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FINANCIAL MARKETS

Preliminary Observations on the October 1987 Crash

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Comptroller General
of the United States

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The Honorable Edward J. Markey
Chairman, Subcommittee on Telecommunications and
Finance
Committee on Energy and Commerce
House of Representatives

The Honorable Doug Barnard, Jr.
Chairman, Subcommittee on Commerce, Consumer
and Monetary Affairs
Committee on Government Operations
House of Representatives

The Honorable William Proxmire
Chairman, Committee on Banking, Housing, and Urban Affairs
United States Senate

The Honorable Patrick J. Leahy
Chairman, Committee on Agriculture, Nutrition,
and Forestry
United States Senate

The Honorable Fernand J. St Germain
Chairman, Committee on Banking, Finance,
and Urban Affairs
House of Representatives

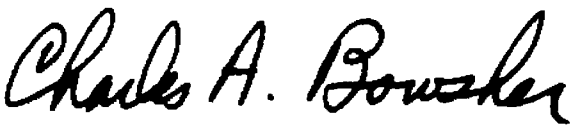
The Honorable Edward R. Madigan
House of Representatives

In response to your requests we are providing our preliminary report on the market crash of October 1987. We believe it is too early to reach final conclusions about the October crash anc what the appropriate response to it might be. Many of the issues raised by these events are quite complex and have been studied and debated for some time as the financial markets have evolved. We thus view the events of October as additional information to use in analyzing the continued evolution of our financial markets.

Our preliminary report and those issued by other study groups are a first step in better coming to grips with the issues and facts needed to reach conclusions. Our preliminary repor is based on much information that we have not yet verified. Thus, it does not represent our final conclusions and recommendations. Nevertheless, we believe the data raise fundamental questions that need careful consideration and resolution.

On some matters, our preliminary report confirms information similar to that already reported by several other study commissions. In addition, however, our report provides further perspective on what market participants, the self-regulatory agencies and federal regulators were confronted with as they made decisions in the extremely fast-paced and uncertain environment of October 19 and 20, 1987, as well as an extensive perspective on th performance of the New York Stock Exchange's computer systems, which are critical to the orderly operation of the markets. Chapters 5, 7, and 9 explain the environment. Chapter 8 discusses the computer systems.

We are providing copies of this report today to other interested Members of Congress, executive branch agencies, and the public.



Charles A. Bowsher
Comptroller General
of the United States

Executive Summary

Purpose

On October 19, 1987—a date now called "Black Monday"—the nation financial markets experienced one of their most severe shocks in history. Amidst unprecedented volume and price volatility, the New Yorl Stock Exchange's Dow Jones Industrial Average plunged 508 points, c 23 percent—comparable only to the percentage drop that occurred ov 2 days in October 1929. Had the precipitous decline continued for evei another day, massive disruptions to the United States financial systen might have occurred. In all, during the first 19 days of October, the Dc lost about 34 percent of its total value, almost $1 trillion.

Even though the Dow finished the year higher than it began, the spect of the Great Depression that followed the 1929 crash, and questions about how the decline occurred so quickly, have left the markets unce tain. Market participants are concerned about how such an event can prevented from happening again.

In the wake of the decline, numerous studies, including that of a Presi dential Task Force, were initiated to determine what happened, why, and what could be done, if anything, to prevent a recurrence. Several congressional committees asked GAO to address these issues and a number of related ones to help them consider legislative or regulatory actions that may be needed.

Background

The U. S. capital markets facilitate channeling funds from savers to users and thus provide for capital formation. An orderly and active securities market is essential for this process because it is an efficient mechanism for allocating resources, providing liquidity, and establish prices. To assure the continued existence of these functions and to ma tain the confidence of investors who supply capital funds, a system o self- and federal regulation was developed.

Options and futures markets function to transfer the risk of price flu ations to persons willing to speculate on those movements for a poter tial profit. Futures markets operate differently than stock markets, a they developed their own system of self- and federal regulation.

In the 1970s and 1980s, options and futures markets began offering derivative products based on financial instruments that were intende to help their holders protect against price fluctuations (hedge). These products have been subject to continued study and controversy betw those who sell and use them as hedging devices and those who fear tl the products and trading strategies improperly influence the underly

capital markets. The October 1987 market decline renewed that controversy.

Results in Brief

Most market experts have agreed that the market decline of October 1987 was caused by a confluence of macroeconomic, political, psychological, and trading factors, and that isolating any one cause would be difficult. However, the events of October demonstrate that broad new trading interests and strategies have evolved in capital markets and that the previously segregated stock, options, and futures markets have become linked and international in scope.

Current market and regulatory systems were faced with unprecedented volumes and price changes for 2 days. In view of the circumstances, it is remarkable that the systems performed as well as they did. However, GAO found two areas needing immediate attention to help restore confidence in the markets and alleviate concerns that the markets could crash again soon:

- Some automated systems had difficulty handling the extraordinary volume. Problems with the New York Stock Exchange's systems adversely affected trade executions and pricing information both in New York and in other markets. Several actions to try to correct problems have been taken; others need to be taken as quickly as possible. The Securities and Exchange Commission needs to reassess its oversight role and capabilities for evaluating automated systems.
- Decisions of self- and federal regulators were made without benefit of any formal intermarket contingency planning. Such plans should be developed to deal with any future market emergencies that may occur.

No agency currently has responsibility for intermarket decisionmaking. Given the new intermarket linkages, the need to assure financial system liquidity, and the increased internationalization of markets, strong leadership is needed to develop and implement an appropriate intermarket regulatory structure. Moreover, if the current barriers between commercial and investment banking are relaxed, the need for such leadership becomes all the more important.

Over the longer run, a number of other issues, discussed below, will require careful consideration. GAO will continue to explore these issues.

GAO's Analysis

Markets Are Linked

As GAO reported in 1986, the futures and securities markets, which evolved separately and have been regulated independently under differ ent statutes, have become linked through the introduction of new futures and options products based on securities or broad groups of securities comprising major indexes. These new products create prices i two separate markets for securities. They are used in some cases as sub stitutes for ownership in the underlying stocks or for changing position: and exposures in those stocks. The users of these products trade in both markets, sometimes simultaneously. (See chap. 3.)

During the October market decline, some traders tried to use both futures and securities markets to manage risk based on expectations of future market performance and thereby prevent portfolio losses. Marke participants considered not only the actual activities of these traders, but also the anticipation of their activities, as important factors in the market break. Although there are disagreements about the exact extent and effect of this activity, it reinforces observations made earlier by GA and others that the markets are closely interconnected. These links necessitate more coordinated intermarket regulation.

Foreign markets also experienced dramatic price declines and increased trading activity during this period. Unprecedented volumes and price changes could be tracked around the world. (See chap. 5.)

Market Systems Stressed

The massive volume of trading activity strained some automated systems to meet the needs of traders. System backlogs caused intended trades to be delayed or unexecuted and contributed to an overall inability to conduct normal trading activities. This added to the confusion an panic in the markets. Investor complaints during this period most often related to poor or non-execution of orders or to problems with margin calls.

The unprecedented volumes, coupled with large order imbalances and rapid price movements, strained the marketmaking capacity, particularly at the New York Stock Exchange and in the primary over-the-counter market. Their inability to maintain orderly markets and, at times, to make any market at all in large numbers of stocks, was a majo source of uncertainty for traders. Evidence about marketmaking in the

securities and trading in the futures markets is still being evaluated. (See chaps. 5 through 8.)

Actions by Regulators

Self- and federal regulators implemented procedures to respond to high volatility in their markets during October 19 and 20. These involved primarily increased market surveillance, increased margins, rule changes, and more frequent communication with each other. Many decisions were made as events unfolded, and market participants generally praised the regulators' performance. For example, federal regulators clarified the rules affecting when corporations may buy back their own stock. This helped provide buying support in the falling market. In addition, the Federal Reserve system, which said it had developed contingency plans for a market disaster, provided needed liquidity to the markets on October 20, which probably prevented even more serious financial problems.

A critical communication problem that arose was confusion about whether the New York Stock Exchange would close on Tuesday, October 20. Trading in the Standard and Poors 500 stock index futures contract on the Chicago Mercantile Exchange closed for a short time because of the confusion, which disrupted trading activity for investors using both markets.

Regulators have recognized the linked nature of the securities and futures markets for some time and have begun to make changes to improve intermarket data sharing and communication. However, the regulatory structure has been established primarily for individual markets with no central intermarket leadership responsibility. The self- and federal regulators had no intermarket planning group nor any preexisting coordinated intermarket contingency plan. The events of October provide impetus for developing the leadership and intermarket planning necessary to restore confidence in the markets and protect consumer interests. (See chap. 9.)

GAO Observations

Much of the information available to GAO at this time is incomplete and unverified, so observations about the events of October 1987 are preliminary. Nevertheless, steps should be taken immediately by the self- and federal regulators to reduce or eliminate problems, such as the following, that may create unnecessary market uncertainty.

- Trading and information systems should be reevaluated and improvec by the markets to ensure that they are capable of handling the new tr ing pressures placed on them. In addition, the limited federal oversigh role in trading systems development and enhancement needs to be strengthened.
- Self- and federal regulatory agencies should develop integrated intermarket contingency plans to deal with market breaks such as thc demonstrated in October. These plans would contribute to confidence assuring the market that a repetition of the October events has been considered by those responsible for regulating these markets, and an approach to dealing with the problems created by those events has be developed.

In addition, strong leadership must be exerted to develop an appropriate intermarket regulatory structure. Such a stru ture should be able to deal with issues such as

- intermarket products and strategies,
- provision of adequate liquidity in normal times and in emergencies, a
- the growth in linkages across international financial markets.

Congress is considering the repeal of Glass-Steagall Act provisions which could allow the merging of the securities and banking industrie This would lend further emphasis to the need for an appropriate regu tory structure for linked markets and industries. GAO will continue to evaluate these issues.

Over the longer term, a number of other issues remain to be decided. I analyzing the events of October, the Presidential Task Force on Mark Mechanisms and others have recommended certain changes to margir regulatory structure, controls over market activity, and clearing systems. These recommendations help frame issues that should receive careful consideration, both individually and taken together, in terms their potential effects on trading activity, market liquidity, internatic competitive positions of U.S. markets, and, most important, the funct of providing capital to the nation's businesses. In addition, other issu must be addressed including the adequacy of current marketmaking s tems, the long-term automation needs of market systems, the adequa of current consumer protection requirements, and the need for regula tion and coordination of increasingly linked international markets.

GAO's principal observations, based on its work to date, are discussed chapter 10.

GAO discussed its findings and observations with appropriate officials and organizations.

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Figure 8.1: Flowchart of the Process Followed at the New York Stock Exchange to Execute Securities Trading

Abbreviations

AMEX	American Stock Exchange
BOTCC	Board of Trade Clearing Corporation
CFTC	Commodity Futures Trading Commission
CBOE	Chicago Board Options Exchange
CBT	Chicago Board Trade
CME	Chicago Mercantile Exchange
CRS	Congressional Research Service
CST	Central Standard Time
DJIA	Dow Jones Industrial Average
DOT	Designated Order Turnaround System
Fed	Federal Reserve System
FFIEC	Federal Financial Institutions Examination Council
FTSE	Financial Times Securities Exchange
GAO	General Accounting Office
ITS	Intermarket Trading System
MAX	Midwest Automated Execution System
MMI	Major Market Index
MWSE	Midwest Stock Exchange
NASAA	North American Securities Administrators Association
NASD	National Association of Securities Dealers
NASDAQ	National Association of Securities Dealers Automated Quotation Systems
NASDAQ/NMS	NASDAQ National Market System
NFA	National Futures Association
NYFE	New York Futures Exchange
NYSE	New York Stock Exchange
OCC	Options Clearing Corporation
OEX	Standard and Poors 100 Option Contract
OTC	Over-the-Counter
RAES	CBOE's Retail Automated Execution System
S&P	Standard and Poors
SEAQ	Securities Exchange Automated Quotation System
SEC	Securities and Exchange Commission
SIA	Securities Industry Association
SIPC	Securities Investor Protection Corporation
SOES	Small Order Execution System
SRO	Self-regulatory organization

Introduction

On October 19, 1987, the world's financial markets experienced almos unprecedented turmoil as the value of equity markets fell dramaticall amidst record trading volumes. Events on that day prompted the chai men of a number of congressional committees and subcommittees to request that the General Accounting Office (GAO) conduct a study of v ious aspects of the decline including its causes, the regulatory respons and what might be done, if anything, to better deal with problems tha might have contributed to such a significant drop.

From August 1982 to August 1987, the Dow Jones Industrial Average (DJIA) index grew from 776 to 2,722, heralding a prolonged bull mark that saw stock values soar. While the market, as measured by the DJI had reversed its upward course since August 1987, on Monday Octob 19 it dropped 508.32 points, a record decline. Trading volumes on the New York Stock Exchange (NYSE) and elsewhere set records. Tuesday October 20 saw a substantial recovery in the DJIA attributed by some statements and activities of the Federal Reserve System aimed at pro viding liquidity to market participants.

This report presents GAO's early observations on the events of Octobe focusing on the evolution of the futures and securities markets and th interrelationships as exemplified by the activity on Monday, October Tuesday, October 20, and the prior week. It is based on much informa tion that we have not as yet verified and, thus, does not represent our final conclusions and recommendations. In addition, we have not had opportunity to carefully evaluate information contained in other stud and conduct any necessary supplemental analyses based on these wo Finally, we have not yet obtained some key information that will be n essary in order to conclude our work.

Objectives, Scope and Methodology

We received written requests from a number of congressional commit tees and subcommittees to study several aspects of the crash, the per formance of regulators, and the markets themselves. In addition, we received oral indications of interest from others. These sources includ in order of request date,

- Congressman Edward J. Markey, Chairman of the Subcommittee on Telecommunications and Finance of the House Committee on Energy and Commerce,
- Congressman Doug Barnard, Jr., Chairman of the Subcommittee on C merce, Consumer and Monetary Affairs of the House Committee on G ernment Operations,

- Senator William Proxmire, Chairman of the Senate Committee on Banking, Housing, and Urban Affairs,
- Senator Patrick J. Leahy, Chairman of the Senate Committee on Agriculture, Nutrition, and Forestry,
- Congressman Fernand J. St Germain, Chairman of the House Committee on Banking, Finance and Urban Affairs, and
- Congressman Edward R. Madigan.

In addition, Congressman John D. Dingell, Chairman of the House Energy and Commerce Committee, and Congressman E. (Kika) de la Garza, Chairman of the House Committee on Agriculture, indicated their interest in our work.

In letters to these individuals, we indicated we would undertake a broad study which would include the following areas:

- The evolution of the futures and securities markets and the interrelationships created by new derivative products and trading strategies based on them.
- The operating structure of the specialist system, over-the-counter (OTC) markets, futures markets, and options markets, including their concept and actual performance.
- Regulation of each market and of the interrelated products and strategies, including the self-regulatory and federal regulatory systems.
- The internationalization of markets and the challenges it presents to operations and regulation.
- The availability of adequate capital and liquidity, especially in times of stress, and the sources of liquidity from the banking system and elsewhere.
- Abusive sales and trading practices.

Thus, our scope of work covers several markets, their regulators, and a variety of issues. It combines documentary research with testimonial evidence and data analysis. Nevertheless, we have not had time to look at all aspects of the crash.

To date we have interviewed officials and gathered data at the following federal agencies, self-regulatory organizations (SRO), clearinghouses, and industry organizations:

Federal Agencies
Commodity Futures Trading Commission (CFTC)

Federal Reserve System (Fed)
Securities and Exchange Commission (SEC)

Self-Regulatory Organizations
American Stock Exchange (AMEX)
Chicago Board of Trade (CBT)
Chicago Board Options Exchange (CBOE)
Chicago Mercantile Exchange (CME)
Midwest Stock Exchange (MWSE)
National Association of Securities Dealers (NASD)
National Futures Association (NFA)
New York Stock Exchange (NYSE)
Securities and Investor Protection Corporation

Clearinghouses
Options Clearing Corporation (OCC)
Chicago Board of Trade Clearing Corporation (BOTCC)
Chicago Mercantile Exchange's clearinghouse department

Industry Associations
North American Securities Administrators Association (NASAA)
Securities Industry Association (SIA)

In addition, we conducted interviews with broker/dealer firm official NASD market makers, investment advisors, futures exchange member options market makers, NYSE specialist firms, and portfolio managers. We have reviewed research literature from a variety of sources, inclu ing the academic community, trading firms, independent organizatior and government agencies. We have obtained and reviewed studies pr pared by other organizations analyzing October's events, including th of the CME and its special Committee of Inquiry, the CBT, the OCC and t CBOE. We have also obtained and reviewed briefly the preliminary re of the CFTC, a study of program trading the NYSE commissioned, and tl report of the Presidential Task Force on Market Mechanisms.

At the outset of our work, we chose not to duplicate the federal regul tory agencies' requests for raw data from SROs and market participar for analysis of trading activity. Anticipating the number of other suc studies and the difficulties in data collection and compatibility that could and did ensue, we are monitoring their data collection, and ana sis efforts and have gained access to the data for review and subseq analysis. The extent of any subsequent analysis will depend, in part,

indications of unreliability or significant differences in content or interpretation of the data by various sources. We have not as yet conducted reliability test of the regulators' data bases. However, since we do not have direct legal access to the basic records of many of the self-regulatory and private organizations providing this data, we cannot make a final determination on their reliability.

At this time, we must consider much of the information provided to us through interviews as unverified. Additional interviews and follow-up sessions will be necessary in the longer term.

It is essential to understand the way the markets operate and how they are regulated in order to fully evaluate the implications of October. We have not provided much of the basic description of these operations in the report. However, in a staff study issued in May 1986, we have described the historical development of the securities and futures markets, how they operate and how they are regulated.[1] This study, primarily a descriptive document, also raised some of the issues being debated as a result of October's events—namely, that changes in technology and new product innovations have raised concerns about new potential risks to investors and to the markets themselves. Most of the study's description of trading, clearing, regulatory, and other operations remains current, although some information had to be supplemented for our current work.

Because of time constraints in completing this preliminary report, we did not seek official comments on this report from the organizations involved. But we did discuss our findings and observations with appropriate officials and organizations.

[1]Securities and Futures: How the Markets Developed and How They Are Regulated (GAO/GGD-86-May 15, 1986).

Purpose of Capital Markets and Market Regulation

Understanding the purpose of U.S. capital and derivative product mar kets and their regulation provides a framework for evaluating their pe formance during the October market break and for determining the ne for change in their structure or operation.

Capital markets include the debt and equity, or cash markets. The der ative product markets include the stock options, stock index futures, debt futures, and options on stock index futures markets. Each of thes markets is overseen by an SRO, such as NYSE or the CME, and a federal regulator—either the SEC for debt and equity as well as stock options the CFTC for stock index futures, debt futures, and options on stock index futures. This report is principally concerned with the operations of the equity market and its associated derivative product markets.

Purpose of Capital Markets

Stock markets were formed to assist channelling funds from savers to those with a need for funding investment projects by providing a secondary market for securities. In contrast, the derivative product markets developed to allow investors to protect against adverse price movements by transferring the risk of price fluctuations to persons w ing to speculate on those movements for a profit. Both markets indirectly facilitate capital formation. Orderly and active markets are essential for this process because they provide for liquidity, price discovery, and efficient allocation of resources.

Stock Markets Aid Capital Formation

Businesses and governments use securities—both equity securities su as capital stock and debt instruments such as bonds—to obtain funds the United States, securities are resold or traded on 10 exchanges including the NYSE and AMEX. Securities are also traded through the National Association of Securities Dealers Automated Quotation (NASDAQ) system and in the non-NASDAQ over-the-counter (OTC) market.

The ability to resell securities quickly makes many investors willing t buy them and thereby furnish capital to organizations needing it. The resale, or secondary, markets, along with their associated clearing org nizations, provide the liquidity necessary to ensure adequate capital formation.

The markets also provide a mechanism for discovering the prices of securities. For sellers of securities to decide how much money they ca raise on the market, and how much it will cost to do so, they must be able to discover what investors will pay for their securities. Converse

prospective investors need to know what prices they would have to pay for various kinds of securities in order to gauge their returns.

It is in the interests of all participants that the markets be perceived as fair and orderly. Investors rely on market professionals to comply with applicable rules and regulations so that they can act on informed decisions without fear of fraud from, or unfair advantage to, fellow investors. Accordingly, securities markets and their regulation were developed to ensure that investors could obtain adequate, reliable information about potential investments and that fair and orderly practices are followed to execute investment decisions.

Stock Option and Futures Markets Aid in the Management of Risk

Stock options and stock index futures allow investors to hedge against possible market losses. Options are standardized contracts giving the holder the right to buy or sell a stated number of shares of a stock at a fixed price within a predetermined time period. Normally, futures contracts create the obligation for the delivery of a specified quantity and type of product at a future date. Stock index futures do not involve the delivery of a product; they are settled in cash. Standardized stock options and futures contracts listed and traded on exchanges are not issued by corporations seeking capital. However, by reducing the cost of trading, stock options and stock index futures make possible a variety of strategies that permit adjustment and control of company specific or market risk due to price fluctuations in a stock portfolio.

