Four

reported as affirmed by ID system on T+2, T+3, T+4 and T+4;
 (3) number of affirmed ID trades that settled T+5; and
 (5) number of non-affirmed trades that settled on T+5, and
 after T+5 by actual settlement date.

5. For each of the trade dates October 14 through October 30, please provide the following data concerning institutional trades involving delivery-against-payment or receipt-against-payment ("DVP/RVP") to be settled in the U.S., that were not processed through the ID system: (1) number of confirmations sent on T+1, T+2, after T+2; (2) number of those trades that settled on T+5, after T+5, and related aggregate dollar values.
6. For each business day from October 14 through November 6, please provide: (1) the average number of business days from receipt of certificates from customers to delivery to transfer agents or deposit into a securities depository; and (2) the number of business days from receipt of certificates from transfer agents or depositories to delivery to customers.

III. Financial Responsibility (Response due November 30, 1987 --
 Contact Michael Macchiaroli (202) 272-2904)

1. For each day from October 14 through October 30, please provide total margin debits, margin deficits and margin calls for securities accounts and commodities futures or options accounts. For each of those days, please identify the amount of securities and commodities futures or options margin calls satisfied through:
 - (1) receipt of additional cash or securities;
 - (2) sales of securities initiated by customers; and
 - (3) liquidation of customer accounts by the firm upon failing to receive margin. When providing the above information please distinguish between institutional accounts, retail accounts and customer accounts introduced on a fully-disclosed basis. Please answer separately the above questions for domestic and foreign accounts.
2. Please indicate the firm's procedures for liquidating customer stock or options positions if unable to contact the customer (or reach an agreement) about a margin call, and provide figures on the number of such liquidations and the daily aggregate dollar amounts of liquidations for each trade date from October 14 to 30.

Page Five

3. Please identify the amount of trading losses incurred between October 14 and October 30 related to firm equity securities positions. For that period, please identify the amount of probable losses related to deficits in customers' cash and margin accounts.

IV. Order Routing (Response due December 7, 1987 -- Contact Kathryn Natale at (202) 272-2405)

1. What order-routing and execution systems does the firm use for exchange and OTC trades? For October 13 to 30, please provide the following information concerning your use of those systems: (1) which systems were not operating on particular days and for how long; (2) in which systems did you experience execution delays and how long were those delays; (3) in which systems were you unable to obtain confirmation of execution and how many trades were involved; (4) what other problems did you experience with those systems; (5) what alternatives to these systems did you use?
2. Please indicate approximately how many orders (proprietary and customer) your firm can direct routinely by automated means to each automated exchange and OTC execution system per minute (e.g., your order-routing system capacity)? Did the number of orders you received on October 13-23 at any time exceed that capacity? If possible, provide an estimate of normal use, normal peak activity and peak activity on October 13-23. What alternatives to these automated systems did the firm use?

V. Internationalization (Response due December 7, 1987-- Contact Kathryn Natale at (202) 272-2405)

1. For each trade date in October 1987, please provide aggregate daily purchases and sales of U.S. stocks (in thousands of shares and approximate dollar value) executed in: (1) markets outside the U.S. by marketplace and (2), for NYSE-listed stocks, in the domestic third market.
2. What effect, if any, did the closing of the Hong Kong Exchange have on your firms' proprietary, institutional, and retail trading?

Page Six

**VI. Customer Complaints (Response due December 14, 1987 --
Contact Catherine McGuire at (202) 272-2790)**

1. How many customer complaints (written and oral) in the following categories have been received concerning activity related to high volume and high volatility in the period from October 14 to 30: (1) inability to contact broker-dealer; (2) lack of verbal confirmation of execution; (3) poor quality of execution; (4) lack of notice or time related to margin calls; and (5) other.
2. Please describe any special procedures your firm has adopted for resolving any of the types of disputes that arise out of October's high volume and high volatility.
3. Do you anticipate any increase in use of self-regulatory organization sponsored arbitration systems to resolve disputes arising out of October's high volume and high volatility? How many cases?

We sincerely appreciate your cooperation in helping us meet the severe time constraints imposed on us for completing this review.

Sincerely,



Richard G. Ketchum
Director

cc:



E-13
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 30, 1987

Dear

Your firm's assistance in providing information for the Division of Market Regulation's review of the October Market Break is greatly appreciated. As we noted in our November 12, 1987 letter, an essential question in our review is when did various types of selling occur, e.g., by retail or institutional accounts or by various types of proprietary accounts? When did any of these accounts enter the market to buy? This is the context in which we must place our analysis of index-related trading during the Market Break.

While most of the firms we have contacted in our November 12 letter have produced useful daily aggregate trading statistics (requested in questions 1 and 2 in Section I), few have been able to reconstruct the hour-by-hour statistics requested for October 16, 19, and 20 in questions 3 and 4. The difficulty for the firms is that their routine automated trading/clearing records do not include times for trades; thus, reconstructions would require extremely time-consuming and expensive checking of individual order tickets. The Division recognizes that such an effort to reconstruct all types of trading in all securities would be extremely difficult. As a result, the staff has attempted to refine its data request in an effort to reduce the reconstruction burden on the firms while at the same time producing useful information on timing patterns for the key trading days under inquiry. In particular, we believe that an hour-by-hour breakdown for a small sample of NYSE-listed securities may be sufficient to meet our analytical needs.



Page Two

The Division is therefore revising its request by deleting question 3 and 4 in Section I of the November 12, 1987 letter and requesting instead that each firm conduct an hour-by-hour breakdown by checking order tickets for the following fifteen NYSE-listed stocks for October 16, 19, and 20:

1. International Business Machines
2. Merck and Company
3. General Motors
4. American Telephone and Telegraph
5. Exxon Corp.
6. General Electric
7. E.I. Dupont
8. Sears, Roebuck & Co.
9. Coca Cola Co.
10. Phillip Morris
11. Digital Equipment Corp.
12. Bell & Howell
13. Dayton Hudson
14. Harley Davidson
15. Ryland Group

We request that the results of the order ticket review be submitted to the Division no later than December 11, 1987 on "floppy" disks in the Lotus II Format illustrated in the attached sample spreadsheets. Please do not submit the results on Lotus I Format.

We recognize that even this limited reconstruction will involve some reconstruction burden. We would not request this effort if an alternative was possible (the Division's on-going analysis of audit trail information is expected to produce only a limited amount of useful information because of the absence of complete information from all of the firms). Your assistance in this effort, therefore, is essential.

Sincerely,



Richard G. Ketchum
Director

Enclosure

TRADING IN IBM - OCTOBER 16, 1967														
TIME	PROPRIETARY					INSTITUTIONAL					RETAIL			
	BUY	SELL	NET	SHARES	AMOUNT	BUY	SELL	NET	SHARES	AMOUNT	BUY	SELL	NET	SHARES
0900-10:00														
10:00-11:00														
11:00-12:00														
12:00-1:00														
1:00-2:00														
2:00-3:00														
3:00-Close														

PROPRIETARY TRADING IN IBM - OCTOBER 16, 1967														
TIME	INDEX ARBITRAGE					RISK ARBITRAGE					EQUITY TRADING			
	BUY	SELL	NET	SHARES	AMOUNT	BUY	SELL	NET	SHARES	AMOUNT	BUY	SELL	NET	SHARES
0900-10:00														
10:00-11:00														
11:00-12:00														
12:00-1:00														
1:00-2:00														
2:00-3:00														
3:00-Close														



E-16
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

December 11, 1987

Dear

As you know, the Division of Market Regulation has been working extensively on a comprehensive study relative to the market break in October 1987. As a part of that study we are reviewing and analyzing the impact of short selling activity and issuer repurchases during this period.

Accordingly, the staff is interested in obtaining information with respect to your firm's experience in effecting issuer repurchases and their impact, if any, on the market during the week of October 19-23. In addition, the staff would like to obtain information regarding Rule 10b-18 to determine how the rule functioned in connection with issuer repurchases during that period.

With regard to short selling activity, we are seeking information regarding the extent of short selling activity, what types of market participants were selling short, and where these transactions occurred.

Outlines of the areas of inquiry we intend to pursue are enclosed. The staff prefers to obtain this information through telephone interviews at the earliest opportunity with the appropriate personnel of your firm, as the study must be completed by the end of this year. Except where specifically requested, at this time we do not anticipate seeking client-specific information. Based on the responses we receive, however, we may seek additional detail.



Page Two

We will contact you on Monday, December 14 to schedule a telephone interview for December 16, 17, or 18. Should you require any additional information, please call me at (202) 272-2874, or Nancy Burke at (202) 272-2848.

Sincerely,

Larry E. Bergmann
Assistant Director

**INFORMATION REQUESTS
TO
SELF-REGULATORY ORGANIZATIONS**



DIVISION OF
MARKET REGULATION

E-21
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 16, 1987

Mr. Robert Birnbaum
President
New York Stock Exchange, Inc.
11 Wall Street
New York, New York 10005

Re: October Market Break

Dear Mr. Birnbaum:

As you know, the Division of Market Regulation ("Division") is conducting a comprehensive review of trading during the October 1987 Market Break. Because the data requested involves various parts of the Exchange, we would appreciate having your Office coordinate the NYSE's responses to the following items. We request that this information be submitted to us no later than the dates indicated for each of the following subsections. In addition, we request that the statistical information in your response (particularly the lists requested in Sections I and VIII) be provided in a machine-readable format, preferably on "floppy disks." A Division contact person for questions is provided for each subsection.

- I. Specialist Performance (Response by December 4, 1987 -- Contact Howard Kramer at (202) 272- 2889 or Alton Harvey at (202) 272-2970)
 1. For each of the 50 stocks comprising the list of "pilot stocks" subject to order-imbalance disclosure procedures on recent index product expirations, please submit:
 - (a) Specialists' opening positions for each stock for each trade date in October 1987.
 - (b) Daily market-making statistics for each stock for October 6, 14, 15, 16, 19, 20, and 26, 1987. In



Mr. Robert Birnbaum
Page 2

addition, please provide an average for September 1987 of these daily statistics. Statistics should cover:

- Price Continuity
- Market Depth
- Quotation Spreads
- Stabilization Percentage
- Percentage of Participation

(c) The same market-making statistics broken down by hour bracket (e.g. 9:30-10:00, 10:00-11:00) for trade dates October 6, 14, 15, 16, 19, 20, and 26.

(d) Forms 81 for trade dates October 6, 14, 15, 16, 19, 20, and 26.

2. Please provide the same daily and hourly figures and Forms 81, for the same trade dates, for the following stocks. In addition, please provide an average for September 1987 for these daily statistics.

- | | |
|-------------------|----------------------------|
| a. Dayton Hudson | e. Bell & Howell |
| b. Irving Bank | f. Holly Farms |
| c. Newmont Mining | g. Household International |
| d. Geico | |

3. For October 6, 14, 15, 16, 19, 20, and 26, 1987, please provide a list of all delayed openings ^{1/} for order imbalances. For each delayed opening, please provide:

- (a) Stock symbol.
- (b) Number of shares "paired."
- (c) Number of shares in the imbalance.
- (d) Opening price.
- (e) Change from previous close (dollar amount and ¢ change).
- (f) Indication of whether floor official approval was obtained.
- (g) Time that stock opened.

4. For October 6, 14, 15, 16, 19, 20, and 26, 1987, please provide the same breakdown (3(a) - 3(g), above) for each "gap" opening in a stock that is not already included in the list of delayed openings.

^{1/} Questions on "delayed openings" and "gap openings" refer to those situations requiring the filing of standard forms pursuant to NYSE rules.

Mr. Robert Birnbaum
Page 3

5. For October 6, 14, 15, 16, 19, 20, and 26, 1987, please provide a list of all trading halts, formal or informal, due to order imbalances with the breakdown in 3(a) - 3(f), above, plus:

- time that each halt was imposed
- time that each halt was lifted

6. Please provide the following statistics for each of the following trade dates: October 6, 14, 15, 16, 19, 20, and 26.

	No. of DJIA Stocks/ % of Price Weight	No. of "Pilot" Stocks/ % of Capital- ization	No. of S&P 500 Stocks/ % of Capital- ization	No. of NYSE Stocks/ % of Capital- ization
Open by 10:00 am	___/___%	___/___%	___/___%	___/___%
Open by 11:00 am	___/___%	___/___%	___/___%	___/___%
Open after 11:00 am	___/___%	___/___%	___/___%	___/___%

(Separate Response Due December 11, 1987)

We will send the Exchange in the next few days an additional list of stocks for which we will need daily market-making statistics for October 6, 14, 15, 16, 19, 20, and 26, 1987.

II. Specialist Operations (Response due December 4, 1987 -- Contact Jonathan Kallman at (202) 272-2402 or Michael Macchiarolli at (202) 272-2904)

1. Please provide a list of all NYSE member firms that act as clearing agents for specialists ("clearing members"), and, for each clearing member:
 - (a) The identity of all specialists for whom it acted at any time during October 1987.
 - (b) The securities assigned to such specialists.

Mr. Robert Birnbaum
Page 4

2. Please provide a brief chronology of all specialist unit capitalization or operational-capacity problems providing the identity of the unit and the date and time for:
 - (a) Each unit requiring additional market-making assistance.
 - (b) Each unit transferring a specialty stock book.
 - (c) Each unit being provided special scrutiny by the Exchange staff for possible capitalization problems.
 - (d) Each unit ceasing independent operations or being acquired by other units or other NYSE member firms.
3. Please provide copies of all correspondence since January 1977 from registered clearing agencies (e.g., NSCC, MCC, BSECC, SCP and PCC) concerning these firms' status under NYSE Rule 132.

III. Trading/Clearing Statistics (Response by December 4, 1987 -
- Contact Jonathan Kallman at (202) 272-2402)

1. Please provide the following trading statistics for each trade date in October 1987 and for each hour bracket for October 6, 14, 15, 16, 19, 20, and 26. In addition, please provide a daily average for September 1987.
 - (a) Total number of transactions and shares executed on the NYSE.
 - (b) Total number of transactions and shares involving block-size orders (10,000 shares or more).
 - (c) Total number of transactions and shares involving orders routed via the Exchange's automated systems?
 - (d) Total number of transactions and shares processed by the Exchange's "List" system.
 - For each list program on October 6, 14, 15, 16, 19, 20, and 26, please indicate:
 - Time of entry
 - Identity of Firm
 - Principal/Agency Designation
 - Strategy (if indicated)
 - Share Size

Mr. Robert Birnbaum
Page 5

2. Please provide the following clearing statistics for each trade date in October 1987 and provide a daily average for September 1987.
 - (a) Total number of questioned or "don't know" trades.
 - (b) Total number of questioned or don't know trades resolved by supplemental means at registered clearing agencies.
 - (c) Total number of questioned or don't know trades resolved through exchange facilities on T+2, T+3, T+3, T+4, T+5, T+6.

IV. Order Routing Systems (Response by December 4, 1987 --
Contact Kathryn Natale at (202) 272-2405 or Alton Harvey at
(202) 272-2970)

Please provide the following statistics on each of the Exchange's automated order routing systems for each of the following trade dates: October 6, 14, 15, 16, 20, and 26. In addition, for each of the following questions, please provide a daily average for the month of September 1987.

1. Average number of opening and post-opening orders per second for each hour bracket (e.g., 8:00 - 9:00, 10:00 - 11:00).
2. Average number of opening and post-opening reports per second for each hour bracket.^{2/}
3. Average number of order transmission delays due to "queuing" problems for each hour bracket and average length of delay for each "queued" order.
4. Average size (number of shares) for orders transmitted during each hour bracket.
5. Number of orders being entered into the Exchange's systems during each hour bracket.
 - (a) Of the number of orders entered during each hour bracket, how many were printed out at the specialists' posts for execution: (1) within 5

-
- 2/ In addition, please provide a graph of opening and post-opening traffic, similar to the sample graph attached to this letter, for trade dates October 6, 14, 15, 16, 19, 20, and 26, as well as for an average day in September 1987.
-

Mr. Robert Birnbaum
Page 6

minutes of time of entry; (2) within 15 minutes; (3) within 30 minutes; (4) within 60 minutes; (5) after 60 minutes; (6) not at all?

(b) Of the number of orders entered during each hour bracket, how many of these orders received fill reports: (1) within 15 minutes of time of entry; (2) within 30 minutes; (3) within 60 minutes; (4) after 60 minutes; (5) not at all?

V. Intermarket Trading System (Response by December 11, 1987 -
- Contact Kathryn Natale at (202) 272-2405)

Please provide the following statistics for each of the following trade dates: October 6, 14, 15, 16, 19, 20, and 26. In addition, for each of the following questions, please provide a daily average for the month of September 1987.

1. Number of ITS pre-opening notifications for each trade date.
 - Number of shares requested in response to pre-opening notifications.
 - Number of shares sent pursuant to these requests.
2. Number of "locked markets" for ITS stocks for each hour bracket.
 - Of this number, how many were caused by NYSE specialists?
3. Number of "crossed markets" for ITS stocks for each hour bracket.
 - Of this number, how many were caused by NYSE specialists?
4. Number and nature of ITS inquiries or complaints, e.g., trade-through complaints, directed to NYSE specialists for each hour bracket.
 - Of this number, how many received responses by the NYSE specialists: (1) within 15 minutes; (2) within 30 minutes; (3) within 60 minutes; (4) after 60 minutes; (5) not at all.
5. Similar breakdowns for inquiries or complaints sent by NYSE specialists.

Mr. Robert Birnbaum
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6. Please provide a chronology of operational problems in ITS as well as periods in which the NYSE halted operations of ITS.

VI. Other Systems Problems (Response by December 11, 1987 -- Contact Kathryn Natale at (202) 272-2405)

For trade dates October 6, 14, 15, 16, 19, 20, and 26:

1. Please provide a chronology of delays or other problems in the consolidated quotation or transaction reporting systems.
2. Please provide a brief chronology of similar problems in the "low-speed tape."

VII. Automation Enhancements (Response by December 11, 1987 -- Contact Kathryn Natale at (202) 272-2405 or Alton Harvey at (202) 272-2970)

Please provide the NYSE's projections for overall capacity to process the following categories of transactions by: (1) the end of FY 88; (2) the end of FY 89; (3) the end of FY 90.

1. Number of orders routed to the Exchange floor via automated systems: (1) on an average daily basis; (2) on a peak daily basis; (3) on an average hourly basis; (4) on a peak hourly basis; (5) on an average minute basis; (6) on a peak minute basis.
2. Similar breakdowns for the total number of shares in orders which can be routed to the Exchange floor via automated systems.
3. Similar breakdowns for total number of transactions processed on the NYSE.
4. Similar breakdowns for total number of shares traded on the NYSE.

In addition, please submit copies of all reports submitted to the NYSE Board of Directors since September 1, 1986, concerning possible enhancements to the Exchange's automated order-routing systems and overall order-processing capabilities.

VIII. Investor, Member, and Issuer Complaints (Response due December 11, 1987 -- Contact Catherine McGuire at (202) 272-2790 or Kathryn Natale at (202) 272-2405)

Mr. Robert Birnbaum
Page 8

Please provide a list of all complaints or inquiries received by the NYSE by November 13, 1987 concerning the October market break. For each complaint or inquiry, please indicate the following:

1. Whether the complainant was an investor, a member, or a representative of an issuer
 - If the complainant is an investor, please: (a) indicate whether the complainant is an individual investor or represents an institutional investor; and (b) identify the NYSE member firm for this investor.
 - If the complainant is a broker-dealer, please identify and indicate: (a) whether the firm is an NYSE member; and (b) whether the firm is complaining for itself, an associated person, or a customer.
 - If the complainant represents an issuer, please identify the issuer.
2. The trade dates subject to the complaint or inquiry.
3. The stock and its specialist unit.
4. Whether the following subject areas were included in the complaint:
 - (a) Specialist market-making performance
 - (b) Non-execution of order
 - by Specialist
 - by Broker
 - (c) Quality of order execution
 - by Specialist
 - by Broker
 - (d) Late "fill" reports
 - (e) Inability to obtain accurate quote prices
 - (f) Inability to contact broker
 - (g) Broker liquidating positions due to margin calls without obtaining investor assent
 - (h) Other complaints concerning broker

Mr. Robert Birnbaum
Page 9

- (i) Other complaints concerning specialist
- (j) Complaints concerning the Exchange's order routing systems.
- (k) Complaints about "tape" delays
- (l) Complaints about specialists not using ITS
- (m) Allegations of market manipulation
- (n) Allegations of other securities law violations (please identify)
- (o) Complaints about "program trading"
- (p) Other (Identify)

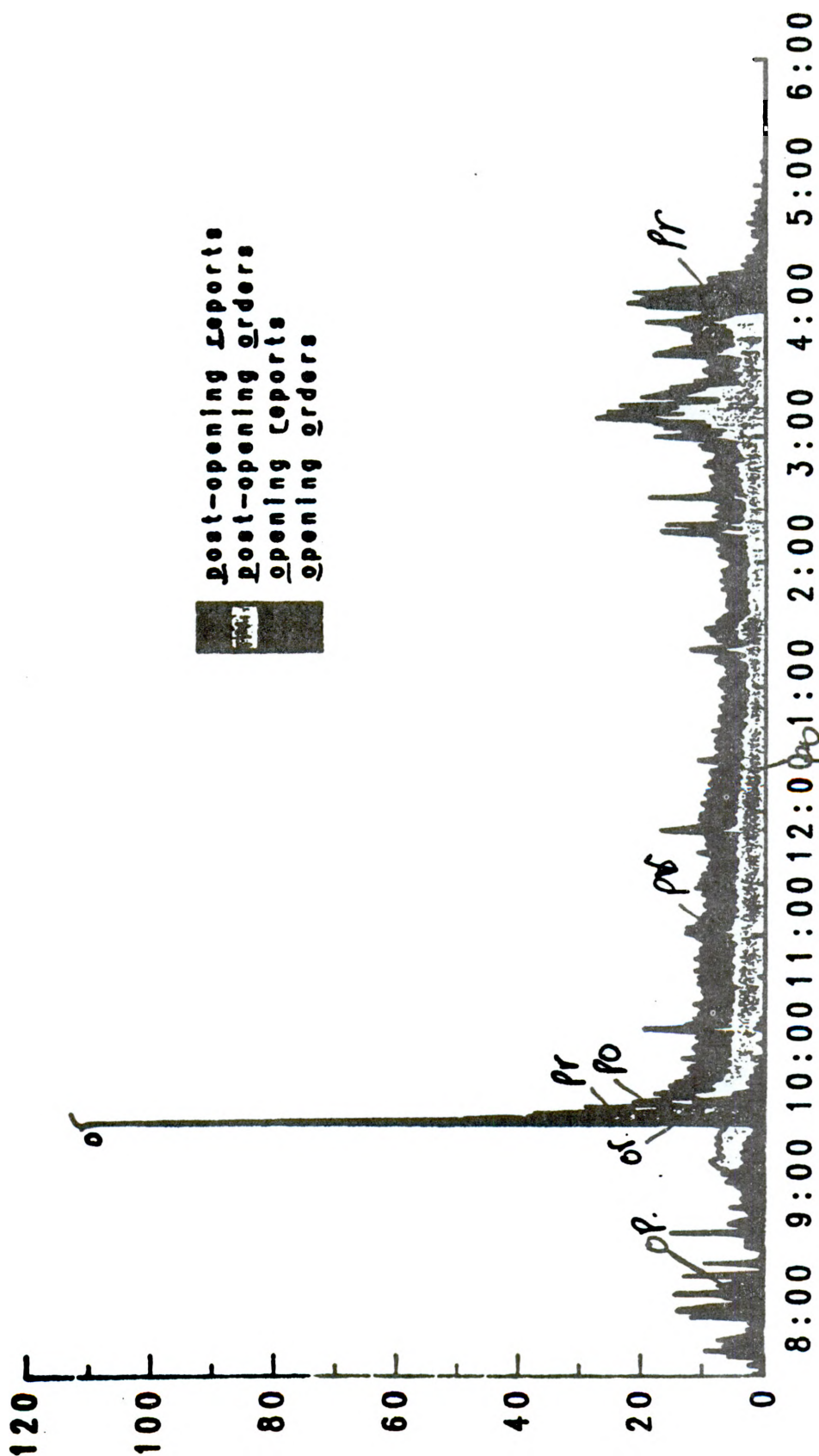
We sincerely appreciate your cooperation in helping us meet the severe time constraints imposed on us for completing this review.

Sincerely,


Richard G. Ketchum
Director

Figure 5

June 19, 1987 Opening and Post-Opening Traffic (orders and reports per second)





DIVISION OF
MARKET REGULATION

E-31
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
December 4, 1987

Harry Day, Esq.
Counsel-Regulation
New York Stock Exchange, Inc.
1800 K. Street, N.W.
Washington, D.C. 20006

RE: October Market Break

Dear Mr. Day:

Thank you for the assistance and cooperation already provided by the Exchange and its members in discussing with the Commission staff the recent market volatility. These discussions were very informative and will aid the staff in its study of market performance during this critical period.

During our visit to the Exchange our staff made some additional requests for information that will supplement the information already requested in Richard Ketchum's November 16, 1987 letter to Robert Birnbaum ("November 16 Letter"). This letter is intended to confirm the additional information requested which the Exchange staff has agreed to provide the Commission. We would like to receive the following information no later than December 11, 1987.

1. A comparison of the overall specialist stabilization rates and percentage of participation as of November 23, 1987, and the rates for September 1987. Please also identify overall TTV for all specialists for each day during the weeks of October 19 and 26.
2. For the weeks of October 19, 26, November 2 and 9, please identify each day when the exchange declared a floor wide delay in the time by which a stock must be opened or a notification would have to be sent out. For each day identified state the period of time the delay existed, e.g., 9:30-10:30. In addition, for those dates identified, please describe how the decision on a floor wide delayed opening was made, who made the decision, what factors were involved, and at what point in time the delayed opening was actually declared.
3. For each day of the week during October 19 and 26, please identify the number of percentage orders that were entered and those that were executed. Identify those percentage orders which needed either Floor Official or Floor Governor approval to be executed and



if approval was granted or denied. Please describe how the percentage order volume figures compare to periods of average trading activity.

4. In addition to the dates of October 6, 14, 15, 16, 19, 20 and 26 identified in footnote 2 of our November 16 Letter, could you please provide a chart on opening and post opening traffic for October 21, 22, 23, 27, 28, 29, and 30 as well.
5. Please identify the stocks and violations your surveillance department is examining for the 25 investigations Bob McSweeney has opened concerning potential violations that occurred during the week of October 19.
6. For all the stocks in which you are providing us information pursuant to our November 19 Letter, please identify which issuers announced corporate buy-backs during the weeks of October 19 and 26. Of the issuers identified, please state the time and date of the announcement and for how long the corporate buy program lasted.
7. Please send a chart on your DOT system similar to the diagram drawn by your staff in our meeting on November 24. Please include in the diagram where ITS orders enter the system and to the extent possible mark the places on the chart where the back-ups occurred.
8. Please send the October 31st Focus reports for the following firms: E. F. Hutton, Paine Webber, Goldman Sacks, Salomon Brothers, Kidder Peabody, Drexel Burnham, Merrill Lynch, First Boston, Shearson Lehman, Bear Stearns, Morgan Stanley, Dean Witter, Prudential Bache, Donaldson Lufkin, A.G. Edwards, Charles Schwab, Smith Barney, Thomson McKinnon.
9. Please provide us with the Specialist Capital Check Report for the following dates:
10/14 - 10/16
10/26 - 10/30.

We sincerely appreciate your cooperation in providing us with this additional information in a timely manner to help us meet the time constraints imposed on us for completing our review.

Sincerely,

A handwritten signature in dark ink, appearing to read "Howard L. Kramer". The signature is fluid and cursive, with the first name "Howard" being more prominent.

Howard Kramer
Assistant Director



DIVISION OF
MARKET REGULATION

E-34
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 25, 1987

Frederic M. Krieger, Esq.
Associate General Counsel
Chicago Board Options Exchange, Inc.
La Salle at Van Buren
Chicago, Illinois 60604

Re: October Market Break

Dear Fred:

As you know, over the past several weeks, Holly Smith and Howard Kramer have made various data requests to the CBOE in connection with the Commission's study of the market events of October 1987. We appreciate the helpful and timely assistance the CBOE staff has provided over a wide range of issues. Nevertheless, I thought it might be useful if I summarized in writing our various data requests. In addition, we ask that the information be provided on or before December 7, 1987. If this date cannot be met, or if you have any questions, please contact Howard Kramer (202/272-2889) or Holly Smith (202/272-2406) as soon as possible.

1. Provide a list of all complaints or inquiries received by the CBOE concerning the trade dates of October 12 to October 30, 1987. For each complaint or inquiry, indicate the nature of the complaint (e.g., pricing, late "fill" report, inability to obtain accurate quotes, etc.); the trade date(s) involved; the option involved; and whether the complainant is an investor or a CBOE member. If the complainant is an investor, indicate whether he is an individual investor or represents an institutional investor. If the complainant is a broker-dealer, indicate whether the firm is complaining for itself or a customer.

2. Position Limits -- All position limit violations during the weeks of October 12, 19 and 26, 1987, and all requests for position limit exemptions during these weeks.



Frederic M. Krieger
Page Two

3. RAES -- The number of market makers on RAES for each day during the weeks of October 12, 19 and 26, 1987, for index products and a representative sample of equity options. In addition, the number of market makers on RAES by half hour time brackets for periods of free trading during the weeks of October 13 and 19.

4. A list of all trading halts, formal or informal, in any option called during the weeks of October 13 and 19. Please provide the time that each halt was imposed and the time that each halt was lifted.

5. A list of all trading rotations in OEX and SPX (SPX also includes NSX in all references in this letter) during the week of October 19 (include opening rotations plus all others), and any equities that had more than one rotation on any day during that week. Please provide the times when the rotation started and when it was completed.

6. Opening times for OEX, SPX and all equity options during the week of October 19.

7. Total number of out-trades each day during the week of October 19, and the same figure expressed as a percentage of total volume. Please provide separate data for out-trades in OEX, and for purposes of comparison, the average daily number of out-trades in September 1987 with a separate identification for OEX.

