Return to the Stone Age . . . The Regulation of Program Trading, 8 Computer L.J. 479 (1988)

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REGULATION OF PROGRAM
TRADING

I. INTRODUCTION

In 1987, the financial markets in the United States experienced the
largest point-advances and declines in history. On January 23, the Dow
Jones Industrial Average (DJIA)\(^1\) climbed 64 points, only to fall 114
points in a period of seventy minutes.\(^2\) On October 19, 1987, also known
as “Black Monday,” the DJIA suffered its single greatest point loss for
a day - a drop of 508 points or 22.6% in value.\(^3\) Yet, most economic in-
dicators for the year were generally positive.\(^4\)

These great price movements, or market volatility, has generally
been tied to a single activity in the financial markets. This activity is
known as “program trading.” Suspicions have been raised about this
practice, which is a form of computerized arbitrage linking the stocks
on the New York Stock Exchange (NYSE) to various stock-index fu-
tures listed on the Chicago markets.\(^5\) Critics of program trading range
from John Phelan, Chairman of the NYSE, to Congressman John

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1. The DJIA is an index composed of thirty stocks. It is the foremost indicator of
the condition of the stock markets. The DJIA comprises the following stocks: Alcoa, Al-
lied Signal, American Express, AT&T, Bethlehem Steel, Boeing, Cheveron, Coca-Cola,
DuPont, Eastman Kodak, Exxon, General Electric, General Motors, Goodyear, IBM, In-
ternational Paper, McDonald’s, Mereck, 3M, Navistar, Philip Morris, Primerica, Procter &
Gambel, Sears Roebuck, Texaco, USX, Union Carbide, United Technologies, Westing-
house and Woolworth.

2. What Next? Investors Seek Clues In Friday’s Frenzied Stock Trading, Wall St. J.,
York Stock Exchange set a record with over 302 million shares changing hands. This beat
the previous record volume, set the previous week, by nearly 50 million shares). See also
Laderman and Frank, What Makes The Market Swing So Wildly, Bus. Wk., Feb. 9, 1987,
at 72.

[hereinafter Stocks Plunge] (losers led gainers by a 40 to 1 margin. A margin of 3 to 1 is
considered a rout. Over 604 million shares traded hands).

4. See Baker Expresses Optimism, Criticizes West Germany On Rising Interest
Rates, Wall St. J., Oct. 16, 1987, at 3, col. 3 (comments of Treasury Secretary James
Baker).

5. See Laderman and Frank, How Chicago Zaps Wall Street, Bus. Wk., September
29, 1986, at 92, 93.
Dingell (D-Mich), Chairman of the House Energy and Commerce Committee which oversees the Securities and Exchange Commission.6 Fearing further volatility, these and other individuals are looking for ways to regulate program trading.

This Note examines the interrelation between stocks and financial commodities and how program trading effects their prices. It then briefly analyses the benefits and problems stemming from the computerized trading practice. The Note also presents various proposed solutions to program trading problems. It discusses whether these solutions address problems arising from the introduction of computer technology to the markets or problems stemming from the use of stock-index futures.

II. THE ACTION

Program trading is a relatively new form of financial arbitrage.7 It is one of many forms of stock-index related strategies which include activities such as portfolio insurance. Arbitrage, as used in program trading, consists of the simultaneous purchase and sale of stock index futures and the bundle of stocks that make up that index. The majority of the stock index futures are traded on the Chicago markets. Stock index futures are a form of commodity contract, just like a contract for wheat, sugar or gold. Commodities have their roots in the agricultural markets, dating back to the time of the Civil War.8 Unlike most commodities, which are used as a means of shifting risk from the producer of a product to a speculator and require delivery of the product at expiration, the stock-index futures are a form of financial commodity. The financial commodity is considered an efficient way to "buy the market," a method of accepting a risk-return ratio equal to the ratio experienced by the market as a whole.

Various stock-index futures are based on either well known broad-based stock indices, such as the Standard & Poor (S&P) 500,9 or specific well-known stocks, such as the Major Market Index (MMI).10 Foreign


7. Stock-index futures, an integral part of program trading, did not become available for trading until February 1982.


9. S&P 500 is made up of 400 industrial companies, 40 utilities, 20 transportation companies and 40 financial institutions.

10. See BYRNE, THE STOCK INDEX FUTURES MARKET 22-23 (1987) [hereinafter Byrne] (the MMI was developed in 1983 by the American Stock Exchange (AMEX) in response
stock indices and narrow-based stock indices, based on a group of stocks from a certain industry like high-technology or oil production, also exist. Unlike most commodity futures, which require settlement through delivery of the commodity, stock-index futures are cash settled. Which means that, upon the close of the market, the future expires. Cash must be paid to the holder of the future based on the price of the index.

