

United States General Accounting Office

Report to Congress on ...

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U.S. Department of Justice  
National Institute of Justice

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United States  
General Accounting Office  
Washington, D.C. 20548

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General Government Division

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March 12, 1990

The Honorable Donald W. Riegle  
Chairman, Committee on Banking, Housing,  
and Urban Affairs  
United States Senate

The Honorable Christopher J. Dodd  
Chairman, Subcommittee on Securities  
Committee on Banking, Housing, and  
Urban Affairs  
United States Senate

The Honorable John D. Dingell  
Chairman, Committee on Energy  
and Commerce  
House of Representatives

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

This report concerns U.S. securities market trading structure and, specifically, the goal to achieve a national market system as outlined in the Securities Acts Amendments of 1975. It is part of our follow-up work on the stock market crash of 1987. We are providing you with copies because it is directed at the Securities and Exchange Commission.

We highlighted three areas for review: (1) exchange-imposed trading restrictions, (2) the Intermarket Trading System, and (3) multiple listing of options. In each of these areas, we make recommendations to the Commission.

This report was prepared under the direction of Craig A. Simmons, Director, Financial Institutions and Markets Issues. Major contributors to the report are listed in appendix III. If you have any questions on this report, please call Mr. Simmons on 275-8678.

Richard L. Fogel  
Assistant Comptroller General

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# Executive Summary

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## Purpose

The October 1987 stock market crash raised critical questions concerning the efficiency, competitiveness, and fairness of U.S. securities markets. Many experts questioned the structure of the marketplace and its ability to both withstand periods of high stress and operate efficiently in ordinary times. Market experts and analysts have debated these questions since the crash. Renewed volatility in the markets, as indicated by the 190-point drop on October 13, 1989, and the subsequent record gains the following week, has again created doubt about whether the financial markets are properly designed to meet the demands placed upon them.

To identify market structure issues, GAO met with federal regulators, exchange and over-the-counter market officials, market professionals, institutional investors, and academics. GAO evaluated what should be done to address the most important issues identified through these discussions—trading restrictions, market links, and options trading.

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## Background

In the 1975 Amendments to the Securities Exchange Act of 1934, Congress called for the establishment of a national market system. Congress sought market structure improvements that would provide efficient, fair, and competitive markets for securities investors. The Amendments set five objectives for the national market system to address: (1) economically efficient execution of securities transactions; (2) fair competition among market participants; (3) the widespread availability of quotation and trade information; (4) the practicability of executing investors' orders in the best market; and (5) the opportunity for investors' orders to interact without dealer participation. In addition, the Amendments mandated that the Securities and Exchange Commission (SEC) remove all securities exchange trading restrictions that impose an unnecessary burden on competition. (See pp. 14-15.)

By focusing on the needs of investors rather than dictating a specific market structure, the 1975 Amendments established permanent goals for which the securities markets should strive. SEC is responsible for monitoring market structure to assure the Amendments' goals are continually addressed.

The securities industry and SEC have made major regulatory and structural changes towards achieving the legislative objectives. Fixed commission rates were eliminated in 1975. Exchange trading restrictions were eased to permit stocks listed since 1979 to be traded by exchange members off the exchange floor. In addition, the Intermarket Trading System was developed. This system links U.S. stock markets and enables

regional exchanges to compete with their primary counterparts in New York. Recently, SEC approved multiple listing of stock options—allowing an option to be traded on more than one exchange.

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## Results in Brief

SEC needs to reevaluate several issues regarding securities market structure to assure the markets continually meet the goals of a national market system. Market participant opinion is divided about whether industry and SEC action to change market structure have gone far enough to achieve national market system goals. Questions remain about the benefits of existing trading restrictions especially as they pertain to after-hours trading, the effectiveness of the Intermarket Trading System, and the type of coordinated system needed to trade the same options on different exchanges.

The marketplace, as evidenced by huge increases in trading volume, unprecedented volatility, major technological advances, and growing global competition, has changed considerably since SEC last reviewed some of these market structure issues. Without continued SEC evaluation and promotion of national market system goals, trading system innovation may be hampered, marketmaking capital may be insufficient—especially in times of stress, investors may pay higher transaction costs, and some trading volume may be lost to overseas markets.

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## GAO Analysis

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### SEC Needs to Reopen the Trading Restriction Issue

Exchange-imposed trading restrictions, such as New York Stock Exchange Rule 390, prevent exchange members from executing trades off an exchange floor. In response to the 1975 Amendments, SEC proposed a rule in 1977 to eliminate these restrictions. However, because of considerable objections to the proposed rule by market participants, SEC withdrew the proposal in 1980. At the same time, SEC adopted a narrower rule that eliminated trading restrictions, but only on stocks listed on an exchange after April 1979. Many of the most actively traded stocks were listed before April 1979—for example, 89 of the New York Stock Exchange's 100 most active stocks. Restrictions on these stocks still remain. (See pp. 18-20.)

Trading restrictions help maintain the current market structure. Removing the restrictions could substantially alter the way exchange-listed

securities are traded, including the possible elimination of trading floors and specialists. Market participant opinions are mixed on the benefits or detriments of these restrictions. Critics contend that the rules are anti-competitive because they restrict price competition and limit marketmaking, and that the rules discourage development of new and more automated trading systems. Supporters argue that the rules are pro-competitive because they require trades to be made in a central location where all bids and offers can interact, thereby preserving the benefits of the auction market. By concentrating supply and demand for stocks in a central market, they say that price efficiency is enhanced. (See p. 23.)

Despite substantial changes in the marketplace since 1980, no comprehensive SEC reviews have been done to demonstrate whether remaining trading restrictions impair market efficiency, fairness, or competitiveness. SEC's only formal review of trading restrictions since 1980 occurred in 1986 and dealt exclusively with the New York Stock Exchange's restrictions on after-hours trading by its members. As a result of these restrictions, exchange member brokers and dealers who wish to trade exchange-listed stocks when U.S. markets are closed must do so in foreign markets. In 1986, the Commission rejected its Division of Market Regulation's recommendation that SEC send a letter to the New York Stock Exchange asking it to consider removing these restrictions on after-hours trading. Because of the substantial changes that are occurring in the marketplace, SEC needs to reconsider trading restrictions, especially for after-hours trading, to determine whether they should be further modified, removed, or reaffirmed. (See pp. 21-23, 32.)

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## **Comprehensive Review of the Intermarket Trading System Is Needed**

The Intermarket Trading System has electronically linked the trading of stocks in various marketplaces around the country since 1978. The exchanges designed the system to meet the 1975 Amendments' goals to encourage competition and to allow customers to have their orders executed at the best price available in any of the linked markets. In 1982, SEC completed a comprehensive review of the system's first 4 years of operation, including an examination of trading volume, operating efficiency, and effect on intermarket competition. Between 1982 and September 1989, SEC continued to monitor the Intermarket Trading System but made no further comprehensive studies of the system. However, after the 1987 market crash, SEC and market participants made some changes to system operations in response to problems experienced during periods of stress such as the crash. (See p. 34.)

Since the beginning of 1979, share volume traded over the Intermarket Trading System has increased over ten-fold. In addition, exchange officials and system users identified system operational weaknesses that they said have limited competition and favored the primary markets—the New York and American stock exchanges. SEC and market participants have recently addressed some of these concerns. In view of the dramatic increase in trading volume and the number of incremental changes made to the system since SEC's last comprehensive evaluation, SEC needs to look again at overall system effectiveness and the extent to which the Intermarket Trading System is meeting its national market system goals. (See p. 35.)

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### Development of Trading Linkage for Multiple Listing of Options Requires SEC Monitoring and Guidance

In May 1989, SEC approved a major change to the way stock options will be listed and traded at exchanges. Rather than the former procedure of allocating an option on a listed stock to a single exchange, SEC now allows all exchanges to trade any new option listed after January 22, 1990. In addition, each options exchange is permitted to list 10 stock options already traded on another exchange. Furthermore, beginning in 1991, SEC will allow any exchange to trade any option regardless of where it was originally listed. SEC approved this change to increase competition among exchanges and to improve options prices for investors. Some exchanges disagree with SEC's assessment of the benefits of listing and trading options on more than one exchange. However, if increased competition results and investors obtain better prices, SEC's approval of this change will be consistent with national market system goals. SEC is taking an active role to implement this change. (See p. 42.)

SEC also noted that the benefits of multiple listing and trading of options would be enhanced by developing a trading linkage system among the exchanges. No such linkage exists. Options exchanges differ on what type of linkage system is necessary. This lack of consensus among competing exchanges makes it unlikely that a system will be developed without active SEC intervention. In January 1990, SEC requested the options exchanges to refrain from listing options already allocated to another exchange for 6 months to allow for development of a market linkage system. (See pp. 48-49.)

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### Recommendations

GAO recommends that SEC reopen the issue of exchange-imposed trading restrictions, such as New York Stock Exchange Rule 390, to determine if

these restrictions should be modified, removed, or reaffirmed. SEC's evaluation should include whether trading restrictions hamper the development and use of more innovative trading systems and limit marketmaking capital. It should also assess the consequences of forcing exchange members to conduct their after-hours trading in foreign markets. If SEC decides against removing the restrictions, GAO recommends that SEC consider the effect of these restrictions on a periodic basis to keep pace with the rapidly changing marketplace. (See p. 32.)

GAO recommends that SEC do a comprehensive evaluation of the Intermarket Trading System. SEC should address the system's operational efficiency, effect on intermarket competition, and capability to handle future market crises. (See p. 40.)

GAO recommends that SEC closely monitor the exchanges' progress in developing a market linkage system for options trading. If SEC determines that the exchanges are not making sufficient progress, GAO recommends that SEC direct construction of a linkage system. (See p. 49.)

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## Agency Comments

GAO provided copies of a draft of this report to SEC for formal comment (contained in app. II) and to each market mentioned in the report for informal review. In general, SEC noted that the report was well balanced. SEC agreed that the issues raised in the report are important national market system issues that require careful scrutiny. SEC agreed that the effects of trading restrictions on after-hours trading should be reopened but disagreed with the need for a review of the effect of trading restrictions during normal exchange hours. SEC indicated that a review of the restrictions' effects during normal trading hours is complicated and was done in 1979. SEC also indicated that it should not remove these trading restrictions until market participants determine that the resulting marketplace will be better than the existing exchange marketplace. (See pp. 56-61.)

GAO believes that the trading restriction issue, both for after-hours and normal hours trading should still be reopened. GAO agrees that the issue is complex. However, the market has changed significantly since 1979 and market participants may not have the perspective needed to view the U.S. marketplace as a whole.

Each market requested that minor changes be made to clear up a few technical inaccuracies. In general, the exchanges did not endorse a review of trading restrictions. However, officials from each market said

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**Executive Summary**

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GAO used sound logic to reach its conclusions. In addition, market officials generally commented that the report was well balanced and fair.

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**Abbreviations**

Amex	American Stock Exchange
BSE	Boston Stock Exchange
CBOE	Chicago Board Options Exchange
CSE	Cincinnati Stock Exchange
CAES	Computer Assisted Execution System
CATS	Computer Assisted Trading System
CORES	Computer-assisted Order Routing and Execution System
DOT	Designated Order Turnaround system
EST	Eastern Standard Time
ITS	Intermarket Trading System
MSE	Midwest Stock Exchange
NASD	National Association of Securities Dealers, Inc.
NASDAQ	National Association of Securities Dealers Automated Quotations system
NMS	National Market System
NSTS	National Securities Trading System
NYSE	New York Stock Exchange
OMINTS	Options Market Integration System
OTC	over-the-counter
PHLX	Philadelphia Stock Exchange
PSE	Pacific Stock Exchange
SEC	Securities and Exchange Commission
SOES	Small Order Execution System
TSE	Toronto Stock Exchange

# Introduction

The 1987 stock market crash raised questions regarding the efficiency, liquidity, and fairness of the U.S. securities markets. Numerous reports and articles criticized the performance of U.S. trading systems during the crash. Some market experts commented that changes are needed to address what they perceive as major structural and operational defects highlighted by the crash.

Designing the appropriate trading structure for the U.S. securities market has generally been left to the marketplace. However, the Securities Acts Amendments of 1975<sup>1</sup> ("1975 Amendments" or "Amendments") mandated sweeping changes in how the markets function and introduced a concept called the national market system. U.S. trading systems and operations have been significantly influenced by the actions the markets and the Securities and Exchange Commission (SEC) have taken in response to the 1975 Amendments.

## Market Crash Raised Questions Regarding the Efficiency of U.S. Trading Systems

Various studies of the 1987 market crash by GAO,<sup>2</sup> a Presidential Task Force,<sup>3</sup> and SEC<sup>4</sup> criticized specialist<sup>5</sup> performance in exchange markets, market maker<sup>6</sup> performance in the National Association of Securities Dealers (NASD) over-the-counter (OTC) market, and the overall performance of trading linkages among the various securities markets. The exchange markets and NASD have taken steps to address the deficiencies highlighted in those reports, but the basic trading structure remains the same. Some market participants and outside experts said the 1987 crash exposed the need for major structural changes to address operational defects, such as insufficient specialist and market maker capital, trading halts resulting from buy and sell order imbalances, and reliance on inefficient trading systems. Some have recommended an automated trade execution system similar to those currently used for certain stocks in foreign markets such as Toronto and Tokyo.

<sup>1</sup>Pub. L. No. 94-29, 89 STAT. 97, June 1975, (codified, as amended, in scattered sections of 15 U.S.C.).

<sup>2</sup>Financial Markets: Preliminary Observations On the October 1987 Crash, (GAO/GGD-88-38, Jan. 1988).

<sup>3</sup>Report of The Presidential Task Force on Market Mechanisms, January 1988. This is often referred to as the "Brady Commission" report.

<sup>4</sup>The October 1987 Market Break, A Report by the Division of Market Regulation, U.S. Securities and Exchange Commission, February 1988.

<sup>5</sup>Specialists are responsible for making fair and orderly markets in their assigned stocks on the exchange floor.

<sup>6</sup>Market makers, also referred to as dealers, execute all trades in the NASD over-the-counter market.

Market regulators have also expressed concern about the structure of the markets. Officials from two of the three largest U.S. markets have said the market crash experience and anticipated changes in the marketplace require a special study, similar to the one done by SEC in the early 1960s.<sup>7</sup> In April 1988, the Chairman of the American Stock Exchange (Amex) called for appointment of a special commission to do a 2-year study of U.S. securities markets, because each marketplace is nurturing its own innovations without examining the whole trading system.<sup>8</sup> In July 1988, a special committee of NASD recommended that an independent, congressionally sponsored special study of the securities markets be undertaken, a position supported by NASD.<sup>9</sup> In December 1989, Philadelphia Stock Exchange (PHLX) and Pacific Stock Exchange (PSE) officials, when commenting on a draft of this report, said they supported a similar comprehensive study. Also, in November 1989, the New York Stock Exchange (NYSE) announced its creation of a "blue ribbon panel" to study ways to control excess volatility in the marketplace.

