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Recommended Citation
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THE CRASH OF 1987: A LEGAL AND PUBLIC POLICY ANALYSIS

LEWIS D. SOLOMON*
HOWARD B. DICKER**

INTRODUCTION

O
n “Black” Monday, October 19, 1987, the Dow Jones Industrial Average (“DJIA”) plummeted 508 points to 1738.74 on record trading volume of 604.3 million shares.¹ This 22.6 percent drop far exceeded the 12.8 percent decline on October 28, 1929, which touched off the Great Depression.² In the aftermath of the crash of 1987, several studies and hearings were conducted to investigate its cause and to make recommendations to avert a similar event,³ in order to restore confidence in the capital markets. These efforts have produced conflicting conclusions. Nevertheless, it is clear that the existence of derivative instruments (specifically, stock index futures and options) and the use of program trading strategies contributed to the market “break.”

At least six studies have investigated the crash of 1987. Nicholas Katzenbach, in a study commissioned by the New York Stock Exchange, concluded that stock index futures-related trading encouraged too much speculation and recommended restraints on such trading by consolidating regulatory authority and raising futures margins.⁴ In contrast, the Chicago Mercantile Exchange, in its preliminary report, found that futures trading did not cause the stock market decline and that low margins did not exacerbate the crash.⁵ Similarly, the Commodity Futures Trading Commission did not find stock index futures responsible for the problem.⁶ The Commission called for improved coordination between

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¹ Professor of Law, George Washington University National Law Center; B.A. 1963, Cornell University; J.D. 1966, Yale University.


2. See id.
exchanges and regulators and for better market data collection.\textsuperscript{7}

In another study, the General Accounting Office ("GAO") found that the breakdown of computer systems at the New York Stock Exchange accentuated the selling pressure on October 19.\textsuperscript{8} The GAO suggested improving these systems to cope with extraordinary trading volume.\textsuperscript{9} Additionally, the office recommended that regulatory authorities establish contingency plans for future emergencies.\textsuperscript{10}

The Presidential Task Force on Market Mechanisms (the Brady Commission) attributed the market crash to the employment of computer trading strategies by a few of the largest institutional investors.\textsuperscript{11} The Task Force called for a single agency, such as the Board of Governors of the Federal Reserve System, to coordinate the regulation of stocks, stock index futures, and stock index options trading because these three markets are essentially a single market.\textsuperscript{12} Furthermore, the Task Force recommended the use of "circuit breakers," coordinated trading halts or limits, to slow trading when it becomes frenzied.\textsuperscript{13}

A report published by the Securities and Exchange Commission concluded that stock index futures-related trading had contributed to the crash of 1987 and that computerized trading increased intra-day stock price volatility.\textsuperscript{14} The SEC suggested additional market surveillance, better coordination among exchanges, and a review of margin levels for futures to control unusual stock price volatility.\textsuperscript{15}

Finally, the report of the Working Group on Financial Markets proposed brief halts in trading across the stock, stock options, and stock index options and futures markets in the case of an extraordinarily large market decline.\textsuperscript{16} The report did not, however, recommend changing the level of minimum margins on futures contracts.\textsuperscript{17}

\textsuperscript{7} See CFTC Final Report, supra note 6, at xii-xiii.
\textsuperscript{9} See id. at 8.
\textsuperscript{10} See id.
\textsuperscript{12} See id. at 69.
\textsuperscript{13} See id.
\textsuperscript{15} See id. at xiv-xvii.
\textsuperscript{17} See id. at 5.
In addition to these studies, Congress has held numerous hearings since the market break in an effort to develop a legislative response. Some testimony has called for eliminating stock index futures and options and/or banning the related computerized trading strategies.\textsuperscript{18} Three bills have been introduced to date. One authorizes the Federal Reserve Board to regulate margin requirements of derivative financial instruments (such as stock index futures and options).\textsuperscript{19} Another would create an Intermarket Coordination Committee whose purpose would be to develop a more coordinated regulatory system.\textsuperscript{20} The third bill proposes to give exclusive jurisdiction over derivative instruments to the SEC and to give margin setting authority to the Fed.\textsuperscript{21}

This Article concludes that many of the current regulatory efforts are "quick fixes," aimed at treating symptoms rather than aimed at addressing the long-run, structural problems of the financial markets. In order to restore investors' confidence, policymakers must consider the current (and future) structure of the financial markets. This structure is presently shaped by the short-term focus of institutional investors, continuing innovations in technology, and the globalization of money flows.\textsuperscript{22} The effects of these three dynamic forces may destabilize the financial markets of the United States, creating uncertainty, volatility in stock prices, and loss of investor confidence. Moreover, additional instability may reinforce these same attributes. In this changing environment, it will be very difficult for United States regulators alone to formulate a policy response. Thus, if the nation's policymakers do anything, they should take steps to ensure that the financial system will be able to withstand the effects of inevitable price shocks, instead of focusing only on increasing the regulation of the markets.