8. Total number of book orders (combine index and equity options) for the week of October 19. Comparison figures for the preceding three months.

9. Data regarding the timeliness of execution of book orders in OEX and equities, if possible.

10. Equity and stock index option volume and trade statistics from October 1 to November 6 -- OEX and SPX volume and trade statistics for this period should be shown separately. RAES volume and trade statistics also should be shown separately.

11. Average quote spread statistics for every trade date from October 14-30 for IBM, EK, MCI, HWP, Amdahl, OEX, and SPX, measured as a percentage of option premiums. Include as a comparison a historical measure of daily quote spreads as a percentage of option premium for these options.

12. Time Value Premiums on near term options for each trade date from October 19-30 for OEX, SPX, IBM, EK, MCI and HWP option series. These time value premiums should be compared to a historical measure for a non-expiration week during the months of January, April, and September 1987.

13. Any information collected by the special "group" or "committee" at the CBOE analyzing the pricing of OEX and SPX options on December 20, 1987.

14. For October 22, 1987, the last trade and closing quote for all series of OEX and SPX and any quote adjustment

15. A "pit profile" of the OEX trading pit for October 16, 19, and 21. This should include the number of market makers who executed a trade in the OEX pit for each day, and the percent each day of trades by the following categories: market maker to market maker trades, trades with a floor broker on only one side, and trades between two floor brokers.

16. A chronological survey of the steps the CBOE took in dealing with the liquidity concerns of First Options and the Fossett Corporation.

17. A profile of all firms who "failed" (e.g., went out of business, transferred accounts or otherwise suffered severe financial distress) during the weeks of October 13 and 19, and summary of the primary reasons for such firm failures. In this regard, please inform us how many seat sales since October 13 have been due to such financial distress.

18. The number of market makers whose trading activities were temporarily restricted (including instances in which market makers were asked to liquidate positions) by their clearing firms. Please include the identity of the clearing firms and the options in which the market makers trade.

19. A description of why the CBOE halted trading on October 20, why it reconvened trading and the precise times of such trading halts.

I appreciate the efforts you and others at the CBOE are expending to produce the requested information in a very short time span.

Sincerely,



Richard G. Ketchum
Director



DIVISION OF
MARKET REGULATION

E-37
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 25, 1987

Carrie Dwyer, Esq.
General Counsel
American Stock Exchange
86 Trinity Place
New York, New York 10006

Re: October Market Break

Dear Ms. Dwyer:

We appreciate the assistance and cooperation already provided by the exchange and its members in discussing with the Commission staff recent market volatility. We believe these discussions will aid the staff in its study of market performance during this critical period. While I understand that the Commission staff already has made several data requests from the Amex, we also will need additional data from the exchange to reconstruct accurately trading during the weeks of October 13, 19 and 26. We request that the information outlined below be submitted to us by December 11, 1987. If you have any questions concerning the request, you should contact Howard Kramer at (202) 272-2889 or Sharon Lawson at (202) 272-2910.

In particular, we request the following information for the trade dates of October 16, 19, 20 and 26:

I. Equity Specialist Performance

1. audit trail information for the above dates in GTI Corp., Wang, Unicorp American Corp., Dillard Department Stores, Amdahl, N.Y. Times, Washington Post, Giant Food, and DeLaurentis Entertainment;
2. specialist positions in the above listed stocks both before the opening and after the close of trading on the above specified dates;
3. daily specialist market making statistics for each stock for the above specified dates, including, if available, price continuity, market depth, quotation spreads, stabilization percentage, and percent of participation. Please provide an average for September 1987 of these statistics;



4. data on all proprietary trading by specialists in the above listed stocks, on the dates specified above;
5. any other information, including any internal reports, the exchange has on specialist activity and performance for the dates specified above.

II. Operations

1. for each trade date during the weeks of October 19 and 26, a list of all trading halts, the time each halt was imposed and lifted and the reason for the halt.
 2. Please provide the following statistics for the PERS system for October 6, 14, 15, 16, 20 and 26
 - Average number of opening and post-opening orders per second for each hour bracket (e.g., 8:00-9:00, 10:00 - 11:00).
 - Average number of opening and post-opening reports per second for each hour bracket.
 - Average number of order transmission delays due to "queuing" problems for each hour bracket and average length of delay for each "queued" order.
 - Average size (number of shares) for orders transmitted during each hour bracket.
 - Number of orders being entered into the Exchange's systems during each hour bracket.
 - (a) Of the number of orders entered during each hour bracket, how many were printed out at the specialists' post for execution: (1) within five minutes of time of entry; (2) within 15 minutes; (3) within 30 minutes; (4) within 60 minutes; (5) after 60 minutes; (6) not at all?
 - (b) Of the number of orders entered during each hour bracket, how many of these orders received full reports: (1) within 15 minutes of time of entry; (2) within 30 minutes; (3) within 60 minutes; (4) after 60 minutes; (5) not at all?
 3. Please provide the following statistics for stocks that the Amex serves as primary market for each of the following trade dates: October 6, 14, 15, 16,
-

19, 20 and 26. In addition, for each of the following questions, please provide a daily average for the month of September.

- a. Number of ITS pre-opening notifications for each trade date.
 - Number of shares requested in response to pre-opening notifications.
 - Number of shares sent pursuant to these requests.
- b. Number of "locked markets" for ITS stocks for each hour bracket.
 - Of this number, how many were caused by Amex specialists?
- c. Number of "crossed markets" for ITS stocks for each hour bracket.
 - Of this number, how many were caused by Amex specialists?
- d. Number and nature of ITS inquiries or complaints, e.g. trade-through complaints, directed to Amex specialists for each hour bracket.
 - Of this number, how many received responses by the Amex specialists: (1) within 15 minutes; (2) within 30 minutes; (3) within 60 minutes; (4) after 60 minutes; (5) not at all.
- e. Similar breakdowns for inquiries or complaints sent by Amex specialists.
- f. Please provide a chronology of any operational problems in ITS as well as any periods in which the Amex halted operation of ITS.

III. Market Statistics

1. Please provide the number of Amex firm failures as well as the names of market makers (i.e., specialists, REMMs, ROTs) that failed or were forced to merge or be acquired due to financial difficulties.
2. Please provide the following trade statistics for each trade date in October 1987 and for each hour

bracket for October 16, 19, 20, and 26. In addition, please provide a daily average for September 1987.

- (a) Total number of transactions and shares executed on the Amex.
 - (b) Total number of transactions and shares involving block-size orders (10,000 shares or more).
 - (c) Total number of transactions and shares involving orders routed via the Exchange's automated systems?
3. Please provide the following clearing statistics for each trade date in October 1987 and provide a daily average for September 1987.
- (a) Total number of questioned or "don't know" trades.
 - (b) Total number of questioned or don't know trades resolved by supplemental means at registered clearing agencies.
 - (c) Total number of questioned or don't know trades resolved through exchange facilities on T+2, T+3, T+4, T+5, T+6.

IV. Options Market

- 1. All position limit violations for trade dates during the weeks of October 12, 19, and 26, 1987, and all requests for position limit exemptions during these weeks.
 - 2. The number of market makers on Auto-Ex for each day during the weeks of October 12, 19, and 26, 1987.
 - 3. A list of all trading halts, formal or informal, in any option during the week of October 19. Please provide the time that each halt was imposed and the time each halt was lifted.
 - 4. A list of all trading rotations in XMI and XII during the week of October 19 and any equity options that had more than one trading rotation at any day that week. Please provide the time when the rotation started and when it was completed.
-

5. Any data regarding the timeliness of execution of book orders in XMI and equity options during the week of October 19, 1987, if available.
6. Equity and stock index option volume and trade statistics from October 1, to November 6, 1987. XMI and XII statistics should be separated.
7. Daily specialist market making statistics for XMI, Apple Computer, and Household International for October 6, 14, 15, 16, 19, 20, and 26, 1987. In addition, please provide an average for September 1987 of these daily statistics. Statistics should cover:
 - Price continuity;
 - Market depth;
 - Quotation spreads;
 - Stabilization percentage;
 - Percentage of participation
8. Average quote spread for XMI measured, as a percentage of premium, for every trade date from October 14-30, as well as a historical measure for comparison purposes.
9. Time value premiums on near-term options for XMI, Household International and Apple Computer options for each trade date from October 19-30, as well as for a non-expiration week in January, April, and September 1987.

We sincerely appreciate your cooperation in helping us meet the severe time constraints imposed on us for completing this review.

Sincerely,



Richard G. Ketchum
Director



UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

DIVISION OF
MARKET REGULATION

November 25, 1987

William G. Morton, Jr.
Chairman and Chief Executive Officer
Boston Stock Exchange, Inc.
One Boston Place
Boston, MA 02108

Dear Mr. Morton:

Thank you for the assistance and cooperation already provided by the exchange and its members in discussing with the Commission staff the recent market volatility. We believe these discussions will aid the staff in its study of market performance during this critical period.

I understand you have provided some data already to the Commission staff. We also will need additional data from your exchange to reconstruct accurately the trading by specialist firms during the weeks of October 12, 19 and 26. We request that the information outlined below be submitted to us by December 11, 1987. If you have any questions concerning the request, you can contact Howard Kramer at (202) 272-2889 or Sharon Lawson at (202) 272-2910.

In particular, we request the following information for the trade dates of October 16, 19, 20 and 26:

I. Specialist Activity

1. Audit trail and/or transaction journal information for any trades executed on your exchange on the above dates in International Business Machines, Merck & Co., Eastman Kodak, General Motors, U.S. Steel, Coca Cola, Dayton Hudson, Newmont Mining, GEICO, Bell & Howell, Holly Farms, Household International, Genrad Inc., Universal Matchbox Group Ltd., Malaysia Fund, Zenith Laboratories, Ryland Group, Towle Manufacturing, Shoetown, Harley Davidson, Lonestar Industries, and Cineplex Odeon Corp.
2. Specialist positions in the above listed stocks both before the opening and after the close of trading on the above dates.
3. Data on all proprietary trading by specialists in the above listed stocks, on the dates specified above, to



the extent this information is not already included in the audit trail information provided by the exchange.

4. Any other information the exchange has on specialist activity and performance for the dates specified above, including any internal reports, or statistics on market making performance. In particular, we would appreciate receiving information about the depth, continuity and quote performance of your specialists.
5. In handling orders, particularly limit orders, how did the specialist ensure that those orders received so-called "primary market protection" during the weeks of October 12, 19 and 26.
6. Estimate the total capital available to your specialists to take positions.

II. Specialist Operations

1. Please provide a list of all exchange member firms that act as clearing agents for specialists ("clearing members"), and, for each clearing member:
 - (a) the identity of all specialists for whom it acted at any time during October 1987, and
 - (b) the securities assigned to such specialists.

III. Operations

1. Please provide the following trading statistics for each trade date in October 1987 and for each hour bracket for October 16, 19, 20, and 26. In addition, please provide a daily average for September 1987.
 - (a) Total number of transactions and shares executed on the exchange;
 - (b) Total number of transactions and shares involving block-size orders (10,000 shares or more); and
 - (c) Total number of transactions and shares involving orders routed via the exchange's automated systems. In addition, of the number of orders entered during each hour bracket, how many orders received fill reports within 5 minutes of time of entry? Within 15 minutes? Within 60 minutes? After 60 minutes? Not at all?

2. Please provide the following comparison and clearing statistics for each trade date in October 1987 and provide a daily average for September 1987.
 - (a) Total number of questioned or disputed trades;
 - (b) Total number of questioned or disputed trades resolved through a correction process at registered clearing agencies; and
 - (c) Total number of questioned or disputed trades resolved through a correction process at the exchange on $T + 2$, $T + 3$, $T + 4$, $T + 5$, later than $T + 5$.
3. Please provide a chronology of any modifications, reductions, or cessation of operation of your small order routing and execution system during the weeks of October 19 and 26, 1987. Please explain the actions listed in the chronology. How were member firms affected? What steps does the exchange intend to take in reaction to problems in the operation of the system?
4. Please provide a description of any problems experienced with ITS during the weeks of October 12, 19 and 26, 1987. In addition, please specify the amount of order flow sent and received through ITS during these weeks.

IV. Financial Integrity

Please provide a list of all market-makers (both equity and option, if applicable) that experienced capitalization problems during the weeks of October 12, 19, and 26, 1987, including the date and end result of any action resulting from such problems.

V. Customer Complaints

A list of all complaints or inquiries from exchange members received by your exchange concerning trades (equities and options) during the week of October 19, 1987. For each complaint, indicate the nature of the complaint (e.g., pricing, late fill report, etc.), the trade date involved, the security involved, and whether the firm is complaining for itself or a customer.

We understand that the Commission's Office of Consumer Affairs has sent your exchange a letter requesting similar information concerning complaints by individuals.

4

We sincerely appreciate your cooperation in helping us meet the severe time constraints imposed on us for completing this review.

Sincerely,

Richard G. Ketchum
Richard G. Ketchum
Director



DIVISION OF
MARKET REGULATION

E-46
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 25, 1987

Richard B. Niehoff
President
Cincinnati Stock Exchange, Inc.
205 Dixie Terminal Building
Cincinnati, OH 45202

Dear Mr. Niehoff:

Thank you for the assistance and cooperation already provided by the exchange and its members in discussing with the Commission staff the recent market volatility. We believe these discussions will aid the staff in its study of market performance during this critical period.

I understand you have provided some data already to the Commission staff. We also will need additional data from your exchange to reconstruct accurately the trading by specialist firms during the weeks of October 12, 19 and 26. We request that the information outlined below be submitted to us by December 11, 1987. If you have any questions concerning the request, you can contact Howard Kramer at (202) 272-2889 or Sharon Lawson at (202) 272-2910.

In particular, we request the following information for the trade dates of October 16, 19, 20 and 26:

I. Specialist Activity

1. Audit trail and/or transaction journal information for any trades executed on your exchange on the above dates in International Business Machines, Merck & Co., Eastman Kodak, General Motors, U.S. Steel, Coca Cola, Dayton Hudson, Newmont Mining, GEICO, Bell & Howell, Holly Farms, Household International, Genrad Inc., Universal Matchbox Group Ltd., Malaysia Fund, Zenith Laboratories, Ryland Group, Towle Manufacturing, Shoetown, Harley Davidson, Lonestar Industries, and Cineplex Odeon Corp.
2. Specialist positions in the above listed stocks both before the opening and after the close of trading on the above dates.
3. Data on all proprietary trading by specialists in the above listed stocks, on the dates specified above, to



the extent this information is not already included in the audit trail information provided by the exchange.

4. Any other information the exchange has on specialist activity and performance for the dates specified above, including any internal reports, or statistics on market making performance. In particular, we would appreciate receiving information about the depth, continuity and quote performance of your specialists.
5. In handling orders, particularly limit orders, how did the specialist ensure that those orders received so-called "primary market protection" during the weeks of October 12, 19 and 26.
6. Estimate the total capital available to your specialists to take positions.

II. Specialist Operations

1. Please provide a list of all exchange member firms that act as clearing agents for specialists ("clearing members"), and, for each clearing member:
 - (a) the identity of all specialists for whom it acted at any time during October 1987, and
 - (b) the securities assigned to such specialists.

III. Operations

1. Please provide the following trading statistics for each trade date in October 1987 and for each hour bracket for October 16, 19, 20, and 26. In addition, please provide a daily average for September 1987.
 - (a) Total number of transactions and shares executed on the exchange;
 - (b) Total number of transactions and shares involving block-size orders (10,000 shares or more); and
 - (c) Total number of transactions and shares involving orders routed via the exchange's automated systems. In addition, of the number of orders entered during each hour bracket, how many orders received fill reports within 5 minutes of time of entry? Within 15 minutes? Within 60 minutes? After 60 minutes? Not at all?
-

2. Please provide the following comparison and clearing statistics for each trade date in October 1987 and provide a daily average for September 1987.
 - (a) Total number of questioned or disputed trades;
 - (b) Total number of questioned or disputed trades resolved through a correction process at registered clearing agencies; and
 - (c) Total number of questioned or disputed trades resolved through a correction process at the exchange on $T + 2$, $T + 3$, $T + 4$, $T + 5$, later than $T + 5$.
3. Please provide a chronology of any modifications, reductions, or cessation of operation of your small order routing and execution system during the weeks of October 19 and 26, 1987. Please explain the actions listed in the chronology. How were member firms affected? What steps does the exchange intend to take in reaction to problems in the operation of the system?
4. Please provide a description of any problems experienced with ITS during the weeks of October 12, 19 and 26, 1987. In addition, please specify the amount of order flow sent and received through ITS during these weeks.

IV. Financial Integrity

Please provide a list of all market-makers (both equity and option, if applicable) that experienced capitalization problems during the weeks of October 12, 19, and 26, 1987, including the date and end result of any action resulting from such problems.

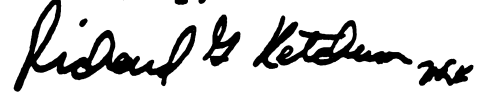
V. Customer Complaints

A list of all complaints or inquiries from exchange members received by your exchange concerning trades (equities and options) during the week of October 19, 1987. For each complaint, indicate the nature of the complaint (e.g., pricing, late fill report, etc.), the trade date involved, the security involved, and whether the firm is complaining for itself or a customer.

We understand that the Commission's Office of Consumer Affairs has sent your exchange a letter requesting similar information concerning complaints by individuals.

We sincerely appreciate your cooperation in helping us meet the severe time constraints imposed on us for completing this review.

Sincerely,

A handwritten signature in dark ink, appearing to read "Richard G. Ketchum". The signature is fluid and cursive, with a prominent "R" and "K".

Richard G. Ketchum
Director



DIVISION OF
MARKET REGULATION

E-50
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 25, 1987

John G. Weithers
Chairman
Midwest Stock Exchange, Inc.
440 South La Salle Street
Chicago, Illinois 60605

Dear Mr. Weithers:

Thank you for the assistance and cooperation already provided by the exchange and its members in discussing with the Commission staff the recent market volatility. We believe these discussions will aid the staff in its study of market performance during this critical period.

I understand you have provided some data already to the Commission staff. We also will need additional data from your exchange to reconstruct accurately the trading by specialist firms during the weeks of October 12, 19 and 26. We request that the information outlined below be submitted to us by December 11, 1987. If you have any questions concerning the request, you can contact Howard Kramer at (202) 272-2889 or Sharon Lawson at (202) 272-2910.

In particular, we request the following information for the trade dates of October 16, 19, 20 and 26:

I. Specialist Activity

1. Audit trail and/or transaction journal information for any trades executed on your exchange on the above dates in International Business Machines, Merck & Co., Eastman Kodak, General Motors, U.S. Steel, Coca Cola, Dayton Hudson, Newmont Mining, GEICO, Bell & Howell, Holly Farms, Household International, Genrad Inc., Universal Matchbox Group Ltd., Malaysia Fund, Zenith Laboratories, Ryland Group, Towle Manufacturing, Shoetown, Harley Davidson, Lonestar Industries, and Cineplex Odeon Corp.
2. Specialist positions in the above listed stocks both before the opening and after the close of trading on the above dates.
3. Data on all proprietary trading by specialists in the above listed stocks, on the dates specified above, to



the extent this information is not already included in the audit trail information provided by the exchange.

4. Any other information the exchange has on specialist activity and performance for the dates specified above, including any internal reports, or statistics on market making performance. In particular, we would appreciate receiving information about the depth, continuity and quote performance of your specialists.
5. In handling orders, particularly limit orders, how did the specialist ensure that those orders received so-called "primary market protection" during the weeks of October 12, 19 and 26.
6. Estimate the total capital available to your specialists to take positions.

II. Specialist Operations

1. Please provide a list of all exchange member firms that act as clearing agents for specialists ("clearing members"), and, for each clearing member:
 - (a) the identity of all specialists for whom it acted at any time during October 1987, and
 - (b) the securities assigned to such specialists.

III. Operations

1. Please provide the following trading statistics for each trade date in October 1987 and for each hour bracket for October 16, 19, 20, and 26. In addition, please provide a daily average for September 1987.
 - (a) Total number of transactions and shares executed on the exchange;
 - (b) Total number of transactions and shares involving block-size orders (10,000 shares or more); and
 - (c) Total number of transactions and shares involving orders routed via the exchange's automated systems. In addition, of the number of orders entered during each hour bracket, how many orders received fill reports within 5 minutes of time of entry? Within 15 minutes? Within 60 minutes? After 60 minutes? Not at all?
-

2. Please provide the following comparison and clearing statistics for each trade date in October 1987 and provide a daily average for September 1987.
 - (a) Total number of questioned or disputed trades;
 - (b) Total number of questioned or disputed trades resolved through a correction process at registered clearing agencies; and
 - (c) Total number of questioned or disputed trades resolved through a correction process at the exchange on T + 2, T + 3, T + 4, T + 5, later than T + 5.
3. Please provide a chronology of any modifications, reductions, or cessation of operation of your small order routing and execution system during the weeks of October 19 and 26, 1987. Please explain the actions listed in the chronology. How were member firms affected? What steps does the exchange intend to take in reaction to problems in the operation of the system?
4. Please provide a description of any problems experienced with ITS during the weeks of October 12, 19 and 26, 1987. In addition, please specify the amount of order flow sent and received through ITS during these weeks.
5. With respect to your OTC/UTP pilot system, please provide information on trade volume, trading halts, if any, and, generally, problems encountered during the weeks of October 12, 19 and 26.

IV. Financial Integrity

Please provide a list of all market-makers (both equity and option, if applicable) that experienced capitalization problems during the weeks of October 12, 19, and 26, 1987, including the date and end result of any action resulting from such problems.

V. Customer Complaints

A list of all complaints or inquiries from exchange members received by your exchange concerning trades (equities and options) during the week of October 19, 1987. For each complaint, indicate the nature of the complaint (e.g., pricing, late fill report, etc.), the trade date involved, the security involved, and whether the firm is complaining for itself or a customer.

We understand that the Commission's Office of Consumer Affairs has sent your exchange a letter requesting

similar information concerning complaints by individuals.

We sincerely appreciate your cooperation in helping us meet the severe time constraints imposed on us for completing this review.

Sincerely,

Richard G. Ketchum

**Richard G. Ketchum
Director**



DIVISION OF
MARKET REGULATION

E-54
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 27, 1987

Dr. Maurice Mann
Chairman & Chief Executive Officer
Pacific Stock Exchange, Inc.
301 Pine Street
San Francisco, CA 94104

Dear Dr. Mann:

Thank you for the assistance and cooperation already provided by the exchange and its members in discussing with the Commission staff the recent market volatility. We believe these discussions will aid the staff in its study of market performance during this critical period.

I understand you have provided some data already to the Commission staff. We also will need additional data from your exchange to reconstruct accurately the trading by specialist firms during the weeks of October 12, 19 and 26. We request that the information outlined below be submitted to us by December 11, 1987. If you have any questions concerning the request, you can contact Howard Kramer at (202) 272-2889 or Sharon Lawson at (202) 272-2910.

In particular, we request the following information for the trade dates of October 16, 19, 20 and 26:

I. Specialist Activity

1. Audit trail and/or transaction journal information for any trades executed on your exchange on the above dates in International Business Machines, Merck & Co., Eastman Kodak, General Motors, U.S. Steel, Coca Cola, Dayton Hudson, Newmont Mining, GEICO, Bell & Howell, Holly Farms, Household International, Genrad Inc., Universal Matchbox Group Ltd., Malaysia Fund, Zenith Laboratories, Ryland Group, Towle Manufacturing, Shootown, Harley Davidson, Lonestar Industries, and Cineplex Odeon Corp.
2. Specialist positions in the above listed stocks both before the opening and after the close of trading on the above dates.
3. Data on all proprietary trading by specialists in the above listed stocks, on the dates specified above, to



the extent this information is not already included in the audit trail information provided by the exchange.

4. Any other information the exchange has on specialist activity and performance for the dates specified above, including any internal reports, or statistics on market making performance. In particular, we would appreciate receiving information about the depth, continuity and quote performance of your specialists.
5. In handling orders, particularly limit orders, how did the specialist ensure that those orders received so-called "primary market protection" during the weeks of October 12, 19 and 26.
6. Estimate the total capital available to your specialists to take positions.

II. Specialist Operations

1. Please provide a list of all exchange member firms that act as clearing agents for specialists ("clearing members"), and, for each clearing member:
 - (a) the identity of all specialists for whom it acted at any time during October 1987, and
 - (b) the securities assigned to such specialists.

III. Operations

1. Please provide the following trading statistics for each trade date in October 1987 and for each hour bracket for October 16, 19, 20, and 26. In addition, please provide a daily average for September 1987.
 - (a) Total number of transactions and shares executed on the exchange;
 - (b) Total number of transactions and shares involving block-size orders (10,000 shares or more); and
 - (c) Total number of transactions and shares involving orders routed via the exchange's automated systems. In addition, of the number of orders entered during each hour bracket, how many orders received fill reports within 5 minutes of time of entry? Within 15 minutes? Within 60 minutes? After 60 minutes? Not at all?
-

2. Please provide the following comparison and clearing statistics for each trade date in October 1987 and provide a daily average for September 1987.
 - (a) Total number of questioned or disputed trades;
 - (b) Total number of questioned or disputed trades resolved through a correction process at registered clearing agencies; and
 - (c) Total number of questioned or disputed trades resolved through a correction process at the exchange on T + 2, T + 3, T + 4, T + 5, later than T + 5.
3. Please provide a chronology of any modifications, reductions, or cessation of operation of your small order routing and execution system during the weeks of October 19 and 26, 1987. Please explain the actions listed in the chronology. How were member firms affected? What steps does the exchange intend to take in reaction to problems in the operation of the system?
4. Please provide a description of any problems experienced with ITS during the weeks of October 12, 19 and 26, 1987. In addition, please specify the amount of order flow sent and received through ITS during these weeks.

IV. Financial Integrity

Please provide a list of all market-makers (both equity and option, if applicable) that experienced capitalization problems during the weeks of October 12, 19, and 26, 1987, including the date and end result of any action resulting from such problems.

V. Customer Complaints

A list of all complaints or inquiries from exchange members received by your exchange concerning trades during the week of October 19, 1987. For each complaint, indicate the nature of the complaint (e.g., pricing, late fill report), the trade date involved, the security involved, and whether the firm is complaining for itself or a customer.

We understand that the Commission's Office of Consumer Affairs has sent your exchange a letter requesting similar information concerning complaints by individuals.

VI. Options

1. A list of all trading halts, formal or informal, in any option called during the week of October 19. Please provide the time each halt was imposed and the time each halt was lifted.
2. The audit trail for October 19 and 20 for any broad-based index option traded on your exchange.
3. Data regarding the timeliness of execution of book orders in your options during the week of October 19, 1987, if available.
4. A measure of the level of market-maker performance (e.g., average quote spread) in any broad-based index option traded on your exchange and for the first, fifth, and tenth most active equity options traded on your exchange ^{1/} as well as options on Dayton Hudson, during the weeks of October 12, 19 and 26 and a representative week in July.
5. An analysis of the pricing relationship maintained in the 10 most active options classes (for the quarter ending September 30, 1987) to their underlying interest (e.g., Were there pricing problems? Did volatility estimates increase?) for the weeks of October 12, 19 and 26.
6. All position limits violations during the weeks of October 13, 19 and 26, and all requests for position limit exemptions during these weeks.
7. Total number of out-trades each day during the week of October 19, and the same figure expressed as a percentage of total volume. Please provide separate data for out-trades in any broad based index option, and for purposes of comparison, the average daily number of out-trades in September 1987 with a separate identification for such broad based index options.

^{1/} As measured for the week of October 19, 1987.

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We sincerely appreciate your cooperation in helping us meet the severe time constraints imposed on us for completing this review.

Sincerely,

Richard G. Ketchum/eg

Richard G. Ketchum
Director



DIVISION OF
MARKET REGULATION

E-59
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 25, 1987

Nicholas A. Giordano
President
Philadelphia Stock Exchange, Inc.
1900 Market Street
Philadelphia, PA 19103

Dear Mr. Giordano:

Thank you for the assistance and cooperation already provided by the exchange and its members in discussing with the Commission staff the recent market volatility. We believe these discussions will aid the staff in its study of market performance during this critical period.

I understand you have provided some data already to the Commission staff. We also will need additional data from your exchange to reconstruct accurately the trading by specialist firms during the weeks of October 12, 19 and 26. We request that the information outlined below be submitted to us by December 11, 1987. If you have any questions concerning the request, you can contact Howard Kramer at (202) 272-2889 or Sharon Lawson at (202) 272-2910.

In particular, we request the following information for the trade dates of October 16, 19, 20 and 26:

I. Specialist Activity

1. Audit trail and/or transaction journal information for any trades executed on your exchange on the above dates in International Business Machines, Merck & Co., Eastman Kodak, General Motors, U.S. Steel, Coca Cola, Dayton Hudson, Newmont Mining, GEICO, Bell & Howell, Holly Farms, Household International, Genrad Inc., Universal Matchbox Group Ltd., Malaysia Fund, Zenith Laboratories, Ryland Group, Towle Manufacturing, Shoetown, Harley Davidson, Lonestar Industries, and Cineplex Odeon Corp.
2. Specialist positions in the above listed stocks both before the opening and after the close of trading on the above dates.
3. Data on all proprietary trading by specialists in the above listed stocks, on the dates specified above, to



the extent this information is not already included in the audit trail information provided by the exchange.

4. Any other information the exchange has on specialist activity and performance for the dates specified above, including any internal reports, or statistics on market making performance. In particular, we would appreciate receiving information about the depth, continuity and quote performance of your specialists.
5. In handling orders, particularly limit orders, how did the specialist ensure that those orders received so-called "primary market protection" during the weeks of October 12, 19 and 26.
6. Estimate the total capital available to your specialists to take positions.

II. Specialist Operations

1. Please provide a list of all exchange member firms that act as clearing agents for specialists ("clearing members"), and, for each clearing member:
 - (a) the identity of all specialists for whom it acted at any time during October 1987, and
 - (b) the securities assigned to such specialists.