Risk shifting, or hedging, is used to transfer the price risk of ownership or potential ownership of commodities or financial instruments, or the price risk of their normal business, to those who are willing to carry these risks in return for a possible profit. Those who seek to shift risk are hedgers and those willing to assume it in return for potential profit are speculators. Speculators, unlike hedgers, are interested solely in speculating on the extent and direction of future price changes. By standing ready to purchase or sell futures contracts, speculators increase the liquidity, efficiency, and competitiveness of markets.

Stock options are traded on five organized exchanges, including the AMEX, NYSE, CBOE, Pacific Stock Exchange, and Philadelphia Stock Exchange. By purchasing stock options, investors can shift the risk of, or hedge, their positions or planned purchases by establishing the price they can, but do not have to, pay for a stock. An investor who buys options can protect against an adverse price movement in the related

stock, risking only the price of the option which is usually much less than the price of the underlying stock.

Stock index futures contracts are traded on a number of the U.S. exchanges, including the CME, the CBT, and the New York Futures Exchange. These markets offer investors low cost opportunities to be ter manage their financial risks, including those associated with inve ment in capital markets, through price discovery and risk shifting. F example, Morgan Stanley demonstrated that the transaction cost of trading a $120 million portfolio in the stock market would be over 1 times greater than in the stock index futures market.

Although futures contracts can be fulfilled either by actual delivery physical commodity, or by cash settlement, depending on the terms c the contract, the existence of organized exchanges and their associat clearing organizations creates a market for these instruments.

Efficient Markets Have Several Characteristics

Efficient markets have several characteristics, including liquidity, which refers to the ability to buy or sell an asset quickly at a price which is close to the price of previous transactions, assuming no new information is available. To achieve liquidity requires price continuit that is, prices must not change greatly from one transaction to the ne In turn, price continuity requires that the market have depth; that is sufficient buyers and sellers must be willing to enter the market and trade at prices above and below prevailing prices. Efficient markets require that information be available on price and volume for past transactions. Additionally, transaction costs should be low and price should adjust quickly to new information. Finally, markets should op ate under predictable rules.

Purpose of Market Regulation

The stock and derivative product markets are governed primarily by number of SROs, which in turn are overseen by federal agencies. This concept of industry self-regulation with government oversight, rathe than direct federal regulation, developed because

- industry officials did not want excessive government involvement ir market operations that could hinder product innovation and compet and
- Congress, as evidenced by the legislative history, appeared to believ self-regulation with government oversight would be more efficient a less costly to taxpayers than direct government regulation.

Regulation of Stocks and Stock Options

At the federal level, the SEC oversees SROs involved with stocks and stock options. Established in 1934 to curb abuses in the industry, SEC is responsible for administering federal securities laws and for developing federal regulations for the industry. Its overall goal is to protect the public from fraud and abuse in these markets.

SEC oversight includes approval of new or amended SRO rules, broker/dealer compliance examinations, and inspections of the SROs to determine how well they police their members. SEC provides direct regulation by conducting independent investigations into illegal activities, prosecuting violators of securities laws, and promulgating regulations which market participants must follow.

SEC is not directly involved in resolving complaints from the public, functioning more as a conduit for information. When an investor submits a complaint to SEC, the SEC staff refers it to either the broker/dealer or cognizant SRO. If the parties can not resolve their differences, the SEC staff informs the investor of binding arbitration programs sponsored by the SROs.

Each stock and stock option exchange is an SRO—for example the NYSE, AMEX, and CBOE are SROs. Other industry-related organizations are also SROs. For example, the NASD is an SRO; it regulates the OTC securities market and all brokers and dealers doing securities business with the public. Also, the registered securities clearing agencies are SROs.

SROs facilitate trading; establish, review, and enforce standards of conduct; regulate ethical standards, business practices, and financial responsibility of members; conduct routine examinations of member firms; conduct investigations of alleged violations; and discipline violators of SRO rules or federal securities laws.

Regulation of Stock Index Futures and Options on Stock Index Futures

Regulation of stock index futures and options on stock index futures is also based on federal oversight of industry self-regulation. The CFTC and futures SROs seek to ensure that futures contracts are traded efficiently and within the framework of related laws and rules. The regulatory framework which governs the futures industry grew out of Congress' belief, as outlined in the Commodity Exchange Act, that federal regulation was essential because

- transactions in futures are carried out in large volume;

- futures transactions are susceptible to manipulation and excessive spe ulation which could cause volatile price fluctuations; and
- unreasonable price fluctuations injure both producers and consumers and are a burden to interstate commerce, making the regulation of the futures industry in the public interest.

The fundamental purpose of federal regulation is to ensure fair and orderly markets, thus providing a measure of control over possible manipulative activities and speculative excesses that could injure agri cultural producers, other customers that use the markets, and the futures markets themselves.

The CFTC, an independent regulatory agency created in 1974, oversees the futures industry and its SROs. CFTC has responsibility for administe ing federal legislation and developing comprehensive regulations to pr tect the public from fraud and manipulation in the marketplace.

The CFTC maintains its oversight function by requiring approval of ne and amended SRO rules, conducting surveillance of the markets, and c ducting various inspections of the SROs to determine how well they police themselves. Direct regulation by CFTC comes through its indepe dent investigations into allegations of illegal activities, prosecution of alleged violators of futures laws, and implementation of regulations which SROs and industry professionals are mandated to follow. In add tion, CFTC conducts its own proceedings for deciding claims from custo ers seeking monetary damages from brokerage firms, a function whic has no direct SEC equivalent.

The futures exchanges, such as the CME, CBT, and NYFE, are SROs as is t National Futures Association (NFA), an industry-wide organization, cr ated in 1981 as a nonprofit corporation to register futures profession. conduct financial surveillance and compliance audits, arbitrate com- plaints against its members who deal with the public, and establish st dards of professional conduct.

Except for NFA, futures SROs facilitate trading by establishing, review and enforcing standards of conduct; regulating ethical standards, bus ness practices, and financial responsibilities of members; monitoring marketplace for manipulation and attempted manipulation; conducti investigations of alleged violations; and disciplining violators of SRO rules. NFA facilitates trading in all these ways, except it does not mon the market place for manipulation.

Observation

The basis for evaluating the performance of U.S. capital and derivative product markets lies in a comparison of their actual operations with the attributes outlined in this chapter. It is important that the attributes of liquidity and fairness be kept in mind as we review the events of "Black Monday" and their effects on market participants.

The Evolution of the Securities and Futures Markets

The financial services industry has been evolving in many ways. In recent years, previously separate industry segments—depository institutions, insurance companies, securities and futures industries—have begun to forge intermarket linkages caused by new patterns of competition, market demands, technologies, and business strategies.

The Growth of New Market Risk Management Interests and Continuing Congressional Concern

As the securities markets became increasingly influenced by institution holding broad portfolios of both equity and debt instruments, the futures and securities exchanges created products designed to help portfolio managers deal with the risks of holding those instruments. Based on these products, a number of trading strategies developed that linked the formerly segregated markets and these have given rise to continuin concern and controversy.

Growth of Broad Institutional Interests in Securities and in Methods for Managing Their Risks

Over the past three or four decades, investment companies, insurance companies, pension funds, personal trust funds, and nonprofit endowments have increased their share of transactions volume in the securities market.

The growth of institutional trading and the reduction of individual trading attracted media attention. In 1983, The New York Times reported that signs indicated that individual investors are being overwhelmed by the big institutions; individuals were doing only about 10 percent of all trading—down from 33 percent in the late 1970s.[1]

Market participants, regulators and Congress have been concerned about the effects institutions and their trading activity might have on the markets. Fearing that institutions' trades of large blocks of individual stocks could cause price aberrations, Congress directed the SEC, in 1971, to conduct a special study of institutionalization. A 1973 report by the Securities Subcommittee of the Senate Committee on Banking, Housing and Urban Affairs laid the foundation for the 1975 Amendments to the Securities Exchange Act of 1934. One of the major provisions was a requirement for large institutional investors to report on their portfolios of shares to measure their effect on markets.

[1] Michael Blumstein, "How the Institutions Rule the Market," New York Times, Nov. 24, 1983, sec. 3 p. 1

A CRS report (No. 85-163E, p. 17) also noted concomitant concerns that institutional influences contributed even then to increased market volatility. The CRS stated (p. 22) that evidence on this notion was inconclusive, citing the following passage from the 1971 SEC study on institutional investors which said the preponderance of data collected from 1968 and 1969 indicated that institutional trading in the aggregate has not impaired price stability in the markets.[2]

Finally, the CRS report pointed out (on p. 23) a 1982 Brookings Institution report that stated available evidence did not seem to support the allegation that the growth of pension plans and other financial intermediaries had significant effects on relative yields and stock market performance. In terms of the stock market, there is little evidence to support the contention that price volatility increased because of speculative trading by institutions.[3]

Increasingly, individual retail customers began participating in the securities market by purchasing shares in mutual funds, some of which propose to track the movements of the markets as exemplified by the market indexes (called "index funds"). Also, according to The Wall Street Journal (Dec. 23, 1987, p. 17) between 1982 and August 1987, assets of stock, bond, and income funds tripled to nearly $850 billion. The Federal Reserve, in its December 1987 Bulletin (p. A35), reported that assets of open-end investment companies, excluding money market funds, grew from almost $251.7 billion in 1985 to over $529 billion in August 1987, based on data from the Investment Company Institute. The SEC's Division of Investment Management informed us that, as of October 1, 1987, the total assets (bonds and equities) of investment companies, including mutual funds, stood at $1.2 trillion, up from $315 billion in October 1982.

Institutions such as pension funds and mutual funds sought to diversify their risks by mixing broad portfolios of equity and debt securities. As a recent study commissioned by the NYSE noted, if managers became somewhat pessimistic about economic developments, they could tilt their mix toward debt instruments; if optimistic, toward equities.[4] In other words,

[2]U. S. Securities and Exchange Commission. Institutional Investor Study Report. Summary Volume (Washington, 1971), p. xxi

[3]Alicia H. Munnell, The Economics of Private Pensions, (Washington, D.C., Brookings, 1982), pp. 128-129

[4]An Overview of Program Trading and Its Impact on Current Market Practices (Dec. 21, 1987), p. 3

portfolio managers looked at a variety of macroeconomic factors—such as inflation, trade, and GNP—in making investment decisions.

The NYSE study also noted that the growth in institutional investing led to substantially higher volumes of trading overall at the NYSE and in the AMEX, OTC and futures markets.

As we noted earlier, institutions traditionally had interests in moving large blocks of individual securities, but with the interest in managing broad portfolios of securities, they began trading in groups, or "baskets," of them. This gave rise to the notion of "program trading," a generic term to describe the organized trading of these baskets. Though in recent years this term has come to be associated with a specific technique known as "index arbitrage" (discussed below), it actually has a broader meaning.

Program trading does not theoretically require automated methods, but as a practical matter, modern programs, based on very complex calculations and tracking of values, use computers to track market prices and other factors, recommend trading strategies based on predetermined criteria, and place trading orders.

Computers do not, however, always control the program trading process unchecked. People establish the programs based on their investment strategies and review the computer-recommended trades before they are executed. As we report later, during the October crash, some portfolio managers we talked to said they either could not or did not follow their computers' recommendations.

A number of portfolio management and derivations exist. These strategies relate to the timing of trades and the selection of which stocks or debt instruments to invest in. Timing decisions are based in part on transaction costs, regulatory or tax requirements, and the size of the portfolio itself. Selection strategies are based on the performance objectives of the funds managed, often expressed in relation to a general market measurement or the movement of particular industries.

The ability of program traders to execute their strategies has been facilitated by the increased automation of trading at the major exchanges. While programs can be and are accomplished by hand-delivering order tickets to specialist posts on the exchange floor, they are frequently conducted on the NYSE via the Designated Order Turnaround System.

whereby orders are sent automatically and simultaneously to the appropriate specialist posts.

Programs that make decisions about the market as a whole have come under criticism as having little to do with the underlying capital formation process which the securities markets were supposed to foster. Supporters of such trading counter that it adds liquidity to the secondary market and thus facilitates the primary sale of instruments by businesses seeking funds.

Thus, to the concerns about the behavior of institutions and their effect on the markets has been added the new dimension of how decisions based on modern portfolio management factors might endanger the original purpose of securities markets—to facilitate the capital formation process.

Development of Index Futures

Managers of large portfolios may trade in relationship to general measures of market value, the major stock indexes. They therefore have an interest in hedging the risk of the loss of market value in portfolios relative to those indexes. Stock index futures were introduced in 1982 as a risk-transfer device to meet this need. Stock index futures volume grew from about 5 million contracts in 1982 to over 25 million in 1986.

In 1981, during the approval process prior to allowing the S&P 500 futures contract to be traded, the SEC stated that it was concerned that, given the similarity between stock index futures and stock options, regulatory disparities, the absence of appropriate margin requirements, and the lack of adequate customer suitability requirements, the proposed CME contract could both draw investment away from other equity markets and lead unwary participants to unwittingly expose themselves to financial risk. In addition, the SEC stated that trading in the proposed contract could seriously undermine the surveillance activities of both the SEC and securities SROs.

The CFTC believed that the futures contract was subject to only a limited degree of substitutability with individual stock issues; therefore, the CFTC felt that limited potential existed for diversion of trading activity.

The Fed stated that it has the right to set margins on stock index future contracts. But it did not do so, instead choosing to closely monitor futures trading in them so that it could make an informed judgment on the need for Fed margin requirements.

From the inception of index futures contracts concerns about regulator jurisdiction existed. Former CFTC Commissioner James Stone, in a letter dated February 23, 1982, to House Agriculture Subcommittee Chairmai Ed Jones, stated, "In the last few years, the distinctions between securi ties and commodities have rapidly eroded. The largest commission firm in commodities are not specialty houses; they are affiliates of the major securities firms . . . . The approval by the CFTC just last week of an appl cation to trade futures on a common stock index is a final proof that th lines have been blurred" (p. 2). Later in his letter, Commissioner Stone raised concerns about speculation in new futures products. One respons he promulgated, should the markets continue to merge, was the consoli dation of the CFTC and the SEC.

The problem of jurisdiction over financial futures was resolved in a December 7, 1981, agreement between then CFTC Chairman Philip M. Johnson and SEC Chairman John S. R. Shad. Under that agreement, the SEC regulates options on securities, options on stock groups or indexes, and options on foreign currencies traded on a national securities exchange. The CFTC regulates futures on certain "exempted" securities (such as Ginnie Mae certificates), futures on broad-based groups or indexes of securities, options on each of these types of futures product and options on foreign currencies not traded on a national securities exchange. In addition, when Congress enacted the accord into law (as a 1982 amendment to the Commodity Exchange Act), it granted the SEC authority to disapprove new applications from exchanges introducing futures contracts based on stock groups or indexes. Since the accord's enactment into law, the SEC and CFTC have developed guidelines and agreed on an interpretation of the statutory provisions.

In the act, Congress directed the Federal Reserve, the CFTC, and the SEC with the assistance of the Treasury Department, to study the futures and options markets. The study concluded that

- The new products serve a useful economic purpose.
- The financial futures and options markets appeared to have no measu able negative implications for the formation of capital.
- Financial futures and options do differ in important characteristics.
- Trading in functionally similar products under the separate jurisdictio of the SEC and CFTC did not appear to have resulted in significant harm
- No legislation was needed with regard to establishing a new regulatory framework.

However, the study recognized a continuing need to harmonize certain securities and commodities rules.

The Linkage Between Index Futures and Equities Markets

The controversy over the cross-market influences between the futures and securities markets has caused some to fear that the trading in stock is improperly influenced by trading strategies based on derivative products traded in the futures and options markets.

Futures/Cash Market Interrelationships

A futures contract on an index of stocks and the index itself establish current prices for the same basket of commodities in different time periods. Because of the close relationship between a futures contract and the cash "commodity" (the index value itself), the prices of these two products are linked.

A futures contract is an agreement to buy or sell in the future, but the time delay means that ownership of the stocks and receipt of any associated dividends is postponed. The relationship between the present price (cash price) and the futures price, called the "basis," is due in part to the postponement of ownership transfer and is called the "cost to carry."

Index Arbitrage

If the cash and futures prices do not conform to the cost-of-carry relationship, a profit potential theoretically exists. For example, if the futures price is too high (at a premium) relative to the cash price (index value), a profit can be earned by buying the cash stock and selling futures contracts. Arbitrageurs can lock in the profit if they can take simultaneous futures/stock positions when a mispricing situation occurs. Then, when the futures contract expires, for example, the arbitrageur "unwinds" the position by buying the futures contracts and selling the cash stock. Conversely, when the futures price is low in relation to the cash index (at a discount), the arbitrageur would buy the futures and sell the underlying stock short to establish a position and unwind it by closing out those positions.[5]

While index-arbitrage has been characterized as locking in a "risk-free" profit, the strategy is not entirely riskless. For instance, arbitrageurs

[5]Implementing this type of arbitrage, called "short-side" index arbitrage, can be difficult in a falling stock market because Rule 10a-1 of the Securities Exchange Act of 1934 requires a short sale to be executed on an "uptick" at a price higher than the last different price on a stock.

may not purchase all the stocks that make up a large index (for example, all 500 stocks in the S&P 500), preferring instead to hold a subset that is expected to have price movements that are closely correlated with the complete index. In doing so, the arbitrageur runs a risk of "tracking error," that the strategy will not be successful because the price movement of the subset will not track the index.

Another risk relates to the delay between the time the order is placed b the arbitrageur and the time it is executed on the exchange floor. Price may change in that time interval; the more volatile the market, the greater this risk becomes. Also, the arbitrageur must have current and continuous information on trading and prices to properly plan and exe cute this strategy. To the extent that markets are volatile and trading noncontinuous, the arbitrageur will incur additional risks that may prove costly.

The process of arbitrage tends to correct futures/cash mispricing situa tions. For example, selling a futures contract exerts downward pressu on its price, and buying the stocks puts upward pressure on their price Thus it is said that arbitrage activity tends to bring the two markets back into equilibrium, or back into the proper cost-of-carry relationshi When this happens no further arbitrage profit potential exists.

Transmission of Information

One factor in the interrelationship between cash and futures prices is the manner in which economic information is transmitted throughout the marketplace. Because of lower transaction costs in the futures mar ket than in the cash market, investors and traders often transact initially in the futures markets as new information leads them to change their investments.[6] This initial activity in the futures market, by creating a mispricing situation between the futures and cash prices, could lead to arbitrage activity.

Suppose, for example, that some negative macroeconomic news create bearish expectations. Investors may desire to move out of stocks and into less risky assets, such as Treasury securities. Selling index future contracts is a rapid and cheaper way to express that desire. If, as a

[6]Transactions costs are lower in the futures markets because the purchase or sale of, for example, S&P 500 involves only one transaction in the futures market but 500 transactions in the stock mar ket. In a study entitled "Financial Innovations and Market Volatility," Merton Miller states that "transactions undertaken in response to anticipated (or feared) changes in the immediate macroeconomic environment . . now tend to be directed first to the index futures market rather tl the stock market. For this important class of transactions, the cost advantages of the index future market has made it the dominant market."

result of this selling, the futures price falls far enough relative to the cash price, an arbitrage opportunity for selling stocks and buying futures may be triggered. This would put downward pressure on the cash (stock) price, as information about the bearish macroeconomic news is transmitted from the futures to the cash market. There is some early evidence that indicates that the stock index futures price leads the cash price in incorporating new information.[7]

The "Cascade Scenario"

Perhaps the ultimate fear in the interplay between the futures and securities markets is expressed in what has been referred to as the "cascade scenario." This scenario begins with portfolio managers perceiving bad economic news and beginning hedge programs (such as portfolio insurance) by selling index futures contracts. This selling creates a mispricing between the futures and cash markets, with the futures price selling relatively cheaply, or at a discount with regard to the cash price. Next, arbitrageurs, perceiving a profit opportunity, would begin buying the index futures and selling the stocks making up the index. Other programs, such as those described above, might also begin selling securities further depressing stock prices, in turn compelling more futures hedging, leading to further arbitrage activity and so on, leading the stock markets into a downward spiral.

Some market experts have discounted the danger of such a cascade because of other market forces that come into play. For one factor, they state that when stock prices reach a level at which they are perceived a good buys in their own right, buying will halt the fall. Another factor cited is that if futures prices reach a significant discount to cash prices, hedging by selling futures contracts becomes relatively expensive and would not be an attractive strategy to managers. And the progress of a cascade scenario would depend, in part, on the confluence of a number of hedging programs, which may be constructed differently and be based on different trigger points and other factors. Finally, the "uptick" rule on short sales might preclude some selling activity.