Stock indexes have cash values. For price-weighted indexes, cash values are the sum of the price of each component stock divided by a number determined at the creation of the index. The divisor is used to convert the value of the index into amounts that are easier to trade. The cash value for stock indexes and their corresponding futures do not always have the same value. In the static mode, however, futures should sell at a slight premium over the index value. Although an investor, who buys a futures contract which represents ownership of an entire basket of stocks, loses in dividend income, he realizes his loss in interest income since he invests a fraction of the purchase price of all the stocks in the index. The equation illustrating the relationship between the price of the futures and the stock index is \( F = S(1 + r - d) \), where the price of the futures contract is \( F \), the underlying stock index price is \( S \), where \( r \) is the riskless rate of interest over the life of the contract and \( d \) is the rate at which dividend income is expected to accrue on an investment in the underlying index over the same contract life.

In the market, two basic considerations govern the pricing of the
stock-index future as based on the index's cash value. The first is the investor's outlook on the market. If investor sentiment is bullish, and an upward move in prices is predicted, the futures will sell at a premium over the value of the index. Conversely, if sentiment is bearish, and a price fall is expected, then the futures will sell at a discount. The second consideration in pricing stock-index futures is the margin requirements for each instrument. Buying a security on margin is a form of leverage because a broker allows one to pay only part of the purchase price of the security. An investor who wants to take advantage of an upward movement in the market, to realize greater gains by buying on margin. Buying stocks on margin requires a 50% down-payment, where corresponding futures contracts require only 10%. The importance of the margin requirement of securities depends on if one is short selling the futures or the underlying stocks.

The key to program trading is the computer. A computer program actively tracks the prices of individual stocks and futures, the dividend yields, the interest rates, and the expiration dates of the futures contracts. Tracking the spread between a single stock and the option sold for that stock is relatively easy and requires no computer. Yet, with a stock-index, a trader is dealing with as many as 500 stocks and must track all simultaneously. The computer can also be used as a cost cutting device by using it to trade fewer stocks than those that are included in the index. Computer models can demonstrate the correlation of (or lack thereof) a small group of component stocks to the index. Some traders engage in arbitrage programs using about half of the S&P 500 stocks and follow the index with 95% accuracy.

Generally, traders use either "buy" or "sell" programs. The choice

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16. Angrist, The Not So Awful Truth, FORBES, March 23, 1987, at 180 (by purchasing the futures contract on margin, instead of the underlying stocks, most investors' funds are free to be invested in short-term interest-paying instruments, such as T-bills). See also Selkin and Walsh, Program Trading In Action: How An Aberration Pays Off, FUTURES, July 1986, at 52; Byrne, supra note 10, at 40-43 (for an in-depth discussion of buying stocks on margin).

17. In the securities market, one often hears the old saying "buy low, sell high." This, however, can only work in an advancing market. In a falling market, an investor can still follow this advice through short selling; an investor borrows stocks and immediately sells them on the open market, hoping that the price will fall and he can later buy them back at a lower price.

18. Laderman, Follow the "Spread," or the Market Will Leave You Behind, BUS. WK., Dec. 29, 1986, at 84 (computers also take the anxiety out of predicting market movements). See Byrne, supra note 10, at 71-97 (for a discussion of the psychology of the trader).

19. Laderman, Weiss, Frank, Cohan and Cuneo, Those Big Swings On Wall Street, BUS. WK., April 7, 1986, at 32 (four years ago, arbitrage couldn't be done, since traders didn't have the computer software necessary to track prices by the minute).

20. Weiss, "Rocket Scientists" Are Revolutionizing Wall Street, BUS. WK., April 21,
of program depends on whether futures are selling at a premium or a discount to the cash value of the stock index. A trader executes a buy program when the stock-index futures sell at a premium to the index. Once the spread reaches the required amount, the computer initiates orders to buy the stocks that make up the index and sell the corresponding futures short. These buy-stocks/sell-futures orders constitute the most prevalent form of program trading.

Conversely, if the futures are selling at a discount to the index, the trader executes a sell program. The sell program initiates orders to buy the stock-index futures and sell the underlying securities short. This program is inherently more difficult to execute because of the up-tick rule. The up-tick rule provides that, before someone may sell a stock short, the stock price must experience an a slight upward movement in its price. Thus, a sell program must wait until all the stocks in the index (which could range from 20 for the MMI to 500 for the S&P) undergo an up-tick before execution of the short sales.