III. Operations

1. Please provide the following trading statistics for each trade date in October 1987 and for each hour bracket for October 16, 19, 20, and 26. In addition, please provide a daily average for September 1987.
 - (a) Total number of transactions and shares executed on the exchange;
 - (b) Total number of transactions and shares involving block-size orders (10,000 shares or more); and
 - (c) Total number of transactions and shares involving orders routed via the exchange's automated systems. In addition, of the number of orders entered during each hour bracket, how many orders received fill reports within 5 minutes of time of entry? Within 15 minutes? Within 60 minutes? After 60 minutes? Not at all?

2. Please provide the following comparison and clearing statistics for each trade date in October 1987 and provide a daily average for September 1987.
 - (a) Total number of questioned or disputed trades;
 - (b) Total number of questioned or disputed trades resolved through a correction process at registered clearing agencies; and
 - (c) Total number of questioned or disputed trades resolved through a correction process at the exchange on T + 2, T + 3, T + 4, T + 5, later than T + 5.
3. Please provide a chronology of any modifications, reductions, or cessation of operation of your small order routing and execution system during the weeks of October 19 and 26, 1987. Please explain the actions listed in the chronology. How were member firms affected? What steps does the exchange intend to take in reaction to problems in the operation of the system?
4. Please provide a description of any problems experienced with ITS during the weeks of October 12, 19 and 26, 1987. In addition, please specify the amount of order flow sent and received through ITS during these weeks.

IV. Financial Integrity

Please provide a list of all market-makers (both equity and option, if applicable) that experienced capitalization problems during the weeks of October 12, 19, and 26, 1987, including the date and end result of any action resulting from such problems.

V. Customer Complaints

A list of all complaints or inquiries from exchange members received by your exchange concerning trades during the week of October 19, 1987. For each complaint, indicate the nature of the complaint (e.g., pricing, late fill report), the trade date involved, the security involved, and whether the firm is complaining for itself or a customer.

We understand that the Commission's Office of Consumer Affairs has sent your exchange a letter requesting similar information concerning complaints by individuals.

VI. Options

1. A list of all trading halts, formal or informal, in any option called during the week of October 19. Please provide the time each halt was imposed and the time each halt was lifted.
2. The audit trail for October 19 and 20 for any broad-based index option traded on your exchange.
3. Data regarding the timeliness of execution of book orders in your options during the week of October 19, 1987, if available.
4. Please provide daily specialist market making statistics for Value Line, Newmont Mining and Genrad Inc. options as well as for your first, fifth and tenth most active equity options, ^{1/} for October 6, 14, 15, 16, 19, 20, and 26, 1987. In addition, please provide an average for September 1987 of these daily statistics. Statistics should cover:
 - Price continuity;
 - Market depth;
 - Quotation spreads;
 - Stabilization percentages; and
 - Percentage of participation.
5. An analysis of the pricing relationship maintained in the 10 most active options classes (for the quarter ending September 30, 1987) to their underlying interest (e.g., Were there pricing problems? Did volatility estimates increase?) for the weeks of October 12, 19 and 26.
6. All position limits violations during the weeks of October 13, 19 and 26, and all requests for position limit exemptions during these weeks.
7. Total number of out-trades each day during the week of October 19, and the same figure expressed as a percentage of total volume. Please provide separate data for out-trades in any broad based index option, and for purposes of comparison, the average daily number of out-trades in September 1987 with a separate identification for such broad based index options.

^{1/} As measured for the week of October 19, 1987.

We sincerely appreciate your cooperation in helping us meet the severe time constraints imposed on us for completing this review.

Sincerely,

Richard G. Ketchum H.G.K.

Richard G. Ketchum
Director



DIVISION OF
MARKET REGULATION

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

Joe Carmichael
General Counsel
Boston Stock Exchange Clearing Corporation
1 Boston Place, 38th Floor
Boston, Massachusetts 02109

RE: October Market Break

Dear Joe:

As you may be aware, the Division is conducting a comprehensive review of market activity during the record volume and market decline in October 1987. We would appreciate having your office coordinate the responses to the following items. Your staff has provided us with considerable data during the last month and we appreciate their responsiveness and cooperation. If information is available in a readily available, but different format, we are prepared to accept that data in that format. We request that this information be submitted to us no later than December 10, 1987. If you have any questions please contact Jonathan Kallman or Jerry Greiner at 202/272-2402 or 202/272-2775.

I. Operations

- A. Please describe all system down time, if any, during October 1987, and provide the following related information:
 1. types of system and related functions or services;
 2. date and time of occurrence;
 3. the length of the downtime;
 4. consequences for participant services, such as delayed report distribution; and
 5. cause or estimated cause of the downtime.
- B. Please provide the following information concerning system and service capacity for trade comparison (please identify types of trades for which you perform the comparison function, if any, and please provide data separately for OTC and ITS activity, if possible):



1. average processing time for loading, editing, and processing trade comparison reports;
2. actual processing time daily from October 14 through October 26;
3. peak number of trade sides the system is designed to process;
4. number of trade sides processed daily from October 16 through October 26; and
5. peak number of trade sides processed (and date).

C. Trade Data Input (Please provide data separately for each system)

1. Did you experience delays in receiving trade data input from any of the following sources?
 - a. member firms (including clearing members)
 - b. service bureaus
 - c. other clearing agencies
2. Did any such delay impede or delay orderly processing of transactions? If so, please identify the responsible entity, the date and time the delay occurred, the reason for such delay.
3. Do your rules authorize disciplinary action for such a delay?

D. Participant Services

1. Did you expand the time periods during which certain services are provided?
2. If so, what services were involved, what time frames normally apply and what were the expanded time frames?

E. Clearing Agency Interfaces

1. Did you experience any delays or problems with the Regional Interface operation or the Depository Interfaces?

2. Please describe any such problems, delays or unusual events.

II. Financial Risk Management and Member Monitoring

A. Member settlement defaults:^{1/}

1. For each business day in October 1987, please provide a list of all accounts with settlement debits that were suspended overnight.
2. Please list all accounts with suspended settlement debits that exceeded the member's clearing fund deposit, the dollar value of debits, and the dollar value of the clearing fund deposit.
3. Please indicate when those suspended items were paid.
4. If not paid, please indicate when a decision was made to cease to act for that participant (generally or with respect to specific transactions), or when the participant announced its intention to withdraw from membership or to cease business through your clearing agency.
5. For each participant who withdrew voluntarily or suspended its activities through your clearing agency during October, or for whom your clearing agency ceased to act, please provide the following October daily reports:
 - a. preliminary/final settlement statements;
 - b. projected CNS reports; and
 - c. copies of all position and account adjustments.

^{1/} If data requested in items 1, 2, or 3 are included on a summary report for management, please provide a copy of all such reports.

6. For each participant that withdrew voluntarily or for whom you ceased to act (generally or with respect to specific transactions) during October, please provide the following information:
- a. a summary of securities positions closed-out or bought-in (please describe briefly how those transactions were executed, and anything unusual that occurred in connection with those transactions). Please provide, in summary form, the dollar values and dates of execution for any securities position that accounted for more than 15% of the clearing agency's losses.
 - b. all securities deliveries reversed and related payment debit or credit adjustments.
 - c. list the dollar value of money credits or debits reversed or adjusted by the clearing agency (unrelated to specific securities deliveries).
 - d. required clearing fund contribution and actual deposit.
 - e. form of clearing fund contribution deposit (i.e., cash, government securities, letter of credit).
 - f. amount of clearing fund contribution applied against participant obligations or clearing agency losses.
 - g. loss on liquidation, if any, to date.
 - h. expected recoveries, if any.
- B. Litigation
- 1. Please describe any litigation in which your clearing agency was named as a party or, in connection with litigation among or against
-

any of your participants, you were served with any subpoenas, orders or other process.

2. Please provide a copy of all such documents and any response filed on your behalf.

C. Further Assurances and Member Financial Responsibility.

1. At any time from October 6 through November 6, did you seek from (a) all members; or (b) specific members (please identify):
 - a. additional clearing fund deposits;
 - b. additional mark-to-the-market payments;
 - c. deposits in the nature of further assurances; and
 - d. additional margin deposits.
2. If so, please provide date requested, date paid, dollar amounts requested and dollar amounts collected.

III. Statistics

Please provide the following data with respect to each business day, October 14, 1987 - November 6, 1987.

Continuous Net Settlement System:

Dollar value of debits, credits and net money settlement.
Dollar value of Fails -- Long
Dollar value of Fails -- Short
No. of Shares -- Long
No. of Shares -- Short

Regional Interface Operation:

Number of trade sides processed
 Number of trades rejected
 Dollar value of daily debits and credits

Marks-to-the Market collected or paid
 (and manner of payment)
 Number of fails--long
 Number of fails--short
 Number of breaks or items suspended

Balance Orders:

No. of Deliver Tickets issued
 No. of Receive Tickets issued
 Total Dollar Value

Automated Customer Account Transfers:

No. of Instructions Received
 No. of Instructions Rejected
 No. of Instructions Processed

Money Payments among participants:

No. of Payments processed
 Total Dollar Value

Depository Deliveries:

Total number of book-entry deliveries
 total number of reclaims

Institutional Delivery System

No. of confirms processed
 No. of affirms processed

Depository Custodial Services:

No. of Deposits
 No. of Withdrawals
 -- COD
 -- Withdrawal by Transfer
 (including direct mail)

Interface Deliveries

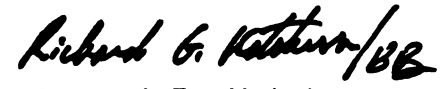
Number of Third Party Deliveries

Number of Dual Participant Deliveries
Number of Fourth Party deliveries
Number of breaks in interface accounts
Dollar value of interface deliveries
Number of interface reclaims/rejects

* * * *

Again, thank you for your cooperation.

Sincerely,

A handwritten signature in cursive script, reading "Richard G. Ketchum" followed by a stylized flourish or set of initials.

Richard G. Ketchum
Director



DIVISION OF
MARKET REGULATION

E-71
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

Richard B. Nesson, Esq.
General Counsel
Depository Trust Company
7 Hanover Square
New York, New York 10004

Re: October Market Break

Dear Richard:

As you may be aware, the Division is conducting a comprehensive review of market activity during the record volume and market decline in October 1987. We would appreciate having your office coordinate the responses to the following items. Your staff has provided us with considerable data during the last month which may address many of the specific areas below, and we appreciate their responsiveness and cooperation. If information is available in a readily available, but slightly different format, we are prepared to accept that data in that format. We request that this information be submitted to us no later than December 10, 1987. If you have any questions, please contact Jonathan Kallman or Jerry Greiner at 202/272-2902 or 202/272-2775.

I. Operations

A. Please describe all system down time, if any, during October 1987, and provide the following related information:

1. types of system and related functions or services;
2. date and time of occurrence;
3. the length of the downtime;
4. consequences for participant services, such as delayed report distribution; and
5. cause or estimated cause of the downtime.

B. Participant Services

1. Did you expand the time periods during which certain services are provided?



2. If so, what services were involved, what time frames normally apply and what were the expanded time frames?

C. Trade Data Input

1. Did you experience delays in receiving trade data input from any of the following sources?
 - a. Participant firms
 - b. service bureaus
 - c. other clearing agencies
2. Did any such delay impede or delay orderly processing of transactions? If so, please identify the responsible entity, the date and time the delay occurred, the reason for such delay.
3. Do your rules authorize disciplinary action for such a delay?

II. Financial Risk Management and Member Monitoring

A. Member settlement defaults:1/

1. For each business day in October 1987, please provide a list of all accounts with settlement debits (in excess of \$250,000) that were suspended overnight.
2. Please list all accounts with suspended settlement debits that exceeded the participant's fund deposit, the dollar value of debits, and the dollar value of the participants fund deposit.
3. Please indicate when those suspended items were paid.
4. If not paid, please indicate when a decision was made to cease to act for that participant (generally or with respect to specific transactions), or when the participant announced its intention to withdraw from membership or to cease business through your clearing agency.

1/ If data requested in items 1, 2, or 3 are included on a summary report for management, please provide a copy of all such reports.

5. For each participant who withdrew voluntarily or suspended its activities through your clearing agency during October, or for whom your clearing agency ceased to act, please provide the following October daily reports:
 - a. preliminary/final settlement statements; and
 - b. copies of all position and account adjustments.
6. For each participant that withdrew voluntarily or for whom you ceased to act (generally or with respect to specific transactions) during October, please provide the following information:
 - a. all securities deliveries reversed and related payment debit or credit adjustments;
 - b. list the dollar value of money credits or debits reversed or adjusted by the clearing agency (unrelated to specific securities deliveries);
 - c. required participant fund contribution and actual deposit;
 - d. form of participants fund contribution deposit (i.e., cash, government securities, letter of credit);
 - e. amount of participants fund contribution applied against participant obligations or clearing agency losses;
 - f. loss on liquidation, if any, to date; and
 - g. expected recoveries, if any.

B. Further Assurances and Member Financial Responsibility.

1. At any time from October 6 through November 6th, did you seek from (a) all participants; or (b) specific participants (please identify):
 - a. additional participants fund deposits;
 - b. additional mark-to-the-market payments; and
 - c. deposits in the nature of further assurances.
2. If so, please provide date requested, date paid, dollar amounts requested and dollar amounts collected.

C. Litigation

1. Please describe any litigation in which your clearing agency was named as a party or, in connection with litigation among or against any of your participants, you were served with any subpoenas, orders or other process.
2. Please provide a copy of all such documents and any response filed on your behalf.

D. Transfers--Please provide a copy of any summaries of Transfer Agent report cards for turnaround performance during September, October and November.

III. Statistics

Please provide the following data with respect to each business day, October 14, 1987 - November 6, 1987.

Money Payments among participants:

No. of Payments processed
Total Dollar value

5

Depository Deliveries:

total number of book-entry deliveries
total number of reclaims

Automatic Deliveries (e.g., PDQ)

Total number of deliveries
Automatic Delivery Rate (%completed) --
Corporate
Automatic Delivery Rate (%completed) --
Municipal

Institutional Delivery System

No. of confirms processed
No. of affirms. processed

Depository Custodial Services:

No. of Deposits
No. of Withdrawals
-- COD
-- Withdrawal by Transfer
(including direct mail)

Interface Deliveries

Number of Third Party Deliveries
Number of Dual Participant Deliveries
Number of Fourth Party deliveries
Number of breaks in interface accounts
Dollar value of interface deliveries
Number of interface reclaims/rejects

* * * *

Again, thank you for your cooperation.

Sincerely,

Richard G. Ketchum / RB

Richard G. Ketchum
Director



DIVISION OF
MARKET REGULATION

E-76
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

A. M. Anderson, Jr.
President
Midwest Clearing Corporation
Midwest Securities Trust Company
MBS Clearing Corporation (Clearing Division)
120 S. LaSalle Street
Chicago, Illinois 60603

RE: October Market Break

Dear Andy:

As you may be aware, the Division is conducting a comprehensive review of market activity during the record volume and market decline in October 1987. We would appreciate having your office coordinate the responses to the following items. Your staff has provided us with considerable data during the last month and we appreciate their responsiveness and cooperation. If information is available in a readily available, but different format, we are prepared to accept that data in that format. We request that this information be submitted to us no later than December 10, 1987. If you have any questions please contact Jonathan Kallman or Jerry Greiner at 202/272-2402 or 202/272-2775.

I. Operations

- A. Please describe all system down time, if any, during October 1987, and provide the following related information:
1. types of system and related functions or services;
 2. date and time of occurrence;
 3. the length of the downtime;
 4. consequences for participant services, such as delayed report distribution; and
 5. cause or estimated cause of the downtime.
- B. Please provide the following information concerning system and service capacity for trade comparison (please identify types of trades for which you perform the comparison function, if any, and please provide data separately for OTC and ITS activity, if possible):



1. average processing time for loading, editing, and processing trade comparison reports;
2. actual processing time daily from October 14 through October 26;
3. peak number of trade sides the system is designed to process;
4. number of trade sides processed daily from October 16 through October 26; and
5. peak number of trade sides processed (and date).

C. Trade Data Input (Please provide data separately for each system)

1. Did you experience delays in receiving trade data input from any of the following sources?
 - a. member firms (including clearing members)
 - b. service bureaus
 - c. other clearing agencies
 - d. securities exchanges
2. Did any such delay impede or delay orderly processing of transactions? If so, please identify the responsible entity, the date and time the delay occurred, the reason for such delay.
3. Do your rules authorize disciplinary action for such a delay?

D. Participant Services

1. Did you expand the time periods during which certain services are provided?
2. If so, what services were involved, what time frames normally apply and what were the expanded time frames?

E. Clearing Agency Interfaces

1. Did you experience any delays or problems with the Regional Interface operation or the Depository Interfaces?
-

2. Please describe any such problems, delays or unusual events.

II. Financial Risk Management and Member Monitoring

A. Member settlement defaults:^{1/}

1. For each business day in October 1987, please provide a list of all accounts with settlement debits that were suspended overnight.
2. Please list all accounts with suspended settlement debits that exceeded the member's clearing fund deposit, the dollar value of debits, and the dollar value of the clearing fund deposit.
3. Please indicate when those suspended items were paid.
4. If not paid, please indicate when a decision was made to cease to act for that participant (generally or with respect to specific transactions), or when the participant announced its intention to withdraw from membership or to cease business through your clearing agency.
5. For each participant who withdrew voluntarily or suspended its activities through your clearing agency during October, or for whom your clearing agency ceased to act, please provide the following October daily reports:
 - a. preliminary/final settlement statements;
 - b. projected CNS reports; and
 - c. copies of all position and account adjustments.
6. For each participant that withdrew voluntarily or for whom you ceased to act (generally or with respect to specific

^{1/} If data requested in items 1, 2, or 3 are included on a summary report for management, please provide a copy of all such reports.

transactions) during October, please provide the following information:

- a. a summary of securities positions closed-out or bought-in (please describe briefly how those transactions were executed, and anything unusual that occurred in connection with those transactions). Please provide, in summary form, the dollar values and dates of execution for any securities position that accounted for more than 15% of the clearing agency's losses.
- b. all securities deliveries reversed and related payment debit or credit adjustments.
- c. list the dollar value of money credits or debits reversed or adjusted by the clearing agency (unrelated to specific securities deliveries).
- d. required clearing fund contribution and actual deposit.
- e. form of clearing fund contribution deposit (i.e., cash, government securities, letter of credit).
- f. amount of clearing fund contribution applied against participant obligations or clearing agency losses.
- g. loss on liquidation, if any, to date.
- h. expected recoveries, if any.

B. Litigation

1. Please describe any litigation in which your clearing agency was named as a party or, in connection with litigation among or against any of your participants, you were served with any subpoenas, orders or other process.

2. Please provide a copy of all such documents and any response filed on your behalf.

C. Further Assurances and Member Financial Responsibility.

1. At any time from October 6 through November 6, did you seek from (a) all members; or (b) specific members (please identify):
 - a. additional clearing fund deposits;
 - b. additional mark-to-the-market payments; and
 - c. deposits in the nature of further assurances.
2. If so, please provide date requested, date paid, dollar amounts requested and dollar amounts collected.

III. Statistics

Please provide the following data with respect to each business day, October 14, 1987 - November 6, 1987.

A. Statistical data regarding MCC/MSTC

Continuous Net Settlement System:

Dollar value of debits, credits and net money settlement.

Dollar value of Fails -- Long

Dollar value of Fails -- Short

No. of Shares -- Long

No. of Shares -- Short

Regional Interface Operation:

Number of trade sides processed

Number of trades rejected

Dollar value of daily debits and credits
Marks-to-the Market collected or paid
(and manner of payment)

Number of fails--long

Number of fails--short

Number of breaks or items suspended

Envelopes Deliveries:

No. of items
Dollar value of debits and credits

Balance Orders:

No. of Deliver Tickets issued
No. of Receive Tickets issued
Total Dollar Value

Automated Customer Account Transfers:

No. of Instructions Received
No. of Instructions Rejected
No. of Instructions Processed

Money Payments among participants:

No. of Payments processed
Total Dollar value

Depository Deliveries:

Total number of book-entry deliveries
total number of reclaims

Stock Loan Activity

Total number of shares loaned to
participants (Corporate and Municipal)

Total dollar value of shares loaned
(Corporate and Municipal)

Number of participants borrowing
securities

Number of participants loaning
securities

Institutional Delivery System

No. of confirms processed
No. of affirms processed

Depository Custodial Services:

No. of Deposits
No. of Withdrawals
-- COD
-- Withdrawal by Transfer
(including direct mail)

Interface Deliveries

Number of Third Party Deliveries
Number of Dual Participant Deliveries
Number of Fourth Party deliveries
Number of breaks in interface accounts
Dollar value of interface deliveries
Number of interface reclaims/rejects

B. Statistical data Regarding MBS Clearing Corporation (Clearing Division)

Total dollar amount of margin on deposit
(Specify form of deposits)

Number of trades recorded
--SBO
--Trade for trade
--Dollar value of those trades

SBO net settlement value

* * * *

Again, thank you for your cooperation.

Sincerely,

Richard G. Ketchum /ck
Richard G. Ketchum
Director



E-83
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

December 3, 1987

DIVISION OF
MARKET REGULATION

Robert J. Woldow, Esquire
Executive Vice President
and General Counsel
National Securities Clearing Corporation
55 Water Street
New York, New York 10041

Dear Bob:

The Division of Market Regulation is conducting a comprehensive review of market activity during the record volume and market decline in October 1987. We would appreciate having your office coordinate the responses to the following items. As indicated below, your staff has provided us with considerable data during the last month which may address many of the specific areas below, and we appreciate their responsiveness and cooperation. To assure the accuracy of that information, we are enclosing a copy of that data for your reference and review. If information is available in a readily available, but slightly different format, we are prepared to accept the data in that format. We request that this information be submitted to us no later than December 11, 1987. If you have any questions regarding these requests, please contact Jonathan Kallman or Jerry Greiner at 202/272-2402 or 202/272-2775.

I. Operations

- A. Please describe all significant system processing delays, if any, during October 1987, and provide the following related information:
 1. types of system and related functions or services;
 2. date and time of occurrence;
 3. the length of the delay;
 4. consequences for participant services, such as delayed report distribution;
 5. cause or estimated cause of the delay.
- B. Please provide the following information concerning system and service capacity for trade comparison:



2

1. average elapsed time from when data was received, input for comparison, compared, and reports were transmitted and distributed;
2. with respect to item 1., actual elapsed time daily from October 14 through October 26;
3. peak number of trade sides system is designed to process;
4. number of trade sides processed daily from October 16 through October 26; and
5. peak number of trade sides processed (and date).

C. Trade Data Input

1. Did you experience delays in receiving trade data input from any of the following sources?
 - a. member firms
 - b. service bureaus
 - c. other clearing agencies
 - d. national securities exchanges
 - e. NASD
 - f. qualified special representatives.
2. Did any such delay impede or delay orderly processing of transactions? If so, please identify the responsible entity, the date and time the delay occurred, the reason for such delay,
3. Do your rules authorize disciplinary action for such a delay?

D. Participant Services

1. Did you expand the time periods during which certain services are provided?
2. If so, what services were involved, what time frames normally apply and what were the expanded time frames?

E. Participant Operations-- please provide a copy of any summaries of participant report cards for services such as trade comparison.**II. Financial Risk Management and Member Monitoring**

A. Member settlement defaults:

1. For each business day in October 1987, with respect to all members, please provide a list of all accounts with settlement debits (in excess of \$250,000) that were placed in suspense accounts overnight;
 2. please list all accounts identified in item 1 above with settlement debits that exceeded the member's clearing fund deposit, the dollar value of debits, and the dollar value of the clearing fund deposit.
 3. please indicate when those items were paid;
 4. if not paid, please indicate when a decision was made to cease to act for that participant (generally or with respect to specific transactions), or when the participant announced its intention to withdraw from membership or to cease business through your clearing agency.
 5. For each participant who withdrew voluntarily or suspended its activities through your clearing agency during October, or for whom your clearing agency ceased to act, please provide the following October daily reports:
 - a. final settlement statements
 - b. CNS accounting summaries;
 6. For each participant that withdrew voluntarily or for whom you ceased to act (generally or with respect to specific transactions) during October, please provide the following information:
 - a. a summary of securities positions closed out or bought in (please describe briefly how those transactions were executed, and anything unusual that occurred in connection with those transactions). Please provide, in summary form, the dollar values and dates of execution for any securities positions that accounted
-

4

for more than 15% of the clearing agency's losses.

- b. all securities deliveries reversed and related payment debit or credit adjustments;
- c. list the dollar value of money credits or debits reversed or adjusted by the clearing agency (unrelated to specific securities deliveries).
- d. required clearing fund contribution and actual deposit;
- e. form of clearing fund contribution deposit (i.e., cash, government securities, letter of credit);
- f. amount of clearing fund contribution applied against participant obligations or clearing agency losses.
- g. loss on liquidation, if any, to date.
- h. expected recoveries, if any.

B. Litigation

- 1. Please describe any litigation in which your clearing agency was named as a party or, in connection with litigation among or against any of your participants, you were served with any subpoenas, orders or other process.
- 2. Please provide a copy of all such documents and any response filed on your behalf.

C. Further Assurances and Member Financial Responsibility.

- 1. At any time from October 6 through November 6th, did you seek from (a) all members; or (b) specific members (please identify):
 - a. additional clearing fund deposits

b. additional mark-to-the-market payments

2. If so, please provide date requested, date paid, dollar amounts requested and dollar amounts collected.
3. For the period October 16th to October 23rd, please list daily aggregate clearing fund contributions calculated under your new clearing fund formula and old clearing fund formula. Also provide the aggregate clearing fund requirements for the month of October 1987 under your new clearing fund formula and old clearing fund formula.
4. Please list the approximate total amount of letters of credit held by you during October 1987, the five largest issuers and the total amount issued by each of those banks.

D. Correspondent Accounts at Members

1. Please provide the following information with respect to clearing members that clear for other broker-dealers (specifically, Bear Stearns, Merrill Lynch/Broadcourt, Pershing, Spear Leeds, Lewco Securities):
 - a. if possible, the type of correspondents (e.g., specialists, marketmakers, municipal securities dealers, etc.);
 - b. net settlement debits or credits for those members for each day during the period October 14 to October 30th.

III. Statistics

Please provide the following data with respect to each business day, October 14, 1987 - November 6, 1987.

N.B.: Based on data from your organization and other SRO's we have compiled the attached chart. We would

appreciate your reviewing the chart and correcting any information that appears to be erroneous.

Continuous Net Settlement System:

Dollar value of debits, credits and net
money settlement.
Dollar value of Fails -- Long
Dollar value of Fails -- Short
No. of Items -- Long
No. of Items -- Short
Average Dollar Value/Item -- Long
Average Dollar Value/Item -- Short

Regional Interface Operation:

Number of trade sides processed
Number of trades rejected
Dollar value of daily debits and credits
Number of fails--long
Number of fails--short
Number of breaks or items suspended

Envelope Deliveries:

No. of Items
Dollar value of debit and credits

Money Payments among participants:
No. of Payments processed
Total Dollar value

Balance Orders:

No. of Deliver Tickets issued
No. of Receive Tickets issued
Total Dollar Value

Automated Customer Account Transfers:

No. of Transfer Initiation Forms
("TIFs") Received
No. of TIFs Rejected
No. of Assets Processed

Fund Serv:

No. of Transactions received from
brokers for transmission to funds
-- purchases
-- liquidations

No. of Transactions received from funds
-- purchases
-- liquidations

No. of As of Transactions received from
funds, brokers

Fund Agent Settlements:
Total debits
Total credits

Broker-Dealer Settlements:
Total debits
Total credits

* * * *

Again, thank you for your cooperation.

Sincerely,

Richard G. Ketchum / *82*
Richard G. Ketchum
Director

Appendix A - Expanded Clearing Agency Guarantees

As you know, clearing corporations are moving to earlier trade guarantees, e.g. from T+4 to the date of comparison. As part of its study of the October 1987 market break, the Division is assessing the exposure to clearing corporations from earlier trade guarantees coupled with extreme price volatility and the ways clearing corporations guard against that exposure. The following questions concern that assessment.

(1) When do you currently assess mark-to-the-market payments, i.e. on what day after trade date are marks collected and paid?

(2) When do you now, and when do you plan in the future to, guarantee member trades by reference to the date and hour after trade date?

(3) What specific safeguards do you use now, or do you plan to use with an earlier guarantee, to guard against the increased exposure between the date of guarantee and the date of mark-to-the-market payments?

(4) For trade dates October 15, 16, 19, 1987, please estimate what your members mark-to-the-market debits would have been if marks were collected from the date of trade guarantee. Please provide a sample group of members and the specific debits they would have paid. Please provide the clearing fund deposits you held for these members at that time and those members net settlement obligations from October 19 to 23.

(5) Please contact Jerry Greiner at 202/272-7470 to discuss the manner in which you intend to respond to the above questions.

1. Share Volume - Lines 1-4 list share volume in each market and total share volume for all 3 markets. Peak volume for those markets occurred on October 20 at approximately 280% of normal levels.

NYSE share volume peaked on October 20 at nearly 340% of normal levels. For 12 consecutive trading days (October 15-30) NYSE volume exceeded significantly normal levels.

AMEX share volume exceeded normal levels more than other markets peaking on October 20 at 410% of normal volume.

OTC share volume peaked on October 21 at approximately 200% normal volume.

2. Transaction Volume - Lines 5-7 list transaction volume in each market by referral to trade "sides" reported to NSCC for trade date compared sides and T+1 compared sides. Trade date compared sides refer to transactions executed in automated execution systems, which generally are reported to NSCC by the markets as "locked-in" and do not require input by brokers to NSCC. T+1 compared sides reflect two-sided input by trading parties that is matched by NSCC.

Transaction volume peaked on October 14 at approximately 320% normal levels. Approximately that level was sustained for the three trading days of October 19, 20, 21.

NYSE transaction volume peaked on October 19 at nearly 340% of normal volume. Locked-in trades accounted for approximately ____% of transaction volume.