Congress has also recommended a comprehensive study of the securities markets. In 1988, Congress found that "federal securities laws, rules, and regulations have not undergone a comprehensive and exhaustive review since the advent of the modern international, institutionalized securities market."<sup>10</sup> Congress required SEC to make a study and investigation of the adequacy of federal securities laws, rules, and regulations to protect the public interest and the interests of investors. Congress further directed SEC to study the factors impeding the fairness and orderliness of the securities markets and those impeding improvements in the breadth and depth of the capital available to the markets. However, Congress made this study subject to the availability of funds appropriated to it specifically. According to SEC officials, as of January 1990, Congress had not appropriated the \$5 million to SEC, as outlined in the law, for this study.

The securities markets have continued to experience periods of significant volatility since the October 1987 crash. On October 13, 1989, the

<sup>7</sup>Report of the Special Study of Securities Markets of the Securities and Exchange Commission, April 3, 1963.

<sup>8</sup>Speech entitled "After the Crash - A Look Ahead" by Arthur Levitt, Jr., Chairman, American Stock Exchange, before the National Press Club, Washington, D.C., April 5, 1988.

<sup>9</sup>Report of the Special Committee of the Regulatory Review Task Force on the Quality of Markets, National Association of Securities Dealers, July 1988, p. 51.

<sup>10</sup>Insider Trading and Securities Fraud Enforcement Act of 1988, Pub. L. No. 100-704, 102 STAT. 4677, November 1988, (codified, as amended, in scattered sections of 15 U.S.C.).

Dow-Jones Industrial Average fell 190 points—the market's second largest decline in history. On the next trading day, the Dow-Jones Industrial Average, after being down 63 points, closed up 88 points, the market's fourth largest gain ever.

## Congressional Mandate to Develop an Efficient, Competitive, and Fair Trading System

The most recent and significant legislative impetus for major change in the U.S. securities markets came by congressional directive in the 1975 Securities Acts Amendments. The Amendments resulted in Congress' most comprehensive restructuring of the competitive and statutory framework surrounding the securities markets, the securities industry, and public investors since the 1930s.

The Amendments addressed changing market conditions and regulatory deficiencies. These included the increasing role of the institutional investor, the negative impact of a fixed-commission rate system, the fragmentation of the market,<sup>11</sup> and a financial crisis in which numerous broker/dealers failed due to their inability to handle increasing paperwork from the rapidly rising trading volume. More importantly, the legislation sought to improve the efficiency of the U.S. securities markets for future years. In passing the legislation, Congress recognized the securities markets as an "important national asset" that must be preserved and strengthened. The conference report accompanying the legislation explained that

"The increasing tempo and magnitude of the changes that are occurring in our domestic and international economy make it clear that the securities markets are due to be tested as never before. Unless these markets adapt and respond to the demands placed upon them, there is a danger that America will lose ground as an international financial center and that the economic, financial, and commercial interests of the Nation will suffer."<sup>12</sup>

In the Amendments, Congress called for SEC to facilitate the establishment of an efficient, competitive, and fair national market system for securities. Congress considered the national market system to be an evolving concept that requires adjustments as market conditions and technology change. The Amendments set the following five broad objectives for the markets to address:

<sup>11</sup>A market is fragmented when orders for the same stock are executed in unlinked markets where bids and offers are not exposed to each other. This fragmentation results in a market that does not reflect all buying and selling interest.

<sup>12</sup>H.R. Conf. Rep. No. 229, 94th Cong., 1st sess. 91, reprinted in 1975 U.S. Code Cong. & Adm. News 185, 268.

- economically efficient execution of securities transactions;
- fair competition among market participants;
- the widespread availability of quotation and trade information;
- the practicability of brokers executing investors' orders in the best market; and
- the opportunity, consistent with the above provisions, for investors' orders to be executed without dealer participation.

In addition, the Amendments called for SEC to review all existing and proposed rules of national securities exchanges and to remove any rule imposing a competitive restraint that was neither necessary nor appropriate in furtherance of the Securities Exchange Act of 1934. In this regard, Congress specifically highlighted exchange rules limiting or putting conditions on exchange members executing trades away from the exchange floor.

These objectives are very broad and are subject to various interpretations. Generally, however, Congress wanted securities trading to occur in the market with the lowest possible transaction costs and at the best prices available. The securities industry and SEC embarked on major regulatory and structural changes to meet the objectives of the 1975 Amendments. These changes, which substantially influenced the current market structure, included eliminating fixed commission rates charged by broker/dealers; developing a consolidated tape system,<sup>13</sup> a consolidated quote system,<sup>14</sup> a last-sale reporting system for NASD Automated Quotations system (NASDAQ) stock, and the Intermarket Trading System (ITS); and removing certain exchange-imposed trading rules that limited competition. An overview of today's securities markets is contained in appendix I.<sup>15</sup>

## Objectives, Scope, and Methodology

We undertook this review as an outgrowth of our work on the stock market crash of October 1987. Our objective was to identify whether further actions are needed to enhance the efficiency, competitiveness, and fairness of current trading systems as called for by the goals of a

<sup>13</sup>The consolidated tape system collects and displays price and volume data for all trades of most exchange-listed stocks. Some stocks listed only on a regional exchange are not in the system.

<sup>14</sup>The consolidated quote system collects quotations from all markets trading reported securities, identifies which market has the best bid and offer, and disseminates the information.

<sup>15</sup>For a full description of U.S. securities trading and regulatory structure, see Securities and Futures: How the Markets Developed and How They Are Regulated, (GAO/GGD-86-26, May 1986).

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national market system. We reviewed the overall structure of the market and the trading linkages connecting individual markets, rather than the soundness of trading systems at any one market.

We discussed market structure issues with federal regulators, exchange and over-the-counter market officials, market professionals, institutional investors, and academics. We evaluated what should be done to address the most important national market system issues they identified. These issues are: (1) whether existing exchange-imposed trading restrictions need to be modified or removed; (2) whether the ITS operates as efficiently and fairly as practicable; and (3) whether new systems are needed to assure that the competitive benefits of multiple listing of options are achieved. However, we recognize that other factors affect market structure, such as the practice of broker/dealers paying for order flow, the new "basket of stocks" products traded at certain exchanges, the proposed trade-reporting plan to allow for exchange trading of over-the-counter stocks, and the registration of proprietary trading systems. Although we discussed the potential effects of these issues with market officials and participants, we include them in this report only as they affect our three primary issues.

In doing this review, we visited and interviewed senior officials at the NYSE, Amex, Boston Stock Exchange (BSE), Cincinnati Stock Exchange (CSE), Midwest Stock Exchange (MSE), PSE, PHLX, NASD, and Chicago Board Options Exchange (CBOE) to ascertain their opinions on the current market trading structure. We also interviewed officials of the Toronto Stock Exchange (TSE) to inquire about their automated trading system. We interviewed specialists at each stock exchange and toured all the stock exchanges' trading floors. We also spoke with exchange floor brokers and NASDAQ market makers. We interviewed officials of firms doing business in the third and fourth markets. We reviewed the minutes of ITS meetings at which market participants and market officials discussed their concerns.

We interviewed officials of SEC's Division of Market Regulation and Office of Economic Analysis, an SEC Commissioner, and former SEC officials. We reviewed numerous SEC Dockets that identified SEC actions intended to facilitate the establishment of a national market system.

We interviewed the heads of equity trading at 21 institutional investors in seven states, including money management firms, banks, and pension funds, to obtain the perceptions and experiences of those who are major market participants. We also interviewed the heads of equity trading of

many of the largest broker/dealer firms as well as those at some mid-sized and regional firms. In addition, we interviewed officials of securities information processors and vendors.

We contacted some participants on the original panels that were organized by Congress or SEC to develop plans to meet the goals of the 1975 Amendments. We also contacted several people from the academic and broker/dealer communities who have been associated with the national market system concept since its inception.

We provided copies of a draft of this report to SEC for formal review and comment. SEC's comments and our response to them are contained in appendix II; our evaluation of SEC's comments is at the end of chapters 2, 3, and 4. At the same time we provided a draft to SEC, we asked officials of NYSE, NASD, Amex, MSE, PSE, PHLX, BSE, CSE, and CBOE to review the report draft and provide us with their reactions and informal comments. We then discussed the draft report with officials from each organization, either in person or by telephone.

The preponderance of comments we received concerned NYSE Rule 390 and the multiple listing of options. One common component of the exchanges' and NASD's comments was that we had tackled extremely complex issues and produced a report that was fair and well balanced. This point is reiterated by SEC in its formal comments to the report.

Our audit work was done between June 1988 and May 1989 in accordance with generally accepted government auditing standards.

# SEC Needs to Periodically Address Effects of Trading Restrictions

The 1975 Amendments mandated that SEC eliminate any exchange trading restriction imposing a burden on competition that did not serve a regulatory purpose. In 1975, and again in 1980, SEC removed certain trading restrictions, but significant restrictions still remain—most predominantly NYSE Rule 390 and its equivalent on other exchanges—which prevent exchange members from trading many stocks away from the exchange markets.

These restrictions could (1) limit the amount of marketmaking capital available to respond to heavy selling pressure such as was experienced in October 1987; (2) limit price competition, thereby preventing investors from receiving better prices; (3) inhibit the development and use of more innovative trading systems; and (4) drive trading overseas. On the other hand, these restrictions may be necessary to preserve a central auction market, to prevent market fragmentation, and to continue efficient and effective market operations. The markets have changed substantially since 1980, and SEC needs to reevaluate the effect of existing trading restrictions now and, to the extent restrictions remain, on a periodic basis in the future.

## SEC Took Action to Remove Certain Trading Restrictions

In response to the 1975 Amendments, SEC acted quickly to address the trading restrictions issue. In 1975, SEC allowed exchange member broker/dealers to route customer orders to non-exchange member firms for execution, a practice formerly prohibited by exchange-imposed restrictions.<sup>1</sup> This rule provides exchange members with an alternative place to execute agency trades,<sup>2</sup> called the third market, rather than only executing such trades on the exchange floor. For example, Charles Schwab & Co., a large discount broker and NYSE member, may execute trades on behalf of its customers, not only at NYSE or a regional exchange, but also at Bernard L. Madoff Investment Securities, a third market maker who is not a NYSE member.

In 1977, SEC proposed removing all remaining trading restrictions.<sup>3</sup> SEC received over 200 comment letters on the proposal from the exchanges, NASD, broker/dealers, investors, issuers, the Department of the Treasury, and other interested market experts. The proposal was harshly

<sup>1</sup>SEC Rule 19c-1, 17 C.F.R. 240.19c-1 (1989).

<sup>2</sup>Agency trades are where a broker/dealer executes trades through another broker/dealer on behalf of a customer.

<sup>3</sup>Proposed SEC Rule 19c-2, 42 Fed.Reg. 33510 (to be codified at 17 C.F.R. 240.19c-2)(proposed June 23, 1977; withdrawn June 18, 1980).

criticized by most respondents, especially by the exchanges and exchange broker/dealers. None of the exchanges<sup>4</sup> submitting comments to SEC favored the proposal. Amex considered it to be "the most crucial step the Commission has considered in four decades." The consensus among the exchanges was that removal of the restrictions would cripple the existing exchange structure. The resulting marketplace, they projected, would be characterized by fragmented dealer markets where market makers internalized order flow,<sup>5</sup> best execution of orders would be nearly impossible to assure, and the resulting marketplace would create a significant regulatory challenge. While PHLX was not opposed to removal of the trading restrictions, it stated that SEC's decision to eliminate the restrictions was untimely because systems were not in place to adequately disseminate trade information.<sup>6</sup>

NASD and the Department of the Treasury argued in favor of the proposal. NASD stated the rule would increase market making and competition for exchange-listed stocks, although it suggested that substantial order flow would probably remain on the exchanges. While the Department of the Treasury supported the potential for increased marketmaking, it cautioned SEC that removal of existing restrictions should be conditioned on implementation of a nationwide quotation system, and that the resulting marketplace should be closely monitored. SEC, citing the possible "dramatic and radical effects" of adopting this change, withdrew the proposal in 1980.

Instead, SEC adopted Rule 19c-3.<sup>7</sup> This SEC rule allows exchange member broker/dealers to execute trades off-board, sometimes referred to as "in-house," in NYSE stocks listed after April 26, 1979. Therefore, a broker/dealer can execute a customer order for such a stock against the firm's inventory or against another customer order, rather than take the order to the exchange floor for execution.

SEC stated in 1980 that because Rule 19c-3 would only apply to a limited number of securities, it would not significantly affect the existing structure of the securities markets. SEC's forecast was accurate. Rule 19c-3

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<sup>4</sup>NYSE, Amex, MSE, PHLX, PSE, BSE, and CBOE.

<sup>5</sup>Internalizing order flow refers to large broker/dealers executing customer orders by buying and selling from their own accounts without exposing the orders to bids and offers elsewhere.

<sup>6</sup>Since that time, the composite tape and consolidated quote have been added to market trading structure.

<sup>7</sup>17 C.F.R. 240.19c-3.

has had little effect on trading patterns. Two explanations are commonly cited as reasons why broker/dealers have executed relatively few trades in Rule 19c-3 securities. The first explanation is that broker/dealers found that the rule did not encompass enough quality stocks to justify their changing established internal systems to accommodate trading of newly listed stocks in-house. The second explanation is that broker/dealers preferred to execute trades on the exchange floor rather than in-house.

## Significant Trading Restrictions Remain

NYSE Rule 390, Amex Rule 5, and similar rules at four regional stock exchanges impose restrictions on where their member firms may trade.<sup>8</sup> Simply stated, these rules prohibit exchange member broker/dealers<sup>9</sup> from making markets in many exchange-listed stocks off the exchange floor. These rules are generally referred to as off-board trading restrictions. An effect of these restrictions is to restrict exchange member broker/dealers from competing with exchange specialists in making markets in exchange-listed stocks. Many of NYSE's active stocks, including 89 of its 100 most active—such as Exxon, Ford, General Electric, General Motors, and IBM—are covered by the Rule 390 restrictions.<sup>10</sup>

One further consequence of NYSE Rule 390 is that it prevents exchange members from executing certain trades of exchange-listed stocks in the domestic OTC market even when U.S. exchanges are closed. Yet, exchange members are allowed to execute these trades in foreign markets. NYSE interprets Rule 390 to allow a member firm

“[to] trade as principal or as agent in any listed stock on any organized exchange in any foreign country at any time;<sup>11</sup> and outside of exchange trading hours, [to] trade as principal or agent in any listed stock in a foreign country over-the-counter.”<sup>12</sup>

<sup>8</sup>These restrictions are as follows: Boston Stock Exchange, Section 23 of Chapter II; Midwest Stock Exchange, Rule 9 of Article VIII; Pacific Stock Exchange, Rule XIII; and Philadelphia Stock Exchange, Rule 132. For ease of presentation and because NYSE is the most significant market, our discussion of trading restrictions focuses on NYSE's Rule 390.

<sup>9</sup>Broker/dealer members of NYSE include such firms as Merrill Lynch, Morgan Stanley, Shearson Lehman Hutton, First Boston, Alex. Brown, and Prudential-Bache.