[7]For example, see Anthony F. Herbst, Joseph P. McCormack and Elizabeth N. West, "Investigation of a Lead-lag Relationship between Spot Stock Indices and Their Futures Contracts," The Journal of Futures Markets, Vol. 7, No. 4 (1987) (p. 375). The results of their empirical work support this hypothesis. See also Ira G. Kawaller, Paul D. Koch and Timothy W. Koch, "The Temporal Price Relationship Between S & P 500 Futures Prices and the S & P 500 Index," Federal Reserve Bank of Atlanta, Working Paper 86-3, June 1986.

Modern Portfolio Management Strategies

Many portfolio managers today use a variety of sophisticated techniques to manage their equity positions. The one most often discussed with regard to the October decline is termed "portfolio insurance" or "dynamic hedging." However, a variety of strategies are used.

Portfolio insurance strategies seek to give partial or incremental protection against the risk of falling equity portfolio values while preserving the possibility of participating in some of any rise in market values. They typically seek to preserve a stated percentage of portfolio value over time.

Portfolio insurance is a strategy that involves continued rebalancing between equities and debt securities as the stock prices are changing. For example, as the stock market falls, managers could sell off increments of equity holdings in favor of Treasury securities to minimize losses on equity investments. But since transaction costs in the futures markets are lower, instead of selling stocks directly, managers may sell index futures. Conversely, if stock values increase, managers may purchase futures contracts instead.

Managers can profit from temporary imbalances between the futures and cash (securities) market prices by using index arbitrage or index substitution. The former technique was discussed above. The latter may be employed by, for example, a mutual fund holding a portfolio of stocks designed to replicate the weighting scheme of a particular index (an index fund). When a futures contract is selling at a discount relative to the index value, a fund manager may substitute temporarily a futures contract for stocks and thereby add to the fund's returns. This position would be reversed as the discount is reduced, either at the expiration of the futures contract or earlier.

Internationalization of Markets

While most of the attention paid to the October 19 experience in the stock markets has focused on U.S. markets and exchanges, the stock market crash—and the bull market that preceded it—were international in scope. Major exchanges around the world have become increasingly connected. They all experienced substantial increases in stock prices in the years prior to the crash, and similarly experienced sharp drops in value in the period of the crash.

Institutional differences do exist among the exchanges, however. Stock index futures, for instance, are not yet as extensively used on overseas exchanges as they are in the U.S. financial system. In the opinion of

some observers, the fact that stock prices fell even in markets in which stock index futures and portfolio insurance strategies were not factors undermines the theory that portfolio insurance and financial innovations caused the crash. However, the fact that the crash hit all major markets highlighted the concern that a crisis in one market is rapidly transmitted throughout the international financial system.

While international financial flows are not recent developments, their importance is growing and the links among the financial systems of different nations are becoming stronger. Several reasons have been advanced for this development:

(1)Relaxation of rules and regulations governing capital movements, portfolio composition, and access to markets by national authorities.

(2)The continued regulation or restriction on banks engaging in securities business that exists in the limitation of bank powers in the United States and Japan, have "deflected" business to international markets as the banks seek to avoid the limitations on this potentially profitable business. The increasing securitization of debt, by diverting loan business away from banks and thereby cutting bank earnings, has increased the attraction of banks to the securities business.

(3)Other rules and regulations, market structures and conditions, and the development of financial innovations.

(4)Improvements made in the technology of trading and communications.

(5)Attempts on the part of issuers of securities to reach the largest possible market.

One indication of the increasing internationalization of the securities market is the growth of net international bond financing, which increased from $32.0 billion in 1981 to $156.0 billion in 1986. International equity listings are also a potentially important development, although their current impact appears to be fairly small.

As of May 1986, over 500 companies are listed globally and traded on exchanges outside their home country, including such U.S. corporations as Dow Chemical, Citicorp, and IBM. Listing on a foreign stock exchange is not a recent development, however. Dow Chemical and Citicorp have

been listed on the Tokyo Stock Exchange since 1973, and IBM has beer listed there since 1974.

Trading volumes of international equities is still small in comparison t volume on home country exchanges, although it has been growing. Int national equity offerings of common and preferred stock increased sul stantially in the 1980s, with the total value of common and preferred stock, convertible bonds, and bonds with warrants growing from $8.2 billion in 1983 to $34.1 billion in 1986.[8] Price quotes for these are disseminated through the (London) International Stock Exchange's Automated Quotation System (SEAQ), modeled on the NASDAQ system.[9] The deregulation of the London stock market, together with increasing tra ing in foreign equities on the Tokyo Stock Exchange, suggests that thi trend may continue.[10] The conversion of state-owned enterprises to pr vate ownership (e.g., the British Petroleum and Nippon Telegraph and Telephone selloffs), which require access to a large base of potential buyers, can also further this trend.

Foreign activity on domestic exchanges has been significant. In 1986, U.S. investors' purchases and sales of foreign stocks was a record $10 billion, while foreign investors' activity on U.S. stock markets reached $277.6 billion, also a record.[11]

While not as well developed as their U.S. counterparts, international trading of futures and options has also been growing. London began trading options and futures in 1978 and 1981, respectively. Yen gover ment bond futures are now traded on the Tokyo Stock Exchange, and the Ministry of Finance is expected to endorse a recommendation fron one of its advisory panels to create a comprehensive futures market t would be open to both banks and securities firms. While no timetable has been announced for this development, we note that the advisory panel's recommendation—and the implicit Ministry endorsement—w announced after the October crash.

[8]Internationalization of the Securities Market. SEC Staff Report, July 27, 1987, p. II-53

[9]Internationalization of the Securities Market, p. III-4.

[10]There are also trading linkage agreements among U.S. and Canadian exchanges, such as an agre ment between the Toronto and American Stock Exchanges, but these do not appear to have gener significant activity.

[11]Internationalization of the Securities Market, p. II-3.

Observations

The events of October 1987 have raised a number of questions about the workings of securities and futures markets, the linkages that exist between them and their regulation. These questions are not new.

In this chapter, we have described the institutionalization of securities markets and the evolution of financial futures products and their growing use by institutions as a mechanism for controlling risk in portfolios. We have also discussed the debate that has taken place in the past over the appropriate configuration of the regulatory structure for the securities and futures industries. Additionally we have briefly described the growing internationalization of securities markets.

Several things are clear. It has been recognized for some time that, as a result of the growth in financial futures and their use as mechanisms for controlling risk in institutional portfolios, the financial futures and securities markets are closely linked. The debate over the appropriate regulatory structure for the financial futures and securities industries has been going on since the mid-1970s recurring whenever there was a major new product development in the financial futures industry. Finally, linkages that have developed between U.S. securities and futures markets are expanding beyond our borders to overseas markets. These linkages have developed only recently and warrant considerable further study because of their potential to complicate even further an understanding of financial activity and the causes of any financial dislocations that may occur in the future.

The Bull Market and Related Macroeconomic Conditions

Between 1982 and 1987, stock markets around the world increased in value, and the average daily number of shares traded rose. Market participants we interviewed attributed this "bull market" to a variety of economic and psychological factors, as well as the use of new trading strategies based on derivative products. Many said that by August 198 prices on securities did not accurately reflect the worth of firms. As a result, they expected a significant market correction.

Market Values and Share Volumes Increase

The Report of the Presidential Task Force on Market Mechanisms stat that the rise in market indices for the 19 largest markets in the world averaged 296 percent from 1982 to 1987; the average U.S. rise was 19 percent during the period. According to SEC data, market capitalizatior or the total value of stocks traded on all stock markets, increased from $2,472 billion in 1980 to $5,995 billion in 1986. This growth occurred i all three major international markets as shown in the table below:

Table 4.1: Market Capitalization

(Billions of U.S. Dollars)

	1980	1986	Perc incre
U.S.	1,391	2,556	
United Kingdom	190	440	
Japan	357	1,746	

Source: Internationalization of the Securities Markets, SEC staff report July 27 1987 p II 12

The table shows the volume increases on the NYSE and the price increases in the S&P 500 composite price index from 1982 to 1987.

Table 4.2: NYSE Volume

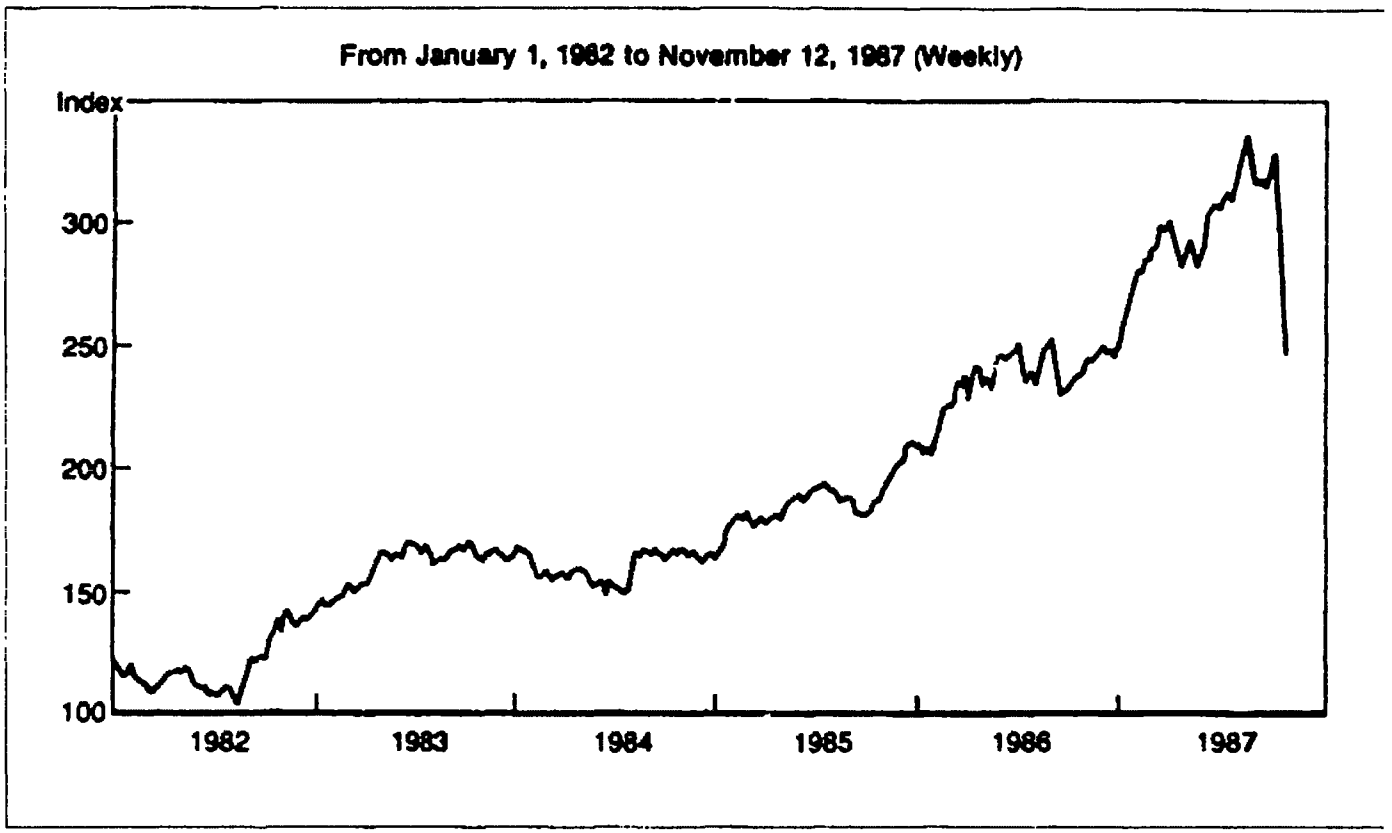
(thousands of shares)

Year	Highest volume day	D aver
1982	149,385	65
1983	129,411	85.
1984	236,565	91
1985	181,027	109.
1986	244,293	141.
1987[a]	302,390	180.

[a]through September 30

Source: Based upon information provided by the NYSE and the Securities Industry Association

Figure 4.1: New York S&P Composite—Price Index



Source: Report of The Presidential Task Force on Market Mechanisms, January 1988, Appendix p. I-18

Overall, U.S. market capitalization increased from almost $1.4 trillion in 1980 to over $2.5 trillion in 1986, according to the SEC. This occurred in spite of the fact that a large volume of corporate stock retirement had led to a decline in equity shares outstanding in 5 of the last 6 years.

By several historical measures, the U.S. stock market appeared to be overvalued preceding the crash. The market as measured by the S&P 500 stock index was trading at 23 times earnings, a postwar high, and far above the postwar average of 14.5 times earnings. In addition, on average stocks were producing annual dividend yields of 2.2 percent, or only about one-half the postwar average of 4.25 percent. Finally, stocks were trading at nearly three times book value, double the postwar average. However, during the bull market other measures of stock value may have been operative.

The Presidential Task Force reported that the valuation of stocks bas on the liquidation value of companies, rather than their earnings pote tial may have become dominant in the summer of 1987. The report stated that liquidation value rarely provides a higher valuation than that based on a future flow of returns, but this may have been the ca: in the middle 1980s. The report also stated that the valuation method used in corporate takeover activity may have supported the price of a broad range of stocks well above traditional valuation levels. It state that there was a large pool of funds accumulated for takeover activit during 1987. These funds had the capability to buy $150 billion of co: porate stock, and the availability of these funds reinforced the use of takeover valuation methods in the public market.

Market Participants' Views on the Bull Market

Market participants we interviewed cited a number of factors as poss ble contributors to the bull market. Some agreed that the market had become overvalued.

Some market participants cited economic factors as causes of the bull market. These included low interest rates, the end of a recession, low inflation, decreasing unemployment, higher corporate profits, increas foreign investment, and the greater desirability of holding equity instead of debt. Others cited as a factor the psychology of investors v believed that markets would continue to rise even though overvalued The bull market, they said, was fueled by the belief of many investor that they were international financial experts and by their desire to make the last dollar before taking their profits in an overvalued marl

Some participants said that the use of derivative products and strate that sought profit from trading activity, rather than from the econon growth of companies, contributed to the bull market. Others maintair that the existence of certain recent portfolio management strategies, such as portfolio insurance, gave institutional investors a false sense security, thereby encouraging overinvestment in the stock market.

On the basis of these factors that seemed to produce an overvalued n ket, many market professionals told us they expected a significant m ket correction to take place. Feelings that the market was overpriced developed among our sources as early as February 1987. By July thi: sentiment had become more widespread.

As a result, market professionals expected a correction, but a 200-po drop was the most many of them could envision in one day. Some of

them told us they had anticipated a slow, steady drop over a three, six, or nine month period.

The Macroeconomic Environment That Contributed to the Downturn

Most market professionals, exchange officials, and regulators told us that fundamental macroeconomic and political factors, combined with the belief that the market had become overvalued, were major factors contributing to the decline. Not surprisingly, opinions about the relative importance of each factor vary. Some said that no single factor could be blamed, pointing out that much of the economic news, especially budget deficits, rising interest rates, and the Middle East situation, had been around for some time. Others singled out the potential changes to take-over legislation and Treasury Secretary Baker's remarks on West German monetary policy as being very important.

One economic factor that market participants said may have played a major role in the October 19 decline was rising interest rates in the U.S., Japan, and West Germany beginning in August. Typically, when interest rates rise above stock market yields, investors move funds from stocks to alternative investments offering higher yields. On August 11, 1987, the yield on 30-year Treasury bonds was 8.8 percent. On the morning of October 19 this long-term rate had increased to 10.5 percent.

With respect to short-term rates, the Federal Reserve raised its discount rate from 5-1/2 percent to 6 percent on September 4. The federal funds rate jumped from 6.5 percent on August 11 to 7.6 percent on October 19 and the prime rate rose from 8-1/4 percent to 9-3/4 percent in this time period. Money supply growth over these 2 months had slowed to an annual rate of 4.2 percent from 9.8 percent in the preceding 12 months, suggesting higher interest rates. Over approximately the same period, the West German Central Bank increased interest rates on four occasions. Similarly, interest rates were rising in Japan.

The DJIA declined almost 500 points during this period from its peak of 2,722 on August 25 to 2,246 at its close on October 16.

Another economic concern cited by market participants was the U.S. budget deficit. Although the U.S. had incurred a budget deficit in excess of $145 billion each year since 1983, and the fiscal year 1987 deficit was projected to be below that of the previous 4 years, in mid-October Congress and the Administration appeared to be making very little progress in achieving substantial additional reductions. This created uncertainty

about the government's future financing needs and the effect of those needs on the future course of interest rates.

Participants also cited the large and somewhat intractable U.S. merchandise trade deficit that was contributing to a decline in the U.S. dollar on the international exchange markets. Not only did the declining dollar raise concerns about future rates of inflation, the anticipation of further declines in the U.S. dollar were believed to be discouraging foreign lenders from purchasing U.S. debt securities, since expected exchange rate losses might eliminate any additional return from investing in the United States, rather than in their own or other countries. This, in turn implied a bidding up of interest rates in the United States to attract foreign investment, while higher yields on debt instruments implied a decline in the attractiveness of equity investments. Higher yields on debt instruments also raised concerns about the increased likelihood of a recession.

Observations

While no single factor can explain the run-up of stock prices to a post-war high between 1982 and 1987, many have been cited as setting the stage for a major market correction. Market participants told us that a number of factors had made them nervous about stock prices, but none said they had expected the kind of correction that occurred.

The Market Decline and Crash

The market decline began in August 1987, accelerated during the week of October 12, and climaxed on October 19 and 20. The speed of the October 19 decline, the heightened market volatility and volume of October 19 and 20, and the resultant operating system backlogs and breakdowns disrupted the trading strategies of many investors, including index arbitrage and other strategies of institutional fund managers. Institutional investors told us that the events of October 19 and 20 created an uncharacteristic degree of uncertainty, affecting their ability to react to market events quickly and knowledgeably.

The Market Decline Accelerated in October

The generally negative trends in the equity markets that had begun in August gained momentum during the week beginning October 12. Between the start of business on October 14 and the close of business on October 19, the DJIA dropped by over 760 points, a decline of over 30 percent.

During the week of October 12, two significant external events occurred which many observers believe accelerated the price decline. The House Ways and Means Committee approved a tax package which, if enacted, would have eliminated a number of tax breaks for corporate mergers and acquisitions. This legislation would also put a significant brake on highly leveraged corporate takeovers, a phenomenon many believed was a major catalyst for the 1987 increase in stock prices. In addition, the report of an unexpectedly large August merchandise trade deficit led to declines in the value of the dollar and an expectation of higher interest rates, higher rates of inflation, and lower stock prices.

From October 12 through 16 trading volumes increased and prices declined. Total volume in the S&P 500 futures contract rose from 79,907 contracts on Monday, October 12 to 135,344 contracts on Friday, October 16. Trading volume on the NYSE rose from nearly 210 million shares on October 14 to 344 million shares on October 16. From October 14 to the close on October 16, the DJIA declined by over 250 points. In the futures markets, the S&P 500 futures contract declined from 312 on October 14 to slightly over 282 on October 16.

According to some industry observers, between October 14 and 16, institutional traders sold large volumes of securities. At the close on Friday, October 16, the S&P 500 futures contract was trading at a discount from the underlying index. Index arbitrage activity then transmitted the decline in futures prices to the equity market through a combination of futures purchases and stock sales.

On October 14, the DJIA closed down 3.81 percent, and the Nikkei inde: rose 0.93 percent, while the FTSE index fell 1.16 percent. Then on Frid October 16, the DJIA fell 4.60 percent, and the Nikkei index was down 0.23 while the London market was closed. Market prices in Hong Kong and Sydney also declined.

Trading in U.S. Treasury securities was very active during this period According to the CBT, where bond futures are traded, daily volume ha averaged 297,121 contracts. During October 14, 15, and 16, it average 526,700 contracts. Activity in these contracts in London was also hea

According to the President's Task Force, despite the heavy volume of activity on those days, the market closed on Friday, October 16, with great deal of remaining selling sentiment. However, some market parti pants and exchange officials told us that they believed that the week's activities constituted the major correction they had been expecting. Since Friday's trading had ended on an "uptick," they believed the ma kets had weathered the worst.

The Events of October 19 and 20

The market decline climaxed on October 19 and 20. Even though some market participants believed that they had weathered the worst of th decline the previous week, others realized that pressure had built ove the weekend for a major trading day on Monday, October 19.

In foreign markets, which open prior to New York, the Nikkei index dropped by 2.35 percent in its October 19 session and the London FTSE index declined by 10.8 percent. When trading shifted to the United States, massive selling pressure was evident in both the Chicago futur and New York equity markets. According to the President's Task Forc there were large order imbalances. In fact, before the market opened t Designated Order Turnaround (DOT) System contained $500 million in sell orders. When the NYSE opened, the discount on the S&P 500 futures contract from the underlying S&P 500 index was 21 points.

Pension and trust funds, the category of investors most often associat with portfolio insurance activity, were heavy sellers of futures contracts. Because of the discount existing at the market opening, broker, dealers, the category of investors most commonly associated with ind arbitrage, were net purchasers of contracts, which, in turn, resulted ir stock sales in the equity markets.

