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FINANCIAL MARKETS

Information on Computer Data Used for Stock Market Crash Studies

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GAO

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Information Management and
Technology Division

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

Dear Mr. Chairman:

In your March 4, 1988, letter and in subsequent discussions with us you asked that we provide information on several topics dealing with the impact of program trading on the stock market crash of October 1987.[1] On April 27, 1988, we testified before your Committee on, among other things, the differences in methodologies used and conclusions reached by various groups that evaluated the effects of program trading on the decline in stock prices during the October crash.[2] In addition, we reported on the capabilities of the New York Stock Exchange and member firm computer systems to identify program trades and to differentiate between program trading strategies.[3]

This report addresses your request for information on an allegation received by your Committee that the New York Stock Exchange supplied different computer transaction data to the Securities and Exchange Commission (SEC) and the Presidential Task Force on Market Mechanisms (Brady Commission) for use in their studies of the October 1987 market crash than it provided to Mr. Nicholas Katzenbach, a consultant to the Exchange.[4] Mr. Katzenbach was responsible for the preparation of a December 1987 report discussing the impact of program trading on current market practices.[5] Specifically, it was alleged that only Mr. Katzenbach was provided computer transaction tapes with data on the October 1987 crash that (1) distinguished program trades from non-program trades and (2) reflected the actual time each program

[1] The term program trading refers to the buying or selling of a large number of stocks of different corporations simultaneously.

[2] Developments Since the Market Crash of October 1987 (GAO/T-GGD-88-33, Apr. 27, 1988).

[3] New York Stock Exchange: Capability of Automated Systems to Identify Program Trading (GAO/IMTEC-88-36, Apr. 27, 1988).

[4] The SEC report, The October 1987 Market Break, was issued in February 1988. The Brady Commission report, Report of the Presidential Task Force on Market Mechanisms, was issued in January 1988.

[5] Mr. Katzenbach's report is entitled An Overview of Program Trading and Its Impact on Current Market Practices.

trade was executed. This information allegedly resulted in differing con clusions among these studies on the amount of program trading activity and its impact on market volatility during the October 1987 crash.

Although it appears that Mr. Katzenbach received different data on pro gram trades from the New York Stock Exchange than that requested and provided to the SEC and the Brady Commission, our inquiry indicates that the SEC and the Brady Commission had knowledge of the types of data Mr. Katzenbach was provided. The SEC and the Brady Commission chose not to request data similar to that provided to Mr. Katzenbach primarily because the Exchange's data did not distinguish among the various trading strategies employed by its member firms dur ing the October 1987 crash. In conducting their studies, the SEC and the Brady Commission independently decided to obtain program trading data directly from member firms, rather than rely on computer transac tion data provided by the Exchange.

Objectives, Scope, and Methodology

Our objective was to obtain information on whether program trading and order execution data provided to Mr. Katzenbach by the New York Stock Exchange was also made available to the SEC and the Brady Commission for use in their studies of the October 1987 stock market crash. To accomplish this objective we obtained information and documentation from key officials who helped to prepare the studies by the SEC, the Brady Commission, and Mr. Katzenbach. This information included the types of data provided by the Exchange for those studies.

In addition, we obtained from the SEC copies of the audit trail and daily transaction tapes that it received from the New York Stock Exchange for use in its and the Brady Commission's studies.[6] From officials who prepared the Katzenbach study we obtained descriptions of the content of the computer tapes they received from the Exchange and analyzed available documents. We analyzed these computer tapes and documents to identify the types of data the Exchange made available for these studies. As agreed with your office, our purpose was to identify the types of data available; we did not draw any conclusions on the volume or impact of program trading during the October 1987 stock market decline.

[6]Audit trail and daily transaction tapes were the primary source of computerized data provided by the New York Stock Exchange for use by the SEC and the Brady Commission. Among other things, data elements on these computer tapes include each transaction's (1) stock symbol, (2) trade price, (trade volume, (4) recorded time of execution, (5) type of account (principal/agent), and (6) identific tion of executing and clearing brokers.

Our review was conducted in accordance with generally accepted government auditing standards between April and August 1988.

Data Available for the Katzenbach Study

The data available for the Katzenbach study included computerized transaction tapes provided by the New York Stock Exchange that differentiated program trades from nonprogram trades. Specifically, according to documentation provided by an official responsible for the analysis of the tapes provided by the Exchange, the tapes included October 19, 1987, information on a minute-by-minute basis that detailed, for program and nonprogram trades: (1) the number of orders, (2) the number of shares executed in each order, and (3) the dollar value of each executed order. As we reported to you in April 1988,[7] the New York Stock Exchange is able to identify program trading through its computerized trading systems by analyzing the order traffic it receives over its communications lines.