When executing an order for the sale or purchase of stocks; the trader has two options. First, he can write an order sheet manually, deliver it to a specialist's post on the floor of the stock exchange, and wait for the execution of the order. Alternatively, the trader can connect his computer to a market's automated trading system. Automated systems allow a trader to sell or purchase large blocks of stock with a push of a button. Unlike the manual system, the automated system enables the trader to execute an order quickly and cheaply by avoiding the specialist. Program traders thus take advantage of the NYSE's designated order turnaround system (DOT-system) to execute trades. By some estimates the time-frame (from computer identification of an cash/futures price discrepancy to execution of trades based on that discrepancy) to safely execute a trade may be as long as twenty minutes. Most traders feel safer using the DOT-system because the use of the computer virtually assures completion of the trade within the twenty minutes.

1986, at 52. See also Laderman and Frank, supra note 2, at 72 (most investors tracking the S&P 500 use at least 300 of the component stocks).

21. Campbell, Futures: Call of the Stock Index, THE BANKER, Jan. 1987, at 93 (it is suggested that this rule adversely effects the market and should be abandoned); Levinson, Program Trading May Help The Small Investor, FUTURES, March 1987, at 12.


23. Program Trader Nelson Says It Ain't So, Wall St. J., Oct. 13, 1987, at 63, col. 1 (an impatient trader, intending to buy one $25 million package of securities, hit his order button four times and later received a confirmation for $100 million in stock).

24. Industrials Plunge 156.83 Points in Heavy Trading; Bond Prices Surge, and Dollar Falls Against the Mark, Wall St. J., Oct. 27, 1987, at 3, col. 1 (the DOT-system matches sale and purchase orders for large blocks of specific stocks and executes the trade).

25. Id.
minute time-frame. Failure to complete the series of trades based on
the computer model constitutes one of the risks the program trader
faces. This risk is similar to changes in individual stock prices which
create an unprofitable spread.26

The following example illustrates a hypothetical buy program for
the Major Market Index (MMI): On April 1, 1986, an investor
purchases 1,000 shares of the twenty stocks in the MMI (except that
1,500 of General Motors shares and 900 of Mobile Oil Co. shares are
purchased to create precisely equal dollar amounts for the MMI stock
portfolio and the futures position) for a total investment of $1,527,075.
The value of the cash index is $337.19 and is calculated by dividing the
sum of the component stock prices ($1,486.75) by the MMI divisor
(4.40914). The price of the April MMI futures contract is $339.35. Total
contract value, $25027 times $339.35, is $84,837.50. Dividing the value of
the stocks in the MMI portfolio ($1,527,075) by the value of one futures
contract ($84,837.50) equals 18 contracts. The computer issues short
sales orders for the eighteen futures contracts totaling $1,527,075.00. On
April 2, 1986, excessive selling of the futures contract pushes it to a dis-
count relative to the cash position. A sell program issued at this time,
when the value of the portfolio is $1,495,962.50 and the futures contract
is priced at $329.80, brings a loss of $31,112.50 on the stock and a gain of
$42,975.00 on the futures. Thus, a two day trade grosses a total of
$11,862.50, all risk free.28

Arbitrage in general, including program trading, is considered risk
free because once an investor gets into a position, he doesn't care which
way the market goes. Because, by definition, the value of the stock-in-
 dex is equal to the value of the futures at expiration. Since stock-index
futures require cash settlement, the trader can wait until the day the
futures expire and close out the position.29 To insure maximum profit,
the trader executes this close-out at the end of the day with a marketon-close order. A market-on-close order indicates to the specialist that
he must execute the trade for the securities immediately before the

26. See Stoll and Whaley, supra note 22, at 18 (program traders face two other forms
of risk. First, is an unanticipated change in the dividend yield of a stock or stocks over
the life of the futures contracts. Second, if all the stocks in the index are not purchased,
the trader is exposed to tracking risk). See also supra, notes 20-21 and accompanying text.

27. This is an arbitrary figure known as the “index multiplier.” See Byrne, supra
note 10, at 36 (the S&P 500 has an index multiplier of $500).

28. Selkin and Walsh, Program Trading In Action: How An Aberration Pays Off, Fu-
tures, July 1986, at 52. See Laderman, Weiss, et. al., supra note 19, at 32, 34 (for another
example of a buy program using the MMI); Fitzgerald, Wall St. Warlocks and Triple

29. Faust and Doukas, Taking the Bite Out of Stock Index Futures Arbitrage Volatil-
ity, Futures, Dec. 1985, at 50.
closing bell, at 3:59 p.m.\textsuperscript{30} If, however, the value of the index and the futures converge prior to the expiration date, then the program automatically unwinds.