AMEX transaction volume peaked on October 20 at 337% of normal volume.

OTC transaction volume, like share volume, peaked on October 21 at approximately 240% of normal levels.

3. Uncompared trades - Lines 13-16 list uncompared trade sides as of T+1. Although generally there are 2 sides to each transaction, the total uncompared trade sides do not necessarily enable calculations of the actual number of unresolved transactions. The number of uncompared trade sides peaked for trade date October 19 at approximately 600% of normal rates. For total two-sided input, the number of uncompared trade sides was approximately 12.5% of total two-sided input versus normal levels of approximately 7%.

- 2 -

NYSE uncomparad trade sides peaked for trade date October 19 at approximately 700% of normal levels. For NYSE two-sided input, the T+1 uncomparad trade sides percentage was approximately 12.5% of NYSE two-sided input.

AMEX uncomparad trade sides peaked on October 20 at 780% of normal levels. The T+1 percentage of uncomparad trade sides was approximately 13% of AMEX two-sided input.

OTC uncomparad trade sides peaked on October 19 at approximately 450% of normal levels. The T+1 percentage of uncomparad trades was approximately 12.3% of OTC two-sided input.

TRADING DAY	NO SAMPLE	OCT. 12	OCT. 13	OCT. 14	OCT. 15	OCT. 16	OCT. 19	OCT. 20	OCT. 21	OCT. 22	OCT. 23	OCT. 25	OCT. 27	OCT. 28	OCT. 29	OCT. 30
Share Volume																
1-WTSE	100.5	161.9	172.9	207.4	263.2	330.5	604.3	600.1	649.4	397.2	265.6	300.0	260.2	279.4	250.1	303.4
2-WTSE	10.5	0.5	10.9	9.0	12.0	10.5	35.4	43.4	34.5	34.5	10.7	22.4	21.5	20.3	16.0	22.3
3-WTSE	145.5	117.0	131.7	145.6	151.0	195.9	222.9	204.1	200.1	249.0	177.0	190.5	207.3	202.2	205.9	200.4
4-WTSE	335.5	260.2	315.5	362.0	435.0	532.9	602.6	935.6	771.0	660.6	641.3	527.7	609.0	501.9	600.0	534.1
Transaction Volume (Shares)																
WTSE : Trade Date																
5- : Compared Sides	315,000	293,102	290,952	373,954	466,300	670,474	1,231,000	990,410	1,175,000	804,232	479,102	647,001	502,972	503,030	432,122	501,307
6- : Compared Sides	165,000	136,112	147,006	160,042	206,050	263,954	394,114	433,050	367,360	335,050	195,450	269,516	223,470	230,704	202,244	231,116
WTSE : Trade Date																
7- : Compared Sides	22,000	10,310	20,164	21,124	23,744	34,940	71,002	82,092	85,506	61,124	31,776	61,500	45,222	36,370	33,350	30,100
8- : Compared Sides	10,000	15,755	16,253	10,006	20,015	30,025	50,605	51,990	40,550	40,063	25,011	34,903	36,100	32,217	26,507	30,104
WTSE : Trade Date																
9- : Compared Sides	80,000	13,340	14,444	14,776	16,754	21,782	73,210	22,252	25,902	21,070	20,004	21,045	24,590	20,132	10,400	21,340
10- : Compared Sides	15,000	80,650	86,076	90,002	106,014	155,374	196,536	207,174	223,246	209,100	125,922	175,290	162,990	166,242	130,200	165,176
WTSE : Trade Date																
11- : Compared Sides	623,000	545,357	516,595	695,604	840,173	1,176,549	1,400,331	1,707,776	1,976,137	1,552,335	801,153	1,170,240	1,073,000	960,903	842,953	960,140
WTSE : Trade Date																
12- : Compared Sides	0,000	2010	6290	8073	11,040	20,090	56,626	49,415	37,251	26,922	14,327	14,506	13,337	11,970	11,374	13,091
13- : Compared Sides	1,000	914	806	900	1,050	2,335	6,743	7,790	5,913	4,314	2,324	2933	2443	2303	1790	2054
14- : Compared Sides	6,200	5079	5400	6550	6067	11,073	27,405	27,035	26,264	27,407	1,079	13,240	10,000	9649	8305	9400
15- : Compared Sides	1,000	992	871	1159	1554	2616	5001	5491	3974	3305	1,079	13,240	10,000	9649	8305	9400
16- : Compared Sides	6,500	5511	6990	7331	9047	16,003	67,673	62,544	34,102	24,004	12,370	13,472	11,004	9266	1770	1563
17- : Compared Sides	240	202	191	172	219	355	1064	1164	870	705	507	650	406	305	331	326
18- : Compared Sides	400	344	305	401	492	1164	3452	4400	3710	2054	1197	1307	1163	1052	1473	1590
19- : Compared Sides	2,000	2059	2443	3122	2540	4149	10,792	8375	7346	7064	3445	4965	4232	3903	3473	3590
20- : Compared Sides	1,200					2201	4035	6161	9350	5726	5100	6059	3502	3310	3103	3400



E-94
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

DIVISION OF
MARKET REGULATION

Richard T. Chase
Executive Vice President
Philadelphia Securities Depository Trust Company
Stock Clearing Corporation at Philadelphia
1900 Market Street
Philadelphia, Pennsylvania 19103

RE: October Market Break

Dear Richard:

As you may be aware, the Division is conducting a comprehensive review of market activity during the record volume and market decline in October 1987. We would appreciate having your office coordinate the responses to the following items. Your staff has provided us with considerable data during the last month and we appreciate their responsiveness and cooperation. If information is available in a readily available, but different format, we are prepared to accept that data in that format. We request that this information be submitted to us no later than December 10, 1987. If you have any questions please contact Jonathan Kallman or Jerry Greiner at 202/272-2402 or 202/272-2775.

I. Operations

- A. Please describe all system down time, if any, during October 1987, and provide the following related information:
1. types of system and related functions or services;
 2. date and time of occurrence;
 3. the length of the downtime;
 4. consequences for participant services, such as delayed report distribution; and
 5. cause or estimated cause of the downtime.
- B. Please provide the following information concerning system and service capacity for trade comparison (please identify types of trades for which you perform the comparison function, if any, and please provide data separately for OTC and ITS activity, if possible):



1. average processing time for loading, editing, and processing trade comparison reports;
2. actual processing time daily from October 14 through October 26;
3. peak number of trade sides the system is designed to process;
4. number of trade sides processed daily from October 16 through October 26; and
5. peak number of trade sides processed (and date).

C. Trade Data Input (Please provide data separately for each system)

1. Did you experience delays in receiving trade data input from any of the following sources?
 - a. member firms (including clearing members)
 - b. service bureaus
 - c. other clearing agencies
2. Did any such delay impede or delay orderly processing of transactions? If so, please identify the responsible entity, the date and time the delay occurred, the reason for such delay.
3. Do your rules authorize disciplinary action for such a delay?

D. Participant Services

1. Did you expand the time periods during which certain services are provided?
2. If so, what services were involved, what time frames normally apply and what were the expanded time frames?

E. Clearing Agency Interfaces

1. Did you experience any delays or problems with the Regional Interface operation or the Depository Interfaces?

2. Please describe any such problems, delays or unusual events.

II. Financial Risk Management and Member Monitoring

A. Member settlement defaults:^{1/}

1. For each business day in October 1987, please provide a list of all accounts with settlement debits that were suspended overnight.
2. Please list all accounts with suspended settlement debits that exceeded the member's clearing fund deposit, the dollar value of debits, and the dollar value of the clearing fund deposit.
3. Please indicate when those suspended items were paid.
4. If not paid, please indicate when a decision was made to cease to act for that participant (generally or with respect to specific transactions), or when the participant announced its intention to withdraw from membership or to cease business through your clearing agency.
5. For each participant who withdrew voluntarily or suspended its activities through your clearing agency during October, or for whom your clearing agency ceased to act, please provide the following October daily reports:
 - a. preliminary/final settlement statements;
 - b. projected CNS' reports; and
 - c. copies of all position and account adjustments.

^{1/} If data requested in items 1, 2, or 3 are included on a summary report for management, please provide a copy of all such reports.

6. For each participant that withdrew voluntarily or for whom you ceased to act (generally or with respect to specific transactions) during October, please provide the following information:

- a. a summary of securities positions closed-out or bought-in (please describe briefly how those transactions were executed, and anything unusual that occurred in connection with those transactions). Please provide, in summary form, the dollar values and dates of execution for any securities position that accounted for more than 15% of the clearing agency's losses.
- b. all securities deliveries reversed and related payment debit or credit adjustments.
- c. list the dollar value of money credits or debits reversed or adjusted by the clearing agency (unrelated to specific securities deliveries).
- d. required clearing fund contribution and actual deposit.
- e. form of clearing fund contribution deposit (i.e., cash, government securities, letter of credit).
- f. amount of clearing fund contribution applied against participant obligations or clearing agency losses.
- g. loss on liquidation, if any, to date.
- h. expected recoveries, if any.

B. Litigation

1. Please describe any litigation in which your clearing agency was named as a party or, in connection with litigation among or against
-

any of your participants, you were served with any subpoenas, orders or other process.

2. Please provide a copy of all such documents and any response filed on your behalf.

C. Further Assurances and Member Financial Responsibility.

1. At any time from October 6 through November 6, did you seek from (a) all members; or (b) specific members (please identify):
 - a. additional clearing fund deposits;
 - b. additional mark-to-the-market payments;
 - c. deposits in the nature of further assurances; and
 - d. additional margin deposits.
2. If so, please provide date requested, date paid, dollar amounts requested and dollar amounts collected.

III. Statistics

Please provide the following data with respect to each business day, October 14, 1987 - November 6, 1987.

Continuous Net Settlement System:

Dollar value of debits, credits and net money settlement.
Dollar value of Fails -- Long
Dollar value of Fails -- Short
No. of Shares -- Long
No. of Shares -- Short

Regional Interface Operation:

Number of trade sides processed
Number of trades rejected
Dollar value of daily debits and credits

Marks-to-the Market collected or paid
(and manner of payment)
Number of fails--long
Number of fails--short
Number of breaks or items suspended

Balance Orders:

No. of Deliver Tickets issued
No. of Receive Tickets issued
Total Dollar Value

Automated Customer Account Transfers:

No. of Instructions Received
No. of Instructions Rejected
No. of Instructions Processed

Money Payments among participants:

No. of Payments processed
Total Dollar value

Depository Deliveries:

Total number of book-entry deliveries
total number of reclaims

Institutional Delivery System

No. of confirms processed
No. of affirms processed

Depository Custodial Services:

No. of Deposits
No. of Withdrawals
-- COD
-- Withdrawal by Transfer
(including direct mail)

Interface Deliveries

Number of Third Party Deliveries
Number of Dual Participant Deliveries
Number of Fourth Party deliveries
Number of breaks in interface accounts
Dollar value of interface deliveries
Number of interface reclaims/rejects

* * * *

Again, thank you for your cooperation.

Sincerely,

Richard G. Ketchum / R.G.

Richard G. Ketchum
Director



DIVISION OF
MARKET REGULATION

E-101
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 30, 1987

Mr. Fred D. Casey
President
Options Clearing Corporation
200 South Wacker Drive
Chicago, IL 60606

Dear Fred:

As you know, the Division of Market Regulation is conducting a comprehensive review of market activity during the record volume and market decline in October 1987. Your staff has provided us with considerable data during the last month which may address many of the specific areas below, and we appreciate their responsiveness and cooperation. We would appreciate having your office coordinate responses to the following additional items. If information is available in a readily available, but slightly different format, we are prepared to accept the data in that format. We request that this information be submitted to us no later than December 14, 1987. If you have any questions regarding these requests, please contact Jonathan Kallman or Jerry Greiner at (202) 272-2402 or (202) 272-7470.

A. Member Services

1. During October 1987, did you expand the time periods during which certain services are provided?
2. If so, what services were involved, what time frames normally apply and what were the expanded time frames?
3. Were reports to members delayed? If so, what reports were involved, when are those reports normally delivered, and when were delayed reports delivered?

B. Trade Input from Exchanges

1. Did you experience delays or other operational problems in receiving reports from options exchanges during October 1987 (e.g., reports of exchange transactions or price information)? If so, please identify the reports, exchanges, reasons for delay, and effects on your processing.



Mr. Fred D. Casey
Page Two

C. Pricing Information

1. Please identify what types of pricing information are necessary for OCC processing and who provides that information to OCC.
2. During October 1987, was pricing information supplied to OCC delayed or inaccurate? If so, identify the type of information, the provider of that information, and the effects of delays or inaccuracies on OCC processing (e.g., margin calculations).
3. What steps have been taken to correct any problems which were encountered?

D. Member Monitoring

1. How does OCC monitor the financial capacity of its clearing members on a day-to-day basis?
2. How does OCC interact with other clearing agencies to monitor joint members? Specifically, please list all clearing corporations (both securities and commodities) with whom OCC interacts on a routine basis concerning the financial responsibility of its members.

E. Member Settlement Defaults

1. For each business day in October 1987, please provide a list of all accounts with settlement debits that were not paid on that day.
 2. Please list all accounts identified in item 1 above with settlement debits that exceeded the member's margin and clearing fund deposits, the dollar value of debits, and the dollar value of the margin and clearing fund deposits.
 3. Please indicate when those items were paid.
 4. If not paid, please indicate when a decision was made to cease to act for that member (generally or with respect to specific transactions), or when the member announced its intention to withdraw from membership or to cease doing business through your clearing agency.
-

Mr. Fred D. Casey
Page Three

5. For each member who withdrew voluntarily or suspended its activities through your clearing agency during October 1987, or for whom your clearing agency ceased to act, please provide summary position reports for each business day during October 1987.
6. Please provide a narrative description of how those members were handled under your contingency system, including contingency system reports.
7. Please identify any losses on liquidations of those members and any expected recoveries.
8. Please describe any litigation your clearing agency is involved in that was initiated since October 1, 1987.

F. First Options of Chicago Incorporated, Fossett Corporation, Timber Hill Inc.

1. Please provide the following information for accounts maintained by the above firms during October 1987:
 - a. number and identity of separate market-maker's or specialist's accounts;
 - b. number of combined market-makers' or specialists' accounts and the number of market-makers or specialists using those accounts;
 - c. number of registered trader's accounts and number of combined registered traders' accounts (including number of registered traders serviced by those accounts); and
 - d. number and identity of stock market-maker's or stock specialist's accounts.
2.
 - a. Please provide for each day during the month of October the total amount and composition of margin and clearing fund deposits attributable to those firms.
 - b. For intra-day margin calls on October 19, 20, 21, 1987, please indicate the number and amount of variation margin calls applicable to those firms and the portion of each call

Mr. Fred D. Casey
Page Four

attributable to the accounts above. Also, please indicate when those calls were paid and whether and how any calls were reduced, revised, or forgiven. To the extent possible, please provide information concerning variation margin attributable to specific NEO options (e.g., by reference to class or product groups).

3. During the month of October 1987, with respect to those firms, what information was exchanged and what reports were shared between clearing corporations, including commodity clearing corporations?
4. Please provide any information you have concerning the failure of specific market-makers, specialists, registered traders, and stock market-makers or specialists to meet their obligations to those firms and the approximate dollar values of those failures.
5. Please indicate any limitations placed on those firms during October 1987. In particular, please provide a complete chronology of all formal and informal actions, including any transfer or non-routine closing of positions, taken with respect to those firms.
6. We understand that OCC calculates on a daily basis potential losses on liquidation of member positions. Please provide any estimates you have concerning those probable losses on liquidation of those firms' positions as of specific dates during October 1987 that you have examined. Please indicate whether those probable losses include application of margin and clearing fund deposits of those firms. We also understand that because of market activity and position size some positions posed unique potential problems for OCC. Please provide a narrative of OCC's specific concerns with respect to such positions for those firms.

G. Correspondent Accounts at Members

1. Please list the five largest clearing members that clear for other broker-dealers (specifically, broker-dealers that act as market-makers or

Mr. Fred D. Casey
Page Five

specialists) by reference to the approximate number of correspondents each of those clears for. Also, provide the following information about those members:

- a. type of correspondents (e.g., options specialists, market-makers, registered traders, stock specialists, etc.);
- b. net settlement debits or credits for those members for each day during October 1987.

H. Pledge Program Activity

1. To the extent available, please provide daily summary data for equity and NEO options pledged within OCC's pledge program during October 1987 (e.g., total options pledged, options pledgers and pledgees with significant activity, etc.).

I. Margin

1. Please provide a narrative description of how the daily margin intervals are calculated for NEO options and whether any modifications to those calculations were made during October 1987.
2. For each business day during the month of October 1987, please provide the margin interval used for each index option series for the five index options with the largest open interest and the premium margin, additional margin, and total margin requirement per unpaired short put and call contract.
3. For each business day during the month of October 1987, please provide for unpaired or uncovered short equity options series the daily marking price, multiplication factor and total margin requirement per short put and call contract for a sample of 10 of the most volatile equity options during October 1987.
4. Please provide a narrative description of how OCC determines when to make intra-day variation margin calls (e.g., by reference to movements of prices in underlying markets) and how much additional margin to require for individual unpaired or uncovered index options and equity options used in paragraphs (2) and (3) above.

Mr. Fred D. Casey
Page Six

5. For October 16, 19, 20, 21, 26, 1987, please provide the number, amount, and time of intra-day variation margin calls for equity and NEO options. To the extent possible, please provide variation margin amounts attributable to specific NEO options.
6. During October 1987, did you impose special margin requirements or change multiplication factors for equity options? If so, please describe those requirements or changes.
7. Please provide information available to you concerning the amount and composition of margin held by you for a sample or average period during 1987 and for each business day in October 1987 for equity and NEO options. Please list the five largest issuers of letters of credit, total amount issued to you as of November 1, 1987, and the amounts issued by each bank during October 1987.
8. Please provide examples and narrative descriptions of spread margin for index options including puts, calls, longs, shorts, and different classes within product groups.

J. Miscellaneous

1. Please list OCC money settlement figures for each business day during October 1987 (e.g., total debits and credits).
 2. Please describe all actions taken by OCC under new OCC Rule 609A, including applicable Rule 609A reports.
 3. In general, what aspects of clearing member activity exposed OCC to potential risk during the recent market break, e.g., heavy concentration of clearing members' positions in particular option classes? What devices protect against these risks? Were these devices adequate during the period in question?
-

Mr. Fred D. Casey
Page Seven

4. In light of recent events in the market does OCC plan any changes/enhancements to its systems, rules or procedures to account for increased volatility?

We sincerely appreciate your cooperation.

Sincerely yours,

Richard G. Ketchum / *BB*
Richard G. Ketchum
Director

cc: Michael D. Weiner, Esq.

**INFORMATION REQUESTS
TO ISSUERS AND
INSTITUTIONAL INVESTORS**



E-111
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

November 19, 1987

Attention: Chief Financial Officer

Dear Sir or Madam:

The Commission's staff is conducting a comprehensive review of the October market break. This review, which must be completed by the end of the year, will encompass a wide range of issues, from the role of certain index-related trading strategies to the impact of recent price volatility on individual and institutional investments in the nation's securities markets.

We note that on or after October 19, 1987, your company commenced a stock repurchase program. To assist us in completing our review of the market break and its impact, we request that you provide us with a listing of the company's daily purchases of its securities from the time of its repurchase program announcement through November 20, 1987. Please send this information to the Division of Corporation Finance (Attention: Herbert Scholl) either by telecopier or overnight mail, no later than December 7, 1987. The Commission's telecopier number is (202) 272-7050 or 7051.

Your assistance in helping us meet the severe time constraints for our market study is greatly appreciated. If you have any questions concerning this request, please call Mr. Scholl at (202) 272-3229.

Sincerely,

Elisse B. Walter by HM
Elisse B. Walter
Deputy Director



December 4, 1987

Dear _____:

The Commission's staff is conducting a comprehensive review of the October market break. This review, which must be completed by the end of the year, will encompass a wide range of issues, from the role of certain index-related trading strategies to the impact of recent price volatility on individual and institutional investments in the nation's securities markets.

We note that on or after January 1, 1987, your company announced a stock repurchase program. To assist us in completing our review of the market break and its impact, we request that you provide us with the total number of shares authorized for purchase and a listing of the company's daily purchases of its securities from October 19, 1987 through November 20, 1987 (including the daily high and low per share purchase prices for that period). Please send this information to the Division of Corporation Finance (Attention: Herbert Scholl) either by telecopier or overnight mail, no later than December 18, 1987. The Commission's telecopier number is (202) 272-7050 or 7051.

Your assistance in helping us meet the severe time constraints for our market study is greatly appreciated. If you have any questions concerning this request, please call Mr. Scholl at (202) 272-3229.

Sincerely,

Elisse B. Walter
Deputy Director

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549



DIVISION OF
MARKET REGULATION

November 17, 1987

Dear

The Division of Market Regulation is conducting a comprehensive review of the October market break. This review, which must be completed by the end of the year, will encompass a wide range of issues, from the role of certain index-related trading strategies to the impact of recent price volatility on individual and institutional investments in the nation's securities markets. Your perspective, as one of the leading money managers, will be essential to this study. Therefore, we request that your firm complete the following questionnaire, and send this information to the Division of Market Regulation, either by telecopier or overnight mail, no later than December 7, 1987. The Division's telecopier number is (202) 272-7050 or 7051.

Your assistance in helping us meet the severe time constraints for our market study is greatly appreciated. If you have any questions concerning this questionnaire, please call Alton Harvey at (202) 272-2970.

Sincerely,

A handwritten signature in cursive script that reads "Richard Ketchum".

Richard G. Ketchum
Director



QUESTIONNAIRE

Please provide the following information to the Division of Market Regulation, either by telecopier or overnight mail no later than December 7, 1987. The Division's telecopier number is (202) 272-7050 or 7051. Your assistance in helping us meet the severe time constraints for our market study is greatly appreciated.

Background Statistics

For each month in 1987 please provide the following aggregate figures for your firm. In addition, please provide average annual figures for these questions for 1983 to 1986.

1. Average daily U.S. Dollar amount ^{1/} of money under management (discretionary and non-discretionary). If a daily average is unavailable, please indicate beginning-of-month ("BOM") or end-of-month ("EOM") amount.
2. Percentage of the above U.S. dollar amount invested in the following types of stock (also, please provide figures in thousands of shares):
 - NYSE-listed Stock
 - Amex-listed Stock
 - National Market System ("NMS") NASDAQ Stock
 - Non-NMS NASDAQ Stock
3. Percentage of the above U.S. dollar amount invested in long-term and short-term debt securities (government, municipal, and corporate).
4. Percentage of the above U.S. dollar amount maintained in cash and cash equivalents.
5. Percentage of the above U.S. dollar amount invested in the following (also, please provide approximate number of contracts for each type of future or option):
 - Equity options
 - Index options
 - Index futures
 - Other financial futures

^{1/} By "U.S. dollar amount" we mean the total amount of managed money, in whatever currency, calculated to the equivalent amount in U.S. dollars.

Portfolio Insurance

Do you employ, or have you in the past employed, "portfolio insurance" or "dynamic hedging" strategies? If you have, please provide:

1. The time periods in which the strategies were employed.
2. Please provide the identity of the vendor(s) and a brief description of the basic strategy:
 - (a) For each month in 1987, please indicate the time frame (e.g., one-year, two-year) for this portfolio protection.
 - (b) Please indicate the particular index's price movements which would "trigger" transactions in index futures or options on the following trade dates: April 1, 1987, September 1, 1987, and October 6, 14, 15, 16, 19, 20, 26.
3. For each month in 1987, please indicate:
 - (a) The percentages of total positions in the index futures or index options (and number of contracts for each type of future or option) employed in those strategies.
 - (b) Percentage of managed money intended to be protected by those strategies.
 - (c) To the extent that it can be quantified, the increase in the percentages of your managed money invested in equities (if any) which can be attributed, at least in part, to your reliance upon the protections provided by portfolio insurance.

October Market Break

1. Please provide the percentages of stock portfolios liquidated (also, in thousands of shares and approximate dollar amount) during the following periods. Please distinguish NYSE-listed, Amex-listed, NMS NASDAQ, and non-NMS NASDAQ stocks.
 - Weeks of October 5 - 9, October 12 - 16, October 19 - 23, and October 26 - 30.
-

- Trade dates October 6, 14, 15, 16, 19, 20, and 26.
2. Please provide the percentages of your purchase and sell orders (also, in thousands of shares and approximate dollar amount) in NYSE-listed stocks directed to the following markets on October 6, 14, 15, 16, 19, 20, and 26:
- NYSE
 - Other U.S. Exchanges
 - U.S. Third Market
 - Foreign Markets
3. Please provide figures (in number of contracts and approximate dollar amount) for your firm's purchases and sales of index futures and index options for the following periods.
- Weeks of October 5 -9, October 12 - 16, 19 - 23, and October 26 - 30.
 - Trade dates October 6, 14, 15, 16, 19, 20, and 26.
4. If applicable, approximately what percentage of your sales of index futures or index options (also, please provide number of contracts for each type of future or option) would be attributable to the inability to execute stock transactions at acceptable prices on each of the following dates: October 6, 14, 15, 16, 19, 20, and 26?
5. If applicable, approximately what percentage of your sales of NYSE-listed stocks (also, please indicate thousands of shares and approximate dollar amount) would be attributable to an inability to execute futures or options trades in portfolio insurance strategies for each of the following dates: October 6, 14, 15, 16, 19, 20, 26.
6. After contacting your broker to communicate a 10,000 share buy or sell order, approximately how long did it take for you to receive a report of the trade execution on each of the following dates: October 6, 14, 15, 16, 19, 20, 26.
- Approximately how long would it have taken, on average, to receive such reports in September 1987?
-

7. Please indicate the methods your firm uses to communicate equity buy or sell orders to securities broker-dealers:
- Telephone
 - Direct Lines
 - Commercial Lines
 - Telex
 - Tele floor
 - Broker-Dealer's communication system
 - Computer link (modem)
9. Please indicate whether you experienced any delay in communicating orders on each of the following dates, and indicate the media through which you experienced delays: October 6, 14, 15, 16, 19, 20, 26.
10. Please provide a brief description of how the October Market Break may have changed your investment strategies for your various types of accounts.
- (a) Has it lead to a reduction in the percentage of your portfolios invested in equities?
 - (b) To a shift in investments in certain types of stock (e.g., NYSE-listed versus OTC stock)?
 - (c) To reduced reliance upon stock order executions on particular markets (e.g., NYSE versus Third Market)?
 - (d) To increased or reduced reliance upon, or initiation or termination of portfolio insurance strategies?
 - (e) If you are reducing your equity investment and reliance upon portfolio insurance strategies, are these changes interrelated?

APPENDIX F

REGIONAL STOCK EXCHANGE TRADING

This Appendix analyzes in more detail market making activity on each of the five regional stock exchanges. ^{1/}

A. Midwest Stock Exchange ("MSE")

During October 16, 19, 20, and 26, the daily average number of trades on the MSE was 34,390 and the average volume was 22,939,933 shares. This compares with a September average daily of 13,969 trades and 12,326,418 shares. For the four day period MSE executed an average of 285 block trades ^{2/} per day involving an average daily volume of 11,252,274 shares or 49% of the total average daily volume of the MSE for each of the four days. During the market break period MSE traded 20 of the 22 stocks for which the Division of Market Regulation ("Division") requested audit trail and transaction journal information. ^{3/}

For Friday October 16, MSE executed 25,981 trades, 186% of the September 1987 average, and had a volume of 19,311,032 shares, 157% of the September daily average. Among the seven blue chip issues in our sample, four were net buyers, and three were net sellers. By the close of trading on October 16, specialists were long in only three of these stocks, and these were relatively small positions. Among the small capitalization issues in our sample traded on October 16, four had no net change in position. For example, the specialist in Genrad opened with no position, bought 1,600 shares, sold 1,600 shares, and closed with no position. Specialists in four other small capitalization issues were net sellers on the 16th.

On October 19, for all issues traded, MSE executed 37,424 trades, 268% of the September daily average, with a volume of 22,711,906 shares, 184% of the September average volume. During the day MSE executed 285 block trades involving 10,328,300 shares or 45% of the total volume of shares traded on the 19th.

Specialists in blue chip issues were primarily net sellers on October 19, but the volume of trading on blue chip issues generally was lower than on October 16. ^{4/} Surprisingly, the closing position for specialists in the four blue chip issues that were net sellers on October 19 were short and, while modest by NYSE standards, some were relatively large for regional specialists (e.g., General Motors, -9,140 shares and Zenith -9,800 shares).

^{1/} See Chapter Four for detail of order flow and number of trades on the regional exchanges.

^{2/} The term "block trades" as used in this portion of the Study means trades of 10,000 shares or more.

^{3/} MSE provided data on all the sample stocks except Towle Manufacturing and Universal Matchbox.

^{4/} For example, volume for Eastman Kodak on October 16 was 83,300 shares versus 30,230 shares on October 19. For General Motors, 89,250 shares were traded on October 16 versus 60,000 shares on October 19.

Specialists in six of the 10 small capitalization issues and all of the takeover issues were net buyers on the 19th. The volume of purchases and sales of shares by the specialists in these issues, however, tended to be low and the closing positions, although long, were generally only a few hundred shares.

Tuesday, October 20, was the heaviest trading day on the MSE for the market break period. During interviews with MSE specialists and floor brokers, they indicated that the increase in orders came from firms that normally routed only a portion of their orders to the MSE but that were now sending up to 100% of their volume to the exchange, and surmised that this was in response to the delays on the New York Stock Exchange ("NYSE"). MSE data shows 46,722 trades were executed, 334% of the average daily trades for September, with a volume of 25,574,422 shares, 207% of the average September daily volume. The trading activity picked up considerably on the 20th. For example, the General Motors specialist participated in trades totalling 224,978 shares (but was a net buyer of only 5,678 shares). Again, in the 20 sample issues MSE provided data for, specialists were generally net sellers (in 12 issues specialists were net sellers, in seven issues specialists were net buyers) on the 20th. Most notably, the Dayton Hudson specialist was a net seller of 12,965 shares, and closed short 12,465 shares.