<sup>10</sup>Amex Rule 5 covers 33 of its 100 most active stocks.

<sup>11</sup>The International Stock Exchange in London listed 185 U.S. stocks in 1989. Designated market makers of the exchange are required to make markets in stocks from 4:00 a.m. to 12:00 noon EST. The Tokyo Stock Exchange listed 70 U.S. stocks in 1989 and is open from 8:00 p.m. to 10:00 p.m. and from 12:00 midnight to 2:00 a.m. EST.

<sup>12</sup>NYSE Rule 390, Interpretation .10.

## No Comprehensive Review of Trading Restrictions Since 1980 Despite Major Changes in the Market

SEC stated in its public release adopting Rule 19c-3 that, because the trading restrictions issue is important to the evolving national market system, SEC expected to reexamine the issue periodically in the light of future market developments. SEC discussed the effect of trading restrictions on after-hours trading in 1986. However, SEC Division of Market Regulation and Office of Economic Analysis officials told us that SEC's last comprehensive review of the effect of trading restrictions on the domestic market occurred in 1980 as part of the approval process for Rule 19c-3.<sup>13</sup> The markets have changed significantly since then.

SEC's 1980 action in approving Rule 19c-3 did not satisfy the House Committee on Interstate and Foreign Commerce. In its report reviewing SEC's actions to implement the national market system goals contained in the 1975 Amendments, the Committee stated that

"The Congress directed the SEC to report on the competitive impact of such rules, and to begin proceedings to eliminate such restrictions. Placing the ultimate decision in the Commission's hands provided the flexibility to deal with problems that many argued would arise upon elimination of the off-board restrictions. But, despite the flexibility as to timing and the development of necessary related rules, it is nonetheless clear that Congress intended such anti-competitive rules to be eliminated."<sup>14</sup>

The Committee further noted in its 1980 report that "despite the fundamental purpose of the 1975 Amendments to eliminate unnecessary restraints on competition, these restrictive rules and practices, although modified, continue in place." In the opinion of the Committee, SEC had "failed to fulfill its obligations with respect to anti-competitive rules and practices." Despite this criticism, SEC has taken no further action on these trading restrictions.

In 1986, SEC's Division of Market Regulation, in responding to a Commission initiative concerning the increasing internationalization of the securities markets, raised the issue of after-hours effects of NYSE Rule 390. The Division recommended that the Commission send a letter to NYSE requesting the exchange to "consider lifting its off-board trading restrictions (Rule 390) on after-hours trading." The Division presented this recommendation to the Commission at an open meeting on internationalization on May 22, 1986. Although no formal vote of the Commissioners was taken, only one Commissioner supported the Division.

<sup>13</sup> Although SEC reviewed market trading structure issues in its report on the 1987 market crash, it did not analyze the effects of Rule 390 on the crash.

<sup>14</sup> House Comm. on Interstate and Foreign Commerce, 96 Cong., 2d Sess., National Market System: Five Year Status Report 14 (Comm. Print 1980).

At this open meeting, one Commissioner was the most outspoken opponent of the Division's recommendation. Among other points, he questioned whether the rule was anti-competitive, whether there was any substantial demand for after-hours trading, and whether it should be considered odd that an exchange should have a rule to control its members' trading even after-hours. The Division contended that SEC has found Rule 390 to be anti-competitive for 10 years and the only question about the rule was whether it was a justifiable burden on competition. The Division further contended that \$100-\$150 million of daily after-hours trading volume in U.S. securities occurs in overseas markets and that it is odd to have a restriction in place when the market it supposedly protects is not available for trading. They concluded by saying that Rule 390's application to after-hours trading has "no perceived benefits." The Commission rejected the Division's recommendation to send the letter to NYSE but, rather, instructed the Division to maintain a dialogue with NYSE on this issue.

In a recent speech, the Director of the Division of Market Regulation revived the issue and questioned the wisdom of having Rule 390 apply to after-hours trades.<sup>15</sup> He said that this after-hours trading, while only a small percentage of U.S. daily trading volume, can be significant. He further stated that these trades are done in foreign markets because exchanges, through off-board trading rules, do not permit their members to execute such transactions in the United States off an exchange floor. Since no U.S. exchange is open at these times to accept trades, broker/dealers execute the trades in foreign markets. In addition, these trades are never reported to SEC or the exchanges and, thus, are not subject to U.S. regulatory oversight.

These recent statements continue to support the Division's 1986 position on Rule 390's application to after-hours trading. In its 1986 memo to the Commission, the Division of Market Regulation, in calling for the removal of Rule 390 on after-hours trades, found "no justification for maintaining this artificial pressure on U.S. firms to trade with U.S. investors overseas." The Division also stated that overseas trading is done in markets where U.S.-style investor protection and anti-manipulative rules are lacking. The Division further noted that these trades are beyond the surveillance reach of U.S. exchanges and SEC.

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<sup>15</sup>Speech by Richard G. Ketchum at a Business Week, Securities Week, and Hewlett-Packard seminar on "Challenges Facing the Securities Industry," New York City, June 16, 1989, p. 12.

Since SEC's comprehensive review of trading restrictions in 1980, the U.S. equity markets have changed substantially. Trading volume has soared on the exchange and NASDAQ markets. In 1980, the total trading volume on U.S. exchanges was 15.5 billion shares; in 1989, that volume jumped to 53.5 billion shares. Similarly, trading volume in the NASDAQ market rose from 6.7 billion shares in 1980 to 33.5 billion shares in 1989. In addition, institutional investors account for continually increasing trading volume. In 1988, large block trading at the NYSE—a measure of institutional participation—accounted for almost 55 percent of NYSE share volume, up from about 29 percent in 1980. Also since 1980, the growing use of derivative products, such as stock options and futures, has contributed to a complex market structure in which sophisticated investment strategies abound. As shown by the 1987 market crash, the stock, options, and futures markets are inextricably linked. Finally, the U.S. marketplace faces additional challenges as overseas financial markets grow in importance and the world's financial markets become increasingly interdependent.

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## Extensive Disagreement About Effects of Trading Restrictions

Securities industry participants and outside experts have sharply different perspectives on the merits of trading restrictions. The issue is complex. However, there is no question that the restrictions help maintain the current market structure and that removing the restrictions could substantially alter the way exchange-listed securities are traded, including the possible elimination of trading floors and specialists. Critics say the restrictions have a substantial adverse effect on levels of marketmaking capital, price competition, and incentives to develop and use automated trading systems. In addition, critics assert that the restrictions are forcing exchange broker/dealers who want to trade after-hours to do so in foreign markets. Supporters of the restrictions argue that the restrictions are pro-competitive because they concentrate supply and demand for stocks in a central market and preserve an auction trading system. This, they argue, provides investors a better opportunity for receiving superior share prices on their stock trades. Supporters also point to the trading system enhancements made in the last decade as proof that system developments are not being retarded by the restrictions.

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## Marketmaking Capital

Perhaps the most significant criticism of the specialist system relates to the inadequate amounts of capital specialists had to handle extraordinary trading demands during the market crash of 1987. SEC, in its report

on the market crash,<sup>16</sup> found that while specialists, in the aggregate, performed satisfactorily, a disturbing number were either net sellers or only small net buyers on October 19, 1987.<sup>17</sup> This performance was contrary to what many believed to be the specialists' affirmative obligation to buy when other buyers do not exist. The Brady Report concluded that "from the final hours of trading on October 19 through October 20, a substantial number of NYSE specialists appear not to have been a significant force in counterbalancing market trends."<sup>18</sup>

Two of the nation's best capitalized exchange broker/dealers told us they would commit more capital to make markets<sup>19</sup> if NYSE Rule 390 was removed. NYSE Rule 390 restricts exchange broker/dealers from using their capital to make markets in many stocks off the exchange floor. This additional capital could increase competition for specialists in normal times and ease pressure on specialists in a crisis such as the October 1987 market crash.

Supporters of NYSE Rule 390 emphasize that the rule does not prevent large exchange broker/dealers from becoming specialists on primary or regional exchanges and using their capital to make markets in their assigned stocks. For example, Merrill Lynch, PaineWebber, and Bear Stearns are specialists at NYSE.<sup>20</sup> NYSE modified its rules after the market crash to encourage large broker/dealers to be specialists. NYSE's rationale was that broker/dealers, by becoming specialists, would bring additional marketmaking capital to the exchange floor. In addition, after the market crash, NYSE increased the minimum capital requirements of specialists from \$100,000 to \$1 million and tripled minimum share position requirements. NYSE also strengthened performance evaluation standards for specialists.

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<sup>16</sup>The October 1987 Market Break, A Report by the Division of Market Regulation, U.S. Securities and Exchange Commission, February 1988, p. xvii.

<sup>17</sup>SEC also detailed NASDAQ market maker performance during the market crash. As with exchange specialists, market makers had significant problems in carrying out their marketmaking responsibilities. SEC found, among other things, that many market makers withdrew from using the NASD automatic execution system and, in some cases, withdrew from making markets in some stocks altogether.

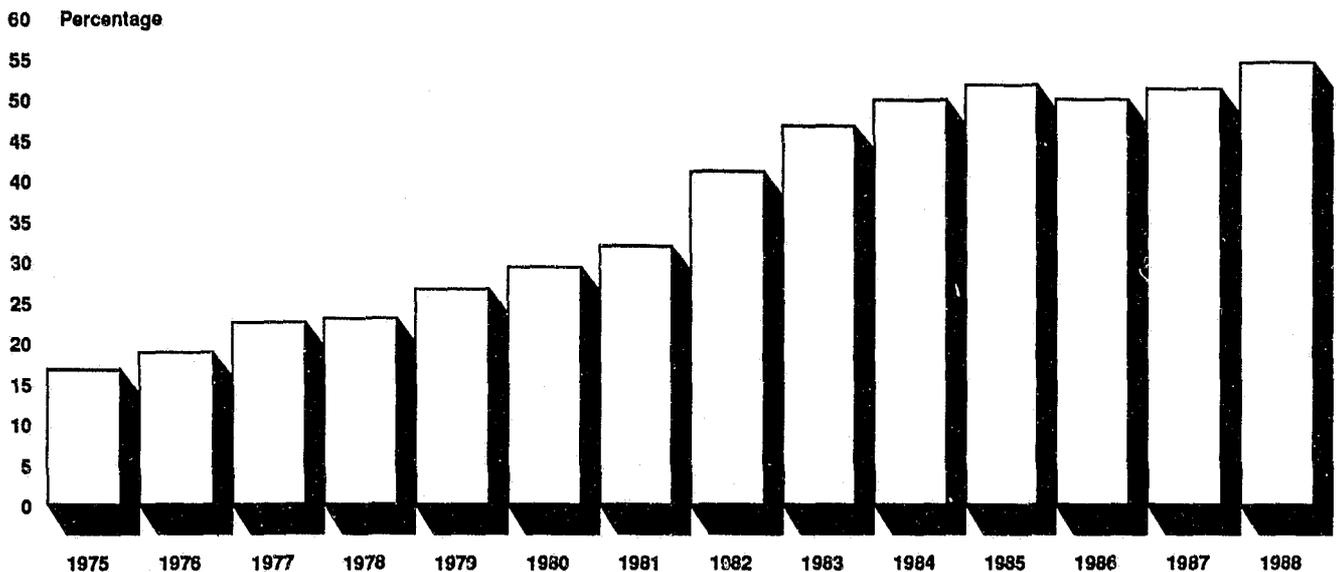
<sup>18</sup>Report of The Presidential Task Force on Market Mechanisms, January 1988, p. 50.

<sup>19</sup>Market making refers to broker/dealers using their own stock inventory and capital to trade with customers and other broker/dealers.

<sup>20</sup>All exchanges with a specialist system now have large broker/dealer specialists. For example, BSE has Merrill Lynch, Dean Witter, and Pershing; Amex has Merrill Lynch and Bear Stearns; MSE has Merrill Lynch and Pershing; PSE has Merrill Lynch, Shearson Lehman Hutton, and PaineWebber, and; PHLX has Dean Witter and Pershing.

Supporters also told us that Rule 390 does not prevent member firms from functioning as upstairs market makers<sup>21</sup> in block trades—large trades generally involving 10,000 shares or more—provided that the trade is routed to an exchange floor for execution. These upstairs—that is, off-the-floor—market makers find institutional customers to take the other side of a trade and commit their own capital, if necessary, to complete a transaction. NYSE granted broker/dealers this authority to arrange—but not execute—block trades in the 1960s because specialists were experiencing difficulties handling the growing number of large orders due to insufficient capital. As shown in figure 2.1, block trades, an indicator of institutional participation, have grown significantly at NYSE since 1975.

Figure 2.1: NYSE Block Trades (1975 to 1988)



Source: New York Stock Exchange.

In addition, NYSE began trading a “basket of stocks” in October 1989. This basket product<sup>22</sup> trades in units valued at about \$5 million. In a break from its reliance on specialists, NYSE primarily uses competing

<sup>21</sup>Upstairs market makers are also referred to as block positioners. As of 1988, there were 66 registered block positioners at the NYSE.

<sup>22</sup>Known as Exchange Stock Portfolio.

market makers to trade the new product. Exchange broker/dealers, acting as competing market makers for the basket product, will be providing additional marketmaking capital to the NYSE floor. NYSE, in its submission of this proposal to SEC, indicated that this additional capital should help address concerns about exchange specialists not being able to provide sufficient liquidity and depth to the market, particularly to handle the large orders of institutional investors. As of January 31, 1990, trading volume in basket units totaled 187, an average of just under 3 a day.

## Price Competition

A major argument for removing trading restrictions is that they prohibit member broker/dealers from competing with exchange specialists. Some broker/dealers and academicians assert that these restrictions give specialists an unfair competitive advantage over exchange member broker/dealers by eliminating their marketmaking competition. If member firms were permitted to compete with exchange specialists in all exchange-listed stocks, some broker/dealers and academicians assert that quotes would be narrowed and investors would obtain better prices. Officials of the NASD market, which is comprised of competing market makers, support the view that removing such restrictions as NYSE Rule 390 would increase the number of market makers, thereby creating a more competitive market for listed securities.

Conversely, supporters of NYSE Rule 390 argue that it is not anti-competitive but, rather, pro-competitive. They contend the rule is pro-competitive because it centralizes order flow in exchange-listed stocks. In 1988, for example, 98 percent of domestic share volume in NYSE stocks was traded on linked markets. Officials of NYSE, Amex, and most of the regional exchanges said trading restrictions limit the market fragmentation—the dispersion of orders among unlinked markets—that would occur if the orders were executed in-house by broker/dealers without exposing them to the exchange market. They added that market fragmentation of order flow, in turn, can have a serious, adverse impact upon price discovery<sup>23</sup> by reducing the extent to which buy and sell orders for a stock interact in one location or within a linked marketplace. This market fragmentation could result in investors not obtaining the best prices available for their orders.

<sup>23</sup>Price discovery is the process by which a market price for an asset is determined through the interplay of supply and demand.