Part I of this Article discusses the evolution of derivative instruments and the development of futures markets as a response to a need for the mutually desired transfer of price risk. Part II explores one of these instruments, stock index futures contracts, in detail. Moreover, this Part explains how institutional investors employ computer assisted strategies, such as program trading, that utilize stock index futures. Part III examines the current regulatory structure governing derivative instruments and how it reflects jurisdictional disputes among several government agencies. Drawing from the six major studies, Part IV briefly describes the stock market crash of 1987 with an emphasis on the role played by the stock index futures and related trading strategies. Finally, Part V

\textsuperscript{18} See Ricks, Regan Calls Financial Markets 'Rigged,' Assails Program Trading, Index Futures, Wall St. J., May 12, 1988, at 2, col. 3.
\textsuperscript{21} See H.R. 4997, 100th Cong., 2d Sess., 6-8 (1988).
\textsuperscript{22} See infra Part V.
addresses public policy responses to the crash of 1987. Specifically, this Part describes several regulatory proposals aimed at preventing a similar occurrence, and concludes that many of these remedies are not the proper treatment for deeper structural problems in the financial market.

I. DERIVATIVE INSTRUMENTS: THE EVOLUTION OF FUTURES AND OPTIONS

The futures and options markets evolved in response to the risks associated with unanticipated price variability. Consider the predicament of Illinois wheat farmers in the mid-nineteenth century. With the opening of the Illinois-Michigan Canal and the laying of railroad track, farmers could ship their harvest to Chicago. Merchants would purchase the grain in Chicago and store it temporarily, awaiting the arrival of ships to transport the harvest to eastern markets and abroad. Sometimes, the amount of grain received exceeded the capacity of storage and shipping facilities, forcing farmers to sell their crops at reduced prices. On the other hand, when deliveries were too small, prices would surge. Farmers eventually found that they could avoid the price risk by participating in futures and options markets.

Before the introduction of exchange-traded futures and options, farmers, distributors, and processors began contracting for the delivery of agricultural commodities at a prearranged price, well in advance of the actual delivery date. These delayed delivery transactions, known as either “to arrive” or “forward” contracts, enabled farmers to secure a specific price while allowing distributors and processors to obtain a guaranteed supply of the commodity. Forward contracts also transferred the risk of an unfavorable price movement from the farmer to the next entity in the distribution chain. These merchants and buyers, however, did not want to carry this risk either. As a result, forward contracts included substantial risk premiums resulting in lower prices paid to farmers or a higher price charged to consumers. Eventually, speculators willing to assume these risks with their own capital began to buy and sell forward contracts without waiting for delivery in the hope of profiting from any change in value. Thus, the merchant who was unwilling to absorb the price risk could sell the forward contract to a speculator who was willing to gamble on the change in prices but not willing to take the actual delivery.

24. See F. Horn, Trading in Commodity Futures 5-6 (2d ed. 1984).
25. See Wolkowitz, Stock Index Futures in Historical Perspective, in Stock Index Futures 9, 11 (F. Fabozzi & G. Kipnis eds. 1984).
27. See id. at 28.
28. See F. Horn, supra note 24, at 6.
29. See id.
Inadequacies inherent in forward contracts, which made them unattractive to speculators, contributed to the development of futures and options contracts.\textsuperscript{30} One problem with forward contracts was the lack of standardized contract terms.\textsuperscript{31} Each forward contract was a custom contract between two parties.\textsuperscript{32} Accordingly, each contract had its own method of determining payment and price.\textsuperscript{33} Moreover, there was no standardized quantity or quality of the deliverable commodity.\textsuperscript{34} The lack of standard contracts, therefore, contributed greatly to the virtual absence of reliable and comparative price information.\textsuperscript{35}

Another problem associated with forward contracts, owing to their customized nature, concerned the lack of a satisfactory means of enforcement.\textsuperscript{36} If one party to the contract did not perform, the other party’s only recourse would be litigation.\textsuperscript{37} Forward contracts became costly to negotiate because the non-commercial trader was generally unfamiliar with evaluating the credit risk of the other party to the contract.\textsuperscript{38} These two inadequacies made the resale of forward contracts (and thus the efficient allocation of risk) difficult and expensive. These shortcomings eventually led to the standardization of contracts and the organization of futures and options exchanges on which futures and options contracts are traded.

