THE OCTOBER 1987 MARKET BREAK

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

February 1988

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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.

TABLE OF CONTENTS

INTRODUCTION AND EXECUTIVE SUMMARY. xi

CHAPTER ONE - BACKGROUND AND DESCRIPTION OF TRADING STRATEGIES

A. Index-Related Trading Strategies 1-1
   1. Asset Re-Allocation and Hedging 1-1
   2. Portfolio Insurance 1-2
   3. Index Arbitrage 1-3
B. Use of Automated Systems for Programs 1-5
C. Prior Commission Studies of Index Trading 1-7
   1. Background Studies 1-7
   2. Expiration Volatility. 1-7
   3. Non-Expiration Volatility 1-8
   4. Concerns Over the Cascade Scenario. 1-9
D. Methodology of the Division's Market Reconstruction 1-10
   1. Analysis of Index Trading during the Market Break 1-11
   2. Analysis of Overall Trading During the Market Break 1-15

CHAPTER TWO - CHRONOLOGY OF TRADING DURING THE OCTOBER MARKET BREAK

A. Introduction 2-1
B. Chronology of Trading During the October Market Break. 2-4
   1. October 6 2-4
   2. October 14-16 2-6
   3. October 19. 2-12
   4. October 20. 2-19
C. Commission Regulatory Actions During the Market Break. 2-24
   1. Commission Monitoring and Supervisory Activities 2-24
   2. Commission Consultation and Decision Making Activities 2-26

CHAPTER THREE - THE EFFECTS OF DERIVATIVE PRODUCTS

A. Institutionalization 3-1
B. Market Basket Trading 3-2
C. The Effects of Futures 3-3
   1. Benefits 3-4
   2. Price Impacts of Futures. 3-6
D. Analysis of October 1987 Trading 3-9
E. Summary and Issues Requiring Further Review. 3-16

1. Market Basket Trading 3-17
2. Derivative Product Leverage 3-19
3. Price Limits 3-23
4. Short Sale Restrictions 3-24
5. Reporting Requirements 3-26
F. Manipulation and Frontrunning 3-28
1. Market Manipulation 3-28
2. Frontrunning 3-30
3. Regulatory Initiatives 3-33

CHAPTER FOUR - EXCHANGE SPECIALISTS

A. Market Maker Performance 4-1
1. New York Stock Exchange ("NYSE") 4-1
2. American Stock Exchange ("Amex") 4-29
3. Regional Exchanges 4-42
B Equity Specialist Capital 4-48
1. Regulatory Capital Requirements 4-48
2. Estimates of Actual Capital Available to Specialists 4-53
3. Analysis of Specialist Failures Due to Market Making Losses 4-61
4. Additional Capital for Specialists 4-66
5. Analysis 4-66

CHAPTER FIVE - ANALYSIS OF CAPITAL ADEQUACY

A. Introduction 5-1
B. Upstairs Firms 5-3
1. Consequences of the Market Break for Net Capital of Upstairs Firms 5-3
2. Margin Accounts 5-11
3. Analysis 5-13
C. Liquidity of Broker-Dealers 5-19
1. Introduction 5-19
2. Background 5-20
3. Bank Lending During the Market Break 5-24
4. Analysis 5-31
D. Options Market Makers' Financial Responsibility 5-32
1. Regulatory Capital Requirements 5-32
2. Financial Condition of Options Markets 5-34
3. Stresses on Firm Resources 5-38
4. Analysis 5-46

CHAPTER SIX - ISSUER REPURCHASE ACTIVITY

A. Introduction 6-1
B. Rule 10b-18 6-1
C. Commission Staff Activity 6-2
D. Analysis of Repurchase Activity 6-3
1. Introduction 6-3
2. Repurchase Volume 6-3

3. Price Performance 6-5
E. Broker-Dealer Survey 6-10
F. Summary 6-10

CHAPTER SEVEN - EXCHANGE OPERATIONAL PERFORMANCE

A. Market Information Systems 7-1
1. Background 7-1
2. Performance During the Market Break 7-3
3. Analysis 7-7
B. Order Handling 7-8
1. Performance of Routing Systems During the Market Break 7-10
2. Experience of Retail and Institutional Investors 7-13
3. Analysis 7-14
C. Automated Order Routing and Execution Systems 7-15
1. Introduction 7-15
2. NYSE's DOT System 7-16
3. Amex's PER System 7-24
4. Analysis of DOT and PER Performance 7-26
5. Midwest Stock Exchange's MAX System 7-26
6. Philadelphia Stock Exchange's PACE System 7-31
7. Pacific Stock Exchange's SCOREX System 7-35
8. Other Systems - Boston and Cincinnati Stock Exchanges 7-38
9. Analysis of Regional Sytems' Performance 7-40
D. Intermarket Trading System ("ITS") 7-41
1. ITS Operations 7-41
2. ITS Transactions 7-42
3. Pre-opening Procedures 7-43
4. Trade-through Rule 7-44
5. Specific Problems and Members' Responses 7-45

