135672

United States General Accounting Office

GAO

Report to the Chairman, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate

April 1988

NEW YORK STOCK EXCHANGE

Capability of Automated Systems to Identify Program Trading

135672

041990/135672

GAO/IMTEC-88-36

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

Information Management and Technology Division

B-229471

April 27, 1988

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

Dear Mr. Chairman:

This report responds to your March 4, 1988, request that we (1) describe the computer systems of major New York Stock Exchange member firms that are linked to the Exchange and used for basket trades,[1] (2) determine whether the Exchange's and members' systems have the capability of identifying basket trades and differentiating between trading strategies such as index arbitrage and portfolio insurance,[2] and (3) determine whether the Exchange's and members' systems have been improved since October 1987 to permit more accurate reporting of various program trading strategies.

The computer systems used for basket trading by the 10 member firms we reviewed ranged from large scale computers to a microcomputer.[3] The firms used either their own software, software provided by the Exchange, or both, to transmit basket trades to the Exchange. Both the Exchange's and these member firms' computers can identify basket trades. The Exchange's computer systems cannot differentiate between trading strategies such as index arbitrage, although 6 of the 10 member firms' computer systems have this capability. The Exchange has not upgraded its systems since October 1987 to differentiate between trading strategies, although it intends to develop this capability. The lack of this capability restricts the ability of the Exchange to electronically monitor the trading strategies employed by market participants under various market conditions and to electronically enforce rules regarding their use. The four member firms whose computer systems could not differentiate between trading strategies do not have plans to develop this capability because it is not required by the Exchange.

[1]Basket trades are trades in which many different stocks are traded at once (also referred to as program trades). In this report, we use the terms interchangeably.

[2]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 is a term used to define a variety of new sophisticated hedging strategies designed to protect broad-based portfolios against losses while retaining some price appreciation.

[3]A microcomputer is a compact computer with relatively limited capability and capacity.

In conducting our work, we interviewed responsible New York Stock Exchange officials regarding their methods used to identify and track program trading and reviewed pertinent documentation. As agreed with your office, we also surveyed 10 member firms, 7 of which were considered by the Securities and Exchange Commission to be major basket traders. The 10 firms were selected from a list of 31 firms identified by the Exchange as basket traders. We obtained limited information on their systems and the capability of their systems to identify basket trades. Because of time limitations, this information was obtained primarily through interviews. Details of our objectives, scope, and methodology are included in the appendix.

Computer Systems That Are Linked to the Exchange for Basket Trading

At the Exchange, computerized trading systems are used to automatically route orders to buy and sell stocks from member firms and other exchanges to the appropriate trading posts on the floor of the Exchange, for execution. The computer system that provides an electronic link for stock trading between the New York Stock Exchange and member firms is called the Common Message Switch System. This system receives orders from member firms through about 600 dedicated communications lines and forwards them to the trading posts through other systems. Of the 10 firms we reviewed, 5 used one or more microcomputers for basket trading. Two of the firms used large-scale computers and medium-sized minicomputers, respectively. The other 3 firms used combinations of large-scale computers, minicomputers, and microcomputers.

In the summer of 1985, the Exchange developed a software package called the List Order Processing feature to facilitate the rapid transmission of program trades from member firms. This software, which can be installed in member firms' computers, enables these firms to prepackage and route orders involving up to 500 stocks into the Exchange's Common Message Switch System. The use of these automated means, as compared to manual processes, reduces the time required to execute a particular program trade, and therefore increases the probability that the basket of stocks will be bought or sold at or near the advertised price of the stocks when the order was transmitted.

To better interface with their own systems, 4 of the 10 firms we surveyed did not use the List Order Processing feature, but had developed their own software to transmit basket trades. Four other firms used only the Exchange's List Order Processing feature for program trading. The remaining two firms used both their own software and the Exchange's List Order Processing feature. All of the firms we surveyed have the capability of modifying the contents of a particular basket of stocks during a trading day.

Capabilities of Exchange and Member Firms' Computer Systems to Identify Basket Trades and Trading Strategies

The computer systems at the Exchange can distinguish basket trades from other types of trades by analyzing the order traffic on the communications lines. The Exchange periodically asks its member firms to identify the communications lines dedicated to basket trades. At the time of our review, the Exchange's members had identified 56 of the Exchange's 600 dedicated communications lines that were used exclusively for basket trades. In addition, 7 of the Exchange's member firms had provided the Exchange with 24 different branch codes[4] that they use to identify basket trades. Exchange officials told us that sales representatives of the Exchange's Equity Sales and Customer Service Department are in close contact with member firms to ensure that information on communications lines and branch codes for basket trading is up-to-date.