If the market rises after the execution of the buy program, the profits made on the rise in the price of the stock exceeds the losses on the repurchase of the futures contract. Conversely, if the market falls, losses on the sale of stock offset the gains accrued on the purchase of the cheaper futures contracts.

In 1985 and 1986, profit margins on the program trading transactions typically ranged from three to five percentage points more than the Federal Government's Treasury bill rate, the measure of a risk-free rate of return. An increase in the number of program traders since 1986, however, restricts the spread, thus reducing the amount of profit to be made from program trading. In 1988, traders can execute only when a program guarantees a return, upon expiration of the futures contract, equal to the prevailing Treasury-bill rate.\textsuperscript{31} Why would an investor invest a large amount of capital in an activity that guarantees only a risk free rate? An investor anticipates that the price of the futures contract and the index's cash value converge before the expiration day, thus raising the rate of return.\textsuperscript{32}

III. PROBLEMS AND BENEFITS OF PROGRAM TRADING

Every disaster needs a villain. In the securities' markets of 1987, program trading played that role. Computerized stock-index arbitrage has been singled out as the source of a number of market ills. At the same time, however, a number of market regulators and traders praise the use of program trading as a technological improvement to the system.

A. MARKET VOLATILITY

The increase in market volatility constituted the most significant trend of the stock market during 1987. The problem with market volatility is that the "health" of the market is measured by the performance of the stock indexes. Market volatility is measured by a combination of three factors: percentage change in the value of an index, number of traded shares during a day and the time-frame of the occurring movement. The DJIA moved only 6% on January 23, 1987.\textsuperscript{33} This movement occurred in only seventy minutes and almost 50 million shares of com-

\textsuperscript{32.} Id.
\textsuperscript{33.} Frenzied Stock Trading, supra note 2, at 25 (during the 1929 crash, the DJIA fell
panies composing the DJIA were traded in a half-hour period. If this type of movement had occurred with the market as a whole instead of only in the DJIA, there would have been some cause for concern. Large movements in indices such as the DJIA are rarely matched by similar movements in broader based indices, like the Standard & Poor 500 or Wilshire 5000. Using the DJIA as the main yardstick of market health therefore distorts disproportionately real changes in the economic environment.

Using traditional methods, a securities analyst considers a company's financial condition, growth potential, and the general economic environment to determine the proper valuation of a given stock. The value of a stock, through its sale price, reflects this information. Regulators are concerned that program trading shifts the focus of securities valuation away from the above traditional factors. It is a general misconception, however, that program trading is a case of the tail wagging the dog. Information regarding specific securities is reflected in the securities' prices in both the stock markets and the futures markets. Program trading simply assures that the information in the stock market corresponds with the information in the futures markets. Program trading does not introduce its own information into market prices and dictate the direction share prices will take.

Program trading is not a method used to evaluate securities to make an informed purchase. By using a computer, a trader reduces the buying and selling decisions to simple price differentials. If the numbers are right for a computer program, orders for large blocks of securities are issued. When large orders of stocks that comprise an index are made in a relatively short period of time, extreme volatility results in that index. Program traders use these same indexes for their arbitrage transactions. Thus, depending upon which spread has reached the proper point, one stock-index moves greatly relative to other stock indices.

While some critics of program trading point to specific days when the indices moved sharply, usually on the down side, studies done by brokerage houses show that market price fluctuations, as a percent-

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34. See Laderman and Frank, supra note 2 and accompanying text.

35. See Laderman and Frank, supra note 2, at 73 (the MMI funnels large amounts of capital into relatively few stocks. This has a large effect on the DJIA). See also Byrne, supra note 10; Faust and Doukas, supra note 29, at 50 (arbitragers tend to key off the same indicators, resulting in unusual pricing action).

36. See Nisse, Semantics of Arbitrage, THE BANKER, Jan. 1987, at 91 (a study done by the economists at Salomon Brothers points to a decline in volatility as a result of program trading).
age, have not changed significantly over the past twenty years.\textsuperscript{37} On a percentage basis, a market change of twenty points in a two thousand point market, for example, is the same as a ten point change in a one thousand point market.\textsuperscript{38}

The greatest potential for market volatility occurs four days of every year. It is during these four days, that all options and futures expire; these are known as “triple witching hours.”\textsuperscript{39} The prices of futures and indexes on these four days are guaranteed to converge.\textsuperscript{40} The convergence triggers the volume of buy and sell orders the program trader needs to execute to close out his position.