Many primary and regional exchange officials, broker/dealers, and institutional investors also argue that if the restrictions were removed, the auction market might be replaced by a dealer market because large member firms might abandon exchanges and execute customer orders themselves. If this occurred, the benefit of an auction market, which allows investor orders to meet directly, without the intervention of a dealer, would be lost. An auction market differs from a dealer market<sup>24</sup> in that a customer order is exposed to the buy and sell interest in the marketplace and can be matched with other customer orders.

NYSE officials point to the problems experienced recently at the International Stock Exchange in London as indicative of trading without a Rule 390. In October 1986, the London exchange experienced "Big Bang," which led to the virtual end of the trading floor in favor of an OTC trading system. The result, NYSE officials contend, is a severely fragmented market with diminished liquidity and a lack of firm quotes.

Exchange officials and some market participants argue, therefore, that customers in the exchange auction market have the opportunity to obtain better prices than those quoted by dealers. The reason for this is that trades are often executed between the bid-ask spread that the specialist is quoting. For example, NYSE statistics show that about 32 percent of NYSE trades during the March 22 to May 30, 1989, time frame were executed between the quoted bid and offer prices.

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## Automated Trading Systems

Trading restrictions may hamper the development and use of more efficient automated trading systems than now exist. Automated trading systems may result in lower trading costs and may expand the opportunity for investors to trade directly with each other. Some broker/dealers assert that the ability of member firms to make markets in all exchange-listed stocks away from exchange floors would serve as an incentive to the securities industry to create and use more highly automated trading systems. Exchange broker/dealers might develop automated systems to execute customer orders in-house, a trading practice that the restrictions prohibit. To respond to such a competitive challenge, the

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<sup>24</sup>In a dealer market, customer orders are matched and executed against the dealer's inventory. At NYSE, although specialists under certain conditions act as dealers, specialists are involved in only about 10 percent of the buying and selling activity.

exchanges might develop more efficient, perhaps fully automated, trading systems. Some market participants consider efficient automated systems to be essential if U.S. securities markets are to remain competitive in an increasingly global and electronic trading environment.

Some market consultants proposed a fully electronic trading system that does not require an exchange trading floor.<sup>25</sup> While initially proposing this system in response to the 1975 Amendments, these proponents argued strongly after the crash that an electronic trading system would have functioned much more efficiently and would have provided much more liquidity and market information during the market crash by permitting investors to trade automatically and continuously. Their proposed system would allow all buyers' and sellers' orders to meet through electronic intermediaries at all times; no trading halts resulting from order imbalances would be declared.

Automated trading systems that allow off-the-floor trading are being increasingly employed by major foreign securities markets. In a February 1989 speech, former SEC Chairman David Ruder observed that one of the more notable foreign automated execution systems was instituted at the Toronto Stock Exchange in 1977.<sup>26</sup> Toronto's Computer Assisted Trading System (CATS) is a screen-based automated trading system. CATS automatically matches and executes buy and sell orders based on the prices stipulated and the time orders are received.<sup>27</sup> As of February 1, 1990, CATS was used for approximately 840 of the 1650 stocks listed at Toronto and accounted for about 22 percent of overall trading volume.<sup>28</sup>

The Tokyo Stock Exchange, which recently surpassed NYSE as the largest stock exchange by volume in the world, has a system similar to CATS. Tokyo's Computer Assisted Order Routing and Execution System (CORES) permits the automated execution of orders entered by traders from their offices. In 1989, this computer assisted execution feature covered 1566

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<sup>25</sup>Junius Peake, Morris Mendelson, and R.T. Williams Jr., The Peake-Mendelson-Williams National Book System, April 1976.

<sup>26</sup>Appendix to speech entitled "Automation of Information Dissemination and Trading in U.S. Securities Markets" by SEC Chairman David S. Ruder at the 1989 Forum on Technology and Financial Markets in Washington D.C., February 27, 1989, p. 27. Chairman Ruder also concluded that fully automated trading systems are unlikely and that a combination of automated trading and auction market is the most probable future course.

<sup>27</sup>CATS also provides a feature by which a trader can add a "+" indication to an order, which communicates to others that the trader is interested in buying or selling more shares of stock than specified in the entered order. This can then lead to telephone discussions of larger transactions.

<sup>28</sup>Data provided by the Toronto Stock Exchange.

of the 1716 stocks listed at the exchange and accounted for 44 percent of total trading volume. However, the 150 most active stocks are still traded in the traditional way on the Tokyo trading floor.<sup>29</sup>

Dr. William Freund, a former NYSE chief economist, argues that the lack of more highly automated trading systems could put U.S. markets at a disadvantage if 24-hour trading begins in foreign markets. In a December 1988 speech at an American Economic Association conference, he said that

“The floor of the NYSE suffers from a major disadvantage in terms of international stock trading. It is difficult to extend trading hours because of the people-intensive nature of the operation.”<sup>30</sup>

Exchange officials disagree that Rule 390 inhibits development of automated trading systems. These officials note that they have adopted automated exchange trading features. For example, NYSE has invested more than \$150 million in SuperDot—a network of electronic order processing and post-trade systems that provides a communications link between a member firm’s trading operations and the NYSE trading floor. Amex filed a rule change with SEC in May 1989 requesting, among other things, approval to begin an automatic execution system for many of its stocks. This aspect of the rule proposal is under SEC review. The five regional exchanges have systems that automatically execute small orders.<sup>31</sup> These orders are executed at the best bid or offer displayed in the consolidated quotation system.

SEC officials point out that Rule 390 has not prevented fully automated trading systems, such as CSE’s National Securities Trading System (NSTS), from operating without a trading floor. Market makers in NSTS can be located anywhere in the United States and do not require a physical presence in Cincinnati. CSE member firms can have their orders executed by these market makers instantaneously through the NSTS. In addition, Instinet and Jefferies and Co. operate fully automated trading systems that allow institutional investors to trade directly with each other.

<sup>29</sup>Data provided by the Tokyo Stock Exchange.

<sup>30</sup>Speech entitled “Electronic Trading and Linkages in International Equity Markets” by Dr. William Freund to the American Economic Association in New York City on December 30, 1988, p. 9.

<sup>31</sup>Small orders are defined differently at the various markets but generally are less than 1100 shares.

NYSE Rule 390 does not prevent non-exchange members from implementing automated systems. Bernard L. Madoff Investment Securities, a broker/dealer that is not a member of NYSE, makes markets in 250 of NYSE's most active stocks. Madoff guarantees its customers automatic execution at the best advertised bid or offer price quoted on the consolidated quote system for up to 3,000 shares.

In a June 16, 1989, speech, the Director of SEC's Division of Market Regulation questioned whether automated trading systems will become the preferred manner of trading. He stated that

"Trading systems which provide for the automatic execution of quotations create new market making risks which are not associated with face to face or telephone trading. Automatic execution exposes market makers to the risk of being 'picked off' by other market professionals before they can respond to news or changes in other participant's quotations. This 'pick off' risk may discourage market makers from trading in size and, as a result, reduce the potential depth and liquidity of any such system."<sup>32</sup>

Investor preference may have a larger impact on automation than trading restrictions. SEC officials note that U.S. markets are not more automated because many institutional investors prefer negotiating trades over the telephone. In the above cited speech, the Director of SEC's Division of Market Regulation said that many institutions like the flexibility of working their orders gradually on an exchange floor without their interest in the stock being disclosed all at once. If institutional investors become dissatisfied with the exchanges, they are free to shift their trading to a proprietary trading system, such as Instinet, that provides fully automated trading or eliminates broker/dealer intermediaries.

## Restrictions May Force Trades to Foreign Markets

As previously discussed, NYSE Rule 390 prohibits exchange member broker/dealers from executing trades in the United States off an exchange floor. As a result, when the exchanges are closed, member broker/dealers execute these trades in foreign markets, a practice permitted by exchange rules. Were it not for the restrictions, these member firms could choose to execute after-hours trades as a market maker against their own, or another broker/dealer's inventory.

<sup>32</sup>Speech by Richard G. Ketchum at a Business Week, Securities Week, and Hewlett-Packard seminar on "Challenges Facing the Securities Industry," New York City, June 16, 1989, p.8.

Neither the exchanges or SEC collects information on the volume of after-hours trading of individual U.S. stocks by member firms overseas. However, the trade volume has been significant enough to prompt MSE to develop an after-hours trading system. In addition, in May 1989, NYSE officials announced their intention to study whether they should develop an after-hours system.

MSE's "Secondary Trading Session," approved by SEC in October 1989, is designed to trade portfolios of stocks through an automated system from 4:30 to 6:00 p.m. EST. MSE stated in its proposal to SEC that the Secondary Trading Session responds to the problem of brokers being forced by NYSE Rule 390 to make after-hours portfolio trades for institutional investors in foreign markets. In supporting its proposal, MSE stated that overseas trades "take place without the benefit of SEC or exchange oversight and without the regulatory protections afforded participants in U.S. securities markets." MSE's system to trade this product became operational in January 1990, but, as of January 31, 1990, no trades had been made.

NYSE is also considering developing a 24-hour trading process should member firms and institutional investors express interest in such a system. NYSE officials indicated that they will be surveying these market participants to determine the extent of that interest. While the officials estimate that NYSE will be studying this idea over the next 6 to 24 months, they indicate that sufficient interest among market participants to justify developing such a system may be 5 or 10 years away.

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## Conclusions

Exchange-imposed trading restrictions like NYSE Rule 390 significantly affect—some say negatively, some say positively—how U.S. stocks are traded. Ten years ago, in a substantially different marketplace, SEC decided against totally removing the restrictions, choosing instead to periodically reevaluate them in light of market developments. However, despite the major market developments of the 1980s, including a market crash, no such reevaluation has occurred or is planned.

These restrictions influence: (1) the amount of marketmaking capital available; (2) the degree of price competition in the marketplace; (3) the development and use of more innovative and efficient trading systems; (4) the centralization of U.S. trading; and (5) the preservation of an auction market. In addition, because of the restrictions, NYSE member broker/dealers who wish to trade after-hours as a principal can only do so in foreign markets. Because of the potential effects of these restrictions,

SEC needs to reconsider whether they should be further modified, removed, or reaffirmed.

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## Recommendations to the Securities and Exchange Commission

We recommend that the SEC reopen the trading restrictions issue to determine whether these restrictions should be further modified, removed, or reaffirmed. One potential modification of the restrictions would be the elimination of their applicability to after-hours trading. If SEC decides against removing any or all exchange-imposed trading restrictions now, SEC should consider their continued appropriateness periodically to keep pace with the rapidly changing marketplace.

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## Agency Comments and Our Evaluation

SEC agreed with our recommendation that the after-hours implications of NYSE Rule 390 should now be reconsidered. However, SEC disagreed with our recommendation for a comprehensive review of NYSE Rule 390's (and similar rules at other exchanges) effects on the domestic market while the exchange is open. Nevertheless, because of SEC's legislative mandate, its own determination of the need to reevaluate trading restrictions periodically, and the vast changes in the marketplace that have occurred in the last decade, we continue to recommend such a review.

Most exchange officials did not endorse our recommendation that the Rule 390 issue be revisited. They contended that a review of Rule 390 would be complex and that elimination of the rule might lead to a less desirable marketplace. However, exchange officials agreed that the logic used to arrive at our conclusion was sound. NASD officials supported our recommendation. They contend that elimination of Rule 390 would lead to a more desirable marketplace.

# Intermarket Trading System Needs a Comprehensive Review

The Intermarket Trading System (ITS) has electronically linked the trading of stocks in various marketplaces around the country since 1978. The exchanges designed ITS to meet the 1975 Amendments' goals to reduce market fragmentation, enhance competition, and allow customers to receive execution of their orders at the best price available in any of the linked markets. Former SEC Chairman David Ruder characterized ITS as perhaps the most visible by-product of the effort to establish a national market system.

SEC's last comprehensive review of ITS operations was completed in 1982. The review covered the system's first 4 years of operation and examined trading volume, operating efficiency, and effect on intermarket competition. Since 1982, SEC and market participants have changed system operations in response to problems experienced during the 1987 market crash and more recently in response to ITS users' concerns. In addition, between 1979 and 1989, share volume trades over ITS increased over ten-fold. The number of incremental changes made to the system since SEC's last comprehensive evaluation and the increasing importance of ITS as shown by the dramatic increase in trading volume indicates the need for SEC to again look at overall ITS effectiveness and the extent to which it is meeting its national market system goals.

## ITS Links the Markets

ITS links the two primary exchange markets (NYSE and Amex) with five regional exchange markets (BSE, CSE, MSE, PSE, and PHLX) and NASD. ITS is a communication and order routing system designed to facilitate trading of NYSE- and Amex-listed stocks among competing markets.<sup>1</sup> Specialists, floor brokers, and market makers can view the quotes in other markets and transmit buy and sell orders—known as “commitments to trade”—through ITS to other markets that are offering a better or the same price.<sup>2</sup> These orders may be accepted, cancelled, or allowed to expire by the receiving market.<sup>3</sup>

Many market officials and experts stated that ITS enhances competition among the various markets and benefits investors. ITS rules attempt to

<sup>1</sup>NYSE Rule 390 does not prevent its members from trading NYSE-listed stock on regional exchanges.

<sup>2</sup>The best bid is the highest priced buy order while the best offer is the lowest priced sell order in the market at a point in time.

<sup>3</sup>If orders are not accepted or cancelled, they automatically expire within 1 or 2 minutes, depending on which market originated the order. A regional exchange specialist's commitment to trade that is not accepted or cancelled by the receiving market will expire after either 1 or 2 minutes as stipulated by the regional specialist.

assure that investors obtain the best price available in the system. Although current measures of investor savings are unavailable, NYSE, in its 1983 Annual Report, estimated that

“the opportunity to obtain a better price in a different market, via ITS, may have saved individual and institutional investors as much as \$150 to \$170 million since 1980.”

Some regulatory officials and exchange specialists said that without ITS, the regional exchanges would have a difficult time competing with the primary markets for order flow. Viable regional exchanges are important because they enhance overall marketplace competition. One indication of the competition from regional markets is that NYSE's portion of consolidated trades declined from 87.0 percent in 1978 to 73.0 percent in 1988. Former SEC Chairman Ruder has stated that ITS enhances the ability of regional exchange specialists to compete with the primary markets by providing them with an efficient method for transmitting what they consider to be excess positions in a stock to other exchanges.<sup>4</sup>

## No Comprehensive Evaluation of ITS Since 1982

SEC published the results of its last comprehensive evaluations of the ITS in two reports issued in 1981 and 1982.<sup>5</sup> These reports examined trading volume, operational efficiency, and the system's effect on intermarket competition during its first 4 years of operation. Since 1982, SEC has continued to monitor ITS. SEC's standard monitoring activities include attending ITS meetings, approving amendments to the ITS Plan,<sup>6</sup> and maintaining informal contact with ITS participants. SEC also reviewed ITS capacity problems experienced during the 1987 market crash. In addition, SEC and ITS participants have made other system changes to resolve specific user concerns.