On October 20, it appears that specialists did not want to close with substantial long positions in the blue chip issues. Indeed, specialists generally ended the day with short positions in the blue chip issues. Closing positions in the small capitalization issues were generally long and small, while takeover issues all closed short with generally small positions.

Monday, October 26, was another heavy volume day for the MSE with 27,436 trades reported, 196% of the September average, and a volume of 24,127,984 shares, 196% of the average September daily volume. The 197 block trades executed accounted for 61% of the shares traded. As with the other days in the study, MSE specialists were usually net sellers on the 26th (12 of the 20 issues). Again, the blue chip specialists were mostly net sellers, as were the specialists in the small capitalization issues.

Although specialists on the MSE both bought and sold throughout the days we studied, it is clear that many did not want to change substantially their positions from the previous day's close. Because of the specialists' perceived difficulty in laying off positions through the Intermarket Trading System ("ITS"), it also appears that the specialists were not as aggressive in buying, and accordingly, often sold more than they bought during the day, many going into the next trading day with short positions.

B. Pacific Stock Exchange ("PSE")

On Friday, October 16, the PSE executed 21,186 trades, 184% of the September average of 11,525 trades per day, and handled a volume of 11,862,400 shares, 162% of the September average volume of 7,345,343 shares. For the day, the PSE specialists were mixed as to buyers and sellers. 5/

On October 16, specialists in five of the seven blue chip issues in our sample were net buyers with two other issues net sellers. The most active net selling blue

5/ PSE provided data on 15 issues.

chip issue was IBM, where the Los Angeles ("LA") and San Francisco ("SF") specialists combined decreased their long positions by 15,309 shares. Specialists in the blue chip issues all closed long.

Specialists in three of the four small capitalization issues for which PSE provided data for the 16th were net sellers. Specialists in the small capitalization issues all closed short with small positions. Two of the three takeover issues were net buyers, and specialists in the takeover issues generally closed long with small positions.

On Monday, October 19, the PSE executed 37,175 trades, 323% of the September average, with a volume of 15,899,200 shares, 216% of the average September volume. On October 19, specialists in six of seven blue chip issues were combined net sellers. Several of the specialists in net selling issues closed with relatively large short positions and had large combined net changes in positions. For example, the Zenith specialist closed short in LA 9,344 shares, short in SF 775 shares, and had a combined net change of -10,855 shares for the day.

Among small capitalization issues specialists were net sellers in two and were net buyers in two. Specialists in net buying small capitalization issues closed with relatively small positions and had relatively moderate combined net changes. The specialists in one net selling small capitalization issue, Geico, had a combined net change of -1,951 shares. Specialists in takeover issues generally were sellers on the 19th.

On Tuesday, October 20, PSE executed 35,877 trades, 311% of the September average, on a volume of 14,746,000 shares, or 201% of the September daily average volume. October 20 saw heavy selling in all blue chip issues. Eastman Kodak had the most active selling, with the specialists closing short 16,362 shares in LA, short 15,752 shares in SF, with a combined net position change of -28,163 shares. The specialist in IBM also had active selling even when combining the LA and SF figures, and was the only issue to have significantly different trading between the LA and SF floors. The specialists in IBM closed long in SF 12,751 shares for a net change of +10,968. In LA, however, the specialists in IBM closed short 34,330 shares with a net change of -34,336. The combined net change for LA and SF in IBM on the 20th was -23,368 shares. Specialists in blue chip issues generally closed short with relatively large positions.

Specialists in small capitalization issues were all net buyers on the 20th while specialists in takeover issues were generally sellers. Specialists in both small capitalization and takeover issues generally closed short with small positions.

On Monday, October 26, volume returned to normal on the PSE, with 9,605 trades executed, or 83% of the September average, and a volume of 7,329,500 shares, 99% of the average daily September volume. As with October 19, a majority of specialists in blue chip issues were net sellers although on a greatly reduced scale. Only the specialists in USX Corp. showed significant buying activity (a combined net change of +7,452 shares). Specialists in blue chip issues generally closed short with smaller positions than on October 19 and 20.

Specialists in takeover issues were all net buyers, although, again, on a greatly reduced scale from the 20th. Specialists in takeover issues generally closed short with small positions.

In summary, many of the PSE specialists in the blue chip stocks were buyers on October 16 and entered October 19 with long positions. After October 16, however, there appeared to be a selling trend by the specialists, generally, for both October 19 and 20. By October 26, when market volume had dropped significantly, it appears specialists remained somewhat reluctant to close with either substantially long or short positions. Generally, they attempted to maintain relatively flat positions, although there was more of a tendency to be short rather than long by the close.

C. Philadelphia Stock Exchange ("Phlx")

For Friday, October 16, the Phlx executed 9,316 trades, or 170% of the average daily trades for September 1987, with a volume of 4,525,600 shares, 144% of the average daily September volume of 3,136,090 shares. 6/

On October 16, specialists in five of the seven blue chip issues were net buyers, with specialists in the remaining two issues net sellers. For example, the Coca-Cola specialist opened short 219 shares, bought 54,100 shares, sold 40,800 shares and closed long 1,618 shares with a net change of +1,837 shares. 7/ Specialists in the small capitalization issues examined were mixed with three net buyers, two net sellers, and two that closed with no net change in position. Similarly, specialists activity among takeover issues was mixed. Specialists in all issues generally closed long with small positions.

For Monday, October 19, the Phlx executed 17,085 trades, 312% of the September average, with a volume of 6,749,700 shares, 215% of the September average. Ninety block trades involving 2,592,200 shares accounted for 38% of the total daily share volume. Among the blue chip issues, specialists were net sellers in four and net buyers in three. Specialists that were net buyers in blue chip issues, with one exception, bought only slightly more stock than they sold. Specialists in the small capitalization issues generally closed long. Small capitalization issues had three net buyers, three with no change in position and one net seller. Specialists in two of the takeover issues were net sellers, each closing with short positions.

On Tuesday, October 20, the Phlx executed 15,246 trades, 278% of the September average daily trades, with a volume of 6,501,100 shares, 208% of the September average. It executed 112 block trades involving 2,976,400 shares or 46% of the total daily share volume. Specialists in four of the seven blue chip issues were net sellers and three were net buyers. Specialists in most of the net selling issues sold significantly more stock than they bought on the exchange, and made up the difference by buying over ITS or the wire. For example, the Eastman Kodak specialist bought 21,900 shares and sold 45,300 shares on the Phlx, but bought 9,300 more shares than it sold on ITS. Specialists in small capitalization issues were predominately net sellers with small changes in position. In spite of this, specialists in the small capitalization issues generally closed long with small positions. Specialists in takeover issues were mainly net buyers.

6/ The Phlx provided data on 17 issues.

7/ Phlx data for specialist buying and selling does not include purchases or sales by the specialist executed on other markets by telephone order (so called "wire" transactions). These transactions are reflected in the net change in positions.

On Monday, October 26, the Phlx executed 7,512 trades, 137% of the September average, with a volume of 3,240,100 shares, 103% of the September average volume. On that day, 49 block transactions were executed involving 1,099,800 shares or 34% of the total share volume.

Specialists in all three categories of issues in our survey were predominately buyers on this day including: five of seven blue chip issues, three of seven small capitalization issues (specialists in three other small capitalization issues had no change in position with one net seller), and two of the three takeover issues. Specialists that were net buyers in blue chip issues had moderate net changes in position in these stocks, for example General Motors (+1279 shares) and IBM (+858 shares).

Specialists in small capitalization issues that were net buyers assumed relatively moderate closing positions and had generally moderate net changes in positions. Specialists in takeover issues all closed long with relatively small positions.

The trend on the Phlx was somewhat similar to that of the other exchanges. Generally, a majority of the specialists the Division studied entered October 19 with small long positions. On October 19 and 20, buying and selling appeared to be mixed, although there was more selling than buying overall. Moreover, specialist positions did not change substantially on the days we examined. Closing positions on both October 19 and 20 remained relatively small, indicating a desire not to enter the next trading day with substantial long or short positions. By October 26 it appeared there was somewhat more confidence on the Phlx floor, with specialists more willing to close the day with long positions, albeit small ones.

D. Boston Stock Exchange ("BSE")

Of the 22 stocks in the Division's sample, the BSE makes markets in all but Universal Matchbox. Several of the stocks, however, are relatively inactive issues on the BSE and no or little trading occurred with respect to them during the days in question. Accordingly, this section focuses on the relatively active BSE issues, on a day by day basis.

The volume on the BSE was relatively heavy on October 16, with 4,016,339 shares traded on the BSE, 133% of the average daily volume for September 1987. Moreover, while specialists were both buying and selling on October 16, slightly more net selling than net buying was taking place, particularly in the blue chip stocks (in contrast to the MSE, PSE, and Phlx). Out of the seven blue chip issues that traded on the 16th, four of the specialists were net sellers and three were net buyers. 8/ Indeed, out of the 15 issues which traded on October 16, seven of the specialists were net sellers, six were net buyers and two were flat.

8/ For example, on October 16, the specialist in IBM opened long 3,985 shares, bought 34,664 shares and sold 38,911 shares, closing short 262 shares. It should be noted that the figures cited in connection with trading at the BSE reflect trades done on the floor of the BSE and trades through ITS, and do not reflect trades done through a correspondent broker at the NYSE.

Volume on October 19 on the BSE rose to 5,189,105 shares, 171% of the average daily September volume. Most of this increase came from smaller orders. 9/ The net selling by the specialists on October 16 also continued on October 19. Indeed, overall, more net selling took place on October 19 than on October 16, although this was not the case in connection with blue chip stocks (again, the opposite of the MSE, PSE, and Phlx). 10/ Moreover, although specialists were both buying and selling on October 19, trading data indicate that in general, specialists avoided taking substantially long positions. For example, the BSE specialist in Eastman Kodak opened long 366 shares, bought approximately 42,307 shares and sold approximately 41,695 shares, closing long 978 shares. Similarly, the specialist in Dayton Hudson opened flat, bought approximately 3,300 shares and sold approximately 3,200 shares, closing long 100 shares.

Volume increased slightly on October 20 to 5,952,065 shares, 196% of the September average. Once again, although specialists were both buying and selling, more net selling than net buying was taking place, especially in connection with blue chip stocks. Of the 17 issues that traded on October 20, specialists were net sellers in 11 and net buyers in six. Of the seven blue chip issues that traded on October 20, specialists were net sellers in six and a net buyer in one. 11/

By October 26, volume had decreased to 3,773,013 shares, 125% of the September average. Generally, specialists were both buying and selling on the 26th. Once again, they did not take substantially long positions. For example, the BSE specialist in Coca-Cola opened short 776 shares, bought approximately 10,600 shares and sold approximately 9,487 shares, closing long 346 shares.

Fewer transactions occurred during the week of October 26, and the size of the trades were smaller than those during the week of October 19. On October 26, 4,394 trades were executed on the BSE, as opposed to 10,023 trades on October 19. The average size trade during the week of October 26 was 289 shares, which is approximately 45% of the average size trade of 675 shares during the week of October 19.

9/ During the week of October 19, the average trade size was 640 shares. This is approximately 38% smaller than the average trade size for fiscal year 1987, which was 885 shares.

10/ Out of the 16 issues that traded on October 19, specialists were net sellers in 9 stocks and net buyers in 7 stocks. Specialists were net buyers, however, in 3 out of the 6 blue chip stocks that traded that day. (They were net sellers in the other 3 blue chip stocks.)

11/ For example, the BSE specialist in IBM opened short 1,052 shares, bought approximately 51,857 shares and sold approximately 52,949 shares, closing short 2,144 shares. Similarly, the specialist in Coca-Cola opened short 7,061 shares, bought approximately 76,028 shares and sold approximately 77,485 shares, closing short 8,518 shares. Finally, the specialist in Merck opened long 6,322 shares, bought approximately 19,230 shares and sold approximately 26,149 shares, closing short 597 shares.

E. Cincinnati Stock Exchange ("CSE")

Of the 22 stocks in our sample group, CSE makes markets in the following: Eastman Kodak, General Motors, IBM, Coca-Cola, Merck, and USX Corp. CSE, which uses a multiple market maker system instead of a specialist system, has up to five designated dealers in these stocks. 12/

Of the four days in question, the volume on the CSE was the heaviest on October 16. On that day, 1,589,600 shares traded on the CSE, which is 169% of the CSE's daily average volume for September, 1987. 13/ While the designated dealers were both buying and selling on October 16, buy activity was predominant. Moreover, not only were the majority of market makers buying, trading data indicates that, in general, they took and/or retained fairly substantial, long positions. The activity in IBM, one of the most active issues on CSE, illustrates this point. On October 16, the three designated dealers in IBM opened short 20,710, long 91,420 and short 20,564, respectively. They closed long 24,915, long 96,420, and long 27,636, respectively.

On October 19, 1,588,000 shares traded on the CSE, 169% of the September average volume. During the day, the majority of market makers attempted to reduce the long positions acquired on October 16, although they still remained substantially long overall. Moreover, while both volume and the number of transactions on October 19 decreased, relative to the 16th, 14/ the number of block trades increased. There were 37 block trades on October 19, the highest amount out of the four days. 15/ Over a third of the block trades on October 19 occurred between 3:00 p.m. and 4:00 p.m., when the primary market on the NYSE was dropping precipitously.

The designated dealers on the CSE were affected by the market drop on October 19 in several ways. Two stopped making markets, one for the remainder of the week, the other from October 20 through November 20. Apparently, the second market maker experienced capitalization problems after October 19. The other market makers also were affected. As a result of the market drop, a majority of CSE designated dealers widened their bid/ask quotations and lessened quotation size for the remainder of the week. CSE dealers continued to guarantee orders of 2,099 shares or less at the ITS best bid or offer throughout the week.

12/ See discussion of Regional Exchanges in Chapter Four.

13/ The CSE's figures for their designated dealers' open/close positions reflect trading done on the floor, through ITS, and over-the-counter. Its figures, however, for the number of shares bought and sold per designated dealer, and its aggregate figures on the number of shares traded or on block transactions, and the number of transactions per day, do not reflect trades done over-the-counter or through a correspondent broker. Instead, the latter figures only reflect trades done on the floor of the CSE and through ITS.

14/ The number of transactions on October 19 was 903. The number of transactions on October 16 was 1,019.

15/ There were 25 block trades on October 20 and 8 block trades on October 26.

On October 20, volume decreased with respect to October 19 with 1,447,900 shares traded, 154% of the September daily average. Although market makers were both buying and selling, net selling activity predominated, probably due to the fact that many of the market makers remained substantially long as of the previous day's close. For example, one IBM market maker was long 24,915 shares by the end of October 16. This position was reduced to 21,170 by the close of October 19 and further reduced to a short position of 2,684 at the close on October 20.

On October 26, volume was substantially less than it had been the week before with 441,700 shares traded, which is 47% of the September daily average. Although market makers were both buying and selling on October 26, no particular trend emerged.

Overall, the CSE market differed substantially from the other exchanges in that a substantial number of market makers entered, and closed, October 19 with very large long positions. As illustrated above, October 20 appears to have been used at least by some market makers to reduce these positions.

TRADE AND SHARE VOLUME DATA ON THE FIVE REGIONAL EXCHANGES FOR BLOCK TRADES AND SMALL ORDER EXECUTION SYSTEMS¹					
	Sept. Daily Avg.	10/19	10/20	19th as % of Sept.	20th as % of Sept.
BSE					
Block Trades	50	58	64	116%	128%
Block Volume	1,270,645	1,288,200	1,357,850	101%	107%
% of Volume	42%	25%	23%	—	—
Small Trades	n/a	—	—	—	—
Small Volume	n/a	—	—	—	—
% of Volume	n/a	—	—	—	—
CSE					
Block Trades	25	37	25	148%	100%
Block Volume	455,400	1,026,500	1,069,100	230%	240%
% of Volume	47%	65%	74%	—	—
Small Trades	82	256	592	312%	721%
Small Volume	17,900	84,239	134,634	470%	752%
% of Volume	2%	5%	9%	—	—
MSE					
Block Trades	307	285	333	92%	108%
Block Volume	6,624,000	10,328,300	11,104,000	155%	167%
% of Volume	54%	45%	43%	—	—
Small Trades	8,982	25,653	30,203	285%	336%
Small Volume	2,094,093	6,691,603	7,146,280	319%	341%
% of Volume	17%	29%	28%	—	—
Phlx					
Block Trades	60	90	112	150%	186%
Block Volume	1,543,238	2,592,200	2,976,400	169%	192%
% of Volume	49%	38%	46%	—	—
Small Trades	4,024	14,927	12,519	370%	311%
Small Volume	920,515	3,563,404	2,927,105	387%	317%
% of Volume	29%	53%	45%	—	—
PSE					
Block Trades	42	34	30	80%	71%
Block Volume	1,397,114	640,000	597,900	45%	42%
% of Volume	19%	4%	4%	—	—
Small Trades	5,258	22,410	21,196	426%	403%
Small Volume	1,425,581	6,228,800	5,599,600	436%	392%
% of Volume	19%	39%	38%	—	—
The number used in connection with the CSE actually reflect all agency trades. The CSE has indicated, however, that the vast majority of these trades (at least 99%) reflect the automatic execution of public agency markets and marketable limit orders, up to 2,099 shares, at the ITS best bid and offer.					

APPENDIX G

FINANCIAL CONDITION OF BROKER-DEALERS
October 1987

Directorate of Economic and Policy Analysis

HIGHLIGHTS

In order to evaluate the effect of the October market break on broker-dealers' financial condition, we have analyzed the October FOCUS Reports of a sample of 58 NYSE member firms. These firms all carried customer accounts or cleared securities transactions. We have classified the sampled firms into six groups, based on firm size and type of business -- National Full Line Firms, Large Investment Banking Houses, Brokers, Equity Dealers, Debt Dealers, and Other Large Firms. The sample is not at all random, but rather is weighted towards large firms, and to firms specializing in the brokerage and principal businesses. However, the firms in the sample dominate the industry, so the aggregate results of the sample should approximate that of the industry.

Income and Profitability

- o The 58 sampled firms lost \$1.7 billion in October. These losses exceeded the \$1.6 billion in profits earned in the record-setting first quarter.
- o The annualized return on equity was -96.1% for the sampled firms in October. If profits in November and December match the average over the past 15 years, the fourth quarter and full-year returns on equity for the sampled firms will be -16.4% and 7.9% respectively. These would be the lowest rates of return since 1974.
- o Three out of four of the sampled firms lost money. Debt Dealers were the only firm group to show profits.
- o Not unexpectedly, proprietary equity trading was the most important factor behind these losses. The sampled firms reported losses of \$1.6 billion in investments and in equity trading, not including the expenses normally associated with these businesses.
- o Although transaction activity was at record levels, the agency business was not a source of profits for the sampled firms. The increase in revenues was overwhelmed by losses relating to customer activity. Brokers saw an increase in brokerage-related revenues of \$24.8 million in October, relative to an average month in the first three quarters of 1987. However, losses in error accounts and bad debts increased \$60.4 million.
- o While high-grade debt securities increased in value in October, this increase was small relative to the decline in equity values. And debt securities usually are well hedged. The result was an increase in revenues from trading debt securities of only \$86 million (17%) for the sampled firms in October compared to an average month in the first three quarters of 1987.

Financial Integrity

- o Although suffering large losses, the 58 sampled firms came out of October in excellent financial shape. Total capital increased \$389.3 million in October, the result of capital infusions by parent companies, other owners, and subordinated lenders. Excess net capital grew by \$762.1 million.
- o The capital condition of the National Full Line Firms and the Large Investment Banking Houses were the least affected by the market break. Excess net capital of National Full Line Firms grew by \$785 million, while that of Large Investment Banking Houses rose by \$357 million. Brokers witnessed a drop of \$76 million in their excess net capital, primarily the result of a \$62 million increase in unsecured customer receivables. Equity Dealers, who lost \$715 million, remained in healthy financial condition, thanks to a strong initial capital base and massive liquidations of equity securities.
- o An analysis of individual firms leads to similar conclusions. About as many of the sampled firms saw an increase in their excess net capital as saw a decrease. And comparing excess net capital to total capital suggests a slight improvement in the capital position of these firms.
- o At some firms, the decline in equity values overwhelmed haircuts, the capital requirement specifically designed to cushion these declines. Fifteen firms had losses trading equities in excess of their haircuts on equities. Ten firms suffered trading losses on all securities in excess of all haircuts.

Operational Condition

- o There was little change in the number and value of aged fails to deliver and receive between September 30 and October 31. We don't know whether this results from the industry's success in accommodating the increased transaction volume or reflects weaknesses in the available data.
- o Losses in error accounts and bad debts -- the expense item which contains "write offs" -- was 644% higher in October relative to its average in the first three quarters of 1987. In October, these losses equalled \$314 million, 8.6% of expenses. In an average month in the first three quarters of 1987, this item equalled \$42 million, 1.2% of expenses.
- o Unsecured customer receivables were 114% higher on October 31 than they had averaged in the previous three quarters. The increase in these unsecured receivables -- \$737 million -- equalled twice the amount already written off in losses in error accounts and bad debts, and was equal to 44% of October losses.

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I. Introduction

The month of October saw unprecedented market activity and declines in equity values. All major stock indexes witnessed record declines. The Dow Jones Industrials, the S&P 500, and the NASDAQ OTC Composite fell 23.2%, 21.8%, and 27.2% respectively between September 30 and October 30. Conversely, bond prices rose as they became a more attractive investment alternative. For example, the price of the Treasury's 9 3/8s of 2006 (an 18-year maturity) rose 6.4%, while the 8 3/4s of 1993 (a 5-year maturity) rose 3.3%.

These price shifts were accompanied by record transaction activity. October NYSE volume reached 6.1 billion shares, 2 billion above the previous high of 4.1 billion shares in August. Prior to October 1, the record daily share volume on the New York Stock Exchange stood at 302 million shares. ^{1/} On each of two days, October 19 and 20, share volume exceeded 600 million shares, twice the pre-October record. Seven of the twenty-two trading days in October exceeded this earlier record.

These events had the potential to greatly impair the financial condition of securities firms. Broker-dealers observed a decline in the value of their proprietary equity positions, and suffered losses when some customers walked away from net debit balances. In addition, higher transaction activity threatened the operational condition of firms. On the other hand, the increase in volume generated greater commission revenues, and the value of proprietary positions in debt securities rose, albeit more modestly than the decline in equity prices.

In order to evaluate the effect on the industry of these developments, we have analyzed the October financial results for a sample of fifty-eight NYSE member firms. These firms all carried customer accounts or cleared securities transactions. We have classified the sampled firms into six groups based on firm size and type of business -- National Full Line Firms, Large Investment Banking Houses, Brokers, Equity Dealers, Debt Dealers, and Other Large Firms. Exhibit G-1 describes the firm groups and the sampling procedure.

The sample is not a microcosm of the industry. It is not at all random, but rather is weighted towards large firms, and to firms specializing in the brokerage and principal businesses. Thus, the results for the sample should not be considered a reflection of the "average" firm. However, the firms in the sample dominate the industry, so the aggregate results of the sample should approximate that of the industry. And an analysis of the results for Brokers and the two dealer categories, while themselves very specialized firms, should give an indication of the effect of the October market break on these businesses at less specialized firms.

II. Income and Profitability

The securities industry has been riding a wave of unprecedented prosperity. After suffering a major downturn in the late 1960's and a mini recession in the early 1970's, the industry has had over a decade of profitability. Between 1975 and 1986, the annual pre-tax return on equity capital for NYSE member firms fell below 20% in only two years. And as a group, NYSE members have lost money in only 2 of the 51 quarters

^{1/} Set January 23, 1987.

since 1975. In contrast, during the down cycle of 1973 and 1974, NYSE members lost money in four of the eight quarters.

Exhibit G-2 presents data on various performance measures for NYSE member firms doing a public business from 1972 through the third quarter of 1987. These performance measures trace the movement of the largest securities firms into low margin, albeit profitable dealer businesses. Dealing in Government securities, which has shown rapid growth since the late 1970s, is a highly leveraged business which results in very small margins on enormous transactions. Many of the recent developments in investment banking, while very profitable, need huge asset bases. The result has been a significant increase both in leverage and in the dollar amount of assets needed to generate a given dollar amount of revenues (represented by a decline in the asset turnover rate). ^{2/}

These patterns can be seen more clearly in Exhibits G-3 and G-4, which trace the movement of the industry to a dealer business from its earlier concentration on brokerage. Since 1976, the proprietary long positions of NYSE members have increased 13-fold, from \$9.2 billion in the first quarter of 1976 to \$123.2 billion in the third quarter of 1987. Short positions grew sixty-fold during this period, from \$1.2 billion to \$73.9 billion. In the first quarter of 1976, long positions and resale agreements combined comprised 41.8% of all assets. By the third quarter of 1987 these two items accounted for 68.7% of assets. Conversely, receivables from customers declined as a proportion of assets, from 36.1% in the first quarter of 1976 to 10.7% in the third quarter of 1987.

In line with these balance sheet developments, the customer business has become a less important source of income. In 1986, commissions from securities and investment company transactions and margin interest comprised 32.3% of all revenues, down from 54.7% in 1976. By contrast, revenues from trading and investments, underwriting, and "other securities related revenues" ^{3/} increased from 40.3% of revenues in 1976 to 58.3% in 1986.

The profit picture was mixed as the industry entered October. In 1986, pre-tax income of NYSE members set an annual record of \$5.5 billion. Business remained excellent and in the first quarter of 1987 income reached a new quarterly peak of \$2 billion. Income dropped sharply to \$533 million in the second quarter of 1987, increasing only to \$757 million in the third quarter. The result was a subpar performance for NYSE members-- an annualized three-quarters return on equity of only 18.1%.

The October market break's potential for hurting the profitability of securities firms was considerable. On the dealer side, broker-dealers maintain large positions in equity securities. These include positions in their trading and investment accounts,

^{2/} The asset turnover rate is revenues expressed as a percent of assets. This performance measure indicates how successful a business was in turning assets into revenues. The profit margin indicates how successful the firm was in turning revenues into profits.

^{3/} Other securities related revenues are now predominantly made up of interest on resale agreements and M&A activity.

market-making inventory, and positions accumulated executing block transactions for institutional customers. Equity inventories for the sampled firms were at record levels on September 30. During the month of October the values of equity securities declined across the board. Conversely, Government and high grade corporate debt increased in value as interest rates declined, potentially ameliorating the decline in equity values. However, while securities firms hold much larger inventories of debt than equities, the increase in bond prices was much smaller than the decrease in that of equities. And debt instruments usually are well hedged, limiting the adverse impact when bond prices fall, but also reducing gains when these prices rise.

The record level of transaction activity during October suggested exceptionally high securities commissions. But even the brokerage business faced potential problems. Some customers could not, or would not, make good on large unsecured debit balances that developed in their accounts. These balances occurred when the value of margined securities declined and no longer equalled or exceeded the amount of the loan, or the deposit on a naked put option did not cover the decline in value of the underlying security. Broker-dealers also suffered losses when customers refused to complete unfavorable trades made before October 19, but due to be settled after that date. The high volume of transactions threatened operational problems. Operational problems increase expenses and may result in bad trades. In the extremely volatile markets, a delayed transaction could result in an unfavorable price for a customer who might look to the broker for restitution.

A. Income and Profitability of Sampled Firms

October was a very bad month for the 58 sampled firms. In total, they lost \$1.7 billion (see Exhibit G-5). Their annualized return on equity capital was -96.1 percent (see Exhibits G-6 and G-7). The effect of the market break was broad-based. Three out of four of the sampled firms lost money in October. The median annualized return on equity equalled -66.1 percent. ^{4/} That is, half of the sampled firms had an annualized return on equity less than -66.1 percent, while half exceeded this rate.

All firm categories were adversely affected. Eight of the fourteen Brokers lost money, suffering a median annualized return on equity of -23.5 percent. Seven of the ten National Full Line Firms and nine of the ten Large Investment Banking Houses experienced losses. The average firm in these two groups had annualized returns on equity of -62.6 percent and -29.4 percent, respectively. As expected, Equity Dealers were hurt the most. Twelve of these thirteen firms lost money, for a net loss of \$714.7 million and a median annualized return on equity capital of -652.9 percent.

To put these losses in perspective, Exhibit G-8 compares the losses of the sampled firms in October with their profits in the record first quarter. The losses in

^{4/} The weighted averages in Exhibits G-6 and G-7 are computed by first aggregating the numerator and denominator in each group, and then computing the ratio. Large firms, and firms with large losses or gains, will dominate the average return on equity. While the weighted average is the appropriate statistic for examining the results of a group or the sample in the aggregate, it is a poor measure of the results of the "average" firm. For this we use the median ratios. A median ratio is computed by first dividing the numerator by the denominator for each firm, ordering the computed ratios by size, and choosing the middle value.

October of the sampled firms as a group exceeded their first quarter profits. This was primarily due to the Equity Dealers, whose October losses equalled their gains for the preceding nine months. The October losses of the National Full Line Firms, the Large Investment Banking Houses, and Brokers ranged from 55% to 85% of first quarter earnings.

Exhibit G-8 also presents estimates of the annualized return on equity of the sampled firms for the fourth quarter and for 1987 as a whole, assuming profits in November and December equal to the 1972-1987 average. ^{5/} The fourth quarter estimated return on equity for the sampled firms is -16.4% per annum; the estimated return for 1987 is 7.9%. These rates of return would be the lowest since 1974. ^{6/} Under this scenario, Brokers would have the most successful year, with a return on equity of 18.5% for the year. National Full Line Firms and Large Investment Banking Houses would see annual returns of 6.1% and 10.5%, respectively.

B. The Agency Business

Exhibit G-9 compares the revenues and expenses of the sampled firms with their average monthly values in the first three quarters of 1987. Exhibit G-10 presents this information for the firm groups. In line with the increase in transaction activity in October, revenues associated with the agency business increased markedly. Securities commissions and margin interest were 51.3 percent and 32.1 percent higher in October than the three-quarters' average. Revenues from selling mutual fund shares were the only downside of the commission business, falling 31.3%.