The market becomes most volatile at the end of the trading day when there is a triple witching hour. As mentioned, the price of the futures contract and the cash value of the index are equal at the close of trading on a triple witching hour. A program trader initiates his programs on the assumption that he can take advantage of the full spread, i.e. that any difference between the price of the futures and the stock index will be reduced to zero when the position is closed out. The trader guarantees the maximum profit possible by issuing market-on-close orders when the spread between the index and the futures approaches zero.

A study by Hans Stoll of Vanderbilt University confirms that stock-index related trading affects market prices during triple witching hours. The study shows, however, that the triple witching effect on prices does not warrant a restriction on stock-index arbitrage.\textsuperscript{41} Stoll argues that the effect of program trading on stock prices is similar to the effect on prices of a large purchase or sale of a block of stocks, which can occur at any time.\textsuperscript{42}

\textbf{B. ACCENTUATED DOWN-SIDE MOVEMENTS}

During 1987, the volatile market posted large single day gains and losses. Critics of program trading surfaced with claims that computerized trading accentuates a market decline by means of a snowball effect.

\textsuperscript{37} See Laderman, Weiss, et al., \textit{supra} note 19, at 36 (stating: “Traders challenge volatility charges by showing that the number of days in which the market moved more than 2% was greater coming off the bottom of the 1982 bull market than it has been in the past three months”).

\textsuperscript{38} Contra Angrist, \textit{The Not So Awful Truth}, \textit{FORBES}, March 23, 1987, at 180 (critics claim that analysis using percentage of market hides the volatility. Studies using the maximum daily price change as a measure show that volatility was lower in “three of the past four years than in ten of the thirteen years preceding 1983”).

\textsuperscript{39} Fitzgerald, \textit{supra} note 28, at 22.

\textsuperscript{40} See \textit{supra} note 13 and accompanying text.

\textsuperscript{41} Stoll, Expiration Day Effects of Index Options and Futures (1987).

\textsuperscript{42} Id.
Snowballing occurs when stock-index futures selling at a discount to the underlying basket of stocks lead traders to buy the cheap futures and sell the stocks. In turn, the sale of stock lowers the price of stocks and consequently of the futures. More futures are then purchased and more stocks sold, causing further decline. During the days following "Black Monday" critics asserted that program trading caused the crash with a snowball effect.

While sound in theory, little evidence exists to prove that the market reacts as depicted above. Weeks after the market's crash in 1987, investigators found that program trading accounted for only 9% of trading volume on the day of the crash and most of those program trades were executed early in the day. Moreover, when a market is in decline, sell programs call for the short sale of stocks. Short sales are not always possible, however, because they are limited by the up-tick rule and demand to purchase stocks diminishes.

Stock-index related strategies other than program trading, may have contributed to the market's decline in 1987. For example, fund managers utilize portfolio insurance on Black Monday in order to protect the value of their investments. Portfolio insurance involves the systematic sale of stock-index futures in a declining market. Proceeds from the sale of the futures offset losses from the drop in value of stocks. When the market begins to rise again, the futures are repurchased so the fund manager can “zero out” the account’s position.

Front running also added to the 1987 market decline. This practice combines sale and purchase of stocks and futures. Unlike program trading, front running is not a form of arbitrage and requires no com-

43. Traditional economic theory leads one to believe that an increase in demand in futures leads to an increase in their prices. The prices of stock-index futures, however, are not controlled solely by their supply and demand. Futures traders also base their pricing based on the change in value of the corresponding stock.


45. See supra, notes 21-22 and accompanying text.

46. Byrne, supra note 10, at 190 (some non-arbitrage program trading allows money managers to establish or liquidate a large portfolio as inexpensively as possible).

47. CFTC Reports, supra note 44, at 43, col. 1 (investigation after October 19, showed that portfolio insurance was a predominant in the decline than program trading). See also Portfolio Insurance Helps Investors but Hurts Market, Wall St. J., Oct. 19, 1987, at 16, col. 5.