These incremental changes have been made without any further comprehensive evaluation of ITS operations since 1982. Such an evaluation could determine the effectiveness of changes already made, the need for

<sup>4</sup>Speech entitled “Automation of Information Dissemination and Trading in U.S. Securities Markets” by SEC Chairman David S. Ruder at the 1989 Forum on Technology and Financial Markets, Washington D.C., February 27, 1989, p.8.

<sup>5</sup>A Monitoring Report on the Operation of the Intermarket Trading System, Directorate of Economic and Policy Analysis, U.S. Securities and Exchange Commission, February 1981; and A Report on the Operation of the Intermarket Trading System: 1978-1981, Directorate of Economic and Policy Analysis, Securities and Exchange Commission, June 1982.

<sup>6</sup>The ITS Plan sets forth the rules under which ITS operates.

any additional changes, and the extent to which ITS continues to meet national market system goals.

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### Changes Since the Crash

SEC and ITS participants made changes to the system after they experienced problems during the 1987 market crash. SEC reported that the high volume of trade commitments routed over ITS to NYSE on October 19 and 20, 1987, caused capacity problems with the NYSE printers. Therefore, numerous trades took more than the required 2 minutes to reach NYSE specialists and, thus, expired.

In an effort to speed the process, NYSE has made several changes to the way ITS commitments reach specialists. NYSE now routes orders received through its automated order routing system<sup>7</sup> directly to the specialists' electronic display books, freeing up the capacity of its floor printers to handle ITS commitments. The electronic display books show both market and limit orders for each of the specialist's assigned stocks on a computer screen. As a further enhancement, NYSE is planning by early 1990 to route ITS commitments directly to the electronic books, thereby bypassing printers altogether. NYSE specialists could then receive, send, and respond to ITS commitments using the display books. According to NYSE officials, this change to the display books for ITS orders will shorten NYSE specialists' response time to ITS commitments. In addition, NYSE did a stress test of its ITS interface in September 1989. SEC also suggested that ITS participants consider adopting default procedures so that, after 2 minutes, the commitment would be automatically executed rather than cancelled.

SEC reported that regional specialists expressed concern that the ITS Plan did not require NYSE specialists to issue pre-opening notifications before trading resumed after an order imbalance halt. SEC suggested that these pre-opening notifications be given when trading resumes after a halt. ITS participants have been negotiating this proposal.

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### Changes Being Made to Address User Concerns

During our fieldwork, various ITS participants, including market officials, specialists, floor brokers, and market makers, told us changes were needed to ITS pre-opening procedures, time-stamping requirements on NYSE's trading floor, automatic execution of ITS orders, and the resolution process for ITS-related complaints. After completion of our fieldwork,

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<sup>7</sup>Designated Order Turnaround system, also known as DOT or SuperDot.

SEC and ITS participants made changes to resolve several of these concerns.

### Pre-Opening Procedures

Specialists and officials of regional exchanges said ITS rules limit regional participation in the opening of ITS stocks. Before opening trading in their assigned stocks, NYSE and Amex specialists assess pre-opening buy and sell interest to determine an opening price. Heavy trading volume frequently occurs at the opening of stocks. Under certain circumstances, ITS rules allow regional exchange specialists to participate in opening ITS stocks by sending their buy and sell orders directly to NYSE or Amex specialists, thereby avoiding brokerage fees.

For example, according to the ITS Plan, if an ITS stock will open on NYSE at a price higher or lower than the previous day's closing price by a given amount, the NYSE specialist must notify regional exchanges by sending a "pre-opening notification" over ITS. At NYSE, pre-opening notifications must be sent if the specialist anticipates that the opening price will be more than one-eighth of a point away from a closing price of under \$15, or more than one-quarter of a point away from a closing price of \$15 or more. Regional exchange specialists can respond by sending orders to NYSE through ITS at no cost.

If the opening price is within the parameters, the NYSE specialist need not notify the regional exchanges' specialists. To participate in the opening in these cases, regional exchange specialists must send their orders through NYSE brokers, thus incurring brokerage fees. Consequently, the NYSE specialists have a competitive advantage. Regional exchange specialists said pre-opening price parameters in the ITS Plan are too wide; therefore, they cannot participate in most openings of ITS stocks.

### Time-Stamping of NYSE Floor Broker Orders

During our review, regional exchange specialists told us that floor broker's orders at NYSE were not time-stamped which may lead to an audit trail problem. Many regional exchange specialists and officials we met with voiced this concern. ITS commitments may be legitimately traded ahead of and cancelled if a specialist executes a floor broker's order before the ITS commitment is received. However, these regional specialists said that, since NYSE specialists were not required to time-stamp floor brokers' orders left with them for execution, it was difficult, if at all possible, to document whether an ITS commitment was cancelled for a valid reason.

NYSE has taken steps to address some of these concerns. In September 1989, SEC approved a NYSE rule change requiring specialists to time

stamp floor brokers' orders left with the specialist for execution. The rule also requires floor brokers to time-stamp orders when they are received at the floor broker's booth.

### Automatic Execution

NASD is linked to ITS through an automated interface with its Computer Assisted Execution System (CAES). ITS stocks that are not subject to NYSE and Amex off-board trading restrictions<sup>8</sup> can be traded over the ITS/CAES linkage.<sup>9</sup> However, as stated in chapter 2, many of the more actively traded NYSE stocks are covered by the trading restrictions and are ineligible for trading over the ITS/CAES linkage. CAES automatically executes orders routed to NASD market makers from the exchanges.<sup>10</sup> However, orders sent from NASD market makers to the exchanges (except CSE) are not automatically executed by the receiving market. According to NASD officials, the CAES automatic execution feature, though voluntarily used by NASD for its ITS linkage, puts NASD market makers at a disadvantage by exposing them to more risk than other ITS users. This discourages NASD market makers from using the link; about 90 percent of share volume over ITS/CAES can be attributed to one NASD market maker. NASD contends that ITS trades should be automatically executed up to the number of shares advertised for sale or purchase by the specialist or market maker. CSE also supports automatic execution of ITS orders.

SEC has recently discussed a possible need for automatic execution of certain ITS orders. In June 1989, the Director of SEC's Division of Market Regulation, speaking before a group of industry professionals, recommended that ITS public investor orders be guaranteed automatic execution. Without automatic execution, an ITS public investor order is not assured immediate execution, posing a risk to the investor in a market with rapidly changing prices. However, according to SEC officials and some ITS participants, this proposal has not been well received by the majority of the exchanges.

### ITS Complaint-Resolution Process

The ITS Plan contains procedures for resolving complaints that result from trading. During our review, however, many ITS users said the resolution process is lengthy and cumbersome. Furthermore, they said they believe the process to be biased against the complaining exchange member. Two ITS users we spoke to said they were so dissatisfied with the

<sup>8</sup>NYSE Rule 390 and Amex Rule 5, as discussed in chapter 2.

<sup>9</sup>Although 871 NYSE- and Amex-listed stocks were eligible for trading through CAES in December 1988, only 30 stocks were traded over the CAES system.

<sup>10</sup>The Cincinnati Stock Exchange has a similar automatic execution feature in its hookup with ITS.

complaint-resolution process that they stopped making trade complaints. However, SEC officials said they have never received a formal complaint concerning ITS.

Numerous types of ITS trade complaints are made. For example, an ITS user may complain about not receiving a pre-opening notification when one is required by the ITS plan. Also, an ITS user might complain that a commitment to trade was improperly cancelled by the receiving market.

The trade complaint resolution process has several stages, starting with communication between the injured and alleged-offending specialists. If the matter is not resolved, the complaint is reviewed by the alleged-offending exchange. Complainants dissatisfied with the exchange's resolution of the complaint may file for arbitration with the alleged-offending exchange member. Exchange officials said that very few complaints go to arbitration. The arbitration procedure is viewed as cumbersome, and few specialists would pursue a complaint to this point unless it involved a large trade or they felt it was a matter of principle.

Recently, the ITS participant markets agreed in principle to establish a program in which ad hoc groups will do informal reviews of ITS-related complaints. These groups would then issue non-binding decisions on the day of the contested trading or soon thereafter.

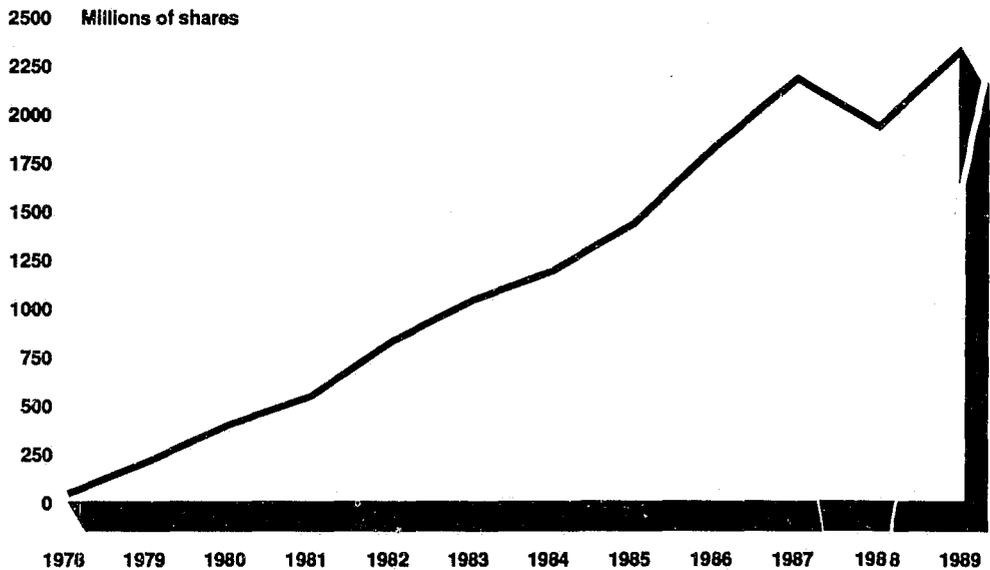
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## ITS Volume Has Increased Dramatically

The number of stocks traded over ITS and ITS annual share volume have increased steadily since the system's inception. In 1989, 2,082 stocks traded over ITS compared to 688 stocks in 1979. Of the 2,082 stocks traded over ITS in 1989, 1,633 were listed on NYSE and 390 were listed on Amex. The remaining 59 stocks were listed on regional exchanges. As shown in figure 3.1, ITS annual volume has increased substantially, from 209 million shares in 1979 to 2.3 billion shares in 1989. Table 3.1 shows the distribution of ITS share volume among participant markets for December 1989.

Although the 2.3 billion shares traded over ITS is not significant in terms of the total share volume of NYSE or NASD, this volume is significant relative to the shares traded on the other exchanges. For example, ITS' 2.3 billion shares exceeds the individual 1989 trading volumes of PSE, PHLX, BSE, and CSE.

Figure 3.1: ITS Volume - 1978 to 1989



Source: New York Stock Exchange

Table 3.1: Distribution of ITS Share Volume Among Participant Markets (December 1989)

Market	Percent of ITS share volume	
	Receiving	Originating
New York Stock Exchange	54.3%	30.1%
Midwest Stock Exchange	17.8%	26.7%
Pacific Stock Exchange	11.8%	18.1%
Cincinnati Stock Exchange	5.7%	4.6%
American Stock Exchange	3.7%	2.0%
Boston Stock Exchange	3.2%	8.2%
Philadelphia Stock Exchange	2.1%	7.8%
National Association of Securities Dealers	1.4%	2.4%
<b>Total</b>	<b>100%,<sup>a</sup></b>	<b>100%,<sup>a</sup></b>

<sup>a</sup>Percentages may not equal 100 percent when added due to rounding.

Source: New York Stock Exchange

## Conclusions

Effective trading linkages among the markets can enhance competition and may result in better prices for investors. ITS has helped reduce market fragmentation through its electronic linkages. SEC has been effective

in promoting ITS change when it acts aggressively to overcome market-place inertia. However, in view of the number of incremental changes made to the system since SEC's last comprehensive evaluation and the dramatic increase in trading volume, SEC needs to look again at overall system effectiveness and the extent to which ITS is meeting its national market system goals.

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## Recommendations to the Securities and Exchange Commission

We recommend that SEC do a comprehensive evaluation of ITS, paying particular attention to the effects of recent system changes and increased trading volume. SEC should address the system's operational efficiency, effect on intermarket competition, and capability to handle future market crises.

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## Agency Comments and Our Evaluation

SEC noted in its comments that a continual assessment of the effectiveness of ITS is an important aspect of SEC's responsibilities and that SEC has been continually reviewing ITS since the system's implementation. SEC further noted that a number of enhancements to ITS, all of which are included in this chapter, are currently being considered or are in the process of being adopted by the ITS participants. We believe that the number of changes made since SEC's last comprehensive review supports the need for an overall assessment to determine whether the system continues to meet national market system goals. While we continue to believe that a comprehensive review of ITS is necessary, we understand that the changes to the system currently being considered are important and should continue. To the extent that a comprehensive review of ITS would detract from resolving these issues in the near term, the overall assessment could be delayed. However, such additional changes to ITS further support the need for a comprehensive system review.

# Trading Linkage System Development for Multiple Listing of Options Requires Close SEC Monitoring and Guidance

In May 1989, SEC approved a major change to the way stock options<sup>1</sup> will be listed and traded at exchanges. Rather than the former procedure of allocating an option on a listed stock to a single exchange, SEC now allows all exchanges to trade any new option listed after January 22, 1990. In addition, each options exchange is permitted to list 10 stock options already allocated to another exchange. Furthermore, beginning in 1991, SEC will allow any exchange to trade any option regardless of where it was originally allocated. SEC approved this change to increase competition among exchanges and to improve options prices for investors. Some exchanges disagree with SEC's assessment of the benefits of multiple listing and trading of options. However, if increased competition results and investors obtain better prices, SEC's approval of this change will be consistent with national market system goals.

SEC noted that the benefits of multiple listing and trading of options may be enhanced by developing a trading linkage system among the exchanges. No such linkage currently exists. Options exchanges, in commenting on SEC's proposal, differed on whether a trading linkage system was needed or even feasible. The five options exchanges then commissioned two separate studies addressing the feasibility of an intermarket linkage system. One study, commissioned by PHLX, PSE, and NYSE, recommended that a linkage system similar to ITS be constructed. The other study, commissioned by CBOE and Amex, recommended that a completely new system be developed to take advantage of modern technology.

The lack of consensus among exchanges regarding a linkage system makes it unlikely that a system will be developed without active intervention by SEC. In January 1990, SEC requested the options exchanges to refrain from multiply listing existing options for 6 months to allow for development of a market linkage system. This type of guidance from SEC is necessary if a linkage system is to be built.

<sup>1</sup>Stock options are contracts that give the holder the right to buy or sell a stated number of shares of a particular stock at a fixed price within a predetermined time period. The two basic types of options are known as a "put" and a "call." A put gives the holder of the option the right to sell, and a call gives the holder the right to buy.