Futures contracts and options contracts are derivative instruments, in that their values depend primarily on the prices of the underlying commodities, currencies, financial instruments or indices on which they are based.\textsuperscript{39} Indeed, the futures and options markets are distinguishable from the cash markets (frequently referred to as the spot markets), where the underlying commodities\textsuperscript{40} are themselves bought and sold.\textsuperscript{41} A fu-

\begin{itemize}
\item \textsuperscript{30} See Wolkowitz, supra note 25, at 11.
\item \textsuperscript{31} See id.
\item \textsuperscript{32} See id.
\item \textsuperscript{33} See id.
\item \textsuperscript{34} See F. Horn, supra note 24, at 6.
\item \textsuperscript{35} See Board of Governors of the Federal Reserve System, Commodity Futures Trading Commission, Securities and Exchange Commission, A Study of the Effects on the Economy of Trading in Futures and Options, ch. 3, at 3 (Dec. 1984) [hereinafter Interagency Study].
\item \textsuperscript{36} See id.
\item \textsuperscript{37} See Wolkowitz, supra note 25, at 11.
\item \textsuperscript{38} See Interagency Study, supra note 35, ch. 3, at 3.
\item \textsuperscript{39} See Katzenbach Study, supra note 4, at 6; Task Force Report, supra note 11, at 5.
\item \textsuperscript{40} There is no cash market for an index since it is merely a mathematical calculation; however, there is a cash market for the securities composing the index (i.e., the stock market is a “cash” market).
\item \textsuperscript{41} See F. Horn, supra note 24, at 7.
\end{itemize}
A futures contract is a binding agreement to buy or sell a particular item on a future date for a predetermined price. A "long" position holder, who has bought a contract, profits from rising futures prices. A "short" position holder, who has sold the futures, profits from a price decline. Both parties to futures contracts are obligated to comply with the contract.

All futures trading and listed options trading is conducted on organized exchanges using standardized contracts for each type of underlying item, in accordance with the rules adopted by each exchange. Because the terms and conditions of futures contracts are uniform, the seller and buyer need negotiate only the month of delivery, the number of contracts and the price. Members of exchanges trade futures and options in areas of the exchange floor designated for a particular future or option. Each member makes competitive bids or offers by open outcry until a transaction is made.

There are futures contracts on agricultural and industrial commodities (e.g., wheat and copper) as well as on currencies (e.g., West German Marks), financial instruments (e.g., Treasury bonds), and indices (e.g., Standard & Poors 500 Index). See R. Teweles & F. Jones, The Futures Game 58-75 (2d ed. 1987). There are no futures contracts on individual stocks. See Johnson, Federal Regulation in Securities and Futures Markets, in Futures Markets: Their Economic Role 305 & n.29 (A. Peck ed. 1985).

An option is a contract that gives the holder the right, but not the obligation, to buy or sell a particular item on or before a future date for a specified price (called the exercise or striking price). See L. McMillan, Options as a Strategic Investment 4 (2d ed. 1986). The option buyer (or holder) makes a non-refundable payment (the premium) to the seller (or writer) for the rights conveyed by the option. See The Options Clearing Corporation, Characteristics and Risks of Standardized Options 6 (1987). As compared to the two dimensions of futures contracts (that is, buyers are long and sellers are short), options contracts have four dimensions. A purchaser can either buy calls or buy puts. See Options Clearing Corporation, supra, at 4. A call option conveys the right to buy, and a put option the right to sell, a specific quantity of the underlying interest. See id. Similarly, an options seller can sell either puts or calls. See id. While the option buyer incurs the risk of losing his investment—the premium—the option seller assumes potentially unlimited risk if the price of the underlying interest moves unfavorably. See Options Clearing Corporation, supra, at 16-21. Sellers of options have the unconditional obligation to perform whenever the buyer chooses to exercise the option. See Interagency Study, supra note 35, ch. 2, at 1.