Brokerage activities were not a source of profits for the sampled firms, however. The increase in revenues was overwhelmed by losses related to customer activity, particularly uncollectable margin debt. Restricting ourselves to Brokers to isolate the commission business, we see that brokerage related revenues were \$24.8 million higher in October than in an average month in the first three quarters of 1987 (see Exhibit G-10). However, losses in error accounts and bad debts, generally an insignificant expense item, amounted to \$60.4 million in October.

Only three Brokers had a profitable month, with a median return on equity of 57.2 percent. Four other Brokers showed insignificant earnings or losses. The remaining seven Brokers lost significant sums due to bad debts or large trading losses, and showed a median return on equity of -90.2 percent per annum. The smallest Brokers were more likely to be profitable in October than larger ones.

C. The Principal Business

It was on the dealer side that securities firms took their greatest hits. Broker-dealers maintain large inventories of corporate stock. These include trading and market-making inventories, positions in issues they are underwriting, and long term (for a broker) investments, such as an interest in potential takeover targets. The sampled

^{5/} Between 1972 and 1987, NYSE members doing a public business averaged a return on equity of 23.4% per annum.

^{6/} The annualized return on equity capital for NYSE members doing a public business was -18.9% in the second quarter of 1974 and 1.5% for the entire year.

firms reported investment losses of \$1.3 billion, wiping out their investment gains during the previous nine months. We think that most of these investment losses resulted from risk arbitrage. About half of investment losses were suffered by Equity Dealers, a group comprised primarily of arbitrageurs. The National Full Line Firms and Large Investment Banking Houses reported over \$500 million in losses in this line item.

Trading and market-making activities also were adversely affected. Short run proprietary trading is captured in "other" equity trading. October losses were \$231 million, primarily due to large losses at three National Full Line Firms. Declining inventory prices also resulted in a \$6 million loss in OTC market-making. These trading losses understate the effect of the October market on these businesses. These losses are revenues (albeit negative) and have yet to have expenses netted from them.

The October market break also hurt the investment banking activities of the sampled firms. Underwriting revenues were only \$32.1 million in October, compared to \$437.4 million in an average month in 1987. The dollar amount of offerings, particularly of common stock, fell during the month. As importantly, after the market break these equity issues declined in value, resulting in losses for syndicate members.

Revenues from debt trading increased 17%. But this \$86 million increase in revenues equalled only 5% of net losses. The three Debt Dealers were the most profitable group in October, with positive net income.

III. Financial Integrity

The principal regulatory tool used to insure the financial integrity of broker-dealers is the Commission's net capital rule (Rule 15c3-1). Rule 15c3-1 requires broker-dealers to maintain capital equal to the full value of their illiquid assets ("illiquid assets"), a prescribed percentage of other assets such as security positions ("haircuts"), plus the greater of a fixed dollar amount or a percentage of their customer-related assets or liabilities ("required net capital").

Firms may determine required net capital in one of two ways. Firms choosing the basic capital method ("BCM"), must maintain net capital equal to the greater of \$25,000^{1/} or 6 2/3% of their aggregate indebtedness (primarily customer related liabilities). Firms choosing the alternative capital method ("ACM"), must maintain net capital equal to the greater of \$100,000^{2/} or two percent of their Reserve Formula debits (monies owed the broker-dealer by customers). Smaller firms tend to use the BCM, as they cannot meet the ACM's \$100,000 minimum requirement. Large firms tend to use the ACM because of its smaller ratio requirement and lower haircuts on equity securities. These two ratio tests serve to prevent the unlimited expansion of a broker-dealer's customer business financed solely with customer credits.

^{1/} The minimum dollar amounts for broker-dealers (other than market-makers) which neither carry customer accounts nor clear securities transactions range from \$2,500 to \$25,000 under the BCM. The minimum dollar amounts for market-makers range from \$25,000 to \$100,000.

^{2/} Sole municipal securities dealers using the ACM have a \$25,000 minimum dollar requirement.

Haircuts serve primarily to require broker-dealers to maintain sufficient capital to account for the market risk of proprietary positions. The size of haircuts varies, depending on the type of security and length of time to maturity. Treasury and government agency securities, for example, have no credit risk and thus have the lowest haircuts. Those maturing within 3 months are considered to have negligible market risk and take no haircuts. They may be financed solely with debt. Government securities maturing after 25 years take haircuts of 6 percent. In effect, at least 6% of the value of these securities must be financed with the firm's capital. Corporate stocks and below investment-grade corporate debt securities ^{9/} take the highest haircuts -- 15% for firms computing their net capital requirement using the ACM, 30% for those using the BCM.

Exhibit G-11 presents data on capital, haircuts, and illiquid assets of NYSE members doing a public business from 1976 through the third quarter of 1987. The dollar amount of losses experienced in October must be considered in conjunction with the capital buffers in place. These buffers exist in part to accommodate market reversals, such as took place in October. As Exhibit G-11 shows, capital of NYSE members grew from \$3.8 billion in the first quarter of 1976 to \$35.0 billion in the third quarter of 1987. Nearly 95% of the increase in capital has taken place since 1980. Haircuts equalled \$7.7 billion as of September 30, 1987. That is, NYSE members were required to maintain a regulatory capital cushion of \$7.7 billion, which, in effect, was allocated solely to reverses affecting their securities inventory.

Exhibit G-12 presents data on net capital, required net capital, excess net capital, and the two bases for the ratio test. Net capital equals capital after deducting illiquid assets, haircuts, and certain other charges. Excess net capital equals capital in excess of all regulatory requirements (including the minimum net capital requirement). Among other things, excess net capital serves as a cushion to prevent business fluctuations, such as the October market break, from putting a firm into net capital violation, which in turn might result in liquidation. As Exhibit G-12 shows, on September 30, 1987 NYSE members were maintaining \$12.9 billion in capital in excess of regulatory requirements.

A. Changes in Capital and Its Components of Sampled Firms

Exhibit G-13 presents data on the regulatory capital of the sampled firms. Exhibit G-14 presents these data for the firm categories. As a group, the sampled firms remain in excellent financial condition. Total capital increased \$389.3 million in October, the result of capital infusions by parent companies, other owners, and subordinated lenders. Excess net capital grew by \$762.1 million.

While pre-tax income was a negative \$1.7 billion in October, equity capital declined by only \$450 million. Most of this difference represents capital infusions. ^{10/} Exhibit G-15 presents the components of change in equity capital for the sampled firms. Netting infusions and withdrawals, these firms acquired \$869 million in equity capital

^{9/} Below investment-grade securities are corporate debt instruments which, among other things, are not rated in one of the four highest rating categories by at least two nationally recognized statistical rating organizations.

^{10/} Adjustments to pre-tax income, primarily provisions for Federal Taxes, reduced the impact of these losses by \$345 million.

from outside sources in October. Twenty firms obtained a total of \$1.1 billion. About \$0.9 billion of this amount came from four large broker-dealers, three with parents outside the industry. Eleven of the sampled firms withdrew a total of \$189 million of equity capital. The sampled firms also showed net increases in subordinated debt of \$839 million.

The capital condition of the National Full Line Firms and the Large Investment Banking Houses were the least affected by the October market break. The excess net capital of the National Full Line Firms grew by \$785 million, while that of the Large Investment Banking Houses rose by \$357 million. These increases were primarily due to net additions of \$935 million in equity and \$646 million in subordinated debt for the two groups combined. Brokers saw no net change in total capital, but witnessed a drop of \$76 million (17.8%) in their excess net capital. This was primarily the result of a \$62 million increase in unsecured customer receivables, an illiquid asset deducted from capital in the computation of net capital.

Equity capital of Equity Dealers dropped \$824 million (43%) in October, reflecting a \$715 million pre-tax loss and \$164 million in net withdrawals of capital. The effect on excess net capital was moderated by massive liquidations of equity positions. ^{11/} Haircuts dropped \$415 million. As a group, Equity Dealers still remain in healthy financial condition, the result of a strong initial capital base. On October 31, excess net capital comprised two-thirds of total capital.

Exhibit G-16 presents data on changes in equity capital and excess net capital for the sampled firms. Eight Equity Dealers experienced declines in equity capital of 25% or more. No other sampled firm saw a decline in equity capital of this magnitude. Thirteen of the sampled firms saw declines in excess net capital of 25% or more.

Exhibit G-17, which classifies the sampled firms by excess net capital relative to total capital on September 30 and October 31, shows a slight improvement in capital position during October. One firm (a Debt Dealer) moved from an excess net capital position of less than ten percent of total capital to the 10 - 25% category. In addition, there was a net movement of three firms from the 25 - 50% category to a capital buffer of over 50% of total capital. Brokers were the only firm group to show a worsening capital position. Two Brokers with excess net capital exceeding 25% of capital on September 30 had ratios of less than 25% on October 31.

B. Losses of Sampled Firms Relative to Relevant Capital Cushions

Haircuts and excess net capital serve as cushions to accommodate fluctuations in a broker-dealer's business. Excess net capital, or capital in excess of regulatory requirements, assures that short term downturns in a firm's business don't result in liquidations. As observed, haircuts require broker-dealers to finance a certain proportion (equal to the haircut) of proprietary positions with capital. The intent is

^{11/} The value of equities held by Equity Dealers fell from \$4.0 billion on September 30 to \$1.5 billion on October 31. Falling equity prices certainly played a role in this decline in value, but reported investment and equity trading losses for Equity Dealers summed to \$722.5 million, only 29% of the drop in the dollar value of equity positions.

that any decline in the value of proprietary positions will affect firm capital, not creditors.

Exhibit G-18 presents total losses and losses in two business categories as a percent of the relevant capital cushions in place. The first series of rows displays investment and equity trading losses in October as a percent of equity haircuts on September 30. Forty-one firms lost money trading equities in October. These losses exceeded haircuts for fifteen firms. Another twelve firms had losses in excess of 50% of haircuts.

The second series of rows in Exhibit G-18 compares all trading and investment losses in October with all haircuts on September 30. Gains from debt trading reduced the losses of some firms while debt haircuts added to the capital cushion. Thirty-five firms suffered trading losses on all securities in October. Of these, ten had losses in excess of all haircuts; another nine had losses in excess of 50% of haircuts. We have included investment gains (losses) in the numerator because we think most of the underlying securities in investment accounts are equities. Note that trading and investment losses will understate the decline in equity values, which haircuts are designed to cover. For example, OTC market-makers make money on the spread, ameliorating the declines in the values of their inventories.

The last series of rows in Exhibit G-18 compare all losses in October with the sum of haircuts and excess net capital as of September 30. Forty-five firms lost money in October. None of these firms lost money in excess of the capital cushions in place, but two firms had losses greater than 50% of these cushions.

IV. Operational Condition

On each of two days, October 19 and 20, volume on the NYSE exceeded 600 million shares, twice the pre-October record of 302 million. Seven of the twenty-two trading days in October exceeded this earlier record. The magnitude and sustained level of transactions strained the capacity of the institutions responsible for executing and clearing these trades. Difficulties in processing this volume of transactions forced the NYSE, AMEX, and NASDAQ to close early on October 26 through 30.

Operational problems in the late 1960's, resulting from a rapid increase in volume, were responsible for a number of failures and forced mergers. During the 1960's, volume on all exchanges increased substantially. The back offices of many firms were unable to cope with the ensuing surge of paperwork, and because of the interrelatedness of firms in the securities business, such operational problems had widespread effects on the industry.

In the intervening years, the securities industry has computerized trading operations and back offices and made progress in immobilizing stock certificates in securities depositories. The result is that the industry is now much better able to accommodate not only higher volume levels, but also surges in volume. Surges in volume similar to that of the 1960's have since not adversely affected the operational condition of the industry as a whole.

A. Transaction Efficiency of Sampled Firms

We have attempted to analyze the transaction efficiency of the sampled firms by comparing aged fails to deliver and receive with all fails. Fails occur when a broker-dealer is unable to deliver a security to the contra party on settlement date. The buying broker has a fail to receive, the selling broker a fail to deliver. This is not an unusual occurrence and fails are, in a sense, simply the accounts receivable and payable of the brokerage industry. If the condition persists, the fails "age." Equity securities become aged after five business days.

Exhibit G-19 presents data on the number of tickets, and the number and value of fails and aged fails, as of September 30 and October 31. The number of tickets was 18.4 million in October, a 35 percent increase over the level in September. This record volume did not lead to a significant change in the number or value of aged fails by October 31. The number of aged fails declined nine percent to 26,600 while the value of aged fails rose one percent to \$1,282 million. As a percent of all fails, the value of aged fails rose from 11.5% to 13.2%. Brokers showed a significant increase in the value of aged fails, in dollars and as a percent of all fails.

Unfortunately, we don't think that we can draw any conclusions about the operational efficiency of the industry based on Exhibit G-19. Most firms are on a settlement day basis, which means that fails cannot occur until settlement, five business days after the transaction. Transactions that took place October 19 would have become fails October 26 and aged fails on November 2. So none of the transactions that have taken place since October 19 are included as aged fails in Exhibit G-19. To the extent that any operational inefficiencies have developed since October 19, they would show up only to the extent that they have disturbed the settlement of earlier trades.

B. Customer Exposure and Losses of Sampled Firms

Exhibit G-20 presents data on unsecured customer receivables and losses in error accounts and bad debts. Customer receivables are monies customers owe brokers. Generally, brokers attempt to hold collateral with a value at least equal to the monies owed. When brokers are unsuccessful, and the collateral becomes insufficient, the resulting exposure of the broker to the customer is considered an unsecured receivable.

Unsecured customer receivables can develop in a number of ways. For example, brokers loan customers monies for margin transactions, retaining in their possession securities with a value in excess of the loan. If the collateral should decline to a value less than the loan, the difference is considered unsecured. Similarly, the exposure of a customer who has written a put option, to the extent that this exposure exceeds any credits in the customer's account, would be considered unsecured. Customer receivables also develop in transactions where the customer has not paid for the purchased security on settlement date. If the security should decline in value, the difference between the value of the security and the payment owed by the customer would be considered unsecured.

Once it becomes clear that customers will not make good on unsecured receivables, the receivables are written off and the resulting losses put in the expense item "losses in error accounts and bad debts." This expense item also may be associated with poorly executed transactions. For example, a broker might be obligated to make

up the difference in an unacceptably delayed transaction that resulted in a poor price for a customer. The resulting payment would be included in this expense item.

Losses in error accounts were up 644% in October relative to the average during the first three quarters of 1987. These expenses averaged \$42.2 million in the first three quarters and comprised only 1.2% of total expenses. In October, however, these losses equalled \$313.9 million -- 8.6% of all expenses. Brokers were hurt the most, with losses in error accounts and bad debts increasing from 0.9% to 28.4% of all expenses.

Customer receivables showed little change between the first three quarters of 1987 and month-end October. Unsecured receivables grew 114%, however, from \$645 million to \$1,382 million. On October 31, the sampled firms were carrying about \$737 million more in unsecured customer receivables than they had averaged during the previous three quarters. This additional exposure was more than twice the amount they had already written off in losses in error accounts and bad debts, and equal to about 44% of October losses.

Exhibit G-1**Sample Selection and Firm Categories**

In order to estimate the industry's financial results during October and its financial condition at the end of October, we obtained the September 30 and October 31 FOCUS Reports of a sample of 58 NYSE members. All of these firms either carry customer accounts or clear securities transactions ("carrying firms"). We have classified the sampled firms into six groups based on firm size and type of business -- National Full Line Firms, Large Investment Banking Houses, Brokers, Equity Dealers, Debt Dealers, and Other Large Firms.

The ten National Full Line Firms are large broker-dealers that are involved in all aspects of the securities business and have nationwide (or multi-regional) branch office networks. The ten Large Investment Banking Houses are large firms that are known principally as syndicate managers (other than those that operate extensive networks of branch offices).

The fourteen Brokers in the sample earned the majority of their revenues from brokerage activities and had relatively small proprietary positions that might be at risk to market fluctuations. There were over 100 NYSE carrying firms which obtained more than half their revenues from brokerage activities (commissions on securities and investment company transactions and margin interest) in the second quarter of 1987. We have included 14 of these brokers in our sample. Most of the sampled brokers had ratios of brokerage revenues to total revenues exceeding 70% and none had proprietary positions in equity or corporate debt securities exceeding ten percent of total assets. While we have included a few smaller brokers, most of the sampled brokers are larger than average.

While many NYSE members specialize in the brokerage business, few concentrate solely on principal activities. We did identify 13 Equity Dealers -- NYSE members that maintained large positions in stocks and options relative to total assets in the second quarter 1987. In fact, stocks and options exceeded 70% of total assets for most of these firms. This concentration of proprietary positions represents their specialization in market-making, arbitrage, and specialist activities. On average, Equity Dealers are smaller than our sampled brokers. Large firms, while participating in these activities, are more likely to be diversified.

We identified three firms with large positions in corporate debt securities in the second quarter of 1987. The value of their inventories of corporate debt ranged from 40% to 80% of assets. We also have included eight large firms that are not as readily categorized. These Other Large Firms assured that the sample included the twenty largest NYSE carrying firms in terms of total assets, total capital, long positions, proprietary positions in stock, and customer receivables.

It is clear that our sample is not at all random. It is comprised solely of NYSE members that carry customer accounts or clear securities transactions. Among this select group, the sample is disproportionately weighted towards large firms, and to firms specializing in the brokerage or dealer business. However, given the constraint on our sample size, it is doubtful that a random sample could be created that would be more representative of the industry, or provide any guidance on the effect of the October market break on the "average" firm. So we have instead concentrated on firms whose results are of most interest from the Commission's perspective.

Exhibit G-1 (con't)

An analysis of the results of Brokers and the two dealer categories, while themselves very specialized firms, should give an indication of the effect of the October market break on these businesses at less specialized firms. And the inclusion of the largest firms in the industry make it likely that the financial results of the sample will approximate that of the industry. As the following table indicates, the sampled firms accounted for over half of the dollar amounts of a number of key financial items in the second quarter of 1987. Thus, the results of the sample should tend to mirror that of the industry.

Exhibit G-1 (con't)

Sample Proportion of Various Financial Items
Second Quarter, 1987

	All Firms <u>1/</u>	Carrying Firms	NYSE Carrying Firms
<u>I&E Items</u>			
All Retail Revenues <u>2/</u>	54.5%	68.4%	77.3%
Securities Commission Income	53.5	67.1	75.5
Trading and Investment Gains (Losses)	66.4	72.4	86.5
Trading in Equities <u>3/</u>	NA	57.6	76.8
Total Revenues	63.7	73.3	83.5
<u>Balance Sheet Items</u>			
Customer Receivables	82.9	82.9	85.8
Long Positions	79.0	81.2	92.8
Equity Securities	NA	77.8	87.8
Total Assets	80.5	81.8	90.6
Total Capital	65.3%	73.3%	85.3%

1/ Broker-dealers without a Commission net capital requirement file FOCUS Reports semi-annually or annually, and thus are not included in this table. The financial items of these firms equal only a few percent of those of firms with a Commission net capital requirement.

2/ Includes securities commission income, investment company revenues, and margin interest.

3/ Includes all trading gains (losses) except those involving debt securities.

NA: Not available for non-carrying firms.

Exhibit G-2

Profitability of NYSE Member Firms Doing a Public Business
1972-1987

		<u>Pre-Tax Net Income</u> (\$ millions)	<u>Pre-tax Profit Margin</u> 1/	<u>Asset Turnover</u> 2/	<u>Financial Leverage</u> 3/	<u>Return on Equity</u> 4/
1972		\$ 789	13.2%	22%	8.6	25.1%
1973		-72	-1.5	23	8.1	-2.8
1974		36	.8	23	8.4	1.5
1975		804	13.7	26	8.4	29.8
1976		984	14.2	18	12.1	31.2
1977		416	6.2	15	13.7	13.1
1978		684	7.7	16	15.7	20.0
1979		1,100	9.8	15	18.9	27.8
1980		2,265	14.2	16	19.1	42.3
1981		2,139	10.8	16	18.1	32.0
1982		3,026	13.0	18	19.3	33.9
1983		3,810	12.9	16	18.3	32.5
1984		1,589	5.1	13	21.6	13.1
1985		4,146	10.7	13	23.7	28.8
1986		5,482	11.0	12	21.1	27.6
1987 (Q1-Q3)		\$3,333	8.2%	12%	19.4	18.1%
1985	Q1	\$ 933	10.4%	14%	19.6	28.8%
	Q2	1,067	11.6	13	20.5	31.1
	Q3	670	7.6	12	20.9	18.7
	Q4	1,476	12.6	12	23.7	35.5
1986	Q1	1,945	15.1	13	21.8	42.5
	Q2	1,317	10.6	12	21.6	27.3
	Q3	1,056	9.0	11	21.2	20.8
	Q4	1,164	9.0	12	21.1	21.7
1987	Q1	2,043	13.9	13	19.2	34.5
	Q2	533	4.2	11	18.8	8.7
	Q3	\$ 757	5.6%	11%	19.4	11.8%

1/ Pre-tax income stated as a percent of total revenues.

2/ Total revenues stated as a percent of total assets.

3/ Total assets stated as a ratio of equity capital.

4/ Pre-tax income stated as a percent of equity capital.

Exhibit G-3

Selected Balance Sheet Items of NYSE Member Firms
Doing a Public Business, 1976-1987

(Millions of Dollars)

		<u>Total Assets</u>	<u>Long Positions</u>	<u>Resale Agreements</u>	<u>Short Positions</u>	<u>Customer Receivables</u>
1976	Q1	\$ 26,357	\$ 9,204	\$ 1,803	\$ 1,170	\$ 9,503
	Q2	28,251	9,642	2,496	1,590	10,180
	Q3	31,184	12,172	2,643	1,579	10,591
	Q4	38,181	15,662	4,255	2,129	11,453
1977	Q1	35,096	11,330	5,070	2,441	11,769
	Q2	39,331	13,215	5,183	2,955	12,941
	Q3	39,932	11,702	7,518	3,628	12,887
	Q4	43,621	13,799	8,187	3,980	13,537
1978	Q1	44,008	12,302	9,109	4,520	15,294
	Q2	50,002	13,679	10,276	5,371	17,760
	Q3	55,750	15,071	12,091	5,997	19,586
	Q4	53,902	15,238	14,018	6,610	15,868
1979	Q1	54,952	16,125	14,695	6,487	15,445
	Q2	68,872	22,159	18,534	7,208	18,064
	Q3	74,147	22,645	20,694	10,765	19,301
	Q4	75,004	20,199	24,244	13,706	17,981
1980	Q1	64,655	16,750	18,019	7,309	17,736
	Q2	78,455	23,027	23,094	9,844	17,466
	Q3	80,042	23,042	20,999	9,729	18,644
	Q4	102,242	29,448	31,016	20,532	22,702
1981	Q1	94,119	32,759	23,877	10,744	20,165
	Q2	99,258	31,532	27,810	13,041	20,606
	Q3	96,472	27,378	32,425	12,691	19,496
	Q4	120,960	37,262	42,436	17,302	20,785
1982	Q1	103,371	33,340	32,265	12,072	17,902
	Q2	111,649	34,111	39,106	15,531	17,696
	Q3	136,908	39,455	47,722	22,460	19,411
	Q4	172,141	65,161	51,486	28,771	23,758
1983	Q1	156,066	50,802	47,168	25,639	25,259
	Q2	169,383	52,761	51,292	28,319	30,709
	Q3	191,357	61,987	60,626	30,643	31,872
	Q4	214,784	70,220	74,914	38,622	31,801
1984	Q1	215,283	67,595	78,805	42,274	29,645
	Q2	219,228	59,453	89,081	37,189	30,755
	Q3	231,023	73,041	87,396	39,883	28,214
	Q4	275,463	100,207	104,409	44,028	29,093
1985	Q1	254,917	81,448	102,611	47,035	27,770
	Q2	281,291	94,348	104,625	50,782	33,392
	Q3	298,796	102,135	111,150	55,433	35,731
	Q4	393,205	139,486	136,147	71,184	45,222

Exhibit G-3 (con't)

Selected Balance Sheet Items of NYSE Member Firms
Doing a Public Business, 1976-1987

(Millions of Dollars)

		<u>Total Assets</u>	<u>Long Positions</u>	<u>Resale Agreements</u>	<u>Short Positions</u>	<u>Customer Receivables</u>
1986	Q1	399,579	145,999	129,483	59,166	47,887
	Q2	416,487	143,255	144,925	60,867	47,679
	Q3	430,854	136,587	167,152	65,003	48,655
	Q4	452,541	145,549	171,516	66,997	52,329
1987	Q1	456,131	139,445	172,391	70,375	49,621
	Q2	459,126	118,342	195,630	66,221	52,439
	Q3	\$497,844	\$123,242	\$219,007	\$73,864	\$53,341

Exhibit G-4

Revenues of NYSE Member Firms Doing a Public Business
1976-1987

(Millions of Dollars)

	Total Revenues	Securities Commission Income	Investment Company Revenues	Margin Interest	Trading and Investment	Underwriting Profits	Other Securities Related Business
1976	\$ 6,902	\$ 3,164	\$ 45	\$ 565	\$ 1,400	\$ 853	\$ 530
1977	6,730	2,809	59	754	1,296	776	574
1978	8,832	3,779	59	1,173	1,543	742	847
1979	11,264	4,012	76	1,652	2,671	770	1,162
1980	15,986	5,671	105	2,089	3,699	1,307	1,725
1981	19,805	5,346	122	2,890	4,813	1,572	2,964
1982	23,212	6,021	288	1,998	6,553	2,319	3,940
1983	29,542	8,348	953	2,130	7,571	3,530	4,387
1984	31,148	7,082	751	2,811	8,253	2,706	6,271
1985	38,739	8,249	1,798	2,575	10,987	4,251	7,175
1986	50,030	10,453	2,796	2,909	13,717	5,923	9,540
1987 (Q1-Q3)	\$40,703	\$ 9,441	\$1,847	\$2,467	\$ 9,509	\$4,492	\$8,491

Exhibit G-5

Net Income of Sampled Firms

	Number of Firms	<u>Monthly Net Income (\$millions)</u>		<u>Percent of Firms With Losses</u>	
		Three- quarters 1987 1/	October 1987	March, June, Sept, 1987 2/	October, 1987
Total Sample	58	\$274.1	\$(1,664.2)	22.4%	77.6%
National Full Line	10	67.3	(433.2)	20.0	70.0
Large Investment Bankers	10	90.3	(311.3)	30.0	90.0
Other Large Firms	8	29.0	(160.0)	20.8	87.5
Brokers	14	17.2	(46.3)	11.9	57.1
Equity Dealers	13	71.6	(714.7)	23.1	92.3
Debt Dealers	3	\$ (1.2)	\$ 1.3	55.6%	66.7%

1/ Average monthly income during first nine months of 1987.

2/ Proportion of firms that lost money during March, June, and September of 1987. Monthly income is available only for last month of a quarter from Part II of the FOCUS Report

Exhibit G-6

Return on Equity Capital of Sampled Firms

	<u>1/ Weighted Average</u>		<u>2/ Median</u>	
	Three- quarters 1987	October 1987	Three quarters 1987	October 1987
Total Sample	16.1	(96.1)	24.3	(66.1)
National Full Line	9.0	(51.4)	10.6	(62.6)
Large Investment Bankers	14.3	(50.3)	19.1	(29.4)
Other Large Firms	27.5	(154.5)	23.8	(114.5)
Brokers	26.7	(68.4)	20.9	(23.5)
Equity Dealers	48.5	(783.6)	48.0	(652.9)
Debt Dealers	(18.1)	20.0	(59.7)	(17.7)

1/ Weighted average ratios are calculated by first summing values in each of the numerator and denominator across all firms and then dividing the aggregate numerator by the aggregate denominator.

2/ Median ratios are calculated by first computing ratios for each firm in a group; second, ordering these ratios by size; and third, selecting the middle value.

Exhibit G-7

Profitability of Sampled FirmsWeighted Average 1/

	Three-quarters, 1987				October, 1987			
	<u>REC</u>	<u>PM</u>	<u>AT</u>	<u>LEV</u>	<u>REC</u>	<u>PM</u>	<u>AT</u>	<u>LEV</u>
Total Sample	16.1	7.4	10.2	21.1	(96.1)	(83.0)	5.5	21.0
National Full Line	9.0	3.6	16.3	15.5	(51.4)	(26.4)	14.0	13.9
Large Investment Bankers	14.3	7.1	6.4	31.4	(50.3)	(36.5)	4.2	32.6
Other Large Firms	27.5	11.9	7.7	30.2	(154.5)	(489.0)	1.2	26.7
Brokers	26.7	10.2	23.5	11.1	(68.4)	(27.8)	14.4	17.1
Equity Dealers	48.5	70.7	23.6	2.9	(783.6)	NA	(270.7)	2.8
Debt Dealers	(18.1)	(13.1)	3.8	36.0	20.0	10.6	5.3	35.7

Medians 2/

	Three-quarters, 1987				October, 1987			
	<u>REC</u>	<u>PM</u>	<u>AT</u>	<u>LEV</u>	<u>REC</u>	<u>PM</u>	<u>AT</u>	<u>LEV</u>
Total Sample	24.3	9.7	19.8	10.0	(66.1)	(47.9)	5.9	8.8
National Full Line	10.6	3.9	16.2	17.4	(62.6)	(33.8)	12.2	16.4
Large Investment Bankers	19.1	7.8	8.1	28.3	(29.4)	(22.1)	5.7	27.9
Other Large Firms	23.8	9.6	8.7	24.3	(114.5)	(247.2)	2.7	18.7
Brokers	20.9	7.3	38.4	6.4	(23.5)	(6.7)	44.4	6.5
Equity Dealers	48.0	69.6	29.5	2.8	(652.9)	na	(280.3)	2.3
Debt Dealers	(59.7)	(132.6)	1.3	16.8	(17.7)	(27.3)	5.3	13.5

1/ Weighted average ratios are calculated by first summing values in each of the numerator and denominator across all firms and then dividing the aggregate numerator by the aggregate denominator.