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## Multiple Listing of Options Attempts to Address National Market System Goals

In May 1989, SEC Commissioners unanimously approved multiple listing of options on exchange-listed stock, thus making all stock options eligible for multiple listing within a specified timetable.<sup>2</sup> SEC ruled that, as of January 22, 1990, all new stock options would be eligible for trading on more than one exchange. Under this rule, each options exchange would also be permitted to list 10 stock options already allocated to another exchange. Furthermore, in January 1991, all stock options will be eligible for trading on any options exchange.

In proposing its rule allowing multiple listing of options, SEC stated that options exchange rules prohibiting multiple trading may be inconsistent with the Securities Exchange Act of 1934, particularly because the rules may impose an unnecessary burden on competition. SEC also stated that a continued postponement of multiple trading may be inconsistent with the national market system goals requiring fair competition among brokers and dealers, and the economically efficient execution of securities trades.

Currently, most options on listed stock are subject to an allocation plan under which one of the five options exchanges has exclusive rights to trade individual stock options. The allocation plan was developed by the nation's options exchanges as a means of fairly allocating newly listed options. This plan was instituted pending completion of a feasibility study on market integration facilities, which SEC anticipated might facilitate multiple listing of options. Only options on OTC stocks and on 13 exchange-listed stocks were not subject to the allocation plan and, therefore, have been eligible for multiple listing. However, with the passage of Rule 19c-5, the allocation plan was abolished for all options listed after January 22, 1990. Therefore, all newly listed options are eligible for trading on any exchange.

SEC based its decision to reconsider expansion of multiple trading of options on improvements in options markets' trading technologies since the adoption of the allocation plan. SEC also found that multiple trading of options on non-equity securities<sup>3</sup> and OTC stocks was a largely positive experience that did not result in any specific harm to the markets.

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<sup>2</sup>SEC Rule 19c-5, 54 Fed. Reg. 23963 (1989) (to be codified at 17 C.F.R. 240.19c-5) [Vol 54, No. 106 June 5, 1989].

<sup>3</sup>Options on Treasury securities, stock indexes, and foreign currencies.

In 1986, SEC released two studies indicating that multiple listing may narrow the spread between the highest bid and lowest offer for individual options. In one study, SEC's Directorate of Economic and Policy Analysis did an econometric analysis of bid/ask spreads of multiply listed options on OTC stock.<sup>4</sup> This analysis found that the multiply listed Amex/OTC options have bid/ask spreads that are 19.8 percent narrower than spreads of options listed only on Amex. The narrower spreads of the Amex/OTC options, which the analysis attributes to their eligibility for multiple listing, translated to a savings of \$25 million to investors who bought and sold options on OTC stock between June 1985 and May 1986. The second study, by SEC's Office of the Chief Economist, estimated that preventing multiple listing of options costs investors approximately \$150 million annually.<sup>5</sup>

## Benefits of Multiple Listing of Options Have Been Questioned

The opponents of multiple listing, including CBOE, PHLX, and PSE, dispute the benefits attributed to multiple listing and point to potential drawbacks as well. Amex, the second most active options market, supported SEC's elimination of the options allocation plan for new options on listed stock but did not support expanded multiple listing of currently traded options.

CBOE, PHLX, and PSE each commissioned critiques of SEC's 1986 econometric studies. These critiques noted numerous methodological flaws and concluded that the studies' findings were open to serious question.<sup>6</sup> For example, the critique commissioned by CBOE criticized the SEC studies on several levels. The critique noted that SEC used a theoretical model developed for common stocks and questioned the applicability of this model to the options market. It also noted that the studies may not have controlled for all variables affecting bid/ask spreads. Finally, the critique questioned whether the bid/ask spread is a reliable measure of competition in the options market. We also found weaknesses in the methodologies of these studies, which we reported by letter to the Chairman, House Committee on Energy and Commerce, on October 19, 1989.

<sup>4</sup>The Effects of Multiple Trading on the Market For OTC Options, Directorate of Economic Policy Analysis, Securities and Exchange Commission, November 1986.

<sup>5</sup>Potential Competition and Actual Competition in the Options Market, Office of the Chief Economist, Securities and Exchange Commission, November 1986.

<sup>6</sup>"Comment on SEC Staff Studies of Multiple Trading of Options," Hans R. Stoll (Owen Graduate School of Management, Vanderbilt University), February 5, 1987; "Memorandum Concerning SEC Staff Studies of Multiple Trading in Options," Seymour Smidt (Johnson Graduate School of Management, Cornell University) February 9, 1987; and, "Competitiveness of Options Trading Under the Options Allocation Plan," Gregory Connor (University of California at Berkeley), March 4, 1987.

CBOE and others have noted that prior experience with multiple listing of options has not resulted in multiple trading. In other words, regardless of the number of exchanges offering an option, a dominant market emerges. Order flow gravitates to the one exchange and remains there regardless of prices or services available on another exchange. These critics contend that brokerage firms generally do not route orders to an exchange on the basis of best available price. Rather, the firms use automated systems to transmit customer orders for multiply listed options to the exchange that the firm has designated as its primary market.

Some market participants fear that this primary market phenomenon may specifically disadvantage smaller regional exchanges. For example, PHLX suggests that, when multiple listing commences, regional options exchanges may lose market share to larger markets. In 1988 testimony before SEC, the PHLX President stated that, in the absence of market integration facilities, "non-New York options markets will be dealt a serious competitive blow for reasons that have nothing to do with the quality of their options markets." This, he stated, is incompatible with the goal of a national market system in which markets compete on a fair and equal footing.

Opponents also claim that multiple listing raises the possibility of market fragmentation, which may impair the ability of brokerage firms to discover and obtain the best price for their customers. If a dominant market does not emerge for a multiply listed option, trades could occur on one exchange at prices inferior to those quoted on another. Further, the absence of an options market linkage system, similar in concept to the stock markets' ITS, will prevent routing of orders from one market to another quoting a superior price.

In approving multiple listing, SEC commented that unfair competition was unlikely in view of the experience of options trading in OTC stocks. In addition, SEC contended that, while brokerage firms generally preselect the market where they send retail order flow, these firms have increasingly emphasized market quality considerations. SEC also noted that it expects broker/dealers to make periodic assessments of the quality of their designated market. In conclusion, SEC found that multiple listing would not result in a significantly fragmented options market. Noting that markets that first list and trade an individual option have generally maintained the majority of order flow, SEC further concluded that a new market will not successfully challenge an existing market unless the latter is a significantly poorer market.

## Considerable Disagreement About a Market Linkage System

SEC recognized as early as 1980 that development of market integration facilities might create a fairer, more efficient market structure within which multiple listing could occur. Nevertheless, SEC approved multiple listing of options without market integration facilities in place. In its approval of multiple listing, SEC reported it could not indefinitely defer its consideration of the multiple listing issue until exchanges develop such systems.

Since 1980, various market participants have expressed serious reservations regarding the feasibility of market integration facilities. In 1981, the options exchanges determined that effective market integration facilities were not feasible at that time. More recently, the Information Industry Association stated in 1988 that the rapid expansion of options quotation and trading information has strained the electronic computer systems and communication networks of financial service vendors. Noting that options trading results in a far larger set of information and records than stock trading, the Association recommended a detailed study of the impact of expanded reporting requirements resulting from multiple listing.

Market officials have also questioned whether competing exchanges would be able to expeditiously coordinate development of a market linkage system. The difficulty of having competing markets design market integration facilities was demonstrated in the stock markets' attempt to design a transaction reporting plan to allow for exchange trading of OTC stocks on an unlisted basis. In 1985, SEC granted each exchange the privilege of being able to trade in 25 OTC stocks. SEC took this action because it would result in increased competition, thereby benefiting the market and public investors. SEC conditioned exchange trading of OTC stocks on a number of factors. One factor required SEC approval of a plan, agreed to by NASD and interested exchanges, that would consolidate the NASD and exchange quotation and trade reports in the OTC stocks. SEC requested that the exchanges and NASD submit this plan by December 1, 1985, for implementation by January 1, 1986. However, the development of the plan was significantly delayed by disagreements among the exchanges and NASD. The exchanges and NASD finally submitted a plan to SEC in June 1989, for possible implementation in 1990, 4 years after SEC's original time frame.

When SEC approved multiple listing of options, it also requested comments on how to further integrate the nation's options markets. In its

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request for public comment,<sup>7</sup> SEC reported that options exchanges should carefully consider at least three possible measures to further link the nation's options markets: (1) an intermarket order routing linkage, (2) a mechanism for order-by-order routing to the market with the best price, and (3) a central limit order file.

The options exchanges differed significantly on the need for market integration systems as well as the recommended type of trading linkage. In their September 1989 responses to SEC's request for comment, PHLX, NYSE, and PSE supported a market trading linkage while CBOE and Amex questioned whether the need for a trading linkage had been demonstrated.

Concerned that market disruptions could be caused by expanding multiple trading before effective market integration facilities are in place, NYSE, PSE, and PHLX formed a task force to study the feasibility and costs of linking the options markets.<sup>8</sup> The task force commissioned the Tellefsen Consulting Group to assess the technological feasibility of various market integration facilities and submit a written report. The Tellefsen report concluded that an ITS-style linkage, the proposed Options Market Integration System (OMINTS), is currently the only viable linkage alternative.<sup>9</sup> The report estimated that such a linkage would cost about \$3.3 million and could be operational within 12 to 15 months.

Based on its assessment of the Tellefsen report and its own assessment of the options markets, PHLX agreed that an ITS-type linkage is presently the most viable way of integrating the options markets and would attain each of the goals of a national market system. However, the PHLX President warned that, in contrast with the market benefits to be derived from a linkage, expanding multiple trading without a linkage will fragment the options markets, jeopardize brokers' ability to obtain the best execution of their customer orders, and weaken the regional exchange system. PHLX recommended to SEC that the January 1990 start date for multiple listing of options be delayed for 8 to 12 months to permit the implementation of ITS-type linkage systems. It added that SEC could reserve the authority to rescind this deferral at any time if it concluded that sufficient progress was not being made. PHLX stated that the goal of

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<sup>7</sup>Exchange Act Release No. 26871, 54 Fed. Reg. 24058 (June 5, 1989).

<sup>8</sup>The PHLX President reported that Amex and CBOE were invited to participate in the task force, but declined. Amex and CBOE later commissioned their own study.

<sup>9</sup>Options Intermarket Linkage System Feasibility and Conceptual Design, Tellefsen Consulting Group, September 1989, p. 79.

implementing a national market system in options can only be attained if all the options exchanges participate and lend their financial support to a trading linkage system. In this regard, PHLX called for SEC to take a strong leadership role to assure there are no barriers to the establishment of a linkage. PHLX concluded that "to expect that market forces will prompt such a cooperative, industry-wide venture is to consign this project to inevitable defeat."<sup>10</sup>

NYSE also supported an intermarket linkage facility similar to ITS. NYSE stated that this type of linkage would best protect investors and promote competition among markets. NYSE determined that, with SEC support, the options exchanges will be able to establish an ITS-type linkage system. However, NYSE cautioned that operation of such a system before multiple trading of options commences is unlikely. NYSE recommended that before such development, a limited linkage system using existing options routing systems should be used.

PSE stated that a market integration mechanism is needed before multiple trading is expanded. It added that without such facilities, multiple trading will result in unfair competition, fragmented markets, price disparities, and "second best" execution of public customer orders. PSE stated that while it is not clear which market integration system would be best, such systems appear technologically feasible. Although PSE concluded that a copy of the ITS network would probably not work for options, some modification of ITS may be feasible.

CBOE and Amex, the two largest options exchanges, did not support the need for the immediate development of a market integration system.<sup>11</sup> In responding to SEC, CBOE stated that it is the wrong time to attempt to decide whether market integration facilities will be necessary and how such facilities will be designed and paid for. In part, CBOE based its conclusion on SEC's statements that the problems that CBOE and other exchanges have raised as being potentially associated with multiple trading are likely to be minimal or insignificant.

Amex supported SEC's position to eliminate the lottery system for options allocation. However, Amex noted that a need for a market linkage had yet

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<sup>10</sup>A NASD Options Committee also concluded that a linkage would only be feasible if all the options markets were participants. The Committee further stated that, given the lack of consensus that a linkage should be built, if a linkage is to be built, an SEC mandate may be needed.

<sup>11</sup>PHLX, in its response to SEC, stated that it is natural for the larger markets to resist linkages because of their desire to protect their market position.

to be established should multiple trading be approved. Amex further stated that before design and implementation efforts are undertaken, a thorough study and analysis of the potential advantages and disadvantages as well as costs of such market integration should be done. Amex added that the nature of options trading makes it extremely difficult to develop a system similar in design to ITS.

After submitting their comments to SEC, CBOE and Amex jointly funded a study to assess existing communications technology and its applicability to options markets. This study also assessed the feasibility of the Tellefsen study's recommendations.<sup>12</sup>

The CBOE and Amex study disagreed with the findings of the Tellefsen study. Its major point was that OMINTS was designed to "clone" ITS and that ITS' technology is outdated. The study recommends constructing a new system to integrate the options markets to take full advantage of modern technology and recent market innovations, such as automatic execution systems. The study notes that "trading systems in the securities markets need a major overhaul." It further recommends that all securities exchanges, not only options exchanges, should take advantage of modern technology and fully integrate trading activities because full integration will enable the U.S. capital markets to prepare "for the challenges of the year 2000 and beyond."<sup>13</sup>

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## SEC Seeks Voluntary Delay in Implementing Multiple Trading of Existing Options

On January 9, 1990, SEC Chairman Richard Breeden sent a letter to the five U.S. options exchanges requesting that they refrain from listing options already allocated to another exchange until June 30, 1990. In his letter, the Chairman wrote that his request is based on comments from the options exchanges, and the two studies commissioned by the exchanges after the rule change was adopted. He determined that market linkages for options trading could be achieved in the near term and that a linkage system "should increase opportunities to ensure best execution of customer orders and improve the ability of members of every options exchange to compete effectively in making markets for each option." The Chairman noted that SEC has the authority to require a specific linkage system, but he prefers that the options exchanges design it themselves on a joint basis. Therefore, he wrote, it is premature for SEC to direct the exchanges to build a specific linkage system. The Chairman

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<sup>12</sup>Options Market Integration: An Evaluation, Yakov Amihud and Haim Mendelson, December 1989.

<sup>13</sup>Options Market Integration: An Evaluation, Yakov Amihud and Haim Mendelson, December 1989, p. 61.

also warned the exchanges that SEC would take "appropriate action" against any exchange that attempts to stall efforts aimed at building a linkage system.

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## Conclusions

To the extent it increases competition and improves prices for investors, SEC's approval to permit multiple listing and trading of options responds to the congressionally mandated national market system goals. However, the full benefits of multiple trading of options, including national market system goals, may not be realized without an effective trading linkage system. Without SEC's direction, it is unlikely that the markets will develop a trading linkage system on their own. SEC's January 1990 letter to each options exchange addresses the need for a market linkage system and attempts to deal with potential competitive conflicts among the exchanges that might stall development of a linkage facility. This is an appropriate first step to ensure that a linkage system is developed in the near term.