There are options on currencies, financial instruments, indices, and futures (all of which are generally referred to as non-equity options). Additionally, there are options on individual stocks (for example, equity options). There are no options, however, on agricultural or industrial commodities. See L. McMillan, supra, at 586-97.

A thorough discussion of options contracts is beyond the scope of this Article, which will primarily be limited to futures contracts. For a comprehensive analysis of options contracts, see generally id. at 1-27; Stoll & Whaley, The New Option Markets, in Futures Markets: Their Economic Role 205 (A. Peck ed. 1985). Nevertheless, the general principles involved with futures are also applicable to options.

66. See F. Horn, supra note 24, at 98. Although the design of the floor at each exchange is different, trading is usually conducted in octagonal pits or around rings, which are flat in the center and have wide concentric steps ascending in stages to the edge. The steps help the traders see one another. They stand in specific areas in the pits according to the delivery month in which they are trading. See id. See generally Board of Trade of the City of Chicago, supra note 23, at 7-11 (describing the trading floor of the Chicago Board of Trade in greater detail).
tion is completed;\textsuperscript{47} no trades may be made by private negotiations.\textsuperscript{48}

Each exchange requires that its members submit records of negotiated trades to the exchange's clearing house.\textsuperscript{49} The clearing house provides several essential functions. It compares the reports of transactions submitted by buyers and sellers and accepts all properly matched trades for clearance. More importantly, it interposes itself between the original parties and substitutes itself as the other party to each side of the transaction.\textsuperscript{50}

One consequence of inter-positioning by the clearing house is that once a transaction clears, a buyer need not concern himself with the identity or the creditworthiness of the seller, or vice versa.\textsuperscript{51} Every transaction is guaranteed by the clearing house, which ensures the financial integrity of futures transactions primarily through the margin system.\textsuperscript{52} Consequently, futures markets facilitate trading among parties who have not dealt with each other in the past.\textsuperscript{53}

In addition, because the clearing house becomes the buyer to every seller and the seller to every buyer, it allows a party with an open position to liquidate it at any time by making a subsequent offsetting trade with any member on the exchange.\textsuperscript{54} Although futures positions can be held until settled on the future delivery date by actual delivery or cash settlement (depending on the futures contract), virtually all futures contracts are closed out by offset prior to delivery.\textsuperscript{55} Differences in the prices of offsetting contracts represent gains or losses that are settled in cash.\textsuperscript{56} Thus, the principle of settlement by offset allows speculators to participate in futures trading without taking delivery, and permits commercial concerns to use futures as a temporary financial hedge, without affecting inventories.\textsuperscript{57}

An open position in the futures market represents a legal obligation,
and a margin acts as a security deposit (or performance bond) to ensure performance of the contract.\textsuperscript{58} The exchanges and the clearing houses (not the Federal government) establish the amount of margin required to be deposited for each type of contract.\textsuperscript{59} Initially, both the buyer and the seller of a futures contract must post margin deposits in cash, government securities, or letters of credit.\textsuperscript{60} This deposit amounts to approximately 10 percent of the full contract value. Additionally, profits and losses on open futures contracts are settled daily in cash through a payment and collection process.\textsuperscript{61} Accordingly, the futures markets are "zero sum" in nature: within the futures market, for every profit there is an offsetting loss.\textsuperscript{62} Thus, although allowing for leveraged transactions,\textsuperscript{63} trading on margin in the futures industry does not involve an extension of credit.\textsuperscript{64}

\begin{itemize}
\item \textsuperscript{58} See Tomek, \textit{supra} note 52, at 144.
\item \textsuperscript{59} See CFTC Follow-up Report, \textit{supra} note 6, at 27. There are four types of futures margins. Clearing houses collect "original" and "variation" margins from their clearing members. In a similar manner, the exchanges require futures commission merchants (e.g., brokerage houses) to receive "initial" and "maintenance" margins from their customers. See \textit{id.} at 16.
\item \textsuperscript{60} See \textit{id.}
\item \textsuperscript{61} See \textit{id.} at 18-19. In part, this process is accomplished by re-valuing (or "marking-to-market") open futures positions. At the end of each trading day, all futures contracts are marked to their current settlement price (i.e., market value). If the value of a long position increases, or if the value of a short position decreases, an unrealized profit is created. If the balance in the customer's brokerage account plus this unrealized profit exceeds the initial margin requirement, the customer may withdraw this excess margin in cash. On the other hand, if the value of a long position decreases, or if the value of a short position increases, and this unrealized loss causes the value of the account to fall below the maintenance margin level, the customer must supply additional margin to the brokerage house sufficient to restore the initial margin amount.
\item To illustrate this process, assume that Trader L initiated a long position in the Standard & Poor's ("S&P") 500 index futures contract on Tuesday at the closing index value of 300.00, representing $150,000 (300.00 \times $500). On the other side of this transaction was Trader S, the "short." Furthermore, assume that each trader deposited a required $15,000 initial margin with his respective broker and that the minimum maintenance margin is $10,000. On Wednesday, the value of the S&P 500 index futures contract falls and closes at 275.00. By marking the positions to market, Trader L incurs a loss of $12,500, but Trader S profits ($150,000 - (275.00 \times $500)).
\end{itemize}