At about 10:15 a.m., the discount between the futures and cash markets began to narrow.[1] The cash market, which initially experienced a significant decline, began to rebound thereafter. Arbitrage net purchases of futures contracts become very heavy around 11:00 a.m. According to CME data, pensions and trusts were net purchasers of futures contracts between 11:00 a.m. and 12 noon, but thereafter became heavy net sellers. The discount between the two markets once again appeared at around 11:30 a.m. and by 12:30 p.m. index arbitrage purchases again became heavy. Adding to the confusion was the Chairman of the SEC's statement concerning the possible closing of the NYSE.

Volume on the NYSE stood at 263 million shares by noon and the DJIA average was down about 125 points from the open. Between noon and 2:00 p.m. the DJIA fell nearly 150 points on 164 million shares of selling volume. The discount between the cash and futures markets widened to around 21 points. A slight market rally occurred between 2:00 p.m. and 3:00 p.m., but thereafter the market declined precipitously from about 2,000 points to close at 1,738. The discount between the cash and futures markets widened from about 10 points at the noon peak of the market rally to about 25 points at the market close.

Between noon and 2:00 p.m. pensions and trusts were heavy net sellers of futures contracts and broker/dealers were net purchasers. though broker/dealers activity was not as heavy as it had been around 11:00 a.m. Indeed, according to CME data, broker/dealers were net sellers of futures contracts between 2:00 p.m. and 3:00 p.m. The relative inactivity of index arbitragers during the afternoon of October 19 has been attributed to delays in the DOT System that made some unwilling to execute their strategies. As a result, arbitragers put less selling pressure on the cash markets and less buying pressure on the futures markets. In the absence of arbitrage activity, there was no opportunity for prices to converge in the two markets.

According to the President's Task Force, the reason for the precipitous decline in the DJIA during the last hour of trading on October 19 was the lack of buying support in the market that, in turn, was a result of the inhibiting effect of the discount. Volume during the last hour of trading totaled 109.5 million shares, the highest hourly volume of the day.

[1]Times are stated as eastern time

Foreign markets continued to drop as the October 20 trading day open around the world. The Tokyo Nikkei index closed 14.9 percent lower while the London FTSE index closed 12.26 percent lower.

When the NYSE opened for trading on October 20, the spread between t cash and futures markets had moved from the large discount at the pr vious day's close to a premium. Before the NYSE opened, exchange offi- cials asked their members to refrain from using the DOT System for making program trade orders.

According to CME data, at 10:00 a.m. pensions and trusts began net sell ing in the futures markets and a discount once again appeared betwee the S&P 500 index futures contract and the cash market index. Roughl one-half hour later, the DJIA, which had risen by nearly 200 points abo the open, began a precipitous decline, and by about 12:15 p.m. the earl morning DJIA gains had been completely reversed. The discount betwe the cash and futures markets moved to 41 points just before 11:00 a.m and stood at about 35 points at 12:15 p.m.

At 12:15 p.m., the CME, based on its belief that the NYSE was about to close, suspended trading in the S&P 500 index. The CBOE had suspendec trading one-half hour earlier because an insufficient number of the S&I 500 stocks comprising its options index were trading on the NYSE.

The CME resumed trading in the S&P 500 index at around 1:00 p.m., anc according to data CME supplied, net futures sales by pensions and trus began shortly thereafter, reaching their highest levels of the day between 1:30 p.m. and 2:30 p.m. This selling pressure was largely offs by heavy purchases of futures contracts by broker/dealers. The dis- count between the cash and futures markets, which initially increased after trading resumed on the CME, began to narrow at approximately 1:15 p.m. and stood at about 13 points by 2:00 p.m. Slightly after 2:00 p.m., the market began to rebound. This rebound has been attributed t the buying support in the cash market provided by announcements of intentions by corporations to buy back their stock. While between 2:1 p.m. and 3:30 p.m. the DJIA rose over 160 points, in the last half hour c trading it reversed course and lost 75 points. Overall, the DJIA increase by slightly over 100 points for the day on trading volume of nearly 60 million shares.

In the equity OTC markets, volume built between October 14 and 20. O October 19, the NASDAQ composite index closed at 360.21, down 11.4 p cent from the close on October 16. Trading volume on October 19 was

heavy at nearly 223 million shares. On October 20, the NASDAQ composit index closed at 327.79, down a total of 24.6 percent from the close of October 13. Trading volume was a record-setting 284 million shares. Thus, the course of the NASDAQ index value lagged that of the DJIA by on day. On October 21, trading volume of 288 million shares set another record, but the NASDAQ composite index rebounded to close at 351.86, a 7.3 percent increase from the previous day.

Index Arbitrage and Portfolio Insurance Strategies Were Disrupted on October 19 and 20

Index arbitrage and portfolio insurance are the two most discussed trac ing strategies related to the October stock market plunge. Consequently our discussions with market participants about the events of October 1! and 20 focused on concerns about the role of index arbitrage and portfc lio insurance. Although market participants had varying views about the effect of these strategies on the stock market decline, users of these strategies agreed that market conditions hampered their successful exe cution during many periods on October 19 and 20.

Views on the Effect of Index Arbitrage Varied; Strategies Could Not Always Be Executed

Market participants had varying perspectives on the effect of index arbitrage on the market plunge. Users of the strategy agreed, however, that many factors precluded its use for much of October 19 and 20.

Many said that the effect of index arbitrage actually stabilizes the markets and improves their efficiency by bringing futures and cash market prices into line. They supported arbitrage as a legitimate and necessary strategy to maintain market efficiency while indicating that only a few participants can use it because of the sophisticated computer equipmer and substantial capital required. Officials of one broker/dealer firm sai that had firms been able to engage in arbitrage activity, this might hav helped keep prices in the futures and stock markets more in balance with each other, providing a measure of stability to the markets.

One money manager said that arbitrage was responsible for 200 to 250 points of the October 19 stock market decline. Three others opposed to index arbitrage did not believe that the strategy was responsible for th crash, though they believed it accelerated the speed, or compressed the time frame of the plunge.

Many market participants told us arbitragers did not fully participate i the market on October 19 because they were either largely invested in arbitrage positions from activity during the prior week when markets

had been volatile, or because market volatility and inaccurate market information made arbitrage too risky.

According to one self-regulatory official, arbitrage could only be performed by firms that could manually deliver their stock orders to the NYSE trading posts. Two broker/dealer firms agreed, only one of which was able to shift to a manual system for implementing these trades. Officials of one broker/dealer firm told us that they were unable to implement index arbitrage strategies in the afternoon of October 19 du to systems delays in executing orders at the NYSE.

Representatives of another firm said it could not execute index arbitrage strategies on October 20 because the NYSE had requested member not to use the DOT System for program trading. Three other arbitragers said that it was not possible to arbitrage successfully on October 19 or 20. Simultaneous buying and selling under panic conditions was virtually impossible. Some leading stocks were not trading, and some stock prices as well as stock index values were inaccurate. These conditions made index arbitrage impossible, because it was difficult to determine the true relationship between the cash market prices and futures price

Regulatory officials and some market participants told us that because of market movements, with trading halts and deep discounts in future the theoretical models on which program trading strategies, such as index arbitrage, are based did not work. They said these models presuppose perfect liquidity in the marketplace which was nonexistent on October 19 and 20. In addition, the up-tick rule at the NYSE prohibits short selling of stocks when they are declining in value. When futures are at a discount to the cash market, arbitragers would buy futures contracts and sell stocks short. This could not be done during much of the day because of the up-tick rule.

Many Believe That Portfolio Insurance Did Not Work as Intended

Many market professionals believed that portfolio insurance may have exacerbated the rate of the stock market decline. They said users of the strategy all wanted to sell at the same time. Some market participants said that the fear that portfolio insurance strategies might fuel the market decline may have had more of an effect on the market than the strategy itself. Others said that the week before the crash, institutional investors became aware that portfolio insurance strategies were not working and protected their investments by liquidating their positions. They blamed the institutions for panicking, adopting a "sell at any co

mentality," and trying to unwind in 1-day positions that may have taken up to a year to build.

Officials at two firms that used portfolio insurance strategies said they had revised their investment approach. One said it is no longer using th strategy due to its experience during the stock market crash; the other has modified the strategy greatly. Officials of these firms cited three limitations that can occur with the rapid market declines and high volatility that affected the use of portfolio insurance strategies during the market crisis. These limitations are price gaps, futures and stock prices not tracking each other, and the need for numerous transactions. Price gaps and tracking problems do not allow transactions at the predetermined prices, either because they do not exist (gap) or because it is unclear if prices are accurate (tracking failure).

Two users of portfolio insurance told us they did not strictly implement their strategies during the decline. One of these participants said that the firm did not hedge to the extent the strategy indicated on October 19, because the cost associated with the number of transactions to mak the required hedge adjustments was prohibitive. The other said his firm stopped trading on October 19, because futures appeared mispriced rel tive to stocks, but it was not clear which pricing was correct.

One market participant suggested that some clients may not have unde stood the risk of implementing the strategy. That is, in a fast-moving market, trades might not be executable at prices close to those of previous transactions. Other market participants said that the term "insurance" is misleading because the strategy has a speculative element lacking in other kinds of insurance.

NASD and AMEX officials pointed out that index arbitrage and portfolio insurance have little direct effect on their markets. They said these strategies typically involve S&P 500 stocks which are listed primarily o the NYSE, and futures contracts derived from these indexes which trade at the CME. However, they also pointed out the price movements on the NYSE are generally reflected in their markets.

Institutional Investors Faced Uncharacteristic Uncertainty

Institutional investors told us that they faced an unprecedented degr of uncertainty on October 19 and 20 which affected their ability to re to market events quickly and knowledgeably.

One institutional investor told us that he could not determine the pric stocks were selling at, and this was disorienting. He said that the thre of a market shutdown may have intensified the impulse to sell stock. Investors were afraid they would not have enough time to execute th orders. He added that some reassurance from authorities that the ma ket would remain open would have been helpful.

Another institutional investor said that lack of quality and timely inf mation drove many large institutional investors out of the market, as buyers or sellers, during the heat of the panic. He also said that the rumors of closure of the NYSE on October 20 probably contributed to t panic. Investors did not know when they might be able to sell again a rushed to complete trades. Based on his firm's experience, he said it v obvious that the trading system was not working well. The firm had l orders delayed or lost.

Representatives of another institution said the most significant regul tory action for them occurred when the NYSE asked members not to us the DOT System for program trading, on October 20. They believed th this action was inappropriate because it changed market rules witho any forewarning. By doing so, it caused uncertainty and lack of confi dence in the market.

Representatives of another firm said that the firm reduced its equity trading substantially on October 19 and 20 because of the obvious ga and inconsistencies in the market. They thought that any fund mana who entered the market under these conditions were derelict in their duties. They added that overall, the market was so fast, volatile, and unpredictable, that one did not actually know what prices major stoc were trading at. Making transactions in this environment would be potentially disastrous.

One institutional fund manager argued that quick decisionmaking an implementation were the keys to successful hedging. For example, pc folio insurance worked beautifully for some firms and failed for othe because a strategy is only useful if it can be readily implemented. On firm was reportedly successful because of its superior ability to recal late its position very quickly. It was able to alter its hedge position a protect itself. Conversely, another portfolio insurer reportedly incur

heavy losses because its calculations and executions were not as quick and timely.

One fund manager said that market momentum was built up by the large number of opening sell orders and the markets' inability to handle them. As investors saw that orders were not being handled, they moved to sell before they were frozen out of the market completely. He added that the price and volume reporting systems broke down or were significantly behind during a good part of the day—making information available to the traders less than desirable.

One broker/dealer said that massive margin calls materialized relative to customers—perhaps 20 to 30 times greater than normal. Many customers liquidated their mutual fund positions to meet margin calls. Yet another broker/dealer stated that it lost money due to its decision to give customers the prices on their sell orders that prevailed at the time the orders were placed, even though the firm often received much lower prices on the trades by the time they were finally executed.

Observations

In chapter 3, we described the evolution of linkages between the cash and futures markets as well as the trading strategies that have contributed to a forging of those linkages. The events of October 14 through 20 validate the existence of the linkages and their importance. The precise effect index arbitrage, portfolio insurance, and other linked trading strategies had on the 508 point decline on Monday, October 19 may be debated. It does seem clear, however, that the relationship between futures prices and cash market prices, which was affected at various times on October 19 and on other days of the period by these trading strategies and by market disruptions, had some effect on investors' perceptions of events.

Individual Investor Complaints About the Market Crash

A number of U.S. investors will remember the October 1987 market decline in terms of substantial losses of personal wealth. These inves were not just speculators, traders, and arbitragers, but individuals w limited savings.

These investors have complained to NASAA, the federal regulatory org nizations and the various SROs. The most frequent investor complaint centered on problems with trade execution and margin calls.

Investors Complained to NASAA's Hotline

According to NASAA, there are nearly 50 million investors in this coun One in every five Americans either owns stock or shares in a stock mutual fund. Forty percent of these investors earn less than $25,000 year.

On November 9, 1987, NASAA started a hotline to advise investors wh may have been improperly treated or had their accounts mismanage their brokers. NASAA officials reported to Congress in December 1987 that as of December 4, 1987, the hotline had received approximately 6,700 investors' calls of which 2,562 cited specific complaints. NASAA also reported that investors who made these complaints suffered pro jected total losses of about $457 million during the October market decline, or an average of more than $172,000 per caller. The losses fc these investors ranged from $62.00 to $5 million. Many callers repor they owed substantial amounts which they could not repay.

Hotline operators reported numerous cases of investors who lost enti savings destined for down payments on homes, retirement funds, an funds for their children's education. For example, NASAA reported th one woman, whose entire $250,000 retirement savings vanished, saic her broker advised her that she could not lose by following his inves ment strategy. Another woman reported that she lost $30,000 when broker placed her in an options strategy without first seeking her approval. A railroad engineer not only lost the $150,000 he had invested, but also owed his broker an additional $300,000 because he was not given adequate opportunity to satisfy the margin call on his index option account.

The most frequent complaint received by NASAA appeared to be the d culty in trade execution. This includes failure to or delays in executi orders and executing orders at different prices than quoted. Accordi to NASAA, 752 of 2,563 specific complaints, or 29 percent, concerned investors' problems with the trade execution.

Another frequent complaint made by investors to NASAA pertained to margin calls. These complaints included investors who had cash or othe securities to meet the margin calls but who were not contacted to satisf the margin account requirements, or when contacted, were given an unreasonably short period of time to satisfy the call. About 14 percent of the complaints received at NASAA were margin call complaints.[1]

Investors Complained to Federal Regulators

The SEC has also compiled statistics on complaints it received relating tc the market collapse. Their statistics indicate that between October 14, 1987, and November 30, 1987, they received approximately 9,000 telephone complaints from investors. The number of complaints in October and the first part of November was more than double the usual volume of telephone complaints SEC receives.

As of December 4, 1987, SEC also received 648 written complaints relating specifically to the market decline. About 49 percent of these writter complaints involved trade executions and 17 percent related to margin problems.

The number of complaints received by the CFTC was minimal in the weeks following the decline. A CFTC official told us that as of December 10, 1987, the CFTC had only received two complaints relating to the mar ket decline, but it had received a number of requests for complaint filin information.

Investors Complained to SROs

The SROs have also received complaints arising out of the market decline. According to data the SROs submitted to the SEC, a number of complaints were filed by investors relating to problems which occurred between October 14, and October 30, 1987. Table 6.1 shows the breakdown of the complaints by type and the market on which the stock in question was traded.

[1]As a result of NASAA's analysis of its 2,562 specific hotline complaints, it has recommended that Congress mandate specific reforms to protect individual investors and the integrity of the financial markets. These recommendations include enforcement of suitability requirements, raising margin requirements for futures and options, and increasing disclosure requirements to investors.

Table 6.1: Investor Complaints

Exchange/Market	Total Complaints	Types of Complaints				
		General	Confirmation	Execution	Margin	Oth
AMEX	72	14	7	46	5	
CBOE	152	19	1	129	3	
NASD	166	21	9	110	25	
NYSE	262	14	46	178	24	
Pacific Stock Exchange	6	0	1	5	0	
Unknown[a]	123	41	4	21	34	
Total	**781**	**109**	**68**	**489**	**91**	

[a]The exchange market was not specified in the complaint to the SEC
Note. Does not include markets that record less than five complaints

The most frequent complaint to SROs involved trade execution difficult such as non-execution of an order, execution at a price different than the one quoted, or problems specifically associated with market make or specialists' performance. Trade execution complaints accounted for 63 percent of the total complaints reported to have been received by t exchanges.

Observations

The number of complaints from investors is understandable given the sharp decline in the market and the chaos that existed. Each of the co plaints received must be evaluated and resolved on the basis of its ow merits by the SROs and federal regulatory agencies. It is too early to ev uate or characterize the significance of the complaints. We plan to review their handling by regulators as well as address such issues as investor suitability and risk disclosure practices in the future.

The Role and Performance of Marketmaking and Trading Systems

Marketmaking and trading systems were strained during the market crisis. Questions about the capacity, capital, and performance of the systems have been raised which require further study. Specialists on both the NYSE and AMEX faced large order imbalances at the openings and throughout October 19 and 20 which resulted in numerous opening delays and trading halts. Buying stocks in a falling market raised specialists' stock inventories and lowered their capital. Market makers on the NASDAQ market faced large numbers of questionable price quotations, were swamped with phone calls they could not or possibly would not answer, and in some cases withdrew from the market.

Futures and options exchanges were marked by uncertainty and confusion due to the delayed openings and trading halts in the underlying stocks. High volume and rapid price declines placed considerable stress on floor participants who normally supply market liquidity. At CME, some floor traders withdrew from the markets while others were forced to sell their seats to cover market losses. At CBOE, problems with option pricing substantially delayed the opening of index option trading on October 20.

Marketmaking and trading systems vary among the stock, options, and futures exchanges and in the OTC stock market. Trading on stock exchanges, including NYSE and AMEX, is conducted through specialists. Specialists, who are assigned stocks by exchanges, are responsible for maintaining fair and orderly markets in individual stocks. AMEX specialists are also used to make markets in options. CBOE uses a competitive market maker system. In the NASDAQ OTC market, no specialist system exists. The NASDAQ system consists of competing market maker firms willing to buy or sell OTC stock for their own portfolios or act as agents between customers and other market makers. Trading in the futures markets is conducted by floor traders who establish prices through open outcry.

In addition to these participants, some broker/dealers, generally referred to as upstairs market makers, have become increasingly important sources of marketmaking capacity. These broker/dealers arrange large volume trades, called block-trades, on the exchange floor in communication with floor brokers and specialists. These trades are then transmitted to the exchange floor for execution.

The Specialist System

Specialists are exchange members whose primary obligation is to maintain fair and orderly markets in the trading of stocks assigned to them

by the exchange. A specialist unit consists of one or more specialist firms with which individual specialists are associated. As of November 1987, there were 55 specialist units at the NYSE. A NYSE official said that 420 of the 1366 exchange members are specialists. The official added that an individual can become a specialist at the NYSE by (1) purchasing or leasing a seat at the exchange, thereby becoming a member; (2) by passing a NYSE specialist examination; and (3) by functioning for a period of time under the tutorage of an experienced specialist.

Specialists can be involved in trades as brokers for others or as dealers for their own accounts. As brokers, specialists match orders, including market and limit orders[1] received from floor brokers or through the automated routing systems. As dealers, specialists execute trades for their own accounts when only one party to a trade at a particular price can be found.

Rule 104 of the NYSE's Constitution and Rules says that the function of a specialist includes

"... the maintenance, in so far as reasonably practicable, of a fair and orderly market on the Exchange in the stocks in which he is so acting."

Rule 104 further indicates that

"The maintenance of a fair and orderly market implies the maintenance of price continuity with reasonable depth, and the minimizing of the effects of temporary disparity between supply and demand."

At the AMEX, Rule 170 of its Constitution and Rules contains similar requirements for its specialists.

If an imbalance materializes when there are no offers on one side of the market or when the spread between the bid and offer quotes is substantial, specialists may either adjust the price gradually by trading for their accounts (hoping that others will enter the market to support the new price) or by instituting an opening delay or a trading halt. Specialists need the approval of a floor official or governor before instituting a delay or halt and before establishing the new opening price.

[1]A market order is an order to execute a transaction at the prevailing market price. A limit order specifies at what price the customer wants the transaction to occur.

A NYSE manual says that both opening delays and trading halts must be for a minimum of 15 minutes. A specialist told us that the purpose of delays and halts is to allow potential buyers and sellers to have equal access to information about an imbalance. In both opening delays and trading halts, called due to order imbalances, the specialist shows the market a range of possible prices at which the stock may begin trading. The initial range of prices is called the first indication. In some cases a second, third, or fourth indication of prices at which trading may resume are displayed. The NYSE manual indicates that, in unusual situations, it is desirable to delay openings or reopenings for as long as it is considered necessary. The manual also says that all stocks should open for trading as close to the market's opening bell as possible.