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## Recommendations to the Securities and Exchange Commission

We recommend that SEC closely monitor the exchanges' progress in developing a market linkage system for options trading. If SEC determines that the exchanges are not making sufficient progress, we recommend that SEC direct construction of a linkage system.

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## Agency Comments and Our Evaluation

SEC noted its Chairman's letter to the options exchanges requesting that they develop a joint plan for a market linkage facility and indicating that SEC will consider ordering construction of a linkage system absent agreement by the options exchanges within a reasonable time. They further noted that the Chairman requested exchanges to refrain from trading any option that had been exclusively granted to another exchange until June 30, 1990. We agree with the approach SEC has taken in regard to the multiple listing of options and the need for a market integration facility. We changed the text to account for the Chairman's January 1990 letter.

Officials of the four major options exchanges each presented their opinions on the need for and form of an intermarket trading linkage. Their comments parallel each exchange's official positions reported in this chapter.

# U.S. Securities Markets Today

In the United States, stocks are traded through two basic types of market structures: auction markets typified largely by exchanges, and dealer markets typified largely by the over-the-counter (OTC) market.<sup>1</sup> The United States has eight stock exchanges, the largest being the New York Stock Exchange (NYSE), and the OTC market, which includes the National Association of Securities Dealers Automated Quotations system (NASDAQ). Table I.1 lists the markets by their 1989 average daily trading volume. Stock options, also classified as securities, trade on five U.S. exchanges.

**Table I.1: Average Daily Volume of U.S. Stock Exchanges and NASDAQ (1989)**

Market	Volume (Shares in millions)
New York Stock Exchange	165.5
National Association of Securities Dealers Automated Quotations system	133.1
American Stock Exchange	12.4
Midwest Stock Exchange	11.6
Pacific Stock Exchange	6.8
Philadelphia Stock Exchange	3.8
Boston Stock Exchange	3.2
Cincinnati Stock Exchange	1.0

Note: The Spokane Stock Exchange is not included in this table because of minimal market activity.

Source: Data provided by each exchange and NASD.

## Stock Markets and Trading Mechanisms

The primary purpose of stock markets is to facilitate capital formation for corporations. Corporations pay fees to the market where their stock is listed. While firms are technically "listed" on either an exchange or NASD market, the general term "listed stock" has evolved to mean only stocks listed on exchanges. Those listed through the NASD are generally referred to as OTC or NASDAQ stock.

Key participants in an exchange auction market are the specialists and floor brokers, while key participants in a dealer market are market makers. Each of these participants plays a unique and different role in the auction and dealer markets.

<sup>1</sup>For a full description of U.S. securities trading and regulatory structure, see *Securities and Futures: How the Markets Developed and How They Are Regulated*, (GAO/GGD-86-26, May 1986).

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## Exchange Markets

Specialists and floor brokers are key players in influencing how well exchange markets operate. Exchange specialists, who are assigned stocks by exchanges, are responsible for maintaining fair and orderly markets in their assigned stocks. Each stock is assigned to only one specialist firm. Specialists act as brokers when they present customer orders to the trading crowd of floor brokers and act as dealers when they buy or sell stock for their own account.

In an auction market, investors' buy and sell orders are usually matched to execute trades. In their orders, investors either stipulate a price at which they will buy or sell, or instruct their broker to execute a trade at the current market price. Investor orders can reach the trading floor in a number of ways. On NYSE, broker/dealers can transmit an investor order to the exchange floor by telephone to its trading booth or through an electronic order routing system<sup>2</sup> to either its trading booth or the appropriate specialist's trading post.

For orders reaching the floor at a firm's trading booth, a floor broker will either take the order to the specialist, who may execute it on the floor broker's behalf when it matches another order, or engage in an oral bidding process in the crowd of floor brokers around the specialist post. A trade is completed when a floor broker's bid or offer matches an offer or bid of another floor broker, the specialist, or an order on the limit order book.

For orders reaching the floor at a specialist's post, the specialist may (1) match the order with other investor orders on the limit order book, (2) match the order with a bid or offer from the trading crowd, or (3) take the other side of the order as a dealer. Specialists act as dealers when they take the other side of an order if no other buyers or sellers exist. Their role as dealers in these cases helps maintain price continuity and market stability, and is part of their responsibility to maintain fair and orderly markets.

With the exception of the Cincinnati Stock Exchange, all the exchanges employ the specialist system for stock trading. Cincinnati, the only fully automated U.S. exchange, has no trading floor and uses a competing market maker system.

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<sup>2</sup>NYSE's electronic order routing system is the Designated Order Turnaround system (DOT), also known as SuperDot.

## OTC Markets

In contrast to an auction market, the OTC market is a competing dealer market. NASD market makers, also referred to as dealers, execute trades in the NASDAQ market. Customer orders do not interact with each other. Because all trades are executed by a dealer and are not subject to floor negotiation, it is not an auction market. Individual dealers compete with each other in making markets by quoting prices at which they will buy and sell a specified number of shares of a stock. The average number of market makers in NASDAQ/NMS<sup>3</sup> stocks is 12, but some stocks have over 50. Trades are made through a system of computers and telephones. NASD market makers are dealers who buy and sell stock for their own account and must quote a continuous two-sided market. Market makers are required to offer two-sided quotes—a bid and an ask price—to be able to trade. In other words, dealers must be willing to execute trades on both the buy and sell side to have their quote displayed.

Market makers act as dealers and as agents. Most trades executed in the NASD market are principal trades where market makers execute orders against their inventory. However, NASD rules require a market maker to execute trades at the best price in the NASDAQ system or to offer the trade to the market maker that is advertising the best price. In these instances, the market maker acts as an agent by routing orders to the market maker with the best price.

When a NASD market maker functions as an agent for an order of less than 1000 shares, he or she may route the order through the small order execution system (SOES). SOES automatically executes the trade at the market maker firm quoting the best price for the customer in the system. NASD rules enacted after the crash require all NASD market makers to participate in SOES for all agency trades in NASDAQ/NMS stocks in which they make markets.

In addition to the exchange and NASDAQ markets, trades are executed in third and fourth markets which, like NASDAQ, are also classified as OTC. The third market consists of firms, not belonging to an exchange, that trade exchange-listed stocks by matching customer orders or trading stocks out of their inventory. Bernard L. Madoff Investment Securities is a prominent third market maker. Fourth market trades are those made directly between institutional investors, usually facilitated through the

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<sup>3</sup>NASDAQ/NMS are stocks that NASD classifies as national market system stocks. These are NASD's most highly capitalized stocks and attract the most volume.

use of proprietary trading systems.<sup>4</sup> Instinet and Jefferies and Co. both operate fourth market trading systems.

## Trading Market Linkages

Communication and trading among the securities markets are linked by such systems as the Consolidated Transaction Reporting System (consolidated tape), the Consolidated Quotation System (consolidated quote), the Intermarket Trading System (ITS), and NASD's Automated Quotations system (NASDAQ). Current quotation and trade information from the exchanges and NASD is transmitted electronically over these systems to video display screens that are available on exchange floors and elsewhere for use by specialists, floor brokers, broker/dealers, NASD market makers, and other subscribers. These systems are designed to centralize and capture all trading volume and prices in stocks. ITS enables users to direct orders to the market with the best available price.

The consolidated tape collects price and volume data for all trade executions made for listed stocks. This information is then disseminated in sequence to exchange floors and other subscribers. The consolidated quote system collects quotations from all markets trading reported securities, identifies which market has the best bid and offer in each security, and redistributes the information.

NASDAQ is the OTC counterpart of the consolidated tape and consolidated quote. It collects and disseminates quotations of NASD market makers in OTC stocks. For the larger, more active OTC stocks, NASDAQ also provides trade reporting.

ITS is an electronic communication and order routing network that links eight markets—NYSE, Amex, BSE, CSE, MSE, PSE, and PHLX, and NASD. ITS allows regional exchanges<sup>5</sup> and the NASD to compete for investor order flow in certain stocks listed on NYSE or Amex.<sup>6</sup> Specialists, floor brokers, and market makers can transmit an order through ITS to the market

<sup>4</sup>Proprietary trading systems are computerized trading and information systems that allow subscribers to anonymously indicate their buy or sell interest, usually for blocks of stock, to other subscribers. The system attempts to match orders between investors.

<sup>5</sup>BSE, CSE, MSE, PSE, and PHLX are referred to as "regional" exchanges. NYSE and Amex are referred to as "primary" exchanges because all ITS stocks are listed on them. One regional exchange official stated that the term "regional" is a misnomer because its market is both national and international in scope.

<sup>6</sup>Stocks traded over ITS are listed at either NYSE or Amex. Although it is not prohibited, as a matter of practice NYSE does not trade Amex-listed stocks and Amex does not trade NYSE-listed stocks.

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offering the best quote. This system provides a system by which specialists at the various exchanges can compete with one another in offering the best price for shares of stock.

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## Options Markets

Stock options are contracts giving the holder the right to buy or sell a stated number of shares of a particular stock at a fixed price within a predetermined time period. Typically, a single option contract gives the buyer the right to buy or sell 100 shares of a specific stock.

Options allow investors to pursue different trading strategies besides the typical long-run investment position of buying a stock, holding it, and hoping for price appreciation, or selling a stock short (i.e., selling a stock before taking ownership) in anticipation of a decline in price. For example, speculators can create highly leveraged positions with high potential returns accompanied by substantial risk by using stock options. Alternatively, investors can use options to create positions having less risk of loss than the above described long or short positions in the stock market.

Stock options are traded on CBOE, Amex, PSE, PHLX, and NYSE. Options on most listed stocks are allocated to a single exchange on a lottery basis. In May 1989, SEC approved a major change to the way stock options will be listed and traded on exchanges. Rather than the former procedure of allocating an option on a stock to a single exchange, SEC now allows any exchange to trade any new option listed after January 22, 1990. Under current rules, multiple listing will be extended to cover all options beginning in January 1991. Table 1.2 lists the 1989 average daily volume of stock options contracts traded at each of the options exchanges. Table 1.3 lists the number of stock option contracts listed at each exchange as of December 31, 1989.

**Appendix I**  
**U.S. Securities Markets Today**

**Table I.2: Average Daily Stock Options  
Contract Volume of U.S. Options  
Exchanges (1989)**

<b>Exchange</b>	<b>Contract volume</b>
Chicago Board Options Exchange	245,647
American Stock Exchange	164,998
Pacific Stock Exchange	71,200
Philadelphia Stock Exchange	66,536
New York Stock Exchange	14,309

**Table I.3: Number of Stock Options  
Listed at Options Exchanges (December  
1989)**

<b>Exchange</b>	<b>Number of stock options listed</b>
Chicago Board Options Exchange	217
American Stock Exchange	189
Pacific Stock Exchange	139
Philadelphia Stock Exchange	133
New York Stock Exchange	44

Source: Data provided by each exchange.

# Comments From the Securities and Exchange Commission

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



DIVISION OF  
MARKET REGULATION

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

January 26, 1990

Richard L. Fogel  
Assistant Comptroller General  
General Government Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Re: General Accounting Office Report, Securities Trading: SEC Action Needed to Address National Market System Issues

Dear Mr. Fogel:

The Securities and Exchange Commission ("Commission") has authorized me to respond to your request for comments on a draft report to be issued by the General Accounting Office ("GAO") entitled Securities Trading: SEC Action Needed to Address National Market System Issues. The Division of Market Regulation ("Division") has reviewed the draft report and is submitting this letter in response to your invitation to comment.

In the draft report GAO concluded that the Commission needs to re-evaluate several market structure issues to assure that the markets continually meet the goals of a National Market System. Specifically, GAO recommended that the Commission revisit: (1) the appropriateness of certain exchange rules that limit members' ability to execute trades off the floor of the exchange (so-called "off-board trading restrictions," e.g., the New York Stock Exchange's Rule 390), particularly as they apply to after-hours trading; (2) the effectiveness of the Intermarket Trading System ("ITS") in meeting the National Market System goals it was designed to address; and (3) whether market integration facilities should be built to accommodate multiple trading of options.

The Division agrees that the issues raised by GAO are important National Market System issues that require careful scrutiny. Indeed, these issues have been the subject of an ongoing assessment by the Commission and its staff since the Securities Acts Amendments of 1975<sup>1</sup> directed the Commission to facilitate the development of a National Market System.

The first recommendation in the draft report was that the Commission again evaluate the continued validity of off-board trading restrictions. The Division agrees that it now may be

<sup>1</sup> Pub. L. No. 94-29, 88 Stat. 97 (June 4, 1975).

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appropriate to re-examine the application of these rules to members' after hours trading.<sup>2</sup> As you know, the volume of off-shore trading in U.S. securities in foreign markets after U.S. markets close has steadily grown over the years. The Division believes that much of this volume is attributable to institutional trading that is booked in London or other foreign markets not because that is where the counterparty was found but because of exchange off-board trading restrictions on the execution of trades in the U.S. OTC market. Two recent initiatives respond in part to these market developments. First, the Commission recently approved a Midwest Stock Exchange proposal to develop an after-hours trading system.<sup>3</sup> In addition, the NYSE has proposed to permit portfolios to be crossed after the close at the closing price on the exchange. While these initiatives provide some ability for exchange member firms to effect after-hours trades, that ability is still substantially circumscribed. Accordingly, the continued expansion of international trading may dictate that the after-hours application of off-board trading restrictions once again be re-evaluated by the Commission.

The Division believes, however, that the question of removing off-board trading restrictions during normal trading hours is substantially more complicated. Traditionally, commentators opposing the removal of off-board trading restrictions have raised a number of concerns over the ability of upstairs, integrated broker-dealers to internalize their order flow. Commentators have asserted that the internalization of order flow results in market fragmentation and does not provide a fair opportunity for exchange markets to compete.

Because of concerns over the anticompetitive nature of off-board trading restrictions, the Commission, in 1979, prospectively eliminated the application of those restrictions through the adoption of Rule 19c-3. In recent years, however, exchange member firms generally have not made markets in Rule 19c-3 securities.

In the absence of any market determination that the over-the-counter market is preferable to exchange markets, it would appear

<sup>2</sup> The New York Stock Exchange ("NYSE") interprets its Rule 390 to prohibit member trading in the U.S. over-the-counter ("OTC") market even outside the NYSE's hours of operation. See NYSE Rule 390, Interpretation .10.

<sup>3</sup> The Portfolio Trading System ("PTS") is a secondary trading system to be operated from 3:30 p.m. to 5:00 p.m. Central Time (4:30 p.m. to 6:00 p.m. Eastern Standard Time; after the New York Stock Exchange close) for the purpose of permitting the execution of transactions in qualified portfolios of equity securities.

See comment 1.

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undesirable for the Commission to override the concerns previously expressed by the vast majority of commentators and remove off-board trading restrictions applicable during normal trading hours. Accordingly, while the Division will continue to monitor carefully developments in the trading markets, including the development of new automated trading systems, we believe it would be premature to commence a formal review of the removal of these off-board trading restrictions at this time.