\begin{tabular}{|l|l|}
\hline
Trader L (Long) & Trader S (Short) \\
\hline
Margin Deposit & \$15,000 \quad \$15,000 \\
Unrealized P/L & \(\text{\(-12,500\)}\) \quad \(+12,500\) \\
Closing Balance & \$2,500 \quad \$27,500 \\
\hline
\end{tabular}

Since the mark-to-market process has reduced Trader L's balance below the minimum maintenance margin level, he must deposit an additional $12,500 with his broker to restore the initial margin level. On the other hand, Trader S can withdraw the excess margin of $12,500.

\begin{itemize}
\item \textsuperscript{62} See \textit{id.} at 19.
\item \textsuperscript{63} See \textit{id.} at 27.
\item \textsuperscript{64} In contrast, margin transactions in securities trading involve an extension of credit from the broker-dealer to the purchaser of the securities. See Tomek, \textit{supra} note 52, at 145. A purchaser of stock is required to deposit a minimum amount, the margin, with his broker so that title to those shares passes to the purchaser. See CFTC Follow-up Report, \textit{supra} note 6, at 14. Generally, the minimum deposit prescribed by Regulation T
The participants in the futures markets fall into three general categories: hedgers, speculators and market makers. They use futures to reduce their risk exposure to price fluctuations in connection with their primary activities in the underlying commodities or financial assets. Arbitrage is a form of hedging. Arbitrageurs simultaneously buy and sell similar items in different markets, attempting to profit from pricing discrepancies between the two markets. By contrast, speculators expect to benefit by increasing their

of the Board of Governors of the Federal Reserve System, which applies to customers of securities brokers, is 50% of the market value of the stock. See 12 C.F.R. § 220.18 (1988). Regulation T, issued by the Board of Governors of the Federal Reserve System, governs the extension of credit by brokers and dealers. 12 C.F.R. §§ 220.1-220.18 (1988). See Board of Governors of the Federal Reserve System, A Review and Evaluation of Federal Margin Regulations 47-51 (Dec. 1984) [hereinafter Review of Margins]. The broker lends the purchaser the remaining balance, the difference between the purchase price and the margin deposit, and the value of the stock, which is held in the broker’s name, serves as collateral for the loan. See CFTC Follow-up Report, supra note 6, at 14-15. Accordingly, the purchaser pays interest on the balance outstanding. Thus, while futures margins are performance bonds, securities margins represent down payments that are equity. See id.

65. See R. Fink & R. Fedunik, supra note 56, at 64-72.

66. See id. at 64.

67. See id. As illustrated by the predicament confronting the Illinois wheat farmers, the futures and options markets first developed in the agricultural sector to insulate farmers and merchants from unanticipated price changes in their commodities. The farmer can protect himself from the risk of an adverse price fluctuation by hedging his anticipated actual market position with an opposite position in the futures market. See V. Harper, Handbook of Investment Products and Services 250 (2d ed. 1986). Thus, a loss on one position will be offset by a gain on the other. For example, in May, suppose the wheat farmer expects to harvest and sell 20,000 bushels in September. The spot price is currently $3.00 a bushel. If a September wheat futures contract is valued at $3.15 a bushel (and assuming this price would provide the farmer with a reasonable profit), the farmer could sell four futures contracts of 5,000 bushels each. Hence, he creates an anticipatory hedge—effectively locking-in a $3.15 per bushel price. See id.; Peck, supra note 51, at 19-21. Assume by September, the spot price for wheat has plunged to $2.90. Although the farmer would incur a loss on the sale of his crop at this price, overall, he will not. Because spot and futures prices converge in the delivery month (and because the activity of arbitrageurs tends to “align” futures and spot prices), when the farmer offsets his original sale of futures with a purchase of four contracts, he will make a profit of $0.25 a bushel ($3.15 — $2.90). Consequently, the proceeds from the actual sale of wheat ($2.90) and the profit on the futures transactions ($0.25) result in an effective sale at a price of $3.15 per bushel. However, if the price of wheat had increased instead, the farmer would have made an excess profit on the actual sale of wheat and had an offsetting loss on the futures transaction. Therefore, by constructing a perfect hedge, the farmer can obtain a predetermined price for his goods.