CHAPTER EIGHT - PERFORMANCE OF THE OPTIONS MARKETS

A. Introduction 8-1
B. Exchange Operations 8-3
1. Trading Halts 8-3
2. Trading Rotations 8-5
3. Vendor Capacity Problems 8-7
4. Order Execution Systems 8-8
C. Market Maker Performance 8-10
1. Introduction 8-10
2. Premiums 8-11
3. Quotations 8-16
4. Market Maker Participation 8-17
D. Factors Affecting Market Maker Performance 8-17
1. Order Flow 8-18
2. Hedging 8-18
E. Analysis 8-20

CHAPTER NINE - THE OVER-THE-COUNTER MARKET

A. Introduction 9-1
B. Overview of NASDAQ Trading In October 9-2
C. OTC Market Information Systems. 9-5
   1. Trade Reporting. 9-5
   2. Quotations - Locked and Crossed Markets 9-6
D. Small Order Handling 9-12
   1. SOES 9-12
   2. Proprietary Systems 9-15
   3. Timely Executions. 9-17
E. Access to Market Makers During Market Break Week. 9-19
   1. Market Maker Formal Withdrawal 9-20
   2. Market Maker Positions 9-22
   3. Quote Spreads 9-23
F. Analysis 9-24

CHAPTER TEN - CLEARANCE AND SETTLEMENT SYSTEMS

A. Introduction 10-1
B. Equity Securities - Clearance and Settlement. 10-1
   1. Trade Comparison, Clearance and Settlement 10-2
   2. Clearing Members Fails and Financial Responsibility 10-13
   3. Certificate Handling by Depositories, Transfer Agents, and Broker Dealers 10-27
C. Options. 10-33
   1. Background 10-33
   2. Options Market Volume and Statistics 10-37
   3. Options Clearing Corporation ("OCC") Services During the Market Break 10-39
   4. Settlement 10-40
   5. Margin and Options Settlements During October 1987. 10-42
   6. OCC Clearing Member Financial Difficulties 10-44
   7. Analysis. 10-48

CHAPTER ELEVEN - THE INTERNATIONAL CAPITAL MARKETS

A. The Trend Toward Internationalization of the Securities Markets 11-1
B. Interrelationships of the World's Securities Markets 11-2
   1. Volume of International Trading in October. 11-2
   2. Analysis of Market Triggering Effects. 11-5
C. Market Performance--London, Tokyo and Hong Kong. . . 11-8
   1. London 11-8
   2. Tokyo 11-13
   3. Hong Kong 11-17
D. The Aftermath 11-20
E. Analysis 11-21

CHAPTER TWELVE - INVESTOR COMPLAINTS

A. Introduction 12-1
   1. Brief Background on SEC Complaint Processing . . . 12-1
   2. Study Methodology. 12-2
B. Summary of Telephone Complaints 12-3
C. Analysis of Written Complaints. 12-6
   1. Broker-Dealer Complaints 12-9
   2. Complaints Concerning Mutual Funds 12-18
   3. Complaints Directed at Self-Regulatory Organizations 12-21
   4. Market-Specific Complaints 12-22
   5. General Inquiries and Complaints 12-23
D. Comparison With Other Sources of Investor
   Complaint Data. 12-23
E. Implications for Investor Protection. 12-25

APPENDIXES

Appendix A - Detailed Trading Chronologies

October 6
October 14
October 15
October 16
October 19
October 20

Appendix B - Chronology of Index Related Trading

Appendix C - Chronology of Portfolio Insurance (Futures)

Appendix D - Charts and Tables

Appendix E - Division of Market Regulation Data Requests

Appendix F - Regional Stock Exchange Trading

Appendix G - Directorate of Economic and Policy Analysis
Capital Study

Appendix H - Office of Consumer Affairs Data Request

Appendix I - Glossary

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 during the market 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.