The second recommendation was that the Commission undertake a comprehensive review of the ITS. The Division agrees with GAO that a continual assessment of the effectiveness of the ITS in achieving the National Market System goals is an important aspect of the Commission's responsibilities under the Securities Exchange Act of 1934. Indeed, the Division has been continually reviewing ITS, from both an operational and a policy perspective, since the system's implementation.<sup>4</sup>

The draft report noted that only "incremental changes" have been made to the ITS since the system was implemented, but that there are a few continuing issues, most of which the Division believes also are capable of solution through what the draft report characterizes as incremental changes to the ITS. Indeed, several of the changes are currently being considered or are in the process of being adopted by the ITS participants.

Specifically, the draft report noted: (1) the lack of pre-opening notifications after order-imbalance trading halts; (2) the lack of pre-opening procedures when the primary market opens the stock within a certain range of the prior day's closing; (3) the lack of time-stamping of floor broker orders by NYSE specialists; and (4) the lack of an effective dispute resolution mechanism. In addition, the GAO noted the capacity problems experienced by the ITS during the October 1987 Market Break. Finally, GAO noted that some commentators have called for an enhancement to the ITS to provide automatic execution for some orders.

As noted in the report, several of these issues are currently being addressed by the ITS participants in conjunction with the Commission. For example, the issue of pre-opening notifications after order-imbalance trading halts is close to being resolved. The ITS participants have nearly reached agreement on proposed amendments to the ITS Plan to provide procedures for such pre-opening notifications. In addition, the participants have begun formal discussions on developing an effective dispute resolution system that would allow the involved ITS participants to choose an

<sup>4</sup> As noted in the draft report, the Commission issued studies in 1981 and 1982 on the operation of the ITS.

See comment 2.

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independent third ITS participant to decide disputes arising under the plan that are above a certain dollar level.

Similarly, the Division believes that the self-regulatory organizations ("SROs"), in conjunction with the Commission, have addressed a number of the capacity and operational problems that arose during the October 1987 Market Break. The Market Break highlighted the need for markets to maintain systems that can efficiently process a high volume of trading activity. Since then, the markets have taken numerous steps to improve their computer and communications facilities. For example, the NYSE has implemented system enhancements that will allow it to handle a 600-million share day without significant delays in its order processing and information dissemination systems. The regional exchanges also have made substantial improvements to their order routing and execution systems. These steps range from adding additional computer hardware to revising software protocols and developing additional back-up facilities. In addition, the SROs have conducted several stress tests, primarily testing the National Market Systems (*i.e.*, ITS and the Consolidated Transaction and Quotation Systems).

The trading experience during the market decline on October 13, 1989, demonstrated that the systems worked substantially better than two years ago. While the Commission believes that the SROs' performance on October 13, 1989, demonstrates that substantial progress has been made, it acknowledges the continued significance of the capacity and operational issues raised in the report. For this reason, the Division has encouraged the ITS users to examine, and if necessary to expand, the capacity and operational capabilities of their systems under conditions of extreme volatility and volume.<sup>5</sup>

With respect to the issue of whether an automated execution feature should be added to the ITS, the Division agrees that this is a change that the SROs should now consider. Such a feature would increase the certainty of customer order executions, which was a problem during the October 1987 Market Break. Currently, the ITS plan allows NYSE specialists one minute to respond after they receive a commitment to trade. During this time, however, the customer order is not assured an execution and is at risk of missing the market. While permitting professional investors to automatically execute against a specialist's quotation may impose

<sup>5</sup> See *e.g.*, the Automation Review Policy Statement recently issued by the Commission. Securities Exchange Act Release No. 27445 (November 16, 1989), 54 FR 48703.

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unacceptable risks for specialists,<sup>6</sup> the Division sees no clear reason why specialists should not be willing to guarantee quote-based executions for public investor orders in ITS.<sup>7</sup> Accordingly, the Division expects to review this issue at future ITS Operating Committee meetings.

See comment 3.

Finally, the draft report discussed the issue of multiple trading of options and the Commission's recent promulgation of Rule 19c-5 under the Act.<sup>8</sup> The draft report concludes that the Commission's action to remove impediments (in other words, certain exchange rules) to multiple trading of options is consistent with, and, in fact, "responds to the congressionally mandated National Market System goals." The draft report also recommended, however, that the Commission determine whether a trading linkage system for options is needed to realize the objectives of multiple trading of options and, if a linkage is necessary, that the Commission direct the options exchanges to develop the linkage. As noted in the draft report, the Commission has received copies of a study prepared on behalf of the NYSE, Pacific Stock Exchange and Philadelphia Stock Exchange and copies of a study prepared on behalf of the American Stock Exchange and the Chicago Board Options Exchange. The Division has met with and discussed these matters with the options exchanges on a number of occasions since the adoption of the rule. On January 9, 1990, Chairman Breeden sent a letter to each of the options exchanges requesting that they work

<sup>6</sup> Automatic execution exposes market makers/specialists to the risk of being "picked off" by other market professionals before they can respond to news or changes in other participants' quotations. This risk may discourage market makers/specialists from trading in size and thus reduce the market's depth and liquidity. Evidence of this problem can be seen even in the National Association of Securities Dealers' ("NASD") Small Order Execution System where the NASD had to expand its prohibitions against professional investor usage because groups of traders were employing the system to pick off market maker quotes after significant news announcements in NASDAQ stocks.

<sup>7</sup> It is important to note that the regional specialists have for some time done so through their automated execution systems.

<sup>8</sup> Rule 19c-5 amended the rules of national securities exchanges to prohibit (after a one-year phase-in period) any exchange from limiting by any means its ability to list any stock option class because that option class is listed on another exchange. See Securities Exchange Act Release No. 26870 (May 26, 1989), 54 FR 23963.

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together to develop a joint plan for a market linkage facility, and indicating that the Commission will consider ordering the construction of a linkage system absent agreement by the options exchanges within a reasonable time. To facilitate the design and construction of a linkage facility, the Chairman's letter requested each of the options exchanges to refrain, until June 30, 1990, from trading any options overlying an exchange-traded stock that was the subject of options trading exclusively on another exchange before January 22, 1990. At the same time, the Commission has abolished the prior system for allocating monopoly option trading privileges, and all new options listed for trading henceforth will be open for multiple trading.

The Division appreciates this opportunity to review the draft report and to provide our comments. We would like to commend the GAO on a well-balanced assessment of the competing policy questions raised by these important market structure issues.

Sincerely,

*Richard G. Ketchum*  
Richard G. Ketchum  
Director

See comment 3.

The following are GAO's comments on the Securities and Exchange Commission's letter dated January 26, 1990.

## GAO Comments

1. We have not recommended that off-board trading restrictions be removed. In fact, a reaffirmation by SEC of the need for trading restrictions would be as helpful as a conclusion that modification or elimination is necessary to ensure that the competitiveness, fairness, and efficiency of U.S. markets is not being hindered. We disagree that it is premature to reevaluate trading restrictions. The legislative mandate, SEC's own determination to reevaluate trading restrictions periodically, and the vast changes that have occurred in the securities markets in the 1980s indicate to us that SEC should now review the continued applicability of exchange trading restrictions. Unlike market participants, who may not have the perspective needed to view the marketplace as a whole, SEC is in a unique position to make determinations or recommendations for change that benefit the entire U.S. marketplace. However, we agree with SEC that the first consideration of this issue should cover the after-hours effects of the trading restrictions.

2. Our characterization of "incremental changes" is meant to show that many changes have been made to ITS on a piece-by-piece basis. The point is not that the changes made to the system have not been beneficial or necessary but, rather, that the number of changes made since SEC's last comprehensive review indicates the need for an overall assessment to determine whether the system continues to meet national market system goals. While we continue to believe that a comprehensive review of ITS is necessary, we understand that the changes to the system currently being considered are important and should continue. To the extent that a comprehensive review of ITS would detract from resolving these issues in the near term, the review could be delayed. However, such additional changes further support the need for a comprehensive system review.

3. We agree with the approach SEC has taken in regard to the multiple listing of options and the need for a market integration facility. We changed the text in chapter 4 to account for the Chairman's January 1990 letter and the December 1989 study commissioned by CBOE and Amex.

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# Glossary

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Ask	The price at which a person is willing to sell a security at a given time. Best ask is the lowest price sell order in the marketplace at a given moment. Also referred to as offer.
Auction Market	A market that permits investors' bids and offers to be matched with each other and executed when they meet.
Best Execution	A transaction that is consummated at the best available price.
Bid	The bid is the price investors declare they are willing to pay for a stock or options contract at a given time. Best bid is the highest priced buy order in the marketplace at a moment in time.
Bid/Ask Spread	The size or amount of the price difference between the bid and the ask of a reported quote.
Block Trade	A purchase or sale of a large number of shares or dollar value of stock. Although the term is relative, 10,000 or more shares, or any quantity worth over \$200,000, is generally considered a block.
Broker	An agent who handles the public's orders to buy and sell stocks or options.
Consolidated Quotation System	A nationwide computerized report of prices currently bid and offered on participating exchanges and in the over-the-counter market for the same securities, and the number of shares sought or offered at these prices.
Dealer	An individual or firm in the securities industry who buys and sells stocks for his own account as a principal rather than as an agent.
Dealer Market	A market in which competing bids and offers are entered by dealers, and customer orders are executed against a dealer's portfolio.

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Glossary

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Derivative	An instrument whose value is determined primarily by the price at which an underlying security is trading. Options and futures contracts are derivatives.
Designated Order Turnaround System	An electronic order routing system at NYSE that allows NYSE member firms to transmit small orders in NYSE-listed stock from their offices to the appropriate trading post on the floor.
Equity Security	A security representing an ownership right of its issuer, such as stock.
Fixed Commission Rate	A fixed schedule of fees paid by investors to broker/dealers for trade execution services. These schedules were abolished in 1975.
Floor Broker	An employee of a member firm of a stock exchange who executes orders on the exchange floor for the firm's customers.
Hedging	Taking a position in a derivative instrument, such as a futures or options contract, opposite to a position held in the underlying asset to minimize the risk of financial loss from an adverse price change.
Institutional Investor	A corporate or organizational investor that is managed by professionals, whose job is to earn income and capital gains by investing pools of capital. Examples of institutional investors are pension funds and mutual funds.
Intermarket Trading System	An electronic trading linkage among the primary and regional stock exchanges and NASD. The system allows brokers to seek best execution in any market within the network.
Limit Order	An order to buy or sell a stated amount of a security or a commodity at a specified price, or at a better price if obtainable, after the order is entered.

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Glossary

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Liquidity	The ease with which an asset may be converted to cash at a price close to its last publicly traded transaction.
Listed Stock	The stock of a company which is traded on a securities exchange.
Market Maker	A dealer who specializes in trading financial products regularly, intending to profit from the timing of trades and the spread between the bids and offers.
Market Order	An order to buy or sell a stated amount of a security at the most advantageous price obtainable in the market after the order is entered.
Member Firm	A firm, registered as a broker or dealer in securities, that conducts business on and is subject to the rules of a stock exchange or a securities association.
Multiple Listing	Listing of a stock or option contract on more than one exchange.
NASDAQ	The National Association of Securities Dealers Automated Quotations system. NASDAQ is an interactive dealer-driven system for advertising quotes and reporting transactions in OTC securities in the United States.
NASDAQ Stock	The stock of a company which is included in the NASDAQ system.
NYSE Rule 390	A rule of the New York Stock Exchange that restricts trading of exchange-listed stock by exchange members in over-the-counter markets; a successor to NYSE Rule 394.
Offer	The price at which a person is willing to sell a security at a given time. Best offer is the lowest priced sell order in the marketplace at a given moment. Also referred to as ask.

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Glossary

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Option	A right to buy (call) or sell (put) a fixed amount of a given asset at a specified price within a limited period of time.
Order Flow	The volume of buy and sell orders sent to a particular market during a particular period of time.
OTC	Over-the-counter. This encompasses all securities trading that does not occur on an exchange. The primary example of OTC trading occurs in the NASDAQ system.
Primary Exchange	Stock exchanges, which, as distinct from regional exchanges, are exchanges of original listing of the stocks of a large number of geographically dispersed firms. In the United States, the New York Stock Exchange and the American Stock Exchange are primary exchanges.
Quote	The price at which a given asset can be bought or sold at a given time.
Regional Exchange	Exchanges whose trading volume is dominated by stocks that are listed on a primary exchange. They do this by virtue of unlisted trading privileges granted by the SEC.
SEC	The United States Securities and Exchange Commission, the federal agency charged with regulating the U.S. securities industry.
Self-Regulatory Organization	Designated groups of industry professionals equipped with quasi-governmental powers to adopt and enforce standards of member conduct. Their regulation is carried out under government supervision. Exchanges and NASD are examples of SROs.
Specialist	A member of an exchange who handles transactions on the trading floor for the stocks for which he or she is registered and who has the responsibility to maintain an orderly market in these stocks. Specialists do this by buying or selling a stock for his own account when there is a temporary disparity between supply and demand for the stock.

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# Related GAO Products

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Financial Markets: Preliminary Observations on the October 1987 Crash (GAO/GGD-88-38, January 1988).

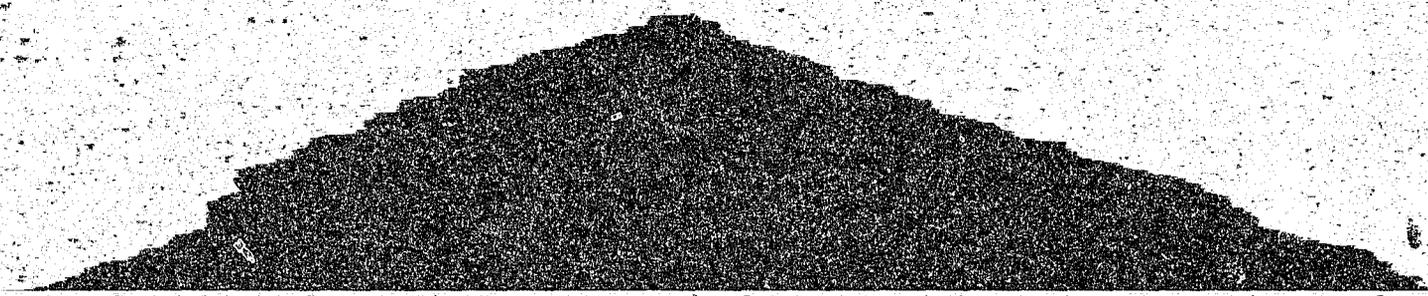
Developments Since the Market Crash of October 1987 (GAO/T-GGD-88-33, April 1988).

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THE UNIVERSITY OF CHICAGO

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FROM: DR. J. J. THORPE, PHYSICS DEPARTMENT  
UNIVERSITY OF CHICAGO

RE: A PROPOSAL FOR THE PURCHASE OF  
A PORTABLE X-RAY FLUORESCENCE ANALYZER

UNITED STATES  
GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

OFFICE OF THE COMPTROLLER  
GENERAL OF THE UNITED STATES

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