Specialists told us that, although their function is to maintain a fair and orderly market, their responsibility is to alleviate temporary market imbalances—not to prevent significant changes in market perceptions from being reflected in stock prices. Therefore, the question becomes how smooth a transition from one price to another the specialist should be expected to provide in rapidly rising or declining markets. All six of the specialists we spoke to said they do not see themselves as the buyers of last resort in markets such as that of October 19. This view was generally supported by broker/dealers we spoke with.

In today's investment environment, other sources of market liquidity are also important. This additional liquidity includes upstairs marketmaking by securities firms, as well as corporate buy-backs. The NYSE Fact Book 1987 reports that with the continued expansion of block positioning, off-floor members' 1986 transactions exceeded specialists' dealings for the tenth consecutive year. Off-floor members' volume rose to a record 11.7 billion shares, accounting for 16.3 percent of all reported purchases and sales. In 1986 specialists, as part of their role in maintaining fair and orderly markets, bought and sold a record 8.3 billion shares, up 42 percent from 1985.

Specialists Faced Massive Trading Imbalances

At NYSE, specialists faced large order imbalances throughout the day on both October 19 and 20. At the opening on October 19, specialists faced large imbalances on the sell side, while on October 20, specialists generally faced large buy order imbalances. These imbalances resulted in opening delays and trading halts in numerous stocks during these 2 days. In total, of the 2,257 NYSE-listed stocks, there were 195 trading delays and halts on October 19 and 280 trading delays and halts on

October 20 at the NYSE. Tables 7.1 and 7.2 provide statistics relating to these opening delays and trading halts.

Table 7.1: Statistics on NYSE October 19 Opening Delays and Trading Halts

	Average Length of Trading Interruption[a]	Avera Percenta Chan in Pric
NYSE Stocks in S&P 500[c]	51 minutes	13
NYSE Stocks not in S&P 500[c]	81 minutes	13

[a]Includes both opening delays and trading halts.

[b]Refers to absolute percentage change

[c]Refers only to stock trading which was delayed or halted and for which we had complete time or pric information relating to the trading interruption

Table 7.2: Statistics on NYSE October 20 Opening Delays and Trading Halts

	Average Length of Trading Interruption[a]	Avera Percenta Chan in Pric
NYSE Stocks in S&P 500[c]	78 minutes	11
NYSE Stocks not in S&P 500[c]	111 minutes	11

[a]Includes both opening delays and trading halts

[b]Refers to absolute percentage change

[c]Refers only to stock trading which was delayed or halted and for which we had complete time or pri information relating to the trading interruption

The specialists we spoke to believed that they were being unfairly crit cized by some market participants for using opening delays and tradin halts. These specialists believed that in circumstances where huge ord imbalances are present, these actions, although not necessarily desir- able, are essential to ensure a fair market. By calling for an opening delay or trading halt, the specialist allows investors time to become aware of a market imbalance.

Two specialists also expressed the opinion that, during the market cris upstairs marketmaking activity evaporated, straining the capacity of the specialists to make orderly markets. However, corporate buy-back eased some of the pressure on specialists during the crisis by counteri sell order imbalances.

A NYSE official told us that the NYSE Market Surveillance Department is reviewing specialists' performance during the crisis relating to, among

other things, opening delays, trading halts, and opening prices. We intend to review their results when they are provided to us.

Specialist Capital

The NYSE requires that specialists have minimum capital of the greater of $100,000 or a percentage of the value of shares of the stock assigned to them. A NYSE official said that the NYSE capital requirements for specialists were last changed in 1977. The official also said that the NYSE reduced the minimum capital requirements for specialists in 1977 from $500,000 to $100,000 at the request of SEC. However, NYSE officials indicated that the percentage of the value of shares standard usually applies.

NYSE officials said that while there are no restrictions on specialists purchasing stock index futures, there are limitations on the extent to which specialists can trade individual stock options that relate to the stocks they are assigned. Only a few specialists trade individual stock options relating to their assigned stocks since the SEC, according to NYSE officials, urged placing certain restrictions on such trading.

The six specialists we spoke to said their capital during the market crisi was sufficient to perform their role of maintaining fair and orderly mar kets. They said that even with additional capital, their actions during the crisis would not have been significantly different. They added that, given the market trend on late Monday, October 19, and mid-morning, October 20, it would have been suicidal to continue to buy when the entire market wanted to sell. For example, one specialist indicated that on Tuesday, just prior to calling a halt in trading, he was facing, just in the crowd of floor brokers (excluding orders received via the DOT system), orders to sell at least 500,000 shares of one stock, without any bu orders. Also, one SEC official said it is not reasonable to expect specialists to engage in "kamikaze" trading strategies.

Although the specialists we spoke to primarily limited their discussion to their own operations, two of the specialists indicated that a few NYSE specialist firms may need additional infusions of capital. In fact, two firms have been acquired by broker/dealers because they experienced financial difficulties during the crisis. In addition, one specialist indicated that although he does not believe additional capital would have stopped the market decline, he would not be opposed to increasing capital if requested to do so by the NYSE.

Officials of 6 of the nation's 15 largest securities firms (in terms of ca tal as of January 1, 1987) commented on the specialist capital issue a offered these opinions. Three said the level of specialist capital may o does need to be raised. One of these officials said that there had been recognition for some time that the depth of capital was missing on the floor, particularly during the bull market, as the specialists' exposure rose with the market in terms of increased trading volume and volatility.

Officials of two securities firms said that specialist capital may not ne to be raised. These officials stated that more specialist capital would have significantly improved matters during the market crisis. One sai study needs to be performed to determine how to improve liquidity in the market.

NASD Markets

Unlike the listed markets, the NASDAQ OTC market is comprised of competing market makers rather than specialists. Market makers are NASI member firms that are linked to each other through a system of computers and phones; there is no exchange floor. NASD requires at least t active market makers for a security to be listed, while the average is approximately eight market makers per issue. Market makers can act both a principal, where they buy or sell stock from their own account for their customers, or as an agent, where they execute customer ord through other market makers or brokers in those stocks which are no their account, or in which they prefer not to trade at a given time. Ma ket makers are required by NASD by-laws to execute orders for a stan ard unit of stock at their quoted price. Although the standard unit is shares, market makers generally deal in transactions much larger tha this.

Market makers may withdraw from making a market in a given stock any time. However, if a market maker withdraws on an unexcused basis,[2] it may not reenter the market in that stock for 2 days as a pen alty for withdrawing.

The NASD has a Small Order Execution System (SOES) which enables a matic execution of customer trades of 1,000 shares or less at the best price in the system. SOES is a voluntary system, operational since Dec ber 1984, which accounts for approximately 1.3 percent of the NASDA share volume, but up to 15 percent of the trades in the NASDAQ marke

[2]Excused withdrawals are outlined in the NASD by-laws.

Because of the different trading structure and mechanisms in the NASDAQ market, and because few NASDAQ securities are components of the S&P 100 or S&P 500 indexes and, therefore, are not directly affected by intermarket trading strategies, the problems associated with the market crash were unlike those of the exchanges. Nevertheless, the problems were substantial. The NASDAQ markets faced: extraordinarily busy telephone communications lines; large numbers of questionable price quotations and the concomitant effects caused by this in the NASDAQ system; market maker withdrawal from the SOES system; market maker withdrawal from making markets; and lack of depth and timeliness of trade execution.

The NASD issued proposed rule amendments to its members in mid-November 1987 that are designed to correct problems in their trading system highlighted during the market crash. The NASD Board of Governors approved the proposed rule amendments in mid-January 1988. Also, NASD, in early January, introduced a new order system designed to reduce dependence on telephones.

Telephone Communications Lines Were Overloaded

Market makers generally said their phones were "ringing off the hook" on October 19 and that, given the staff on hand, it was impossible to answer all the incoming calls. One said his phones were lit up "like Christmas trees" all day long. Market makers said they would go out of business if they had to staff their offices to regularly handle the volume of business on October 19. However, one market maker told us his phon lines were quiet in the afternoon of October 19.

Accusations have been leveled at market markers for not answering their phones. It is difficult, if not impossible, to determine if market makers were deliberately ignoring their phones to avoid making trades. However, it is difficult to determine whether markets were purposely not being made or if the volume of calls simply overwhelmed the firms.

Locked and Crossed Markets Created Uncertainty About Prices and Caused SOES to Be Inoperative in Those Markets

Market markers earn profits from selling stock out of their inventories at prices that are higher than they pay when they buy stock for their inventories. Thus, dealers' bid prices should be lower than their asking prices. A locked market occurs when the best bid and ask prices[3] for a stock, referred to as the inside quote, are identical. A crossed market is where the best bid price is greater than the best ask price, i.e. the price are inverted. Market makers told us that the impact of locked or crosse markets is severe because it shuts down the SOES system in those stock and makes accurate price quotes difficult, if not impossible, to determine. Some market makers we spoke to indicated that locked or crosse markets are similar to a trading halt. However, trading continues wher markets are locked or crossed, but not at the inside quote.

When markets are locked or crossed, SOES by its design becomes inoper tive in those issues. The SOES design is based on the premise that locke or crossed markets represent inaccurate price quotes, and shutting SOE down allows market makers time to adjust their quotes without the financial penalty of accepting trades at a bad quote. Although this system accounts for about 1.3 percent of NASDAQ share volume, it accounts for between 12 and 15 percent of the number of trades. When the system ceased to function in a given stock, it exacerbated the problem of a already overwhelmed telephone system. Nevertheless, the volume of shares traded through SOES set a record on October 19.

If market makers want to execute a trade which will lock or cross a market, it is their obligation to try to contact the market maker whose quote will be locked or crossed to offer them the trade. Market makers had to use the phones to attempt this and could not always get throug Some told us they were forced to lock or cross a market to execute trades because they were unable to contact other market makers to either initiate a trade at the price or have the market maker adjust the quote. Table 7.3 summarizes the number of intraday locked or crossed markets of varying time duration experienced in the NASDAQ system from October 19 to 30.

[3]The bid price represents the price at which a market maker is willing to purchase securities for t account. The ask price is the selling price.

Table 7.3: Number of NASDAQ Issues With Intraday Locked or Crossed Markets[a]

10/19	1,19
10/20	1,57
10/21	1,10
10/22	58
10/23	19
10/26	37
10/27	27
10/28	21
10/29	18
10/30	32

Source: NASD

[a]This includes locked or crossed markets that varied in time from less than 5 minutes to several hours

Because of the numbers of locked or crossed markets, two effects on the NASDAQ system surfaced. First, phone lines, which were already jammed with calls, had more calls coming into and going to market makers to try to have price quotes updated. Second, SOES became inoperative in those stocks with locked or crossed markets, and forced all trading to be done by telephone, jamming the phone lines even further.

Some Market Makers Withdrew From SOES

One market maker who withdrew from SOES on October 19 told us that, before the market opened, he decided to withdraw because he faced enormous exposure by continuing to participate and because SOES is voluntary. Of the top 50 market makers in the NASDAQ system, 46 had been SOES participants on October 16. Four indicated no trades on the SOES system on October 19, 18 showed no trades in SOES on October 20, and 1 reported no trades on October 21.

Some Market Makers Withdrew From Making Markets

During the week of October 19, several market makers withdrew from making markets in individual stocks. One market maker told us he had to withdraw from markets in several hundred stocks over the course of October 19 and 20. From September 30 to October 30, the total number of market maker positions of the top 50 NASDAQ market makers declined from 26,582 to 23,281, or 12.4 percent. In other words, the top 50 market makers, on average, made markets in 532 stocks on the former date and 466 stocks on the latter date. Also, on October 19, the top 50 stocks in the NASDAQ system each had an average of approximately 28 market makers. By the end of the week, the number of market markers had declined to approximately 26 in each of the top 50 stocks.

Trade Execution Depth and Timeliness Was Diminished

The major problem experienced by market makers with trade executio was in their agent rather than principal role. In its role as a principal, a market maker executes orders to buy or sell from its own account. In these types of trades, market makers told us there was little problem ir trade execution once the order got to the trading room.

In the role of an agent, the market maker does not make a market in th stock and must contact another market maker or broker to execute a transaction. A market maker is obligated by rule to execute orders for only 100 shares of stock at the quoted price. In normal times, a market maker will execute orders much larger than that. However, on October 19, some market makers told us that in many instances they were trad ing small orders or parts of large orders. The order breakups added to the telecommunications overload as market makers had to make sever calls to multiple market makers to execute a transaction of 1,000 share which, on a normal day, would be done in one transaction.

NASD Has Proposed Rule Changes Based on the Market Crash

On November 20, the NASD issued proposed rule amendments designed correct problems of the NASDAQ system exposed during the crash. NASD, during the week of January 11, 1988, approved the following rule amendments which will be submitted to the SEC. The proposed rule amendments would, among others things:

- prohibit a firm that withdraws on an unexcused basis as a NASDAQ mar ket maker in a security from re-entering NASDAQ as a market maker in that security for 20 days;
- limit the acceptable reasons for an excused withdrawal from NASDAQ;
- make SOES participation mandatory for all market makers in NASDAQ National Market System (NASDAQ/NMS) securities;
- enable the NASD to establish different levels of maximum order size lim its (e.g., 1,000, 500, and 200 shares) for SOES orders, depending on the characteristics of different securities; and
- provide that SOES executions will continue in a NASDAQ/NMS when quote are locked or crossed, with executions occurring at the best price.

In addition to the proposed amendments, NASD introduced service in m January 1988 on the Order Confirmation Transaction System (OCT). Tl system allows market makers to communicate with one another witho needing a telephone. It also allows brokers to send customer orders to market makers alerting to a buy or sell order. The receiver has 2 min- utes to accept or reject the order. This system also creates a record of accepted and rejected orders.

Stock Index Futures Markets

In the stock index futures markets, liquidity is provided by floor traders who deal exclusively for their own accounts but who have no obligation to make markets or stabilize prices. They are responsible for following all exchange regulations and procedures. Additional liquidity is provided by floor brokers who can either trade for themselves or fill orders for customers.

Confusion and Uncertainty Existed

Although some CME floor participants told us that the CME S&P 500 pit functioned well, they also said that confusion and uncertainty were caused by the price discrepancies between the futures and stock markets, delayed openings and trading halts on the NYSE, as well as the CME's trading halt on October 20. Concerns were amplified when a major clearing firm stopped clearing for floor traders during the crisis, and when traders began leaving the pit or selling their seats.

Also, some CME clearing firms restricted access to the pit to certain brokers or traders they qualified, an action presumably prompted by the sharply increased associated risks the firms faced as a result of potential losses arising from members' trading or brokers' order execution errors. In these cases, floor traders renegotiated their affiliations with other firms and thereby regained access to the pit.

CBT officials stated that the difference (the basis) between its Major Market Index (MMI) futures contract and the cash market was unusually large on October 19 and 20 due to a combination of market volatility, trading halts, and price reporting delays.

Prices Were Too Volatile for Traders to Accept Limit Orders

CME officials told us that they were informed that a number of floor brokers told firms that they would not accept, stop, or limit (contingent) orders. They said that price volatility was so great during the week that some brokers thought they might not be able to act quickly enough to fill customer orders before the price exceeded (or fell below) the desired execution price. If this occurred, the floor broker might have been held accountable for customer losses resulting from noncompliance with their requests.

Liquidity Was Reduced

CME officials said that some less capitalized floor traders stayed away from the S&P 500 pit to avoid the risk of out-trades[4] and unexpected

[4]Those trades which, when submitted to the clearing organization, do not match.

price changes. A CME analysis of S&P 500 liquidity on October 19 and 20 however, showed that while the S&P 500 futures market had significantly larger than normal bid/ask spreads, sufficient liquidity existed t conduct trades. A senior CBT official told use that although some floor traders left the MMI pit during the crisis, they were replaced by others, including more highly capitalized floor traders.

Margin Calls Were Significant

According to officials at CME's clearinghouse, several intraday settlement variation margin calls were made throughout the week of Octobe 19. All such calls were satisfied by CME clearinghouse members. The CB clearinghouse also made special variation margin calls throughout the time period, and all CBT clearing firms, we were told, were able to meet each margin call during the week.

Financial Impact on CME Firms and Floor Traders Varied

According to CME officials, the financial impact of the October decline varied from trader to trader. No CME clearing members defaulted, but some members had to sell their seats to raise capital. Almost twice as many CME seats were sold in October than in any other month in 1987.

CBT officials told us that because of the low activity in MMI futures, the financial impact of the market plunge on CBT market participants was minimal. Although some traders experienced losses from MMI trading, these losses were not large enough to raise default concerns.

Order Handling and Trade Reporting

CME officials said that no evidence existed of any problems with the operation of CME's price reporting system, or matching, clearing, and se tlement systems. Neither CME's clearinghouse department nor CBT's clearing corporation reached capacity limits or experienced operations problems. CBT officials said that as far as the MMI was concerned, the lc trading volume helped minimize operational problems that could have occurred during the steep price decline. CBT officials said the exchange had had no problems with computer support systems.

Trading Abuses

CME officials told us that the exchange is continuing its investigations (trading related to the market crisis and they had identified some possi ble instances of individual trading abuses. CBT officials said they have found no evidence of abusive practices.

Price Manipulation

According to CME officials, the exchange has found no evidence of attempts to manipulate prices. CBT's market surveillance staff told us they found no evidence that the MMI was manipulated.

Speculative Limits

Under the Commodity Exchange Act, either the CFTC or the exchanges with CFTC approval, may set speculative position limits for commodity futures and options on futures. These limits specify the maximum position, either long or short, that one person may hold or control in one commodity future or in all futures of one commodity combined. In CME S&P 500 stock index contracts, the maximum combined limit position long or short a speculator can hold in futures and options on futures combined is 5,000 contracts. According to a CME official, no speculative limit violations existed in either futures or options on futures in the CME's S&P 500 stock index contracts during the week of October 19.

CFTC regulations permit exchanges to grant exemptions to speculative limits in futures and options for bona fide hedgers. The CME's market surveillance department grants and monitors hedge exemptions. Applicants for exemptions in financial futures contracts request a maximum number of contracts for each commodity under each type of exemption. Financial hedgers are allowed under CME rules to exceed their approved limits and retroactively apply for hedge approval.

As the market declined on October 16 and 19, several hedgers exceeded their hedge limits, according to a CME official. The market surveillance staff discussed requested hedge increases with the CME's largest hedgers These discussions continued throughout the next 4 days. On October 22, the CME executive committee officially suspended the rule allowing financial hedgers to exceed speculative or existing hedge limits and then to subsequently justify it.

Stock Index Options Markets -Chicago Board Options Exchange

CBOE market makers are obligated to conduct transactions which are rea sonably calculated to contribute to the maintenance of a fair or orderly market. A market maker has a continuous obligation to engage in trading, to a reasonable degree, when there is a temporary disparity betwee the supply of and demand for a particular options contract. Registered market makers are designated as specialists on the exchange for all purposes under the Securities Exchange Act of 1934.

Fear and Confusion Were Widespread

If market makers are able to hedge their positions by trading in securities and futures markets, they can offer better prices to options customers. If they cannot access the other markets, more risk is incorporated the options prices. Market makers are unable to make quotes on option series based on the movement of the underlying stocks if they cannot determine the prices of the underlying stocks.

According to CBOE officials, market makers were able to make markets throughout the crisis, although not without difficulty. Confusion and fear were created by uncertainty over whether the NYSE would close, b quote delays, and by inaccurate quotes. Because of the confusion, mar ket makers quoted wider spreads and did not take large positions.

According to CBOE officials, CBOE market makers had few operational problems sustaining options trading on October 19. However, on Octot 20, the quality of stock price information deteriorated, and market ma ers also found it more difficult to manage risk through trading in othe markets. CBOE officials and market makers told us they could not tell which stocks were closed because the NYSE did not display the stop tra ing indicator on the quote wire for many of the stocks that were not trading. Instead, either no quotes were shown or inexecutable quotes were displayed. They further said that efforts to confirm with the NYS stock watch desk whether a stock was trading were often unsuccessfu When the CBOE determined that a stock had stopped trading, it halted trading in the individual option for that stock.

According to CBOE officials, on October 20, the trading day in OEX opti was almost entirely consumed by two lengthy trading rotations. There are numerous option series listed for trading on each underlying secu ity or index value—each with a different exercise price or expiration date. During a trading rotation, trading may occur only in one options series at a time. Rotations are employed in opening and reopening tra ing so that all orders present at the trading post in a given series can interact and a single opening price for each series can be arrived at. O normal day, it would take approximately 20 to 30 minutes to complet trading rotation in all of the OEX options series. On October 20, the op ing trading rotation took from 9:30 a.m. to 11:54 a.m.—almost 2½ hours. According to CBOE officials there were two primary reasons. Fi as a result of the 508 point decline on October 19, an additional 112 options series at lower exercise prices had been added so that the tot number of option series in the rotation increased from 160 to 272. Sec ond, due to among other things the extreme volatility in index values

and the uncertain state of the NYSE, it was difficult for options market makers to price the OEX options.