Regarding the availability of data specifying the actual time of each order's execution, New York Stock Exchange officials stated that the tapes provided for the Katzenbach study included information produced by the Exchange's Consolidated Tape System. Among other things, this system maintains data on the time each executed trade was entered into the system.

Data Available for the SEC and Brady Commission Studies

In our April 1988 testimony before your Committee,[8] we provided the results of our analysis of the data assumptions and methodologies used by the SEC and the Brady Commission to determine the effect of program trading on the market's October 1987 decline. We testified that estimates of the levels of total program trading produced by the SEC and Brady Commission reports were similar. The SEC derived its estimates primarily from a survey of 16 firms that were large program traders and active in the futures markets, either for their own accounts or for the accounts of others during the weeks preceding the crash. The SEC provided all of the information it collected to the Brady Commission. Each group supplemented the survey data by conducting interviews

[7]GAO/IMTEC-88-36, Apr. 27, 1988.

[8]GAO/T-GGD-88-33, Apr. 27, 1988.

with the member firms' customers to determine more precisely the trading strategies each of the firms employed. In addition, the groups verified the survey data against audit trail transaction data from the New York Stock Exchange.

Regarding the two points raised in the allegation on the availability of information that differentiated a program trade from a nonprogram trade and the availability of times each executed trade was reported, officials of the SEC and the Brady Commission stated that they had knowledge of the availability of the data provided to Mr. Katzenbach. For example, a senior official within SEC's Division of Market Regulation, who had responsibility for the analysis of the Exchange's computer tapes, stated that the SEC requested and received a spread sheet from the New York Stock Exchange that provided breakdowns of the levels of program trading transactions executed at the Exchange as identified by the Exchange's List Order Processing feature.[9] These spread sheets provided the SEC with information similar to that provided for the Katzenbach study, but in a hard copy, summary format.

According to SEC officials, the Commission did not request more detailed data on program trading because it believed the Exchange's data were incomplete. Specifically, program trading data provided by the Exchange's List Order Processing feature did not include program trades executed on other exchanges and did not include program trades executed manually on the floor of the Exchange. More important, the Exchange's List Order Processing feature was not designed to differentiate among program trading strategies such as index arbitrage or portfolio insurance.[10] Because the SEC wanted to differentiate among program trading strategies, the Commission decided to rely on data it received from its survey of large program trading firms. The Brady Commission also received the program trading data from the SEC and similarly decided to primarily rely on data obtained from member firms. Both the SEC and the Brady Commission did use the program trading data provided by the Exchange to help confirm the accuracy of information received from their surveys.

[9]The List Order Processing feature is a software package developed by the New York Stock Exchange and used by member firms to facilitate the rapid transmission of program trades and trade execution reports to and from member firms and the Exchange.

[10]Index arbitrage refers to a practice where investors attempt to take advantage of spreads that periodically develop between equities, futures, and options markets by buying in the lowest-priced market and selling in the highest-priced market. Portfolio insurance defines a variety of new, sophisticated hedging strategies designed to protect broad-based portfolios against losses while retaining some price appreciation.

Both the SEC and the Brady Commission obtained audit trail tapes and daily transaction tapes from the New York Stock Exchange that provided information on the times each executed stock trade was entered into the Exchange's order processing system. However, because the SEC and the Brady Commission chose to rely on survey data from member firms rather than Exchange-generated computer data, and because the firms could only provide order entry times within the time frames of these studies, the SEC and the Brady Commission decided to base their studies on an analysis of the time that each transaction was reported to have entered the Exchange's order processing system. Specifically, the SEC assumed a 5-minute time lag from order entry to execution in arraying its trading data; the Brady Commission used the actual order entry times reported by the firms it surveyed. Overall, officials of these study groups commented that a more rigorous quantitative analysis of the trading data was not possible given the short time frames they had in which to complete the studies, and the limitations of the data.

We discussed the contents of this report with senior officials of the New York Stock Exchange and the Securities and Exchange Commission. These officials agreed with the information presented and made some clarifying comments. We have incorporated their comments as appropriate.

As arranged with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 5 days from the date of this letter.

Sincerely yours,

Ralph V. Carlone

Ralph V. Carlone
Director

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