49. See Crusade, supra note 6, at 135 (brokers are barred from trading stocks for themselves before trading the same stocks for customers).
puter. The following is an example of front running: A client places an 
order with a broker to sell a large block of XYZ stock. Relying on the 
client's order, the broker purchases futures contracts in anticipation of 
a fall in the price of XYZ stock.\textsuperscript{50} The purchase of the futures causes 
other traders to follow suit, pulling down the price of XYZ stock, which 
falls even further on the sale of the client's block of XYZ stock. Examination 
of the preceding example reveals that front running should 
cause market regulators to scrutinize the ethical implications of the bro-
ker-client relationship.\textsuperscript{51}

\textbf{C. INVESTOR CONFIDENCE}

Market regulators are concerned about the confidence of investors 
in the market because of the 1987 crash. Investors who see price move-
ments that do not correlate to changes in the economy or in corporate 
production may refrain from investing in the market.\textsuperscript{52} The market 
moved sharply on several days during 1987, yet the economic forecast 
remained relatively stable. This stability indicates that factors other 
than the economy moves influence market movement. Federal securi-
ties laws and securities markets are premised on the notion that the 
small stakes individual investor has a fair chance to trade in stocks. 
While most individual investors don't possess the same economic re-
sources as large institutional investors, the rules for investment should 
be the same for both types of investors.

Statistics show that institutional investment comprises 90\% of trad-
ing volume.\textsuperscript{53} Some charge that "program trading disrupts the notion of 
an open and fair game, . . . [as] program trading requires access to mil-
ions of dollars, quick access to multiple trading floors, and the ability to 
trade with very low transaction costs."\textsuperscript{54} Others feel, however, that pro-
gram trading helps individual investors by increasing market efficiency 
and market liquidity.\textsuperscript{55}

\textbf{D. MARKET EFFICIENCY}

Most critics of program trading fail to realize that stock-index arbi-
trage is a way of ensuring that prices of different, but related, securities

\textsuperscript{50} Kirby Partially Boycotts 3 Brokerages, L.A. Times, Jan. 15, 1988, § IV, at 1, col. 2.
\textsuperscript{51} CFTC Urges Better Market Coordination And Halt to Practice of 'Front Running', 
\textsuperscript{52} See Big Board Trading Halt Was Considered After Crash, SEC Chief's Testimony 
\textsuperscript{53} Campbell, Futures: Call Of The Stock Index, THE BANKER, January, 1987, at 93, 94.
\textsuperscript{54} Wall St. Needs To Bring Small Investor Into Program Trading, Grundfust States, 
18 SEC. REG. & L. REP. 1612, 1613 (1986).
\textsuperscript{55} See Levinson, supra note 21, at 12.
remain in line. Having stock prices in line means that they are properly evaluated based on factors such as interest cost and dividend yield, not merely on speculation. The introduction of stock options in the Chicago stock market fifteen years ago created the opportunity for arbitrage on a stock-by-stock basis. Using simple computer programs, investors could determine whether a stock option was priced correctly and could take advantage of price differentials. The market became more efficient because computers incorporated information into prices faster. The use of computers to arbitrage options soon disappeared, however, because market participants could no longer profit from stock-by-stock arbitrage.\(^5\) An increase in the number of traders executing options arbitrage narrowed the price differential so that the spread attained the proper level.

Since program trading began three years ago, the number of program traders dramatically increased. Their computer programs utilize the information relating to price discrepancies and execute buy and sell programs. A large number of market participants who constantly monitor the prices of stocks and futures prevent large price discrepancies between the stocks and the futures.\(^6\)

What troubles most market watchers is the rate at which information is incorporated into prices. A move in the market which in the past spread out over days or perhaps weeks is now compressed into one or two days. Formerly, dissatisfaction with three consecutive twenty-point drops in the DJIA is replaced now with grave concern over a single sixty-point drop in the DJIA.

### E. Market Liquidity

In addition to keeping stock prices in line, program trading increases market liquidity. A market is considered liquid when an investor wishing to buy or sell shares of stock can readily find a willing buyer or seller. Program trading has increased market liquidity by funneling billions of dollars into the market over the past few years. The result is an increase in futures trading which results in more selling and buying opportunities and therefore greater liquidity.\(^7\) Increased liquidity also result in lower costs of capital.


\(^6\) Abbott, Jeffrey Tabak: Special Knack For Arbitraging Indexes, FUTURES, April 1986, at 106.

IV. THE "SOLUTIONS"

Worried about the "perceived" problems of program trading, various regulators are demanding action. These demands have resulted in several proposed courses of action, most of which do not regulate but attempt to restrict the program trading activity. The regulators reaction is "like blaming the floor for breaking a dropped egg," says one market analyst. Institutions, fearing regulation, have voluntarily suspended their own use of program trading.

A. SUSPEND AUTOMATED TRADING

The form of regulation which most closely affects program trading is suspension of automated trading. John Phelan, Chairman of the NYSE, suspended use of the market's DOT-system on October 20, 1987, the day after the 508 point drop in the DJIA. Phelan's action was highly unusual; the last time the market was shut down followed the assassination of John F. Kennedy. He claimed that program trading on October 19, 1987, partly caused the market crash; only suspension of automated trading could prevent any further effects of program trading.