68. See Peck, supra note 51, at 14-17.

69. See Silber, supra note 39, at 86. For example, an arbitrageur who concludes that wheat contracts traded on the futures markets are relatively expensive in comparison to the spot market for wheat might purchase and store the “cheap” spot wheat today and simultaneously sell wheat futures contracts. These transactions virtually “lock-in” a profit (the difference between the price of the “expensive” wheat futures contracts and “fairly” priced contracts) and hedge further price changes. When the futures contracts expire, the arbitrageur fulfills his obligation by delivering the spot wheat, which had been stored in the interim period, to a location that has been approved by the commodity
They take futures positions (long or short) in the hope of profiting by correctly anticipating the direction and magnitude of price movements. Speculators have no involvement in the underlying cash market. Large financial institutions frequently assume both the hedgers’ and speculators’ roles. Some institutions will combine hedging and speculating: they are risk averse but also willing to act on price expectations in search of profits.

Market makers, called locals or scalpers because they trade on the floor of the exchange for their own account, continuously buy and sell to take advantage of temporary imbalances in order flow. However, unlike position traders, locals generally do not hold futures positions open overnight. Instead, they attempt to buy contracts at the bid price and sell them at the offer price during the same trading session.

II. CURRENT USES OF DERIVATIVE INSTRUMENTS

In 1982, the commodities exchanges introduced a new financial product: futures contracts on stock indices. Since that time, institutional investors managing large stock portfolios have employed innovative, computer-assisted strategies that use these derivative instruments to implement their investment decisions. Other institutions have become index arbitrageurs; they recognized that the entry of stock index futures resulted in similar financial assets being traded in two markets (stock index contracts on the futures exchanges and the underlying stocks on the stock exchanges). Until October 19, 1987, these “program trading” strategies (such as hedging, index arbitrage, and portfolio insurance), which are the products of innovations in finance and technology, were exchange. A trader who was long must accept delivery and make payment in full to the arbitrageur.

The arbitrage of an agricultural commodity between the cash and futures markets occurs infrequently, however, because of the inconvenience of taking actual delivery of a physical commodity. Another form of arbitrage, known as spreading, is more prevalent. When both the buy and sell sides are in the futures markets, the transaction is usually referred to as a spread. For example, an arbitrageur might buy and sell futures contracts on two different commodity exchanges that trade similar contracts (e.g., buy wheat futures on the Kansas City Board of Trade and simultaneously sell wheat futures on the Chicago Board of Trade), expecting to profit from inefficient pricing between the two. Certain financial futures such as those on Treasury bonds or stock indexes are more easily arbitrated with the cash market than other commodities because of the absence of physical possession and storage problems (for example, book-entry of securities transactions).

70. See R. Fink & R. Feduniak, supra, note 56, at 72.
71. See id.
72. See id.
73. See Silber, supra note 39, at 86.
75. R. Fink & R. Feduniak, supra note 56, at 68.
76. See id.
generally unknown to most individual investors in the stock market and misunderstood by many institutions.

A. Stock Index Futures

Although the futures and options markets originally developed in the agricultural sector, where futures helped farmers insulate themselves from unanticipated crop price changes, today these markets offer non-agricultural products as well. These include futures on industrial commodities, financial instruments, and financial indices. The latest financial innovation has been the introduction of stock index futures and index options. Like the Illinois wheat farmer, stock market participants are exposed to price risks that they might want to avoid. A futures contract on a stock index serves as a substitute for owning the actual portfolio of stocks that forms the index. Stock index futures, therefore, can be used to offset a loss suffered in an investment portfolio or trading account during a period of general market decline or to facilitate a purchase or sale of the many stocks composing an index. These derivative instruments, therefore, allow investors to adjust the exposure of their portfolios to fluctuations in the general level of stock market prices.