2/ Median ratios are calculated by first computing ratios for each firm in a group; second, ordering these ratios by size; and third, selecting the middle value.

NA: Over half of revenues are negative.

na: Over half of firms had negative revenues

Note: REC is the annualized return on equity capital (pre-tax income as a percent of equity capital).

PM is the profit margin (pre-tax income as a percent of total revenues).

AT is the annualized asset turnover rate (revenues as a percent of assets).

LEV is leverage (assets divided by equity capital).

Exhibit G-8

October Losses of Sampled Firms in Perspective

	<u>Net Income</u>		<u>Estimated Return on Equity</u> <u>1/</u>	
	<u>First Quarter 1987</u>	<u>October 1987</u>	<u>Fourth Quarter 1987</u>	<u>All-year 1987</u>
Total Sample	\$1,644.7	\$(1,664.2)	(16.4)%	7.9 %
National Full Line	512.2	(433.2)	(1.5)	6.1
Large Investment Bankers	575.3	(311.3)	(1.2)	10.5
Other Large Firms	150.4	(160.0)	(35.9)	12.0
Brokers	70.8	(46.3)	(7.2)	18.5
Equity Dealers	338.8	(714.7)	(245.6)	(2.1)
Debt Dealers	\$ (2.8)	\$ 1.3	22.3 %	(7.3)%

1/ Assumes return on equity of 23.4% in November and December.

Exhibit G-9

Revenues and Expenses of Sampled Firms

	<u>\$ millions</u>			<u>Percent of All Revenues</u>	
	<u>Three- Quarters 1987 1/</u>	<u>October 1987</u>	<u>Percent Change</u>	<u>Three- Quarters 1987</u>	<u>October 1987</u>
Securities Commissions	\$ 731.4	\$ 1,106.3	51.3 %	19.8%	55.2 %
Margin Interest	221.9	293.2	32.1	6.0	14.6
Investment Co. Revenues	162.3	111.5	(31.3)	4.4	5.6
Trading and Investment	919.6	(989.5)	(207.6)	24.9	(49.4)
Equity Trading 2/	260.1	(236.7)	(191.0)	7.0	(11.8)
OTC Market-Making	140.2	(6.0)	(104.3)	3.8	(.3)
Other Equity	120.0	(230.7)	(292.3)	3.2	(11.5)
Debt Trading	509.6	596.0	17.0	13.8	29.7
Investment 3/	149.9	(1,348.8)	(999.8)	4.1	(67.3)
Underwriting Profits	437.4	32.1	(92.7)	11.8	1.6
Other Revenues	1,220.8	1,450.3	18.8	33.1	72.4
Total Revenues	3,693.4	2,004.1	(45.7)	100.0	100.0
 Total Expenses	 3,419.3	 3,668.3	 7.3	 92.6	 183.0
Losses in Error Accts.	42.2	313.9	643.2	1.1	15.7
 Net Income	 \$ 274.1	 \$(1,664.2)	 (707.2)%	 7.4%	 (83.0)%

1/ Average monthly revenues, expenses, or income for first nine months of 1987.

2/ Includes all trading revenues except debt trading.

3/ Investment gains (losses) are not broken out by instrument.

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Exhibit G-10

Revenues and Expenses of Sampled Firm Categories
(\$millions)

	<u>National Full Line</u>		<u>Large Investment Bankers</u>		<u>Other Large Firms</u>	
	<u>Three- Quarters, 1987 1/</u>	<u>October, 1987</u>	<u>Three- Quarters, 1987 1/</u>	<u>October, 1987</u>	<u>Three- Quarters, 1987 1/</u>	<u>October, 1987</u>
Securities Commissions	\$ 445.6	\$ 675.4	\$ 151.9	\$ 245.3	\$ 52.2	\$ 74.5
Margin Interest	137.4	170.1	50.8	75.7	15.7	26.9
Investment Co. Revenues	145.8	102.3	3.7	2.3	.6	.4
Trading and Investment	409.4	(78.2)	364.8	(9.7)	49.0	(178.9)
Equity Trading 2/	136.9	(189.4)	89.7	11.9	13.6	(28.2)
OTC Market-Making	88.9	26.1	35.1	(20.4)	3.3	(7.5)
Other Equity	48.1	(215.5)	54.7	32.3	10.3	(20.7)
Debt Trading	256.9	342.5	241.7	256.9	7.7	(4.6)
Investment 3/	15.6	(231.3)	33.3	(278.4)	27.7	(146.1)
Underwriting Profits	233.2	130.1	186.2	(111.8)	11.2	7.8
Other Revenues	520.7	643.9	520.1	650.0	115.6	102.1
Total Revenues	1,892.1	1,643.6	1,277.5	851.8	244.2	32.7
Total Expenses	1,824.8	2,076.8	1,187.2	1,163.2	215.2	192.7
Losses in Error Accts.	31.9	160.0	7.9	81.0	1.0	12.4
Net Income	\$ 67.3	\$ (433.2)	\$ 90.3	\$ (311.3)	\$ 29.0	\$ (160.0)
	<u>Brokers</u>		<u>Equity Dealers</u>		<u>Debt Dealers</u>	
	<u>Three- Quarters, 1987 1/</u>	<u>October, 1987</u>	<u>Three- Quarters, 1987 1/</u>	<u>October, 1987</u>	<u>Three- Quarters, 1987 1/</u>	<u>October, 1987</u>
Securities Commissions	\$ 76.9	\$104.8	\$ 1.4	\$ 2.0	\$ 3.4	\$ 4.4
Margin Interest	17.9	20.4	0	0	.1	.1
Investment Co. Revenues	12.2	6.6	0	0	0	0
Trading and Investment	15.2	.8	82.8	(722.5)	(1.6)	(1.0)
Equity Trading 2/	10.1	(4.1)	10.7	(31.6)	(.9)	4.7
OTC Market-Making	6.1	(2.7)	6.8	(1.0)	0	(.4)
Other Equity	3.9	(1.4)	3.9	(30.6)	(.9)	5.1
Debt Trading	4.2	5.7	0	0	(.9)	(4.5)
Investment 3/	1.0	(.9)	72.1	(690.9)	.2	(1.2)
Underwriting Profits	7.7	5.8	.1	0	(1.1)	.2
Other Revenues	39.1	28.2	16.9	17.1	8.6	9.1
Total Revenues	169.0	166.6	101.2	(703.4)	9.4	12.7
Total Expenses	151.8	212.9	29.6	11.3	10.7	11.3
Losses in Error Accts.	1.4	60.4	0	.1	0	0
Net Income	\$ 17.2	\$ (46.3)	\$ 71.6	\$ (714.7)	\$ (1.2)	\$ 1.3

1/ Average monthly revenues, expenses, or income for first nine months of 1987.

2/ Includes all trading revenues except debt trading.

3/ Investment gains (losses) are not broken out by instrument.

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Exhibit G-11

Capital and Factors Affecting Regulatory Capital Needs of NYSE
Member Firms Which Conduct a Public Business, 1976-1987

(Millions of Dollars)

		<u>Total Capital</u>	<u>Equity Capital</u>	<u>Subordinated Debt</u>	<u>Illiquid Assets</u>	<u>Haircuts on Securities</u>
1976	Q1	\$ 3,765	\$ 2,995	\$ 770	\$ 983	\$ 567
	Q2	3,799	3,031	768	1,038	587
	Q3	3,830	3,082	748	996	652
	Q4	3,913	3,147	766	1,033	694
1977	Q1	3,880	3,159	721	1,014	694
	Q2	3,941	3,207	734	1,006	795
	Q3	3,913	3,165	748	1,053	766
	Q4	3,927	3,168	759	1,019	799
1978	Q1	3,878	3,150	728	1,069	772
	Q2	4,063	3,291	772	1,118	818
	Q3	4,418	3,517	901	1,142	867
	Q4	4,390	3,427	963	1,207	747
1979	Q1	4,549	3,602	947	1,208	765
	Q2	4,706	3,744	962	1,282	925
	Q3	4,930	3,924	1,006	1,330	984
	Q4	4,999	3,959	1,040	1,376	958
1980	Q1	5,381	4,101	1,280	1,549	743
	Q2	5,948	4,675	1,273	1,626	1,021
	Q3	6,243	4,903	1,340	1,709	995
	Q4	6,835	5,359	1,476	1,995	1,054
1981	Q1	7,109	5,740	1,369	2,016	1,074
	Q2	7,609	6,254	1,355	2,264	1,237
	Q3	7,347	5,983	1,364	2,382	1,112
	Q4	8,168	6,685	1,483	2,922	1,312
1982	Q1	8,383	6,930	1,453	3,344	1,175
	Q2	8,437	7,032	1,405	3,574	1,362
	Q3	9,312	7,733	1,579	3,683	1,635
	Q4	10,779	8,937	1,842	3,750	1,960
1983	Q1	11,612	9,733	1,879	3,971	1,794
	Q2	12,607	10,519	2,088	4,310	2,335
	Q3	13,356	11,117	2,239	4,587	2,325
	Q4	14,207	11,721	2,486	5,025	2,756
1984	Q1	14,886	12,026	2,860	5,319	2,640
	Q2	15,389	11,764	3,625	6,151	2,703
	Q3	15,387	12,082	3,305	6,089	2,823
	Q4	16,848	12,751	4,097	6,347	3,400
1985	Q1	16,930	12,974	3,956	6,118	3,235
	Q2	17,914	13,709	4,205	6,406	4,141
	Q3	18,821	14,305	4,516	6,734	4,171
	Q4	22,039	16,624	5,415	7,142	5,488

Exhibit G-11 (con't)

Capital and Factors Affecting Regulatory Capital Needs of NYSE
Member Firms Which Conduct A Public Business, 1976-1987

(Millions of Dollars)

		<u>Total Capital</u>	<u>Equity Capital</u>	<u>Subordinated Debt</u>	<u>Illiquid Assets</u>	<u>Haircuts on Securities</u>
1986	Q1	24,828	18,295	6,533	7,727	6,678
	Q2	26,137	19,310	6,827	8,516	6,576
	Q3	28,112	20,339	7,773	9,217	6,427
	Q4	30,110	21,479	8,631	9,687	6,758
1987	Q1	32,580	23,706	8,874	10,667	7,977
	Q2	34,043	24,406	9,637	11,404	7,421
	Q3	\$34,992	\$25,637	\$9,355	\$12,164	\$7,741

Exhibit G-12

Net Capital, Required Net Capital, and Excess Net Capital of
NYSE Member Firms Which Conduct a Public Business, 1976-1987

(Millions of Dollars)

		<u>Net Capital 1/</u>	<u>Required Net Capital</u>	<u>Excess Net Capital</u>	<u>Aggregate Indebtedness 2/</u>	<u>Reserve Formula Debits</u>
1976	Q1	\$ 2,133	\$ 595	\$ 1,538	\$5,205	\$10,066
	Q2	2,116	545	1,571	3,892	10,384
	Q3	2,069	619	1,450	2,881	11,196
	Q4	2,116	630	1,486	2,674	13,501
1977	Q1	2,143	598	1,545	2,249	13,103
	Q2	2,123	630	1,493	1,710	14,223
	Q3	2,025	614	1,411	1,227	14,472
	Q4	2,167	628	1,539	879	14,840
1978	Q1	1,975	583	1,392	1,715	13,896
	Q2	2,014	687	1,327	2,095	15,408
	Q3	2,236	787	1,449	2,042	17,656
	Q4	2,341	682	1,659	1,658	15,497
1979	Q1	2,418	596	1,822	1,423	15,323
	Q2	2,635	674	1,961	1,671	16,883
	Q3	2,632	749	1,883	1,649	18,462
	Q4	2,743	766	1,977	1,937	19,142
1980	Q1	2,990	789	2,201	1,546	18,795
	Q2	3,411	815	2,596	1,917	19,894
	Q3	3,461	888	2,573	1,843	21,096
	Q4	3,818	1,064	2,754	2,140	25,357
1981	Q1	3,970	871	3,099	1,774	21,368
	Q2	4,166	930	3,236	1,943	22,721
	Q3	3,954	838	3,116	1,870	20,418
	Q4	4,279	962	3,317	2,006	23,347
1982	Q1	4,258	775	3,483	1,446	18,470
	Q2	4,018	421	3,597	991	13,190
	Q3	4,178	500	3,678	1,371	21,170
	Q4	5,320	632	4,688	1,780	27,042
1983	Q1	5,218	600	4,618	1,506	25,611
	Q2	5,357	737	4,620	1,922	31,404
	Q3	5,902	743	5,160	1,987	32,446
	Q4	5,743	799	4,944	2,206	33,607
1984	Q1	6,356	708	5,648	1,704	30,695
	Q2	6,093	721	5,372	1,706	31,123
	Q3	6,238	733	5,505	1,825	31,248
	Q4	6,599	831	5,718	3,021	35,204
1985	Q1	6,488	704	5,784	1,648	30,541
	Q2	6,301	876	5,425	2,344	38,242
	Q3	6,792	840	5,952	2,478	36,675
	Q4	7,694	1,203	6,491	3,680	51,430

Exhibit G-12 (con't)

Net Capital, Required Net Capital, and Excess Net Capital of
NYSE Member Firms Which Conduct a Public Business, 1976-1987

(Millions of Dollars)

		<u>Net Capital</u> 1/	<u>Required Net Capital</u>	<u>Excess Net Capital</u>	<u>Aggregate Indebtedness</u> 2/	<u>Reserve Formula Debit</u>
1986	Q1	7,987	1,149	6,838	3,580	48,644
	Q2	8,655	1,115	7,540	2,811	48,897
	Q3	10,074	1,148	8,925	2,880	50,087
	Q4	10,845	1,298	9,548	3,377	57,252
1987	Q1	14,111	1,330	12,781	3,639	56,359
	Q2	15,432	1,438	13,994	4,677	59,254
	Q3	\$14,331	\$1,470	\$12,861	\$3,760	\$62,473

1/ Net capital equals total capital after the deduction of haircuts on securities and illiquid assets and the subtraction (or addition) of miscellaneous capital charges (credits).

2/ Aggregate Indebtedness of BCM firms. ACM firms are not required to compute or report Aggregate Indebtedness.

Exhibit G-13

Some Regulatory Components of Capital
of Sampled Firms
(\$millions)

	All Sampled Firms	
	September 30, 1987	October 31, 1987
Total Capital	\$29,474.0	\$29,863.3
Equity Capital	21,232.9	20,783.1
Subordinated Debt	8,241.1	9,080.2
Haircuts	6,674.0	6,067.2
Equity <u>1/</u>	3,682.4	3,120.7
Concentration	123.0	48.5
Other	2,868.6	2,898.1
Illiquid Assets	10,241.8	10,423.7
Net Capital	11,008.5	11,834.1
Required Net Capital	1,207.7	1,271.2
Excess Net Capital	\$ 9,800.8	\$10,562.9

1/ Includes haircuts on stocks, options, and arbitrage.

Exhibit G-14

Some Regulatory Components of Capital
Sampled Firm Categories
(\$ millions)

	<u>National Full Line</u>		<u>Large Investment Bankers</u>		<u>Other Large Firms</u>	
	<u>Sept. 30, 1987</u>	<u>Oct. 31, 1987</u>	<u>Sept. 30, 1987</u>	<u>Oct. 31, 1987</u>	<u>Sept. 30, 1987</u>	<u>Oct. 31, 1987</u>
Total Capital	\$13,714.6	\$14,707.6	\$10,961.1	\$11,049.7	\$1,507.9	\$1,578.8
Equity Capital	9,621.4	10,122.4	7,496.1	7,430.2	1,282.6	1,242.6
Subordinated Debt	4,093.3	4,585.2	3,465.1	3,619.5	225.3	336.2
Haircuts	2,314.7	2,221.9	3,117.7	3,077.4	440.9	387.9
Equity <u>1/</u>	1,051.9	953.0	1,728.5	1,663.5	306.7	270.5
Concentration	2.2	9.5	28.6	9.3	12.8	7.1
Other	1,260.5	1,259.4	1,360.7	1,404.6	121.3	110.3
Illiquid Assets	6,624.4	6,796.1	2,658.1	2,611.2	362.8	374.1
Net Capital	4,240.2	4,993.3	4,359.7	4,819.8	640.0	688.5
Required Net Capital	582.4	550.5	489.4	593.0	70.8	64.5
Excess Net Capital	\$ 3,657.9	\$ 4,442.8	\$ 3,870.3	\$ 4,226.8	\$ 569.2	\$ 624.0

	<u>Brokers</u>		<u>Equity Dealers</u>		<u>Debt Dealers</u>	
	<u>Sept. 30, 1987</u>	<u>Oct. 31, 1987</u>	<u>Sept. 30, 1987</u>	<u>Oct. 31, 1987</u>	<u>Sept. 30, 1987</u>	<u>Oct. 31, 1987</u>
Total Capital	\$1,034.1	\$1,030.8	\$2,062.0	\$1,238.1	\$194.3	\$258.2
Equity Capital	848.5	813.0	1,918.4	1,094.6	65.8	80.3
Subordinated Debt	185.5	217.8	143.6	143.6	128.5	177.9
Haircuts	50.8	42.6	662.7	247.5	87.2	90.0
Equity <u>1/</u>	20.8	18.1	571.6	213.2	2.8	2.4
Concentration	1.2	.9	77.4	21.7	.9	0
Other	28.8	23.6	13.7	12.7	83.6	87.5
Illiquid Assets	457.9	536.2	88.8	60.2	49.7	45.9
Net Capital	489.7	410.1	1,247.6	835.1	31.2	87.1
Required Net Capital	61.8	58.3	1.2	1.3	2.1	3.6
Excess Net Capital	\$ 427.9	\$ 351.8	\$1,246.4	\$ 834.0	\$ 29.1	\$ 83.6

1/ Includes haircuts on stocks, options, and arbitrage.

Exhibit G-15

Components of Change in Equity Capital of NYSE Sample
September 30 Compared to October 31, 1987

	Factors Affecting Equity Capital in October				Equity Capital October 31
	Equity Capital September 30	Pre-tax Income	Adjustments to Pre-tax Income 1/	Net Additions to Equity Capital	
Total Sample	\$21,232.9	\$ (1,664.2)	\$ 345.3	\$ 869.2	\$20,783.1
National Full Line	9,621.4	(433.2)	146.7	787.6	10,122.4
Large Investment Bankers	7,496.1	(311.3)	97.9	147.5	7,430.2
Other Large Firms	1,282.6	(160.0)	23.2	96.7	1,242.6
Brokers	848.5	(46.3)	20.5	(9.7)	813.0
Equity Dealers	1,918.4	(714.7)	54.4	(163.6)	1,094.6
Debt Dealers	\$ 65.8	\$ 1.3	\$ 2.6	\$ 10.6	\$ 80.3

1/ Primarily provisions for Federal taxes.

Exhibit G-16

Percent Change in Equity Capital and Excess Net Capital of Sampled Firms
September 30 - October 31, 1987

	Total Sample	National Full Line	Large Investment Bankers	Other Large Firms	Brokers	Equity Dealers	Debt Dealers
All Firms	58	10	10	8	14	13	3
Percent Change in Equity Capital							
No change or increase	21	5	2	3	7	2	2
Decrease of							
less than 10%	21	5	6	2	6	1	1
10%-25%	8	0	2	3	1	2	0
25%-50%	4	0	0	0	0	4	0
50% or more	4	0	0	0	0	4	0
Percent Change in Excess Net Capital							
No change or increase	27	7	5	5	4	3	3
Decrease of							
less than 10%	6	1	1	0	3	1	0
10%-25%	12	2	3	2	4	1	0
25%-50%	11	0	1	1	3	6	0
50% or more	2	0	0	0	0	2	0

Exhibit G-17

Excess Net Capital as a Percent of Total Capital
September 30 Compared With October 31, 1987

	Total Sample		National Full Line		Large Investment Bankers		Other Large Firms		Brokers		Equity Dealers		Debt Dealers	
	Sept	Oct	Sept	Oct	Sept	Oct	Sept	Oct	Sept	Oct	Sept	Oct	Sept	Oct
All Firms	58	58	10	10	10	10	8	8	14	14	13	13	3	3
Excess Net Capital As a Percent of Total Capital														
Under 0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0-10%	1	0	0	0	0	0	0	0	0	0	0	0	1	0
10-25%	8	9	5	4	2	1	1	0	0	2	0	1	0	1
25-50%	32	29	4	5	7	8	4	4	11	10	5	2	1	0
Over 50%	17	20	1	1	1	1	3	4	3	2	8	10	1	2

Exhibit G-18

October Losses of Sampled Firms Relative to Regulatory
Capital Buffers In Place September 30, 1987

	Total Sample	National Full Line		Large Investment Bankers		Other Large Firms		Brokers		Equity Dealers		Debt Dealers	
		10		10		8		14		13		3	
All Firms	58												
Investment and Equity Trading Losses as a Percent of Equity Haircuts <u>1/</u> <u>2/</u>	41	7		6		6		8		12		2	
All Firms	6	2		1		0		2		1		0	
0-25%	8	2		1		3		1		0		1	
25-50%	12	2		2		1		3		4		0	
50-100%	15	1		2		2		2		7		1	
Over 100%													
Trading and Invest- ment Losses as a Percent of Haircuts <u>3/</u>	35	5		5		6		5		12		2	
All Firms	12	4		3		1		2		1		1	
0-25%	4	0		0		2		1		1		0	
25-50%	9	0		2		2		1		3		1	
50-100%	10	1		0		1		1		7		0	
Over 100%													
All Losses as a Percent of Excess Net Capital and Haircuts <u>4/</u>	45	7		9		7		8		12		2	
All Firms	31	6		8		6		7		2		2	
0-25%	12	1		1		1		1		8		0	
25-50%	2	0		0		0		0		2		0	
50-100%	0	0		0		0		0		0		0	
Over 100%													

1/ Equity trading is all trading less debt trading. Equity haircuts are haircuts on stocks, options,
and arbitrage.
2/ For firms with investment and equity trading losses.
3/ For firms with trading and investment losses.
4/ For firms with losses.

Exhibit G-19

Transaction Efficiency of Sampled Firms
September 30 and October 31, 1987

	Tickets (thousands)		Aged Fails L/ (thousands)		Aged Fails L/ (\$millions)		Aged Fails as a Percent of All Fails L/	
	Sept	Oct	Sept	Oct	Sept	Oct	Sept	Oct
Total Sample	13,637.7	18,439.4	29.3	26.6	\$1,266.1	\$1,282.4	11.5%	13.2%
National Full Line	8,698.3	11,205.4	19.5	17.7	580.7	591.8	11.9	15.4
Large Investment Bankers	1,917.1	2,839.3	2.6	2.5	496.2	471.7	13.3	10.5
Other Large Firms	1,848.8	2,659.3	4.8	4.1	135.2	136.7	7.7	14.8
Brokers	934.6	1,389.5	2.2	2.1	32.4	48.8	8.0	19.8
Equity Dealers	206.5	304.0	0	0	.4	0	9.8	.6
Debt Dealers	32.4	41.9	.1	.1	\$ 21.3	\$ 33.4	10.6%	18.9%

L/ Fails are average of fails to deliver and fails to receive.

Exhibit G-20

Customer Losses and Exposure of Sampled Firms
Three-Quarters Compared to October, 1987

	Customer Receivables (\$millions)		Unsecured Customer Receivables Percent of Customer Receivables		Losses in Error Accounts and Bad Debts		Percent of Total Expenses	
	3Q 1/	Oct	3Q 1/	Oct	3Q 2/	Oct	3Q 2/	Oct
Total Sample	\$44,281.8	\$46,888.4	\$644.8	\$1,382.1	\$42.2	\$313.9	1.2%	8.6 %
National Full Line	23,233.1	24,252.7	438.6	814.9	31.9	160.0	1.7	7.7
Large Investment Bankers	15,673.8	17,454.9	141.4	395.0	7.9	81.0	.7	7.0
Other Large Firms	2,427.2	2,578.2	40.4	85.8	1.0	12.4	.5	6.4
Brokers	2,905.4	2,516.5	24.3	86.5	1.4	60.4	.9	28.4
Equity Dealers	0	0	0	0	0	.1	0	.8
Debt Dealers	\$ 42.3	\$ 86.0	\$ 0	\$ 0	\$ 0	\$ 0	.3%	(.1)%

1/ Average of balance sheet item at end of first, second, and third quarters of 1987.

2/ Monthly average of expense items for the first nine months of 1987.

APPENDIX H



Office of
Consumer Affairs
and Information
Services

H-1

IN REPLYING PLEASE QUOTE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

[Sample -- Sent to all SROs]

November 25, 1987

George Mann, Senior Vice President
Boston Stock Exchange, Inc.
One Boston Place
Boston, MA 02108

Dear Mr. Mann:

The Securities and Exchange Commission has undertaken an extensive study of the stock market decline and volatility that occurred in late October. The study will assist in focusing the Commission's regulatory and oversight efforts to ensure a strong and efficient securities market and to protect the interests of investors. As part of this effort, the Office of Consumer Affairs and Information Services is conducting a special, intensive analysis of "market break complaints" to determine and examine the kinds of problems experienced by investors. "Market break complaints" refers to those complaints and inquiries filed by, or on behalf of, individual or institutional investors that relate to problems/concerns which either occurred during the period of October 14-30, 1987 or were caused by market events of that period.

In order to provide a comprehensive analysis of investor complaints, we would appreciate your office's coordinating responses by the Spokane Stock Exchange to the following requests for information. Please provide the information by the dates indicated in each subsection. Enclosed in this package are preferred formats and coding instructions for the written complaints; we would appreciate receiving the information in a machine readable format (preferably on floppy disks). A preformatted disk using the Lotus 1-2-3 Program is included for your convenience. If you have any questions, please feel free to contact Rick Pullano or John Heine of my staff on (202) 272-7440.

I or a member of my staff will call you early next week to ask you for preliminary figures on written and telephone complaints received so far from the October market break, as well as statistics on your normal volume of complaints.

I. TELEPHONE COMPLAINTS (Response due December 8, 1987)

Please provide responses to the following questions:

- A. What, if any, special provisions were made to handle telephone complaints during the October market break?
- B. Were telephone complaints related to the market break logged in or tracked? If so, how?
- C. Please provide the actual or estimated (indicate which) volume of calls: (1) daily from October 14 through October 30, and (2) weekly from November 2 through November 27.
- D. Which brokers or issuers were most often mentioned in complaints and what were the specific kinds of complaints? (please use the format below)

<u>Firm</u>	<u>Actual or est. number of complaints</u>	<u>Nature of complaints</u>	<u>Comments</u>
-------------	--	---------------------------------	-----------------

- E. For approximately what percentage of telephone complaints did your staff recommend the following types of action?

- (1) Written complaint to your organization or another SRO
- (2) Written complaint to the SEC
- (3) Arbitration
- (4) Contact firm directly
- (5) No action recommended
- (6) Other (specify)

- F. Other comments or information

- II. WRITTEN COMPLAINTS (Response for complaints received by November 13 due December 8; additional November and December complaints due December 15. PLEASE NOTE: Depending on the volume received and the delay in receipt of market break complaints, we anticipate the need to monitor these complaints over a period of several months and will advise you accordingly.)

Please provide a list of market break complaint letters identified with the following information:

- A. Assigned file or tracking number (use designated prefix per page 2 of instructions)
- B. Firm or entity name which is the subject of the complaint, where given *
- C. Entity code *
- D. Nature of complaint (please analyze each complaint letter and identify one or more special complaint codes which apply, as described in the instructions) *
- E. Date(s) of transactions
- F. Issuer of securities subject to the complaint or inquiry (full name as space permits)
- G. Market involved *
- H. Type of security *
- I. Categorization of complainant and/or conduit through which complaint was filed *
- J. Notes (list column headings related to any comments furnished on supplemental sheets)

* Asterisks denote fields for which codes or designated abbreviations are given; please see enclosed instructions.

We have coordinated our requirements with both the Division of Market Regulation and the Division of Investment Management in order to ensure that the information you provide will satisfy all data requirements for complaint information from the Commission.

As you know, the Commission is working under severe time constraints to complete this study. We realize that the deadlines established for your responses are demanding, and we appreciate your considerable efforts in furnishing this information. Thank you, in advance, for your cooperation.

Sincerely,

Bonnie M. Westbrook
Director

Enclosures

cc: Nina Gross
Richard Ketchum
Kathryn B. McGrath

INSTRUCTIONS FOR SUBMISSIONS

ANALYSIS OF OCTOBER MARKET BREAK

OFFICE OF CONSUMER AFFAIRS AND INFORMATION SERVICES

November, 1987

OFFICE OF CONSUMER AFFAIRS AND INFORMATION SERVICES
ANALYSIS OF OCTOBER MARKET BREAK COMPLAINTS
CODES AND CODING INSTRUCTIONS

CODING INSTRUCTIONS

The PC based program you will be using to document market break complaints was developed to cover the unique complaints/inquiries generated by the October market decline, as well as to provide a degree of flexibility not presently available in the existing CMPI system. An attempt was made to identify the most common problems raised by investors based on a review of the complaints received in the home office, and an analysis of the types of telephone complaints/inquiries received both in the regional offices and in the home office. Although we attempted to capture all of the reported problems, as well as a number of anticipated problems, the list is by no means all-inclusive. As a result, we are providing a supplemental worksheet to be used should you encounter a complaint letter which presents information that is incompatible with the program format. Specific guidelines for using the supplemental worksheet will be discussed below, but it should be noted that it is an important part of the program since the worksheet provides space to identify entries characterized as "OTHER" and, in addition, offers an opportunity to comment on individual complaints when necessary.

Proper analysis of the information provided in the complaint letters is essential. Consequently, we ask that you read the accompanying instructions carefully, and follow them closely. In the event that you receive a letter which does not fit into the categories provided or would be inadequately described even after using the supplemental comment sheet, we ask that you send us a copy of the letter. Also, if you are uncertain of your analysis of a letter, we ask that you forward a copy of that letter, indicating the problem area.