For the 10 member firms we reviewed, we compared the number of communications lines and branch codes shown in the Exchange's records with information obtained from them. We found two instances where Exchange records were inconsistent with information provided to us by the firms. In one instance the Exchange's records showed one more communications line than the firm had identified to us. In the other instance the Exchange identified fewer branch codes than the firm was actually using. We pointed out these differences to the Exchange, which was working with the firms to reconcile the differences at the close of this review. Although the Exchange agreed with these discrepancies, it did not believe that they impaired its ability to identify basket trading.

The Exchange's systems are not designed to differentiate between trading strategies such as index arbitrage or portfolio insurance. According to Exchange officials, the Exchange did not design its systems to distinguish between specific types of trading strategies, because in 1985, when the List Order Processing feature was designed, it was unclear which program trading strategies would be broadly and aggressively used. Exchange officials also said that, because of a desire to maintain a consistent automated order format for both retail and basket trades, it

[4] A branch code is a code inserted into a transaction sent to the Exchange's Common Message Switch System from the member firms that, in specified cases, indicates that the transaction is a basket trade.

did not want to add additional codes that would complicate the development of the order format.

The computer systems of all 10 member firms we reviewed were also capable of identifying program trades. In addition, 6 of the 10 were able to identify, from internal transaction records within their own computers, the types of trading strategies they employed. To distinguish between trading strategies, the 4 remaining firms had to either manually reconstruct records of orders or ask their customers which strategies were employed.

Capability of Computer Systems to Identify Program Trading Strategies Has Not Been Upgraded Since October 1987

Since October 19, 1987, neither the Exchange nor the 10 member firms we reviewed have upgraded their capabilities to identify various program trading strategies. However, on February 24, 1988, the Exchange asked the Securities and Exchange Commission to approve a rule requiring member firms to refrain from using their automated systems to execute index arbitrage strategies on any day that there is a 50-point change in the Dow Jones Industrial Average. This rule was approved on April 20, 1988, for a 6-month period. The Exchange now intends to develop the capability to identify index arbitrage orders. Recommendations on possible alternatives to identify index arbitrage are expected to be presented to the President of the Exchange by the end of April 1988. A timetable for developing this capability has not been determined. Until the Exchange develops this capability, it will be unable to electronically monitor the use of this or other program trading strategies under various market conditions and electronically enforce rules regarding their use.

Officials of the four member firms we reviewed whose systems cannot differentiate between various program trading strategies told us they have not found a need to invest in this type of system improvement since the Exchange does not require their systems to have this capability.

We discussed the contents of this report with senior officials of the New York Stock Exchange and the Securities Industry Automation Corporation, which operates the Exchange's computer systems. These officials agreed with the information presented. We are providing copies of this report to other interested Members of Congress, executive branch agencies, and the public. We will also make copies available to others on request.

Sincerely yours,

Ralph V. Carlone

Ralph V. Carlone
Director

Objectives, Scope, and Methodology

Our objectives were to (1) describe the computer systems of major New York Stock Exchange member firms that are linked to the Exchange and used for basket trades, (2) determine whether the Exchange's and members' systems have the capability of identifying basket trades and differentiating between program trading strategies such as index arbitrage and portfolio insurance, and (3) determine whether the Exchange's and members' systems have been improved since October 1987 to permit more accurate reporting of various program trading strategies. As agreed with your office, we obtained only a general description of the types of computer systems (for example, microcomputer, minicomputer, large-scale computer) used by member firms to execute basket trades.

To accomplish these objectives, we interviewed the Vice President of Computer Operations at the Securities Industry Automation Corporation who is responsible for the operation of the Exchange's automated trading systems. We also interviewed the New York Stock Exchange's Senior Vice President for Equities. These officials maintained information on member firms' program trading activities and the capabilities of the Exchange's computer systems. We also reviewed the Exchange's floor standards, and rules regarding trading requirements of Exchange members using automated systems. In addition, we obtained the Exchange's list of communications lines dedicated to basket trading, and compared this list with information obtained from the 10 member firms we reviewed.

As agreed with your office, because of the short reporting time frames, we judgmentally selected 10 firms from a list of 31 firms identified by the New York Stock Exchange as program traders. Seven of the 10 firms selected were considered by the Securities and Exchange Commission to be major program traders. We obtained each firm's automated capabilities to identify basket trading and trading strategies primarily through interviews with officials from the member firms' marketing, equity sales, computer, and/or legal departments. Because of the limited number of firms reviewed, we are unable to project the results of this survey to the total universe of firms who conduct program trading. We discussed the facts contained in this report with the Exchange's Executive Vice President for Capital Markets, the President of the Securities Industry Automation Corporation, and other senior officials of the Exchange and the Corporation. These officials agreed with the facts in this report. This review was conducted from March 8, 1988, to April 19, 1988, and was conducted in accordance with generally accepted government auditing standards.

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