According to CBOE officials, at 11:54 a.m., at the close of the opening rotation, CBOE determined not to begin open trading in the OEX. Instead, CBOE halted all OEX trading. Information as to the status of the various stocks comprising the S&P 100 index was fragmentary and uncertain at the time; however, CBOE believed that stocks representing more than 20 percent of the index value had in fact ceased to trade and that a trading halt was required under CBOE rules.

At 11:30 a.m., CBOE officials stated they received information from the SEC that the NYSE was about to close. The CBOE officials relayed this information to the trading floor; however, the closing never occurred.

According to CBOE officials, at 1:22 p.m., it began to reopen trading in the OEX. The reopening rotation took approximately 2 hours, from 1:22 p.m. to 3:23 p.m. Market conditions during the reopening rotation were markedly different from what they had been at the close of the rotation that morning. When customers and firms who bought put options during the morning at prices which they believed to have been excessive sold those options in the afternoon, they realized significant losses.

According to CBOE officials, CBOE's Retail Automated Execution System (RAES), which provides automatic execution of small orders of low priced options, did not experience operational problems. However, RAES did not provide automatic execution of OEX put option orders during the crisis. Due to the rapid stock market decline puts became very expensive. RAES was not intended to handle high priced options because they are too risky for market makers to automatically take the other side of customer orders. Therefore, for the first part of the week of October 19, no OEX put options were listed on RAES.

On October 20, vendor price dissemination systems could not handle the unusually large number of options series added to reflect current stock prices. Therefore, retail customers did not have all needed market information respecting those series.

Financial Impacts

CBOE officials reported that despite significant losses by some market makers, all CBOE clearing firms continued to meet margin calls and clear transactions. Some market participants stated that some market makers, fearing margin calls would be made that they could not meet, left the

market on October 20. However, there was no widespread exodus from the trading pits.

Observations

On October 19 and 20, participants in the stock, futures, and options markets were faced with unusual demands on their capabilities and there was widespread confusion and, in some cases, fear. Faced with huge order imbalances, NYSE specialists halted trading or delayed openings in many stocks, making it impossible, at times to determine transactable prices in many securities. Similar problems occurred in the OTC markets due to locked or crossed markets. In addition OTC telephone lines were jammed with calls from customers as well as market makers which added to the uncertainty and fear that already existed in the rapidly declining equity markets. Futures and options market participants were frequently unable to determine prices in the underlying markets because of problems in the NYSE and the uncertainty that this caused was reflected in an increase in price volatility.

The fast-paced events on October 19 and 20 and the financial exposure that events implied caused some participants to back away from their markets, fearing they would lose everything. Despite these developments, there were very few failures of firms in either the securities or futures markets.

The events of these 2 days raise major questions about what steps can be taken in the future to avoid a repetition of as many of the stressful circumstances as possible that contributed to the environment of fear and uncertainty.

Performance of Computer Systems

Computer systems play an important role in all of the stock, futures, and options markets. Market participants told us about problems with the performance of computer systems in several markets. These problems added to the uncertainty about whether timely trades could be executed, at what price, and whether certain trading strategies could be used. Our work for this report focuses on the NYSE because (1) it has a central role in the financial markets, and if its systems do not function smoothly, other markets are affected; (2) it is heavily dependent on computerized trading systems; and (3) its officials reported significant problems with those systems. We plan to examine the other markets' computer systems as part of our ongoing work.

NYSE computerized trading systems automatically route buy and sell orders from member firms and other exchanges to the appropriate trading posts on the floor of the Exchange for execution, and return confirmations of executed trades to the members and other exchanges. Although senior Exchange officials say they have no way of knowing the exact number of orders that come down to the trading floor, on October 19 about 85 percent of the orders for stocks traded, comprising about 25 percent of the volume of shares traded at the Exchange, were estimated to be handled by these systems. Automated systems also keep track of trades and quotations as they occur at the Exchange and on other exchanges nationwide. This information is displayed visually on devices at the Exchange, and is automatically disseminated to other exchanges and commercial information dissemination organizations.

During the week of October 19, the NYSE experienced an unprecedented and unanticipated volume of trades on its automated systems and had significant problems in routing buy and sell orders and trading execution reports to and from the floor of the Exchange. Some critical systems were capable of handling this unanticipated trading volume, which allowed the NYSE to continue to operate; however, other critical systems encountered significant processing problems, including volumes in excess of some systems' capacities, systems design limitations which were exposed by the heavy volume, and hardware and software failures. As a result, some orders were delayed or did not reach the trading floor for execution. The automated systems problems affected not only the timely and efficient trading of stock at the Exchange, but also affected the ability of other financial markets to trade securities and associated derivative products. According to Exchange officials, several actions have been taken to try to correct those problems, and other actions are planned to further improve the performance of the Exchange's automated stock trading support systems.

Because of the central role played by the Exchange in the nation's fin cial markets, we believe the problems experienced by the automated systems at the Exchange raise automation issues requiring continued attention. Specifically, these issues are (1) the extent to which future trading volumes and related systems requirements can be accurately forecasted, (2) the extent to which the Exchange's current system and planned upgrades will accommodate future trading volumes, and (3) whether the SEC should take a larger role in assuring that the Exchange's automated systems are capable of adequately fulfilling th demands placed upon them.

The NYSE's Automated Systems and Problems With Them

As shown in figure 8.1, 12 major computer systems support stock trac ing at the Exchange. Several of the systems are divided into as many four separate banks (A through D). Each bank supports different segments of the trading floor. These systems are configured this way so that a system failure would be isolated to only a particular segment o the trading floor.

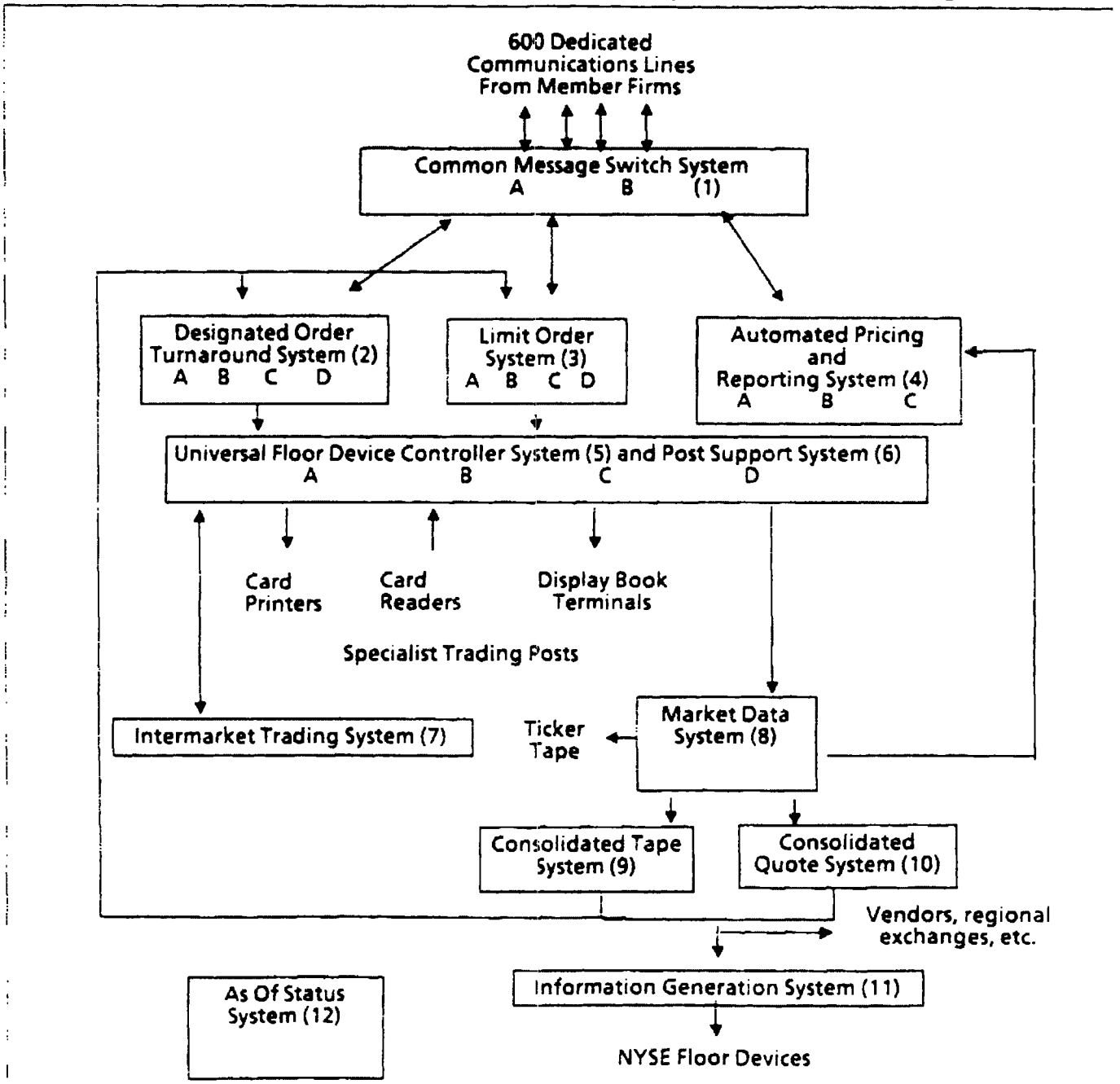
As shown in figure 8.1, firms that are members of the Exchange can place buy and sell orders through about 600 dedicated communicatior lines. This system, called the Common Message Switch, routes orders one of three systems. Market orders are routed to the DOT System and limit orders, day limit orders, and good-'til-cancelled orders are route to the Limit Order System. Odd lot orders are routed to the Automate Pricing and Reporting System.

The DOT System and the Limit Order System forward orders to the Un versal Floor Device Controller System which, as shown in figure 8.1, either prints the orders on card printers located on the trading floor o sends them to the Post Support System for display on terminals on th floor of the Exchange. These displays are called electronic display books. Specialists use the printed or displayed orders to execute trade The Intermarket Trading System, used by other exchanges to place orders on the NYSE, also sends orders to the Universal Floor Device Co troller System, which routes the orders to card printers on the tradin floor.

The Automated Pricing and Reporting System, which processes odd l orders, does not forward orders to the floor. Instead, it automatically executes the orders based upon the prices of trades in round lots. It

does, however, forward inventory information to the appropriate specialists on the floor, who use this information to manage their positions in the market.

Figure 8.1: Flowchart of the Process Followed at the New York Stock Exchange to Execute Securities Trading



Trades executed on the floor are reported via mark sense card readers through the Universal Floor Device Controller System to the Market Data System, which through three other systems[1] disseminates this trading data back to the member firms, other exchanges, commercial information dissemination firms, and the ticker tape. The flow of this information is also shown on figure 8.1. Another system, the As-Of-Status System, provides information the next morning at the request of member firms on the status of outstanding limit orders.

During the first 9 months of 1987, the average daily volume of shares traded on the Exchange was about 181 million. During that period, the highest daily volume was about 302 million. The automated trading support systems were being designed to operate in an environment of 400 million shares per day by the close of calendar year 1987. On October 19 and 20, 1987, however, the daily volumes were about 600 million. This was double the daily peak prior to October 1987 and 1-1/2 times the design capacity of the systems.

Senior Exchange officials estimate that under normal processing conditions, an order is executed on the average within a 2-minute period. However, the unprecedented trading volume during this period caused operating problems for 9 of the Exchange's 12 major automated systems. These problems caused sporadic delays and partial system outages on October 16, 1987, and during the week of October 19, 1987. For example, deliveries of buy or sell orders to the floor of the Exchange were delayed, at times, for periods ranging from about 10 to 75 minutes. The problems experienced were as follows:

- Part of the DOT System was halted once on October 16, four times on October 19, and once on October 20. The failures on October 16 and 19 caused portions of the system to stop processing for about 3-4 minutes. On October 20 a portion of the system stopped processing for about 13 minutes. The problems occurred because the system's internal transaction counters, which control the passing of transactions to other computers, overflowed. As a result, delays were encountered in delivering market orders to the trading floor and routing associated reports of executed trades to member firms and the financial community. Information was unavailable on the magnitude of these delays caused by the system

[1] These systems are the Consolidated Tape System, which receives and disseminates last-sale prices listed stocks in all markets in which they are traded; the Consolidated Quote System, which collects and disseminates current bid and asking quotations from and to all market centers in which listed stocks are traded; and the Information Generation System, which displays information on quotes, indexes, etc., to the Exchange's floor.

- Part of the Limit Order System stopped processing on three occasions October 20 because the number of limit orders received exceeded the system's capability to store additional transactions. As a result, limit orders were delayed by as much as 20 minutes in reaching the trading floor and an undetermined number of orders were unexecuted because they were delivered to the floor after the Exchange closed for the day.
- On October 19, 20, and 21, the Automated Pricing and Reporting Syste encountered delays of up to 2 hours in the execution of odd lot orders and the associated delivery of odd lot information to specialists. The delays occurred because the system was unable to handle the large vo ume of round lot sales reports, thereby causing delays in the processir of odd lot orders. As a result, (1) specialists were unable to manage th odd lot inventories and (2) about 8,000 orders were unexecuted. Base on information provided by the Exchange, these orders involved abou 320,000 shares of stock. Corrections were effected on subsequent day for those firms requesting adjustments.
- The Universal Floor Device Controller experienced significant delays up to 75 minutes in printing orders on October 19 and 20. The delays occurred because the high volume of orders received caused backlogs the card printers. In an effort to clear the backlogs in the Universal Floor Device Controller System, the Exchange was forced to intermittently stop the flow of orders from the DOT System and the Limit Orde System for periods up to 10 minutes. While this occurred up to 12 tim on October 19 and to a lesser extent on October 20 and 21, the delays were not uniform across the trading floor. In addition, an undetermin software problem on October 19 caused the loss of about 7,000 report of executed orders involving an estimated 4.3 million shares of stock. According to the Exchange, the majority of these reports were subsequently recovered and all orders were ultimately resolved.
- The Post Support System exceeded its allotted transaction storage ca bility on October 20 which caused portions of the system to stop oper ing for several 2 to 3 minute periods. As a result, during each of these periods groups of 15 automated display books could not be used to deliver orders to the trading floor.
- The NYSE's interface to ITS experienced delays in delivering orders to t floor of the Exchange on October 19 through 21 because of backups o the card printers. As a result, many orders could not be executed wit the 2-minute time limit established and agreed to by the regional exchange. For example, according to officials at the MWSE, normally about 80 percent of orders sent through this system are executed wit the 2-minute time limit. On October 19, however, only about one-third its orders were executed within the 2-minute time limit. Because thes orders had no way of being executed, on October 19, the NYSE request

other exchanges not to use the system for 7 of the 14 trading posts during an hour and 15 minute period. On October 21 the NYSE closed the system entirely to other exchanges for about 2 hours.

- The Consolidated Tape System encountered several failures on October 19 and 20, the longest of which lasted about 5 minutes. The main problem was that the system was incapable of handling the high volume of sales data. As a result, the system delayed last sale information to inves tors and traders through vendor quotation devices.
- The ticker tape, which displays last sale information from the Market Data System, was delayed for up to 2 hours on October 19 and 20. To b read by the human eye, the ticker tape can display information at a rat of only 900 characters per minute. The impact of this delay was that th tape for last sale information was stale and outdated.
- The As-Of-Status System, which provides information the next mornin on whether a particular limit order has been executed, experienced a software processing problem on October 19. This system's software wa not designed to handle the unprecedented volume of status requests in an orderly fashion. As a result, on October 20, member firms were not immediately provided with information on the status of their requestec limit orders.

The overall effects of the problems encountered by NYSE's order proces ing systems need to be further analyzed. Some believe that the comput problems may have exacerbated the situation by contributing to an inability to maintain orderly markets in the face of overwhelming orde imbalances. Officials at other exchanges reported that NYSE's computer performance problems contributed to an overall inability to conduct no mal trading. For example, the regional stock exchanges reported that the Exchange's card printer delays and resulting backups in the passin of orders through the ITS and the Universal Floor Device Controller Sys tem sporadically prohibited the execution of orders on the Exchange's floor. In addition, officials at the Chicago Board of Options Exchange reported that its trading was inhibited by the NYSE's inability to deliver timely, and accurate information on the status of stocks being traded. NYSE officials disagreed and said that they did provide market vendors with accurate and timely information. An official at a securities firm reported that the Exchange's delays in executing orders on the afternoon of October 19 prohibited index arbitrage strategies which require the immediate execution of orders at the Exchange. These problems an those previously discussed raise questions on the degree to which NYSE computer systems were capable of providing fair and equitable treatment to all market participants during these unprecedented trading volumes.

High Volumes During October 1987 Were Not Forecasted

Most of the problems experienced by the Exchange's automated stock trading support systems on October 16, and during the week of Octob 19, 1987, were due to the high volume of orders during this period. Of cials responsible for operating the automated systems at the Exchang explained that their computer requirements forecasting model, design to predict anticipated trading volumes at the Exchange as well as the associated system requirements, did not forecast the high trading volumes encountered from October 16 through October 21.

The Exchange's previous modeling efforts resulted in decisions to desi a system capable of routinely handling a 400-million share trading da by the close of calendar year 1987, a 500-million share trading day by the close of calendar year 1988, and a 600-million share trading day b the close of calendar year 1990. A senior Exchange official said that a of October 1987, some of the Exchange's stock trading systems were already upgraded to handle a 400-million share day while others were the process of being upgraded.

According to the Exchange, the computer requirements modeling effo has been based, among other things, on an analysis of historical daily peak volume trading patterns. The predominant pattern observed in prior years was high trading periods immediately after the market opens and again just before the market closes. However, more recentl the Exchange has been observing brief intra-day trading peaks, some which are higher than the historical opening and closing peaks. This phenomenon is placing large strains on the automated order processin systems. Although analysis is continuing to modify the Exchange's sy tems requirements modeling process, Exchange officials told us the probable cause of the mid-day peaks is the advent of computerized tr ing techniques and the marketplace's overall reaction to changes in le ing indicators in the U.S. economy, such as trade imbalance reports, interest rate predictions, and joblessness rates.

As a result of this increased volatility in the trading of stocks, the Exchange believes that it is having much more difficulty estimating future peak daily trading volumes, and is reevaluating the way in wh it conducts its systems modeling exercise. One of the methods to be employed by the Exchange to cope with these unprecedented trading volumes is to acquire greater amounts of computing resources than a called for as a result of its modeling efforts to provide for a larger saf factor to handle daily trading peaks.

Actions to Improve Automated Stock Trading Support Systems

Although the Exchange did encounter serious problems with its automated order processing systems, several actions were already underway to improve the automated stock trading systems prior to the events of October. In addition, since the events of October, the Exchange has aggressively worked to expedite the introduction of additional compute resources.

For example, prior to October, the Exchange was implementing the following automated order processing system enhancements which, when completed, are expected to significantly improve the performance of th systems:

- By February 1, 1988, the Exchange plans to have increased the size of its overall trading floor by 7000 square feet and to have added 2 and 1/2 additional trading posts to the Exchange floor. This includes an increase of about 30 additional card printers and readers, and 55 electronic display books to the trading floor, and a rebalancing of the work load on each card printer. It is anticipated that this will result in less stress on the card printers during peak processing periods.
- Throughout the past year the Exchange has been installing additional electronic display books on the Exchange floor, thereby further reducin its reliance on card printers to deliver trading orders to the Exchange floor. As of October 19, the Exchange had installed about 215 display books, which represented 25 percent of the stocks traded or about 40 percent of the order traffic through the system. By mid-February 1988, the Exchange plans to have 310 books in operation representing about 75 percent of the traffic, and by the end of 1988, to have in operation 350 to 360 display books representing 85 to 90 percent of the traffic. This increased utilization of electronic display books will have a dual benefit of reducing the reliance on slow card printers, and will also free up the available printers to more efficiently handle stock orders from regional exchanges through the ITS.
- The Exchange was also in the process of expanding the capacity of its Limit Order System and moving the function of processing its odd lot orders from the antiquated Automated Pricing and Reporting System t the Limit Order System. Exchange officials said that the current Automated Pricing and Reporting System was never designed to handle today's odd lot trading traffic. Prior to October 19, one of the Exchange's 14 posts was already running its odd lot orders through the Limit Order System. By mid-February, the Exchange anticipates odd lo transactions will be fully converted to the Limit Order System.
- The Exchange had also been considering various options to more efficiently link the ITS to the Exchange floor so that orders from regional

exchanges can be delivered more frequently to the trading floor within the established 2-minute expiration period. Alternatives being contemplated include utilizing a higher speed card printer and reducing the overall traffic now going through the card printers.