Phelan's actions succeeded in restricting the use of program trading. During the two week suspension of the DOT-system, most program traders could not execute trades. While it was still technically possible for a program trader to work the market because the computers were not banned, the lack of an automated system with a corresponding manual execution of trades made the time frame too large for traders to execute. Following the market crash, stock-index futures sold at a discount to the index. For an arbitrageur to use the program trading, he needed to short sell the stocks in the index and to buy the cheap futures. With the NYSE's up-tick rule, this practice became nearly impossible; by the time each stock in the index moved on an up-tick and the trader manually executed the orders, the stock price could have moved again.

Suspension of program trading created a disadvantage for the market. First, by reducing the liquidity of the market, it raised the costs of executing trades. Some analysts estimated that transaction costs from

59. See supra note 6 and accompanying text.
62. See supra note 26 and accompanying text.
relying on the specialist instead of the DOT-system increased 66%.65

Second, the suspension reduced market efficiency. Large spreads between stock indexes and their corresponding futures increased during the days after the suspension of the DOT-system. Due to the suspension, pricing information was not incorporated into the prices of the financial instruments. Third, a number of institutional investors stated that suspension of the DOT-system led to greater price volatility in both the stock and commodities markets.66 Finally, suspension hinders market confidence by informing traders that various forms of market access may be denied by the stock exchanges at any time.

The New York Stock Exchange, after months of deliberation, settled on a systematic scheme for suspending use of the DOT-system. Similar to a daily price limit,67 the Big Board decided to suspend use of the computerized trading system anytime the DJIA moves more than 50 points in one day.68

B. TRADING HALTS

In June of 1987, House Representatives Norman Lent (R-NY) and Matthew Rinaldo (R-NJ) introduced the Securities Trading Reform Act of 1987.69 Lent and Rinaldo designed the bill to restrict trading activity surrounding tender offers and takeovers. An amendment added to the bill allows trading halts by the exchanges if the situation is appropriate. This part of the bill states: “Because excessive volatility may occur on or before days on which securities based options and futures contracts expire, permitting trading halts to extend to the markets for those options and futures is justified in the public interest to moderate the effects of certain program trading.”70

How the bill functions in practice remains unclear. In addition, the notion that a trading halt remedies the negative effects of program trading is also not clear. First, a trader must have already begun a buy or sell program before an official could deem it necessary to close a market as a result of harmful program trading. As previously mentioned, once in position, the trader is not concerned with the direction of the market. Second, if fear exists that the market will fall when a program trader

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67. See infra notes 74-75 and accompanying text.


sells stocks purchased through a buy program, calling for a trading halt merely delays, not ends, the sale.

The justification for trading halts is that the market needs time to disseminate information that affects the prices of stocks. It is odd, however, that dissemination of information is attempted through a halt in trading instead of through computers that electronically link the markets together. Up-to-the-minute information is no longer accessible to the institutional investor. Individuals have an array of sources from which they can access with a personal computer. Trading halts are theoretically reserved for times when severe investor panic causes steep market declines and large order imbalances. Severe investor panic is not caused by program trading; trading halts are not effective weapons to combat the effects of investor panic.

Like suspension of automated trading, trading halts hurt the credibility of the market and reduce the confidence of investors entering and getting out of trading positions. In the days following the October crash of 1987, rumors of the market closing shattered confidence in the market.

C. DAILY PRICE LIMITS

An alternative approach to trading halts, and one considered less intrusive, is the use of daily price limits. The commodities markets are heavily blamed for the effects of program trading. Officials at the Commodity Futures Trading Commission have proposed alternatives for regulating the market. One proposal is the use of daily price limits. A daily price limit restricts the sale price range of a commodity on any given trading day. Most non-financial commodities have daily price limits which are designed to prevent speculative excesses and to maintain an orderly market by allowing traders to evaluate the factors influencing wide fluctuations that may not be immediately evident on the trading floor. This form of regulation, at first glance, may seem perfect for the stock-index future.