FILE NUMBER (Column A)

In order to fully account for all complaints, it will be necessary to repeat the file number assigned to most letters. This practice will apply to letters (1) containing multiple complaints, (2) naming more than one entity, (3) citing several transaction dates, (4) naming more than one issuer, or (5) naming more than one market. Examples of multiple complaints are enclosed in your information packet, and an illustration of the corresponding computer entries may be found on the sample computer report.

SPECIAL FILE NUMBER FORMAT FOR SRO's

To accommodate the input of this information to our computer program, a letter prefix to the file number is necessary. As the Commission has pre-assigned prefixes in place, your existing letter prefix (or one arbitrarily chosen) may conflict or cause confusion. Therefore, we ask that you use the following unique prefix: BX.

ENTITY (Column B)

This category should be used to designate the name of the entity (broker-dealer firm, mutual fund or stock exchange) about whom the complaint is directed. If more than one entity is named, you should determine the entity that is the primary target of the complaint, enter the abbreviation of that entity first, then repeat the file number (as described previously) and list the remaining entities, along with the corresponding complaint information for each. If there are several complaints against the same firm, the firm should be listed for each additional complaint.

It must be emphasized that while uniformity in entering data is important for the entire program, it is of particular importance in this category. An accurate count depends on using the abbreviations provided or, if none apply, entering "OTH" in this column, "B" in the NOTES column, and specifying the entity on the supplemental sheet. Deviation from the abbreviations provided will cause problems, so please consult the lists before entering data. Please note that mutual funds having the same name as brokerage firms will have a different designation.

CODE (Column C)

This category will be used to identify the type of institution against which the complaint is being made. We have identified seven (7) such types and provided a two-letter abbreviation for each. One additional code has been provided in order to allow for categorization of general/miscellaneous complaints or inquiries and also those instances where the type of entity is not named (use GN).

COMPLT (Column D)

This category will be used to designate the type(s) of complaints/inquiries received. As we indicated previously, we hope to have covered a majority of the potential problems and topics. The complaint types were intended to be self-explanatory;

however, should a question arise, please contact Rick Pullano or John Heine at (202) 272-7440, or indicate your interpretation in the supplemental comment sheet.

DATE (Column E)

The date that we are looking for in this column is the transaction date referred to in the letter (for example, the date on which a stock was bought or sold) or, the date on which some action took place (for example, the date on which the investor tried to contact his broker). The representative letters provided illustrate how the date column should be used, including situations where several dates are mentioned in one letter.

The time frame targeted in this study is October 14 through October 30. The computer program is designed to analyze information based on that time period. Therefore, your entries in this column should be made with that in mind. If the letter refers to a date outside of this timeframe, but the complaint is still related to the market break, an "NA" should be entered in this column, an "E" in the NOTES column, and a corresponding entry of explanation should be made on the supplemental sheet.

ISSUER (Column F)

This column should be used to identify the issuer of the stock or product referred to in the complaint letter. For example, this column could contain the name of a particular stock or, in the case of a mutual fund, the name of a particular fund if that information is provided.

As the number of possible entries in this column is so great, no attempt was made to provide a codified universe of potential issuers. Therefore, we ask that you use your own discretion in deciding whether to enter as many letters of the full name in the space provided or to enter an acronym. Many of the acronyms or abbreviations are so widely used, they are accepted universally and leave no room for doubt (e.g. IBM, MCI, etc.). On the other hand, there may be instances where an abbreviation may leave room for doubt or be subject to several interpretations. Consequently, we ask that if your entry is unclear (acronym, abbreviation or incomplete full spelling), enter "F" in the NOTES column and please identify the issuer in question on the supplemental comment sheet.

MKT (Column G)

This column should be used to identify the market on which the stock in question was traded. We are aware that this column may not be applicable to all complaints/inquiries. Furthermore, as is the case for the entire program, the information we are attempting to document may not always be provided by the complainant or may not otherwise be known by the person coding the letter. This is especially true in this column. In such instances, enter "NA" and proceed to the next column. It should be noted, however, that this information will be very useful and should be included if it is specified in the letter. If the market codes provided are inadequate, please enter "OTH" in the column, "G" in the NOTES column, and identify the market on the supplemental sheet.

TYPE (Column H)

This column refers to the type of security the complainant may refer to in his/her letter. For example, the letter may specify that the investor was dealing in options, or you may be able to determine that, given the circumstances described therein. Again, we realize that not every letter will yield this kind of information; however, it is important data and should be entered if included in the letter. Please use the appropriate letter codes provided, and if those prove inadequate, use "OTH", reference 'H' in the NOTES column, and include information on the supplemental sheet.

CAT (Column I)

This field is used to categorize the complainant (individual investor, representative of an institutional investor, broker, etc.) and whether the complaint was forwarded directly or through another party (the conduit of the complaint information). Please use the appropriate two or three letter code and, if a specific code does not fit, use "OTH" (other), reference 'I' in the NOTES column, and include information on the supplemental sheet.

NOTES (Column J)

This column should be utilized to reference any columns (A through I) for a particular complaint entry for which additional information or explanation is found on the supplemental sheet. For example, anytime you enter "OTH" in a column, that column letter should be entered in the NOTES column, then referenced and explained on the supplemental sheet.

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OFFICE OF CONSUMER AFFAIRS AND INFORMATION SERVICES

ANALYSIS OF OCTOBER MARKET BREAK

CODES AND CODING INSTRUCTIONS

ENTITY NAME (Column B)

BROKER-DEALERS

CODE	FIRM NAME
AGE	A.G. Edwards & Sons
BS	Bear Stearns Co.
BR	Blinder Robinson
CS	Charles Schwab
DW	Dean Witter
DBL	Drexel Burham Lambert
EFH	E. F. Hutton
FDR	F.D. Roberts & Co.
FB	Fidelity Brokerage
FP	First Potomac Securities Corp.
HBS	H.B. Shaine
JWG	J.W. Gant & Associates
KC	Kennedy & Cabot Co.
KP	Kidder Peabody
LM	Legg Mason Wood Walker
MN	Mabon-Nugent & Co.
ML	Merrill Lynch
OD	Olde Discount
OPP	Oppenheimer & Co.
PW	Paine Webber
PF	Pittcock Financial
PB	Prudential Bache
QR	Quick & Reilly
RC	Rose & Co.
SPB	Security Pacific Brokers
SL	Shearson Lehman
SB	Smith Barney
SJ	Stuart James
TM	Thomson McKinnon
WSI	Waterhouse Securities Inc.
OTH	Other (specify on supplemental comment sheet)

Codes for Entity Names (page 2)

MUTUAL FUNDS (Note: funds will have a different designation than brokerage firms having the same name)

AIM	AIM Advisors
AL	Alliance
AC	American Capital
BCA	Boston Company Advisors
COL	Colonial
DWF	Dean Witter Reynolds, Inc.
DC	Dreyfus Corp.
FED	Federated Investors
FG	Fidelity Group
F	Franklin
HAM	Hutton Asset Management
IDS	IDS Financial Services
JH	John Hancock
KMP	Kemper
KEY	Keystone
MLF	Merrill Lynch Fund
OMC	Oppenheimer Management Corp.
PWF	Paine Webber Inc.
PIO	Pioneer
P	Putnam
PBF	Prudential-Bache Mutual Funds
SCD	Scudder Funds
TRP	T. Rowe Price
TF	Templeton Funds
TC	Twentieth Century
VG	Vanguard Group
WR	Waddell Reed, Inc.
OTH	Other (specify on supplemental comment sheet)

ENTITY CODE (Column C)

<u>Code</u>	<u>Entity</u>
BD	Broker-Dealer
SR	Self-Regulatory Org.
BK	Bank
TA	Transfer Agent
IS	Issuer
IA	Investment Adviser
MF	Mutual Fund
GN	General & Miscellaneous

OFFICE OF CONSUMER AFFAIRS AND INFORMATION SERVICESANALYSIS OF OCTOBER MARKET BREAK COMPLAINTS
CODES AND CODING INSTRUCTIONSNATURE OF COMPLAINT (Column D)

<u>CODE</u>	<u>GENERAL INQUIRY/COMPLAINT</u>
101	o inability to contact broker, fund, etc. by telephone
102	o inability to obtain timely or accurate quote prices (includes "tape" delay complaints)
103	o complaints of "bad/faulty" advice or that representatives did not meet fiduciary obligations
104	o general comments on market break situation
105	o questions/comments on program trading
106	o comments/suggestions on degree of SEC or SRO intervention
107	o questions about SIPC
108	o questions about broker-dealer solvency or insolvency
109	o allegations of market manipulation
110	o allegations of other securities law violations (please specify on supplemental sheet)
111	o allegations that firm put own interests before investors' interests
112	o other miscellaneous problems (if there are serious problems not covered by codes, please specify on supplemental sheet)

CONFIRMATION PROBLEMS

201	o inability to get or delay in receiving oral confirmation
202	o oral confirmation of execution different from written confirmation
203	o no written confirmation received
204	o written confirmation received more than seven (7) business days after transaction
205	o price discrepancies (exclusive of code 303 problems)

EXECUTION PROBLEMS

- 301 o non-execution of order
- 302 o delayed execution of order (includes "missing the market")
- 303 o execution at a price different than the one quoted
- 304 o refusal to execute a market order
- 305 o refusal by BD to open an account so that customers
 may make "quick sales"
- 306 o execution not in accord with stop or limit order
- 307 o refusal or claimed inability to accept or execute
 stop or limit order
- 308 o problems specifically associated with market makers
 or specialist performance
- 309 o "systems" problems related to order execution

MARGIN MAINTENANCE PROBLEMS

- 401 o insufficient notice of (maintenance) margin calls
 - 402 o insufficient time to meet margin call
 - 403 o liquidation of position or account without notice to
 investor
 - 404 o inability to determine maintenance margin requirements
 or changing requirements
 - 405 o past pattern of practice regarding maintenance margin
 calls is changed
-

MUTUAL FUND-SPECIFIC PROBLEMS

- 501 o problems transferring from one fund to another fund within the same group
 - 502 o problems transferring to a fund outside of the group
 - 503 o problem getting immediate access to funds because of seven-day provision
 - 504 o complaint about placing the redemption amount into a cash account which earns no interest
 - 505 o pricing problems (inability to find out or obtain current net asset value)
 - 506 o lack of published price information
 - 507 o problems concerning exit or redemption fees
 - 508 o redemption procedures (paperwork requirements, etc.)
 - 509 o delays in processing redemptions (includes date discrepancies)
 - 510 o other redemption problems
 - 511 o misunderstanding on part of investor of market risks (price fluctuations)
-

OFFICE OF CONSUMER AFFAIRS AND INFORMATION SERVICES
ANALYSIS OF OCTOBER MARKET BREAK COMPLAINTS
 CODES AND CODING INSTRUCTIONS

EXCHANGE/MARKETS (Column G)

<u>CODE</u>	<u>NAME</u>
AMS	American Stock Exchange
BSE	Boston Stock Exchange
CIN	Cincinnati Stock Exchange
SSE	Spokane Stock Exchange
MSE	Midwest Stock Exchange
NYS	New York Stock Exchange
CBO	Chicago Board Options Exchange
PHX	Philadelphia Stock Exchange
PSE	Pacific Stock Exchange
OTC	Over the Counter pink sheets
NAS	Nasdaq listed or NMS
FUX	Futures Exchange

TYPE OF SECURITY (Column H)

<u>ASSIGNED CODE</u>	<u>TYPE</u>
C	Common stock
P	Preferred stock
B	Bonds
O	Options (puts & calls)
MF	Mutual funds
IF	Index futures

CATEGORY (Column I)

<u>CODE</u>	<u>COMPLAINANT/TYPE/CONDUIT</u>
ID	Individual Investor Directly
IR	Individual Investor through Representative (including attorney, Congress; etc. but not broker)
RI	Representative of Institutional Investor (e.g., pension fund)
BDD	Broker-Dealer Directly
BI	Broker on Behalf of Investor
BRI	Broker on Behalf of Representative of Institutional Investor
OTH	Other (please specify)

[illegible]

APPENDIX I

GLOSSARY

ACATS -- The Automated Customer Account Transfer System is operated by NSCC. The system provides centralized, automated transfers of customer accounts between brokers.

ACHA -- The Associate Clearing House Amsterdam is associated with OCC to enable the EOE members to clear XMI options traded on EOE.

ADP -- Automatic Data Processing is a major provider of brokerage services, including market information, front office services for sales operation, and back office services such as processing trades. ADP also owns BTSI, Brokerage Transactions Services, Inc., which is a data-processing facility that performs such functions as the routing of orders between firms and exchange order systems, back office processing, and commission billing.

Amex -- American Stock Exchange, Inc.

Arbitrage -- Arbitrage is trading to profit from differences in price in the same, or functionally equivalent, security, currency, or commodity in two or more markets.

ASAM -- The Automated Search and Match System is an on-line data base used by the NYSE which lists pertinent facts on directors and corporate officers of all exchange-listed companies. ASAM permits analysts to avoid manually searching corporate directories for ties to persons trading before material news announcements. This search can now be completed by ASAM in a matter of seconds.

Auto-Ex -- The Automatic Execution system is used at the Amex to automatically execute certain index options and stock options orders.

Auto-Quote -- Auto-Quote is a generic term which describes computer systems designed to automatically generate quotations through preset algorithms. Originally, such systems were developed by regional stock exchange specialists to track NYSE quotations. The CBOE and Amex, however, have developed systems which permit market makers and specialists to set parameters for automatic adjustments to quotations in all options series whenever the designated "driver" series is manually adjusted.

Beacon -- The Boston Exchange Automated Communications Order-Routing Network will provide, when completed, the BSE with the same order routing and execution capabilities as are used on the other regional exchanges.

BSE -- Boston Stock Exchange, Inc.

CARS -- The Computer Assisted Rotation System is an automated order processing system, implemented by CBOE in October 1986, that electronically collects, matches and provides execution or "fill" reports for public pre-opening market orders in OEX.

CATS -- The Computer Assisted Trading System is an automated trading system developed by the TSE in 1977.

CBOE -- Chicago Board Options Exchange, Inc.

CBT -- Chicago Board of Trade.

CDS -- The Canadian Depository for Securities is linked with NSCC and DTC.

Clearing Firm -- Clearing, or carrying, broker-dealers are broker-dealers that process transactions and maintain custody of funds and securities on behalf of another broker-dealer. In addition to holding funds and securities, clearing firms are contractually responsible for the settlement of the securities transactions of the other broker-dealer and the maintenance of certain records relating to those transactions.

CME -- Chicago Mercantile Exchange.

CNS -- Continuous net settlement is a process by which clearing corporations net daily trading activity of member broker-dealers and then net each day's activity with prior days.

COD Privileges -- COD refers to cash on delivery or payment and delivery of securities instead of five business days after trade date. Operationally, the term refers to a depository member's use of depository facilities for trade settlement with customers to whom the member extends COD privileges. Such privileges are commonly extended by broker-dealers to institutional customers. The legality of COD privileges stems from an exception in the requirement of Regulation T, issued by the FRB, that customers pay for securities within seven business days after the date of purchase. This exception permits payment on delivery within 35 calendar days of a trade.

CQ Plan -- The Consolidated Quotation Plan enables participant markets - the Amex, BSE, CSE, MSE, NYSE, PSE, Phlx, and the NASD - to make quotation information available to quotation vendors as required in the Commission's Quote Rule (Rule 11Ac-1 under the Securities Exchange Act of 1934). The Commission has approved the CQ Plan.

CRD -- The Central Registration Depository is a computer data base that was developed jointly by NASAA and the NASD and is maintained by the NASD. The CRD provides current registration information for every registered representative that is associated with a member of the NASD and/or is licensed in a state that participates in the CRD system. (Currently, every state but Hawaii participates.) The CRD also holds information on broker-dealers that are members of the NASD.

CSE -- Cincinnati Stock Exchange.

CTA Plan -- The Consolidated Tape Association Plan administered by the CTA -- which consists of the Amex, BSE, CSE, MSE, NYSE, PSE, Phlx, and the NASD -- for facilitating the dissemination of consolidated last sale prices for certain eligible securities. Network A disseminates prices for NYSE-listed securities and Network B disseminates prices for Amex-listed securities and regional listings that substantially meet Amex eligibility criteria. The prices and volume of trades in NYSE-listed stocks and of Amex-listed stocks, regardless of the market in which the trade takes place, are disseminated to vendors over high speed data transmission lines over Network A and Network B, respectively. The Commission has approved the CTA Plan.

CUSIP -- The Committee for Uniform Securities Identification Procedures is a subsidiary of Standard and Poor's under contract with American Bankers Association to assign a unique identification number for each fungible securities issue.

DOT -- The Designated Order Turnaround system (also known as Super Dot) was developed by the NYSE to facilitate routing of orders from NYSE members' offices to the specialist in the particular stock on the floor of the NYSE.

Downtick -- A downtick refers to a sale price lower than the last "regular way" sale of the security. Same as minus tick.

DTC -- The Depository Trust Company is the largest registered securities depository.

EOE -- European Options Exchange.

FEDWIRE -- The Federal Reserve System wire transfer facility provides a system for transferring funds and U.S. government securities between all 12 Federal Reserve Banks, their 24 branches, the Federal Reserve Board office in Washington, D.C., U.S. Treasury offices in Washington, D.C. and Chicago, and the Washington, D.C. office of the Commodity Credit Corporation.

FNCI -- Financial News Composite Index is a price-weighted index comprised of 30 stocks listed on the NYSE, designed to track the overall market.

Hedging -- Hedging is a strategy designed to protect a position in securities or commodities against price movements by taking an offsetting investment position.

ICC -- The Intermarket Clearing Corporation is a subsidiary of OCC that clears futures contracts, now operating a netting system with OCC for securities options and futures settlements.

Index Arbitrage -- Index arbitrage is the simultaneous purchase (or sale) of stocks that comprise or closely track a stock index and the sale (or purchase) of either futures or options on that particular index. Index arbitrageurs take advantage of spreads that periodically develop between equities, futures, and options markets by buying in the lowest-priced market and selling in the highest-priced market.

Instinet Corporation -- A registered broker-dealer that offers computerized execution facilities and securities information services.

Introducing Firm -- An introducing broker-dealer is a broker-dealer that, under a contractual arrangement with a carrying or clearing broker-dealer, transmits funds, securities and orders of customers to the clearing firm which executes the orders and maintains custody of the customer funds and securities. The clearing firms' contractual responsibilities also include the proper disposition of customer funds and securities after trade date, the transfer to the customer of funds and securities after settlement and the maintenance of certain records.

ISCC -- The International Securities Clearing Corporation is a subsidiary of NSCC, not yet registered with the Commission but provided with a no-action position to operate a linkage with the ISE.

ISE -- International Stock Exchange of the United Kingdom and the Republic of Ireland Limited (previously the London Stock Exchange).

ISG -- The Intermarket Surveillance Group was formed in 1981 as trading activities on equity and options markets were becoming increasingly interrelated. Its on-going task is to create and maintain a coordinated intermarket surveillance system to ensure that intermarket surveillance concerns are appropriately addressed. Members include the Amex, BSE, CSE, MSE, PSE, Phlx, CBOE, and the NASD.

ISIS -- The Intermarket Surveillance Information System was created by SIAC for the NYSE and provides automated access to consolidated trade, quotation and clearance data for all exchange-listed equities and options. Moreover, ISIS is programmed so that the automated surveillance programs using this information can easily adjust and "fine tune" parameters to detect suspicious trading situations.

ITS -- The Intermarket Trading System is a communications and order routing system designed to facilitate trading of certain securities designated as eligible for ITS trading between competing market centers; the Amex, BSE, CSE, MSE, NYSE, PSE, Phlx, and the NASD are all participants in the ITS, and a plan governing ITS operations has been approved by the Commission.

JSCC -- The Japanese Securities Clearing Corporation is the clearing arm of TKE. It currently is discussing a clearing linkage with ISCC.

KCBT -- Kansas City Board of Trade.

Letter of Credit (L/C) -- Letter of credit is a commitment, usually made by a commercial bank, which allows the named broker-dealer, under certain conditions and/or upon the occurrence of certain events specified under the terms of the commitment, to draw money to a specified amount from the bank.

List -- List order processing is the DOT feature that enables NYSE member firms to send orders through DOT in a list of securities. List is important in program trading strategies because it allows members to rapidly enter buy or sell orders in a large number of previously-identified securities.

Margin (Futures) -- A futures contract is an agreement to buy or sell a specified amount of a commodity at a specified price at a specified time in the future. Margin related to futures contracts of customers of futures commission merchants refers to the funds required by the futures commission merchant to secure ultimate performance under those contracts and to protect the futures commission merchant from customer default relating to adverse price movements in those contracts. In the context of futures trading, margin also refers to the amounts required of futures commission merchants by entities that facilitate settlement of, or clear, futures transactions.

Margin (Securities and Options) -- Broker-dealers extend credit to customers to purchase securities or options in margin accounts. Margin is the equity in the margin account. Generally, equity refers to the net market value of the securities positions increased by any funds in the account or reduced by the amount extended to the customer. When the customer purchases securities in a margin account, the margin provides additional collateral for the extension of credit by the broker-dealer. If the customer sells securities short or writes uncovered options, the margin protects the broker-dealer against losses related to customer default due to adverse price movements in those positions. Under the rules of the FRB and the various exchanges, broker-dealers are required to obtain certain minimum amounts of margin from their customers.

Broker-dealers are allowed to require their customers to submit margin in excess of those minimums, however.

Market Maker -- The term market maker generally means any dealer who, with respect to a security, holds himself out by entering quotations in an inter-dealer communication system or otherwise as being willing to buy and sell such security for his own account on a regular or continuous basis. The term "market maker" is defined in Section 3(a)(38) of the Securities Exchange Act of 1934.

MAX -- The Midwest Automatic Execution System is used by the MSE as a computerized order routing and execution system for small orders (up to 1099 shares).

MCC -- The Midwest Clearing Corporation is a registered clearing agency and is a subsidiary clearing agency of MSE.

Minus Tick -- A minus tick refers to a sale price lower than the last "regular way" sale of the security. Same as downtick.

MMI -- The Major Market Index is a futures contract that is based on a price-weighted index comprised of 20 highly-capitalized U.S. stocks traded on the NYSE. MMI is also the symbol for the future on the MMI traded on the CBT.

MSE -- Midwest Stock Exchange, Inc.

MSTC -- The Midwest Securities Trust Company is a securities depository which is a subsidiary clearing agency of the MSE and is registered as a clearing agency with the SEC.

NASAA -- North American Securities Administrators Association, Inc.

NASD -- National Association of Securities Dealers, Inc.

NASDAQ -- The National Association of Securities Dealers Automated Quotations system, owned and operated by the NASD, is a computerized communications facility that provides broker-dealers with price quotations for securities that are traded over-the-counter.

Net Capital -- The term net capital, as defined in Securities Exchange Act Rule 15c3-1, refers to the net worth of the broker-dealer increased by certain subordinated liabilities and reduced by unsecured receivables, assets not readily convertible into cash and specified percentages of the broker-dealer's securities and commodities positions. Rule 15c3-1 requires the broker-dealer to maintain net capital in excess of certain minimums in order to continue operating.

NMS Securities -- National Market System Securities are those equity securities, both on exchanges and in the OTC market, for which last sale transaction reporting is required.

NQB -- The National Quotation Bureau is the company that publishes the "pink sheets", a listing of market makers for OTC stocks that are not included in the NASDAQ system.

NSCC -- The National Securities Clearing Corporation is the largest clearing corporation and provides trade comparison, netting, and settlement of exchange, OTC, and municipal bond trades.

NYFE -- New York Futures Exchange, Inc.

NYSE -- New York Stock Exchange, Inc.

OARS -- The Opening Automatic Reporting System is an automated order processing system which is used by both the NYSE and Amex for both stocks and options. OARS stores round lot market orders for selected issues prior to the opening. When an opening price has been determined for an issue, the specialist activates OARS which automatically generates execution reports to the various member firms for each order which participated in the opening. OARS also automatically provides the specialist with summary information indicating the number of shares to buy and sell and any share imbalances.

OCC -- The Options Clearing Corporation issues, clears, and settles all standardized options trades.

OEX -- Standard & Poor's 100 Index. OEX is the symbol for an option on the S&P 100 Index, that is based on 100 widely held common stocks.

OPRA -- The Options Price Reporting Authority is composed of five exchanges that trade options -- the Amex, NYSE, PSE, Phlx, and CBOE. It is authorized by the Commission to act jointly as parties to a plan for the reporting of consolidated options last sale reports and quotation information.

OTC -- Over-the-Counter.

PACE -- The Philadelphia Automated Communication and Execution System is used by the Phlx as a computerized order routing and execution system for small orders in secondary issues. (Primary issues on the Phlx are comprised of local issues which are solely-listed on the Phlx, or issues that are dually-listed on another regional exchange or NASDAQ).

PER -- The Post Execution Reporting system at the Amex is a small order routing and execution system.

Philadep -- The Philadelphia Depository Trust Company is the clearing agency subsidiary of the Phlx.

Phlx -- Philadelphia Stock Exchange, Inc.

Plus Tick -- A plus tick refers to a sale at a price higher than the immediately preceding last "regular way" sale of a security. Same as uptick.

Portfolio Insurance -- Portfolio insurance is a hedging strategy designed to control market risk for a broad based portfolio by selling and buying stock index derivative products to protect against market loss at a cost or some limitation on the opportunities for appreciation. Typically, portfolio insurance seeks to assure a minimum value for a portfolio over a specified time period. To achieve this, stock index futures are sold

when the value of the portfolio decreases a certain percentage, and are repurchased when the portfolio regains this loss.

POSIT -- A system operated by Jefferies and Company, Inc. for matching orders for groups of stocks. A computerized order entry mechanism allows the trading of entire portfolios of stocks.

Post -- The "post" is the physical location on a trading floor where a security is traded -- usually by a specialist.

Price Limits -- The maximum price movement from the previous day's settlement price permitted for a contract in one trading session. The futures exchanges set such price limits with the approval of the CFTC. There are no price limits in the securities markets.

Program Trading -- Program trading is the trading of a whole portfolio or basket of stocks. Computers are used extensively in this process to optimize the composition of the stocks and to assist in the execution of the trades.

PSE -- Pacific Stock Exchange, Inc.

Quotron -- Quotron Systems, Inc. is a supplier of financial information services to brokers, banks, and other users in the United States, Europe, and Japan. This major vendor delivers its services to approximately 90,000 terminals supported by over 8,000 branch office host computers and network processors.

RAES -- The Retail Automatic Execution System is used at the CBOE to execute automatically customer orders in options on the S&P 100 Index, the most heavily traded option on the CBOE, and the S&P 500 Index. It is also used in certain designated equity options on the CBOE.

SCCP -- The Stock Clearing Corporation of Philadelphia is the clearing agency subsidiary of Phlx.

SCOREX -- The Securities Communication Order Routing and Execution System is an automated order routing and execution service which is used by the PSE.

SEAQ -- The Stock Exchange Automated Quotations is the electronic communications facility of the ISE and is modeled after NASDAQ. SEAQ collects the quotes of competing U.K. market makers and disseminates them over the ISE's TOPIC System. (The TOPIC System is the ISE's computer terminal network that provides on-line information service to users in the U.K.).

SEAQ International -- The Stock Exchange Automated Quotations International is the electronic communications facility of the ISE covering international equities.

SESDAQ -- The Stock Exchange of Singapore Dealing and Automated Quotation System is designed after NASDAQ.

SIAC -- Securities Information Automation Corporation is a subsidiary of NYSE and Amex that provides data processing service for DTC, NSCC, the NYSE, and the Amex.

It also acts as securities information processor for the consolidated tape and quote systems, the ITS and the ISG.

SIMEX -- Singapore International Monetary Exchange, Ltd.

SOES -- The Small Order Execution System is used by the NASD for the automatic execution of customer agency trades. The system also automatically reports trades to NASDAQ and sends transaction details to the NSCC for comparison and settlement.

Specialist -- A specialist is an exchange member whose chief obligation is to maintain fair and orderly markets in his assigned securities or specialty stocks. In fulfilling this obligation, the specialist functions as both a broker and a dealer. As a broker, the specialist acts on behalf of other floor brokers who entrust to him stop or limit orders that cannot be immediately executed because the execution prices specified on the orders have not been reached. These orders are recorded in the specialist's "book" and are executed when the market reaches the appropriate price levels. As a dealer, the specialist facilitates orderly price movements between successive trades by buying stock for his own account when sellers outnumber buyers and selling stock from the account when buyers outnumber sellers.

SPX/SPZ -- (S&P 500 Index) -- SPX is the trading symbol for an option (SPZ is the symbol for the December future traded on the CME -- the final letter of this symbol changes for different expiration months) that is based on the value of 500 widely held common stocks.

STA -- The Stock Transfer Association is a transfer agent association that, among other things, sets rules of uniform practice for stock transfers, name recently changed to Securities Transfer Association.

Super DOT -- See DOT.

TALISMAN -- The Trade Accounting Lodgement for Investors' Stock Management is the clearing organization of ISE.

TCO -- Trans-Canada Options.

Third Market -- The third market generally refers to OTC market makers who trade listed securities.

TKE -- Tokyo Stock Exchange.

Trade-side -- With two-sided trade comparison and floor comparison, there are two sides to a transaction or trade. With automated locked-in comparison, there are typically four sides to a transaction. Under the locked-in comparison method the system or the exchange that operates the system imposes itself between the buyer and seller and becomes the contra-side to each half of the trade.

Uptick -- An uptick refers to a sale at a price higher than the immediately preceding last "regular way" sale of the security. Same as plus tick.

XVL -- The Value Line Index is an option based on an equally weighted geometric

average of approximately 1700 stocks, some of which are traded over the counter, included in the Value Line Investment Survey.

XMI -- The Major Market Index is an option based on a price-weighted index comprised of 20 highly-capitalized U.S. stocks traded on the NYSE.

Zero Plus Tick (Zero Minus Tick) -- The terms zero plus tick and zero minus tick describe a trade at the same price as the immediately preceding last "regular way" sale which was higher (zero plus) or lower (zero minus) than the next preceding last sale or "regular way" trade at a different price.