Efforts undertaken since the problems encountered on October 19, 198 include the following:

- Immediately increasing various systems' ability to store and process orders by adding additional disk drives and minicomputers. For example, four additional minicomputers have been added to the Universal Floor Device Controller System and the Post Support System. In addition, disk drives have been added to the Common Message Switch System, the Universal Floor Device Controller System, the Post Support System, and the DOT System.
- The Exchange is now engaged in designing and implementing a series c upgrades to the current system which are intended to provide for the routine processing of a 600-million share trading day without unduly stressing any portion of the overall system by the close of calendar ye 1988.
- The Exchange is also reviewing what is being printed out on its card printers to see if all of the printed material is needed or whether the information must be printed on the Exchange floor. Plans involve mov ing administrative information not directly associated with the execution of market or limit orders to other centralized printers on the tradi floor. Exchange officials currently estimate that about 10 percent of tl information from the card printers is administrative data. If this infor mation were redistributed to other printers, the potential delays in printing market and limit orders on the Exchange floor during peak processing periods would be reduced.
- The Exchange has also established an Operations Advisory Committee which is composed of NYSE Exchange officials and representatives fror dealers, brokers, and clearing agencies. The purpose of this Committee to evaluate problems encountered during peak processing periods and recommend associated corrective actions that would enhance the entir process. Areas being considered are the point at which a customer call a broker to place an order, the brokers' order handling processes, and the exchanges' order and clearance handling processes.

We intend to monitor the progress made by the NYSE in implementing those initiatives instituted prior to and after October 19 and will repo on the results of these efforts.

The Role of the SEC

SEC officials told us that there are several ways the SEC becomes aware of the purposes, uses, and implications of utilizing automated order processing systems to execute stock trading at the NYSE. These methods include approval of proposed rule changes including related changes to the automated processing of stock trades, on-site inspections of exchange facilities and systems, and informal meetings with Exchange officials on improvements contemplated to automated systems.

However, these officials said that the SEC does not independently evaluate the specific capabilities of the automated stock trading systems or assess the extent to which the Exchange has purchased sufficient computer resources to efficiently process stock trades. They said that the SEC does not have the resources to determine whether the systems are designed to effectively handle increasing trading volumes. Rather, the SEC sees its responsibilities regarding its review of the order handling and processing systems as assessing whether or not fair and equitable treatment is being provided to all participants in the marketplace. In this regard, the SEC monitors certain automated systems performance indicators to help ascertain how well the systems are working. For example, the SEC reviews statistics on how quickly orders are being executed, and how timely latest stock quotes are being provided to the public.

The SEC said that in the mid-seventies and early eighties, the Commission worked with great enthusiasm to move NYSE to automate its order processing function. However, since that time the SEC has not focused on the need to improve the Exchange's automated support. The SEC has basically been satisfied that NYSE has done a reasonably good job in acquiring needed automated support and believed that the Exchange had the necessary talent and resources to effectively handle the processing of orders. However, the October events have changed the SEC's assessment of the adequacy of the Exchange's computer resources. SEC officials now agree that more needs to be done to improve the Exchange's automated order processing systems.

Observations

NYSE's pivotal role in the nation's financial marketplace makes it imperative that it be able to efficiently operate its order processing systems so that every market participant is treated in a fair and equitable fashion. Computer problems, such as those which took place during the week of October 19 raise important questions regarding the Exchange's ability to provide for an efficient, fair, and equitable marketplace.

These questions relate to the ability of the NYSE to accurately forecast trading volume and related systems requirements, the extent to which the NYSE's automated order processing system upgrades will be able to sufficiently handle anticipated and unanticipated trading volume level and the role that the SEC should play in reviewing the adequacy of the Exchange's order processing systems.

Regulatory Response to the Market Crash

The October 16 market decline led self- and federal regulators to expec a further decline on October 19, but they did not anticipate as steep or rapid a decline as occurred. With one exception—the confusion about whether NYSE would close on October 20—market participants we inter viewed praised the regulators' performance during the crisis. We have not yet verified or evaluated in detail how each regulator responded to the crisis, and more importantly, how they worked with each other to reduce uncertainty in the markets. However, our preliminary observations are as follows:

- Self- and federal regulators implemented procedures to respond to high volatility in their markets.
- Self- and federal regulators had recognized the increasingly linked nature of the markets and had begun to implement additional coordina ing mechanisms in response.
- Regulators made decisions as events unfolded with advice and counsel from a variety of sources. These decisions were based on their respective markets' operations and integrity, but many had intermarket effects as well.
- Federal Reserve officials told us they had made contingency plans for dealing with a market crash. According to some, the Fed's expansionary open market operations beginning on October 20 supplied needed liqui ity to the financial system.

Procedures Implemented to Respond to High Volatility

Self- and federal regulators intensify some of their oversight activities during volatile markets. They had done so during market declines on September 11 and 12, 1986, January 23, 1987, and several times durin October 1987, including October 16 and again during the week of October 19.

Self-Regulatory Procedures During Volatile Markets

Several self-regulatory officials told us about their procedures during volatile markets. We have not examined these procedures in detail, bu the following summarizes what we were told in three markets—NYSE, OTC, and CME.

The NYSE told us that their emergency procedures are embedded in the operational procedures. For example, the procedures call for monitori financial conditions of specialists and broker/dealers and allowing for stock opening delays and trading halts when needed. In addition, they

provide guidance for adjusting automated systems to handle high volume days.

The CME has a risk management team composed of various department heads which meets daily to monitor the financial risk to the exchange market fluctuations. During the crisis it monitored the S&P 500 contrac CME's audit department also visits member firms to monitor margin col lection and the net capital position of the firms. In addition, the Board Governors meets more frequently to monitor events.

SEC and CFTC Also Increase Monitoring

SEC Procedures

SEC officials told us they increase market and financial monitoring and surveillance in response to volatile markets. They said they took these actions during the September 11 and 12, 1986, declines, on January 23 1987, and several times during October 1987. They said they interviewed market participants and collected trading data for each of thes days, specifically to identify the possible role of index-related trading these declines. As a result of these studies SEC officials told us they an CFTC staff have developed procedures to do an intermarket study of ar trading day.

The continuing declines in October led the SEC staff to begin canvassin the various self-regulators about the financial condition of the broker/ dealers which they examine. This activity supplemented their financi early warning system which is normally activated in volatile markets. This system uses self-regulators for initial information as they have th primary responsibility for the financial status of member firms. SEC receives same-day notices of financial problems. The self-regulators advised SEC that these firms were not experiencing any financial difficulties.

After the market decline on October 16, SEC officials told us they met with the SEC Chairman and talked to NYSE officials about what needed be done on October 19. SEC officials said they told the NYSE officials to call them at 9:15 am and provide information on order imbalances at t opening and a status report on how operating systems were working. S officials said they had examined charts on market price swings over t weekend. In addition, before the NYSE opening on October 19, SEC had

received indications of deteriorating market conditions in Tokyo and London. The SEC Chairman testified shortly after the crash that SEC began to monitor activity in the securities and futures markets minute-by-minute on October 19.

CFTC Procedures

Under the Commodity Exchange Act, CFTC has the authority in certain limited circumstances to declare a market emergency and halt trading in any contract deemed necessary. Also, CFTC may direct a futures exchange to undertake action necessary to maintain or restore orderly trading or liquidation of contracts including suspension of trading, raising margins, setting of temporary emergency trading limits, or directing that trading be for liquidation only.

CFTC has halted trading in a futures contract four times since the agency's inception, including suspension of grain trading just after federal imposition of a grain embargo on the Soviet Union in January 1980 In other instances, CFTC has urged the self-regulators to take appropriat emergency actions. Emergency actions taken by the exchanges are generally done in consultation with the CFTC and all emergency actions are reviewed by CFTC.

CFTC intensified its routine surveillance of stock index futures on October 6, when the DJIA fell nearly 92 points. On October 16, when the DJIA experienced a 108 point drop, CFTC scheduled a special market surveillance briefing for the morning of October 19. CFTC invited SEC staff to brief them at the meeting. CFTC reviewed the largest futures positions and position changes in the S&P 500 futures contract and also provided preliminary estimates of the magnitude of index arbitrage and portfolio insurance. CFTC surveillance staff telephoned market users to obtain explanations of their futures market activity and to receive first-hand assessments of market conditions. CFTC also implemented its financial early warning system whereby they are notified when market participants which carry customer accounts fall below 150 percent of their minimum capital requirements.

Changes Made to Recognize Linked Markets

Self- and federal regulators recognized the linked nature of the markets and had expressed concerns about the potential for trading abuses involved in trading across markets. Some intermarket cooperation and sharing of information had begun to be implemented before the crash.

Intermarket Surveillance Group

The Intermarket Surveillance Group (ISG) was formed in 1981 to coorc nate industry-wide exchange of surveillance data with a particular emphasis on assuring the integrity of options and equities trading. The ISG is comprised of senior surveillance and enforcement representative of the following self-regulatory organizations: AMEX, Boston Stock Exchange, CBOE, Cincinnati Stock Exchange, MWSE, NASD, NYSE, Pacific Stock Exchange, and the Philadelphia Stock Exchange. Also, CME, CBT, and NYFE are participants in a sub-committee of the ISG concerning the surveillance of stock-index products. Each SRO has designated contact points for intermarket matters. SEC is an observer to the ISG, and CFTC staff are invited as observers when the futures exchanges attend ISG subgroup meetings.

To improve intermarket surveillance among the self-regulatory organizations, the ISG identified and described intermarket trading activities requiring improved SRO surveillance information, identified sources of intermarket trading surveillance information, developed minimum surveillance procedures needed at each SRO to detect improper trading activity and established communication and coordination procedures f the surveillance, investigation, and prosecution of intermarket violations.

When a self-regulatory organization's preliminary analysis of trading data indicates a potential intermarket violation, it contacts other interested self-regulators. One organization is designated to coordinate the collection and analysis of information related to the investigation and communicate as appropriate with the SEC and all interested self-regula tors. When intermarket violations are found, agreement is reached regarding which self-regulator will bring disciplinary action.

SEC and CFTC Intermarket Actions

The Futures Trading Act of 1982, which reauthorized CFTC, gave SEC tl opportunity to review and object to any proposed stock index futures contracts and options on those contracts. SEC has limited veto power through determining whether the contract can be settled by cash, whether it is a broad based index, or whether it is susceptible to manij ulation. SEC can object if the proposed contract fails one of the tests. Once the contract is approved, SEC has no further veto power. SEC has never vetoed a contract although staff members told us they have requested that changes be made to certain contracts as a condition for approval. We have a study in process to evaluate the effectiveness of the contract approval process.

SEC, in its study of the market decline that ocurred on September 11 and 12, 1986, stated that market surveillance capabilities needed to be enhanced if they were to permit effective monitoring of trading practices that occur across markets. The report expressed particular concern about the potential for market manipulation and frontrunning. In addition, an SEC commissioner told us that a portfolio surveillance capacity i needed in both securities and futures markets. For its September study, SEC used data from the CFTC large trader reporting system. Those data, as well as market contacts, helped distinguish the trading of arbitrageurs and portfolio insurers from other trading. This reporting system was used to obtain data to analyze the events of October 19 and 20.

In addition to these activities, CFTC shares market surveillance information with SEC at weekly market surveillance meetings. Also, CFTC routinely makes financial information available to SEC upon request.

In September and early October, at the request of the Fed and the Department of the Treasury, two meetings were held to discuss intermarket contingency planning. In addition to these two agencies, SEC CFTC, Federal Deposit Insurance Corporation, and Comptroller of the Currency officials met to discuss ways to plan for a market emergency. SEC and CFTC officials told us these meetings were informational and no decisions were made.

Decisions Made as Events Unfolded Had Intermarket Effects

None of the self- and federal regulators expected the magnitude of the decline or the volume of trades that occurred on October 19 and 20. Decisions were made as events unfolded primarily by the self-regulator with advice and counsel from the federal regulators and others. Decisions made to resolve problems in one market often affected other markets as well. Many market participants told us the regulators did a gooc job with the exception of the confusion about the possible NYSE closing on October 20.

Self-Regulator Decisions

NYSE

The NYSE took actions in response to the stock market decline and the extraordinary trading volume to restrict the use of the DOT system for program trading and to stop using the ITS for about 2 hours. Floor officials' and governors' approved a significant number of opening delays

and trading halts because of order imbalances. An NYSE official told us that NYSE was in frequent contact with the White House, the Fed, Treasury, SEC, CME, and the heads of major broker/dealer firms. In additior NYSE officials said that during the week of October 19, they monitored the capital positions of specialists and member firms on a daily basis.

At the market's opening on October 19, the DOT system experienced d ficulty in processing the unprecedented trading volume. On the morni of October 20, NYSE requested its members to refrain from using the D system for executing program trading in order to preserve the system for retail customers. Without using the DOT system, program trading could only be executed manually. On October 21, NYSE requested its members to refrain from manually executing program trades for their own accounts.

The NYSE reported that its interface of the ITS experienced serious dela on October 19 and 20 and, as a result, NYSE made a determination to st ITS trading for about 2 hours on Wednesday, October 21. Most ITS trad commitments (which have a 2-minute life) had expired prior to execu tion due to the magnitude of the queues for delivery to the printers or the trading floor.

NYSE consulted SEC on October 20 about the possibility of calling a tem rary trading halt. NYSE discussed implementing such a decision with th SEC Chairman. At that time, trading in over 160 securities was halted the NYSE because of order imbalances. While temporary cessation of trading was viewed by NYSE officials as an extraordinary measure, cor sideration was given to this option. According to SEC officials, NYSE off cials told them that the closing was imminent. However, NYSE officials told us they decided to keep the exchange open for trading because th thought closing would cause investor panic. An apparent rebound in t orders helped avert the need for closing the exchange at that time.

NYSE in consultation with SEC decided to close its market early from Oc ber 23 to November 6 in order to process and resolve the trades that h accumulated due to the dramatic increase in the volume of trades exe cuted during this period. The securities industry resolved the vast majority of those trades through reduced trading hours and increased working hours including weekends.

NASD

Indications of weak markets before the crash led to increased surveil- lance, and system problems highlighted by the crash led to proposed

rule changes. NASD activities among others, consisted of increased financial surveillance of member firms, targeting those with marginal capitalization or a history of financial and operational difficulties. On October 19, NASD concentrated on calling market makers to have markets unlocked or uncrossed. On October 20, in response to difficulty in contacting market makers directly, NASD officials said they called compliance departments of major marketmaking firms to establish direct phone lines between NASD and the OTC trading desks at firms. Also, on October 20, NASD expanded the hours of its clearing system.

On October 21, still confronted with a large number of locked and crossed markets, NASD called market makers to get them to adjust their price quotations to get the markets unlocked. They also sent messages over the NASDAQ system advising market makers that enforcement actions would be taken against those who did not correct locked and crossed markets and those who did not honor their price quotes.

On October 22, the NASD agreed to close early on the 23, 26, and 27. Also a hotline was established between market makers and NASD headquarters so that market makers could easily reach the NASD to handle complaints about locked and crossed markets and access to other market makers. NASD submitted a rule change to SEC requesting SOES transaction to be a maximum of 500 shares as opposed to 1000 shares. The SEC approved the rule change. On October 26, based on information obtained over the hotline, NASD sent examiners to certain firms to monitor their trading desks directly.

CME

Beginning October 16 and continuing throughout the month, CME, in consultation with CFTC, took several actions regarding its S&P 500 futures and options on these futures contracts responding to stock price declines. CME raised margins, imposed wide-ranging (over 10 percent market daily price change) price limits, suspended rules that allowed hedgers to exceed their position limits without prior approval from the exchange, and allowed floor brokers to switch clearing members with a verbal confirmation to the exchange and paperwork to follow. The CME compliance department increased floor surveillance, and the surveillance department maintained contact with the largest S&P hedgers. In addition, the CME audit department visited member firms daily to monitor net capital and margins.

On October 20, CME suspended all stock index futures and options on stock index futures trading around noon when they thought NYSE was

going to close, and reopened trading about 1 hour later. To coincide w NYSE shortened hours, on October 22, CME changed closing hours for S& futures and options on futures to 2:00 p.m. EST for October 23, 26, an 27, and later expanded the early close through November 6, 1987. Th CME also adopted daily price limits in S&P 500 futures on October 22, effective the following day.

During the period, CME officials maintained contact with officials fron CFTC, SEC, CBOE, OCC, other futures exchanges, clearing organizations, NYSE, AMEX, Federal Home Loan Bank Board, Federal Reserve Bank of Chicago, and futures firms.

CBOE

During the crisis period, CBOE took several actions in response to even taking place in underlying stocks on the NYSE. On October 19, CBOE offi cials began telephone conversations with SEC representatives regardir market conditions and the capital situation of CBOE firms. These daily conversations started before trading began and continued throughout the day. Exchange financial compliance staff also intensified their co munications with member firms to thoroughly monitor the impact of unusual market conditions on firms' financial conditions.

On October 19 and 20, fast market days were declared in OEX and a si nificant number of individual equity options. When the CBOE declares fast market, participants are warned to expect unusual conditions. Fa markets could include discontinuous pricing and increased order turn around. Such a declaration also permits floor officials to change proc dures, including widening the acceptable bid/ask spread.

On October 20, CBOE halted trading in the S&P 100 Stock Index Option (OEX) and in the S&P 500 stock index option (SPX) based on CBOE's rule which requires 80 percent of the underlying stocks to be trading. As underlying prices became available about an hour later, the CBOE deci to reopen the OEX and SPX.

On October 21, before the opening, CBOE officials determined that, pe exchange rule 5.4, out-of-the-money strike prices[1] without open inter could be delisted. However, the impact of this action was limited, and the close of trading, a price vendor notified the CBOE that all May and

[1] A call option with a strike price higher (or a put with strike price lower) than the current marke value of the underlying asset.

June 1988 series were being deleted from the system effective the following morning. The CBOE continued to make premium information for these series available, but a price vendor's capacity problems limited public access to this information.

On October 23, the CBOE, Philadelphia Stock Exchange, Pacific Stock Exchange, AMEX, and NYSE all agreed to coordinate margin increases. Finally, in response to market makers' and firm representatives' concerns, the CBOE decided to establish a panel to review OEX prices on the opening rotation for October 20.

Federal Regulator Actions

SEC

During the crisis period, SEC increased market and financial monitoring and surveillance, approved several important SRO rule filings, increased communications between self-regulatory organizations and other federa regulators, and provided support to the NYSE in their decisionmaking efforts.

According to the Chairman, SEC monitored the operation of each markets' 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.

The Chairman also stated that on October 22, the SEC approved, on an accelerated basis, an amendment to NYSE Rule 98 to ease the restrictions on acquisitions of specialists by retail broker-dealer firms that act as managing underwriters in the stocks in which the specialist makes a market. In addition, he said the SEC approved an Options Clearing Corp ration emergency rule change filed to ease firms liquidity concerns by granting greater flexibility under the corporation's margin and liquidation rules, and this change kept one major firm in operation.

The Chairman further stated that SEC also approved several important SRO rule filings including NASD's proposed rule change giving its president the authority to adjust the maximum size limit of its Small Order Execution System. The rule change allowed the NASD president to set th size anywhere between 300 and 1000 shares from October 23, 1987.

through December 31, 1987. The SEC also consulted with options exchanges regarding their decision to increase the margin requirement for all stock index option contracts. Five options exchanges filed rule changes raising initial customer margin requirements for short index option positions.

During the week of October 19, SEC officials told us they maintained co stant communication with the stock, options, and futures markets, the various clearing agencies, many broker/dealer firms, mutual fund mar gers, the Investment Company Institute, and the Securities Investor Pr tection Corporation. They said SEC was also in constant contact with other governmental agencies, including the Fed, the Comptroller of the Currency, the Department of the Treasury, and the CFTC. The purpose the communication they said was to be knowledgeable about the questions, concerns, and possible remedial measures to be taken by these various parties.

CFTC

Throughout the crisis, CFTC oversaw the actions of the futures exchanges. CFTC has the authority to declare an emergency under the Commodity Exchange Act. Under the Act, CFTC may direct the exchan to take whatever action is necessary to maintain or restore orderly tra ing or liquidation of contracts including suspension of trading, setting temporary emergency trading limits, or directing that trading be for li uidation only. CFTC took no emergency action. CFTC officials said they felt the futures exchanges should exercise appropriate discretion to address the special circumstances of their respective markets.

CFTC's response to the market decline consisted of increased monitorin of large trader activity, including scheduling of several special market surveillance briefings; increased floor surveillance of stock index futures trading; and identification of major market participants and firms likely to be at risk of margin default or financial deterioration fc priority monitoring or other intervention as appropriate. CFTC also increased communications with self-regulatory organizations and othe federal regulators.

CFTC routinely conducts daily market surveillance on the basis of data detailing aggregate market activity and the positions of individual lar traders and conducts weekly market surveillance meetings. On Octobe 6 the DJIA fell nearly 92 points and routine surveillance of stock index futures intensified. The CFTC reviewed futures market activity, includ large trader position data, at a CFTC surveillance briefing on October 1

On October 16, when the DJIA experienced a 108 point drop, CFTC scheduled a special market surveillance briefing for the following Monday, October 19. CFTC reviewed the largest futures positions and position changes in the S&P 500 futures contract and also provided preliminary estimates of the magnitude of index arbitrage and portfolio insurance. CFTC surveillance staff telephoned market users to obtain explanations of their futures market activity and to receive first-hand assessments of market conditions. CFTC officials also said financial surveillance was intensified before the week of October 19.