Futures contracts for gold can move a maximum of $50 per ounce. For example, if, on November 23, the December futures contract for gold opens at $466 per ounce, it could sell no higher than $516 per ounce and no lower than $416 per ounce on that trading day. Most daily price limits for non-financial commodities have expanding limit provisions for extensive price movements. Some expansion provisions allow an in-

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71. For a list of different informational sources, see Nichols, *Commodities Futures Trading* 1-27 (pricing), 29-57 (newspapers), 112-14 (journals) (1985).
crease in the limit to 150% of the value of the futures contracts if the futures contract reaches its price limit on three consecutive days. Thus, if gold ends the trading day selling at $516 per ounce on November 23, moves to $566 per ounce on November 24, and again to $616 per ounce on November 25, the daily price limit is raised to $75. In the past, the Chicago commodities markets have proposed various limit ranges; a limit of twelve points for the S&P 500's was proposed. This equals a movement of approximately 97 points for the DJIA. Following the October 19 decline, Chicago imposed a limit of 30 points for the S&P 500 (equivalent to 242.5 points for the DJIA) as an "emergency action." The action also included an expansion provision for the to be 150% of the stock value if, after two days, it reached the price limit.

The typical movement for the S&P 500 is five to eight points a day; a thirty-point cap therefore may seem harmless. Pricing limitations hinder the commodities markets, however, and do not restrict the use of program trading. Yet, most concede that the daily price limit has psychological effects and appeases regulators in Washington, who might do something more serious — like ban financial commodities based on stock-index futures.

If the market is sharply rising or declining, price limits on the stock-index futures could also be damaging. Unlike other commodities which have daily price limits and are tied to the supply and demand of tangible objects, stock-index futures are based on an intangible item — shares representing ownership in a corporation. In times of extreme market volatility, a stock index could continue to rise in price but leave behind the stock index futures once they have reached a price limit. This scenario would create the unusual situation of a futures contract selling at a discount to the cash value of an index while the market is rising. A continued rise in the price of stocks would thus create a large spread between the cash value and the future values of the index. If the spread gets large enough, sell programs would flood the market with orders. Short selling the stocks would be relatively easy while the market is moving up. Buying the relatively cheap futures, however, would be difficult, if not impossible, under a price freeze.

D. CHANGED EXPIRATION TIMES

Another form of commodity regulation is a change in expiration times. Usually, all stock futures and options expire at the close of the trading day on the third Friday of the expiration month. In an attempt

74. Chicago's Traders Are Trying To Be Their Own Best Watchdogs, Bus. Wk., March 2, 1987, at 38.
to limit price volatility on expiration Fridays, regulators moved the expiration of stock-index futures with June, 1987, contract expirations from the close of the market on the third Friday to the opening of the market on the third Friday. By examining information regarding order imbalances, the regulators noted that minimal volatility occurred during the June expiration period. This experiment is, however, inconclusive in showing that the change in expiration time leads to less volatility in all cases. Some assert that it may increase volatility.

The change in expiration dates, while directed at program trading, has little to do with the regulation of computerized trading. Instead, it seems directed at the general effect of stock-index futures expiring on a specific day.

E. ORDER DISCLOSURE

Another form of regulation of the expiration date of futures is the disclosure of market-on-close orders for futures contracts. Program traders issue market-on-close orders to obtain maximum profit potential. If a trader wishes to close-out a buy program, a larger number of shares of stock must be sold. At the close of the market, a specialist must be able to fill all orders and find the necessary buyers. At this point, the supply of shares of stock exceeds the normal demand and the prices of the shares fall. To prevent a fall in price, the disclosure allows floor traders to match the requisite number of buyers to sellers over the course of a few hours rather than at the close of the trading day.

Market-on-close orders address the closing of a position based on a buy program at the time the trader sells his stock and meets his future contracts payments. This form of regulation does not attempt to regulate the practice of program trading but helps the market adjust to the practice. Second, order disclosures ignore the closing of positions based on sell programs. Thus a flood of buy orders arise and the share prices increase. Regulators seem to be willing to accept sudden increases in share prices.

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78. See The Triple Witching Hour: Trying To Make It Less Spooky, Bus. Wk., Sept. 22, 1986, at 32 (the SEC has suggested that the NYSE require its members to disclose their market-on-close orders by 3:30 p.m.).
79. See SEC Staff To Pursue Ways To LimitExpiration Friday Price Volatility, 18 SEC. REG. & L. REP. 795 (1986).
V. CONCLUSION

Program trading increases market efficiency by incorporating information into stock prices and stock-index futures. Many regulators, looking for a way to stem market volatility or to avoid large price falls, have determined that program trading should be restricted. Yet, many of the proposals restrict trading in ways unrelated to program trading, increase transaction costs, or increase market volatility. Program trading doesn't determine which way the market will head, it only gets it there faster. As for the regulation of program trading, Senator Phil Gramm (R-Texas) said it best when he commented, "if by eliminating the use of the computer, you could get stock prices higher, I suggest you outlaw the use of the calculator . . . and order that trades be chiseled in stone." 80

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