In response to the unusual market volatility, CFTC regional staff began substantially increased floor surveillance on October 19, particularly on the CME. At the CME, CFTC staff observed trading in the S&P 500 pit during all or substantially all of each trading day from October 19 through October 23.

At the close of trading on October 20, CFTC officials said they met to review daily trading activity and price movements in stock index futures to which SEC and Federal Reserve officials were invited. CFTC also held special surveillance briefings on several occasions in addition to the regularly scheduled briefing on October 23.

During the crisis, CFTC's "early warning" system identified high risk firms for intensified financial surveillance. Under this system, firms must notify the CFTC when their net capital falls below 150 percent of its required minimum capital and when other specified conditions exist that constitute or could lead to capital impairment or other financial deficiencies. CFTC received 52 early warning notices from October 12 through October 24, 1987. However, according to CFTC, no futures broker failed and no customer funds were lost due to broker failures.

During the period of October 19 through October 23, 1987, CFTC monitored the collection and payment of daily and intra-day margin calls at the commodity clearing organizations. At futures exchanges, all losses and gains on positions are paid daily such that at settlement there is no credit in the system. According to CFTC, exchange clearing organizations collected all margin payments due them from their clearing firms including daily and intra-day variation payments of unprecedented proportions.

CFTC contacts with other self- and federal regulators were intended to confirm that futures and options exchanges maintained an affirmative financial and market surveillance program and continued coordination

with NYSE. Specifically, CFTC maintained contact with the futures exchanges and clearing houses, NYSE, CBOE, and OCC concerning colle of securities and securities option margins and settlements at dually istered firms and to determine the validity of rumors of financial di culties involving various firms. CFTC frequently contacted SEC and F staff both in Washington and New York and communicated with th Department of the Treasury and the Comptroller of the Currency. I addition, the Acting Chairman contacted the SEC Chairman and the Chairman or the General Counsel of the Fed daily to provide inform on futures margin collections and the financial status of futures co sions merchants.

Examples of Decisions That Had Intermarket Effects

Regulators in different markets and at different regulatory levels v contacting one another attempting to find out what was happening what decisions were being made, and the consequences for their ov markets. For example, stocks experiencing opening delays or tradi halts at the NYSE inhibited trading in derivative instruments. Delay openings and halts in stocks underlying stock index products at CM CBOE greatly increased the risk of trading in those products. Transa delays through the DOT system and subsequent decisions to restrict gram trading through this system disconnected the market segmen created uncertainty about the price at which a trade would be exec At CBOE, the difficulties in opening trading limited the usefulness o options markets for those with positions in stocks and futures.

The event that caused the most intermarket concern was the uncer tainty about whether or not the NYSE was going to close. NASD was c cerned that, if the NYSE closed, the over-the-counter markets would the only source of liquidity for portfolio managers needing to raise NASD decided to close if NYSE did. CME, CBT, and CBOE had similar con about the potential closing of the NYSE, but they reacted differently eral exchanges—including CME and CBOE—halted stock index tradi CBT did not.

CME officials told us they halted trading in stock index futures and options because they feared that if they allowed trading to continu with trading at CBOE halted—and if the NYSE closed, panicking inve could cause the CME's stock index contracts to decline rapidly. CBOE cials told us they had to cease stock index options trading accordin

[2]The Kansas City Board of Trade, NYFE, AMEX, and the Philadelphia Stock Exchange also h stock index futures or options trading.

their rules. The rules require trading to halt when stocks representing more than 20 percent of the index value stop trading at NYSE. They said, in their judgment, shortly before noon eastern time on October 20, those conditions existed.

CBT's executive committee made the opposite decision. At 12:30 p.m., the committee convened upon learning that the NYSE was considering closing. Seventeen of the 20 stocks in the CBT's MMI stock index future were trading at NYSE, and the committee decided to allow trading to continue. The NYSE did not close, and the exchanges that had discontinued trading reopened. At 1:05 p.m. the CME resumed S&P 500 futures and options trading, and at 1:22 p.m. the CBOE began to reopen trading in the OEX.

Decisions to continue or discontinue trading could have had a significant financial impact on market participants. When trading is halted, hedgers with open positions are unable to liquidate those positions to cover margin calls in open markets, potentially forcing them into bankruptcy. Also, those with positions in one market who would like protection from moves in another market are exposed to risk without being able to obtain the price protection that the open markets might normally provide.

Fed Actions

Federal Reserve System officials told us they had made contingency plans for dealing with a market crash. Their response to the crisis on October 20 provided liquidity through the banking system. According to Fed officials, when the new Chairman came to the Fed several weeks before the crash, he asked the staff to put together a study of how the Fed could respond to a variety of potential financial catastrophes, including a stock market collapse. They said this emergency plan helped the Fed react quickly to the events on and after October 19.

On October 20, the Chairman announced "the Federal Reserve System, consistent with its responsibilities as the nation's central banker, affirmed today its readiness to serve as a source of liquidity to support the economic and financial system." Fed officials told us they did a number of things during the crisis period including providing liquidity to the banking system through expansionary open market operations; contacting major banks regarding the importance of meeting legitimate but unusually large customer funding needs while recognizing explicitly the responsibility of market participants to make their own credit judgments; suspending rules governing the lending of securities to accommodate securities dealers at the Federal Reserve Bank of New York; and

extending the opening and closing hours of the Fedwire and Securit Wire electronic transfer systems for large dollar payments.

Some problems did occur on October 20 with using the Fedwire to t fer funds between New York and Chicago banks. Automated wire t: fer systems at the Federal Reserve Bank of Chicago went down for about 2 hours during the day. Also, limitations on the amount of fu banks could send out over the Fedwire without violating certain re: requirements delayed clearinghouse margin payments to market participants.

Observations

Though it has been recognized for some time that the futures and s ties markets are linked, their regulation remains divided among tw eral regulatory agencies and a number of self-regulatory organizati While the self- and federal regulators have implemented some proc dures to respond to volatility in the markets and have begun to imp ment responses that recognize the linked nature of the markets, the events of October 19 reveal that many of the decisions made in tha market emergency had intermarket effects which created uncertai the markets and for investors.

Preliminary Observations

The events of October 19 and 20, 1987, give a sense of urgency to addressing the challenges created by the evolution of the nation's financial markets. Most agree that the ultimate cause of the decline was a confluence of economic, political, and market factors. However, the October trading exemplifies the significance and ramifications of the new futures, options, and equity market linkages and trading strategies, as well as the development of new broad market interests of institutions. Underlying the sense of urgency is the fear expressed by many that the events of October could happen again.

The large trade and budget deficits, the decline in the value of the dollar, the upward path of interest rates and anticipated inflation were some of the underlying factors that precipitated the market decline. The trade and budget deficits in particular must be dealt with. But the crash itself raises a number of important and complex issues about market mechanisms and how they functioned in an emergency.

The Lessons of October 1987

The fact that the previously separate futures and securities markets are linked was known before the October market crash. The new trading interests that had been developing were also evident. But what October demonstrated was that these circumstances could contribute to creating an atmosphere that could disrupt confidence and greatly complicate decisionmaking by investors, portfolio managers, SRO officials, and federal regulators.

The essential lessons are these:

- Individuals at all levels had to make quick decisions in an atmosphere of extreme uncertainty. In essence, they did not know all of what was happening or what was likely to happen next. But they were taking cues from events in both markets, and many market participants were trying to act in both markets. Portfolio managers, some of whom had technology capable of calculating positions and making trading recommendations in seconds, did not have good knowledge of market conditions yet had to decide what to do. Some, faced with great pressures, decided to try to execute trades, while others chose to ignore their computers' recommendations. Market officials, facing events unfolding very quickly that overwhelmed their trading systems and/or created great uncertainty and some confusion, had to make the front line decisions in their own markets on whether to continue trading, or on other important steps to take. Floor traders, faced with incomplete knowledge about orders and about what regulators might do, had to make decisions on

how to act. Market makers, some of whose marketmaking capacities were stretched to their limits, faced massive order imbalances, crosse and locked markets, and did not know in all cases what orders still fe them.

- Automated systems play a crucial role in assuring smooth market fu tions. Problems in automated systems created uncertainty in each inc vidual market they served and may have created problems in others that depend on that market. Thus, proper systems planning, design, development, and operation is clearly an intermarket concern.
- Federal regulators kept informed, increased surveillance, interpreted some rules and made decisions about other rules, and offered advice support to market officials. But final decisions about trading situatio had to be made by those market officials who were closest to the situation.
- Market participants, regulators and SRO officials conferred with one another frequently, and many won praise for their actions. But decis making had to proceed as events unfolded, and market participants (not know what could happen next. Most important, conditions and d sions made in one market affected the others' abilities to conduct bus ness and, consequently, their own decisions in turn. Some key confusions remained in this regard, in spite of continued intermarket communications.
- Equity markets are global and reacted not only to their own political and economic factors but also to trading pressures around the world.
- Events can quickly place pressure on capital resources of firms, secu ties and futures markets, investors, and ultimately, the entire financ system. The assurance of adequate liquidity proved to be of vital im tance in maintaining confidence in our markets.

Much remains to be looked at, and hasty rush to judgment should be avoided. However, some issues must be dealt with more expeditiousl order to help reduce the uncertainty that was created by the events (October 19 and 20.

In this chapter, we divide our observations into three parts: actions needed immediately to reduce market uncertainty; near-term, thougl difficult, decisions to address intermarket regulation; and longer ter issues that require careful consideration and form the basis for furth work by us and others.

Immediate Actions to Reduce Uncertainty

Congressional and regulatory decision makers should move quickly to alleviate as much of the uncertainty as possible about the potential for the recurrence of some of the problems revealed by Black Monday's events. While a significant market downturn probably cannot be prevented—nor should the market be prevented from expressing its opinions about economic, political and business conditions—the problems that may have exacerbated the depth and speed of the decline should not be allowed to repeat themselves unnecessarily. Two areas deserve attention immediately: 1) the automated operational systems that help the markets function smoothly, and 2) emergency contingency planning among the various SRO's exchanges and the federal regulatory authorities.

Market Operational Systems

Although several market systems had some operating problems because of the unprecedented trading volumes experienced on Black Monday, those on the NYSE had far-reaching effects because that exchange is pivotal for other markets. If it does not function smoothly, even for reasons beyond its control, the events of October demonstrated that other markets are affected.

As we indicated, the NYSE was not prepared operationally for the volumes it experienced. At the time of the decline it was in the midst of improving its automation of its trading systems, and it could be argued that events simply overtook those efforts. In the short term, important questions exist as to the extent to which NYSE can accurately forecast trading volumes and related systems requirements. For example, to what extent can the Exchange's computer requirements forecasting be modified to account for a changing trading environment? Other issues concern whether NYSE's planned upgrade of its order processing systems will be capable of handling future traffic. For example, will the interfac to the ITS efficiently handle orders during peak processing periods, wha mechanisms does NYSE have to identify and correct potential processing problems before they occur, and will the planned systems improvement provide for fair and equitable treatment of all market participants? We are continuing to pursue the issues of planning for and development of trading systems with the cooperation of the NYSE.

However, given the intermarket consequences of trading system breakdowns, some ongoing responsibility may rest with the federal regulator to assure that adequate systems are in place to facilitate trading. As part of their oversight reviews of the exchanges, the regulators have evaluated and made recommendations on a variety of systems, includin

those for surveillance, clearing, trading and other functions. Our prel inary work at the SEC indicates that they have relatively few resourc devoted to making sophisticated technical reviews of the design, deve opment and operation of automated exchange trading systems. In the short run, the SEC should expand its capabilities in this area and shou obtain from the Congress the resources necessary to determine whet the stock and options exchanges adequately plan for, design and develop systems necessary to function smoothly.

Better Contingency Planning

As the events of October unfolded, self- and federal regulatory offici maintained more or less constant communications and made a numbe decisions about how to react to market developments. Many market p ticipants we spoke to gave high marks to both self-regulatory official and the federal regulators for their conduct during the crisis. Howeve most intermarket decisions by market officials and federal regulators had to be made as events unfolded. Intermarket confusion existed at various times about which stocks were trading, the permissibility of c porations buying back their stocks at particular times, and, most sign cantly, whether the NYSE would remain open on Tuesday, October 20. The overriding uncertainty, which probably can never be completely resolved under such circumstances but should be ameliorated, was, "What will happen next?" No intermarket, interagency contingency plans existed to help answer that question.

We believe such plans should be formulated immediately by the fede regulators in consultation with the markets, building on the experien of October and some of the beneficial actions that were taken, to incl but not be limited to:

- Agreement on and dissemination of information about how decisions made by both the CFTC and SEC are made and communicated to marke Agreements are needed as well on how unilateral decisions by marke will be coordinated and disagreements resolved.
- Agreements on market information needs and on dissemination of in mation during market crises. The mechanism for providing the infor tion deemed necessary should be established.
- Agreements on and dissemination of information about those circum stances that would call for a relaxation or interpretation of rules to facilitate market liquidity. A case in point is provided by the interpr tion of rules associated with corporate buy-backs of stock.
- In consultation with the Fed, agreements on liquidity support mecha nisms for market participants during the kind of emergency that wa

experienced on October 19 and 20. Because public dissemination of the plans could result in excessive risk taking by market participants, som people believe that its specifics should not be revealed. It may be sufficient that the public knows that such plans exist.

While every possible event cannot be planned for and flexibility must l maintained, some rules for decisionmaking and facilities for it should exist. For example, the NASD established special communication procedures, and the CME raised margins and imposed daily price limits. In Ja uary 1988, the NYSE, in an attempt to limit volatility, experimented wit closing the Exchange's automated systems for program trading whenever the DJIA moved up or down 75 points in a day. Also in January, th NYSE announced that it is considering adopting a rule to formalize temp rary halts in the trading of individual stocks when their prices rise or fall by a certain amount. We believe all these efforts and innovative thinking are needed to fine tune the abilities of self- and federal regula tors to deal with modern market emergencies. But we think that, overa comprehensive intermarket and interagency planning efforts are calle for, as well.

One aspect of contingency planning that has been raised is the imposition of various kinds of price limits, trading halts, and other methods—what the Presidential Task Force termed "circuit breakers." Some of these mechanisms either have been in place for some time, such as tra ing halts in individual stocks, or recently imposed, such as new limits placed on movements in derivative products. But, the Presidential Tas Force pointed out that these operate ad hoc; no coordinated, cross-mar ket mechanisms now exist. In addition, over time the effect of these mechanisms on market efficiency and investor confidence need to be evaluated.

Over the long run, such mechanisms should not be expected to take th place of adequate intermarket structures for operation and regulation. Also, the imposition of such limits and halts is not without potential effects.

Intermarket Regulation Considerations

Solving the immediate problem of emergency planning is only the first step in deciding longer term intermarket regulatory issues. The regula tion of each market involves many unique aspects, such as rule approval, firm and SRO examinations, and so on. This authority may b best left with the current regulatory structure. But the events of October clearly establish the need for some continuing coordinated

intermarket regulation to implement emergency plans; make decisions about some issues such as margins, trading limits, or other suggestions being made to address intermarket linkages; and reconcile these issues with other national and international factors, such as overall system liquidity, international competition, and the newly emerging world of more integrated financial services.

Accordingly, the current industry-oriented self- and federal regulatory structure must be better able to deal with new intermarket and economic realities. While this rationalized regulation could be accomplishe in a number of ways, we believe that strong leadership is needed to ensure that overall national interests are preserved and needed policie are implemented with all deliberate speed.

The Nature of Intermarket Regulation

Although at this point we cannot recommend any single vehicle for achieving it, we can comment on some of the elements necessary for be ter intermarket regulation and some of the considerations if one route the other is chosen to achieve change.

Some of the elements needed for proper intermarket regulation include

- bringing to bear adequate expertise in all relevant markets in a coordinated fashion,
- coordinating operating rules and procedures, as needed,
- coordinating the approval of new products and giving them thorough but expeditious evaluation,
- gathering information on activity in all markets,
- making decisions efficiently about that information, and
- acting on those decisions on a timely basis.

Federal and self-regulators already have some of these activities in place, as we outlined in chapter 9. However, no overall, integrated cro market authority exists.

Having one federal agency may be more efficient for achieving some o the elements described above, but achieving other elements—such as building systems to provide adequate cross-market information — would be challenging regardless of the regulatory structure. Moreover these industries are primarily self-regulated, with differing levels and types of federal roles, all previously debated by the Congress. If any attempt is made to consolidate the agencies, these roles and relationships would have to be carefully thought out. Observations on the oft-

studied question of consolidating federal bank regulatory agencies may be relevant in this regard. Despite the fact that many would not now design the same bank regulatory system that has evolved over the years, it has for the most part been made to work.

The history of bank regulatory consolidation also has relevance if a new organization is created to coordinate intermarket activities. Past efforts at better interagency coordination of bank regulators resulted in the creation of the Federal Financial Institutions Examination Council (FFIEC). The Council was not designed to be a superagency that would add a layer of regulation above the then existing regulatory authorities. So, it was not given strong decisionmaking powers over them. As a consequence, though the FFIEC has accomplished some valuable coordination activities, we reported in 1984 on the difficulties the Council had in solving some of the major questions about which basic regulatory philosophies differed.[1] Thus, if a new organization for coordinating the regulation of the futures and securities industries is desired, the appropriate level of authority must be specified.

Special Considerations

Simply dealing with the intermarket issues might be challenging enough but other considerations complicate the question, leading to the necessity of defining some role for the Federal Reserve. The Presidential Task Force described that agency as "well qualified to fill the role of the intermarket agency" to coordinate "the few, but critical, regulatory issues which have an impact across the related market segments."

While we are not in a position at this point in our work to endorse or reject this role for the Fed, we believe that the Fed must be involved in some way with these markets.

The importance of the Fed's liquidity provision function was amply demonstrated on Tuesday, October 20. The Fed's announcement of its readiness to provide liquidity to the banking system was considered crucial to the restoration of confidence in the markets. The events of October 1987 also established that the Fed has much at stake in the process that is followed in solving the problems revealed as well as the solution themselves because of its de facto lender-of-last-resort function and its monetary policy function.

[1] Federal Financial Institutions Examination Council Has Made Limited Progress Toward Accomplishing Its Mission, (GAO/GGD-84-4, February 3, 1984.)

That equity markets are international in scope was an established fact before October 1987, and regulators had begun to deal with some of the problems of global regulation. However, October demonstrated that domestic market emergencies are linked to trading around the world; they cannot be addressed solely by domestic authorities. Moreover, solu tions posed for domestic problems could affect the international compet itive position of U. S. financial markets. The Fed should clearly be involved in the formulation of solutions to the problem of international emergencies because of its international expertise and relationships.

Finally, Congress has been and again will shortly be involved in debates aimed at deciding whether to relax Depression-era prohibitions against the combination of the commercial banking and securities business, promulgated by the Glass-Steagall Act. If Glass-Steagall is relaxed or fully repealed, in order to reasonably assure the safety and soundness c the banking system and in light of the October crash, the Fed may have to have some involvement in intermarket regulation.

As we have observed in our previous work in the securities and futures industries, the line between government influence and self-regulation has shifted over the years, and there exists a dynamic give-and-take atmosphere between the markets and their regulators in formulating decisions and policies.

The events of October provide a basis for rethinking the regulatory rela tionship between the federal government and the markets. One reason i that the new trading interests have linked the markets, while SROs, which are in competition with each other in the new market environ- ment, must make decisions based on the integrity and operations in the: own markets that may affect others. Another reason for rethinking the federal role is that the international influences of financial markets— recognized by all as a growing factor—were made very obvious by mar ket activity. There is much at stake as our financial system becomes linked to and, in some ways, competitive with others around the globe. And many of the events in the global markets are beyond the control of U.S. self- or federal regulators.

Longer Term Issues

A number of other issues remain to be decided. One important issue to be considered is that of investor protection. Though it is not surprising

that the steep October decline produced significant losses for large numbers of investors, and certainly complaints must be judged on their merits, questions of customer access to markets in times of stress and the suitability of investments for customers have to be addressed.

Another issue involves margin requirements in the various markets. Decisions are needed on what margins are intended to accomplish, what they should not be used to accomplish and whether their consistency across markets will further the efficient functioning of the various markets.

The capabilities of the specialist and other market making systems in the new market environment need to be studied, as well as how they might be strengthened and how much additional capital might be needed to restore and maintain confidence in the markets' performance capabilities.

Issues related to automated systems at exchanges, brokerage firms, clearing agencies, and information dissemination firms, may come to play an important part in the rethinking of the modern marketplace. Not only must these systems be capable of handling unprecedented volumes of trading and fast-breaking intermarket demands, but they must also collectively contribute to orderly, efficient, and cost-effective marketplaces at the national and international levels. These issues need to be studied in the months ahead.