Although many different stock index futures contracts are traded on various exchanges, the most significant contract is the Standard & Poor's ("S&P") 500, which was introduced by the Index and Options Market of the Chicago Mercantile Exchange in 1982. The S&P 500 futures contract is based on the Standard and Poor's 500 Composite Index, which is constructed and maintained by the Standard & Poor's Corporation. The S&P 500 index is the most widely known and quoted index next to the Dow Jones Industrial Average, and is generally recognized as the benchmark against which the performance of portfolio managers is measured. The S&P 500 contract is so popular that, for example, during 1986 its daily dollar volume of transactions was approximately 60 percent greater than the value of actual stock trading on the New York Stock Exchange.

77. See supra note 67.
78. See Katzenbach Study, supra note 4, at 8.
80. When someone asks, "How is the market doing?" the reply is almost always in terms of the Dow Jones Industrial Average ("DJIA"). It is the "average" common stock price of thirty industrial "blue-chip" companies. In 1928, Dow Jones & Co. began changing the divisor because of stock splits, stock dividends, etc. Accordingly, since 1928 the divisor for the DJIA is no longer the number of stocks in the average. As a result, it is not a true arithmetic average. See N. Weiner, Stock Index Futures: A Guide for Traders, Investors and Analysts 37-38 (1984).
81. See Chicago Mercantile Exchange, supra note 79, at 5. Additionally, it is also used by the United States Commerce Department as one of the components of the Index of Leading Indicators. See Task Force Report, supra note 11, Study VI, at 18.
The S&P 500 index, on which the S&P futures contract is based, is constructed from the stock prices of 500 different companies—400 industrials, 40 utilities, 20 transportation companies and 40 financial institutions.\(^8\) The market value of the 500 firms in the index “is equal to approximately 80 percent of the value of all stocks traded on the New York Stock Exchange.”\(^9\) It is a capitalization-weighted index; accordingly, the total market value, and not simply the share price of each stock, is considered in the computation of the index.\(^8\) Hence, “[e]ach component stock’s price is multiplied by the number of common shares outstanding for that company, and the resulting market values are totaled.”\(^8\) This aggregate market value is compared to the market value of the 500 stocks during the base period to derive the index value.\(^8\) Since the index is weighted by the outstanding shares of each company, a price change in one company will influence the index in proportion to the stock's relative market value.\(^8\)

Stock index futures contracts\(^8\) are similar to futures on agricultural products, except for two important differences.\(^9\) First, strictly speaking, there is no cash market for index futures.\(^9\) For example, the underlying commodity for wheat futures contracts is wheat. However, a stock index cannot be purchased or sold; only the individual securities composing the index can be bought or sold.\(^9\) Second, unlike traditional futures contracts that are settled on expiration by physical delivery of, and payment

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83. See Chicago Mercantile Exchange, supra note 79, at 4. As of April 6, 1988, Standard & Poor may vary the size of these categories to promote flexibility in the composition of the overall market measure. See S&P is Adjusting Its 500 Stock Mix to Add Flexibility, Wall St. J., Mar. 15, 1988, at 51, col. 3. The 500 companies composing the index are either listed on the New York Stock Exchange or the American Stock Exchange or traded over-the-counter.

84. Chicago Mercantile Exchange, supra note 79, at 4.
85. See A. Loosigian, supra note 23, at 16.
86. Chicago Mercantile Exchange, supra note 79, at 4.
87. The base value is the average market value of those 500 stocks during the years from 1941 to 1943, and that value was set equal to ten. See N. Weiner, supra note 80, at 42. The base value is adjusted for consistency when there are stock splits or dividends, mergers, acquisitions, or when stocks are added or deleted from the index. See Chicago Mercantile Exchange, supra note 79, at 5.
88. See Chicago Mercantile Exchange, supra note 79, at 5.
89. The value of the S&P 500 index futures contract is calculated by multiplying the futures index (not the spot index) by $500. See id. For example, a futures index of 300.00 represents $150,000 of market value in the 500 component stocks. If the futures price rises one index point to 301.00, traders who are long will have a gain of $500 on each contract and those who are short will have a corresponding $500 loss.
90. Cf. Katzenbach Study, supra note 4, at 7. The Katzenbach Study cites two additional differences: (1) the main participants in agricultural futures market are producers and users (e.g., farmers and grain merchants) of the underlying commodity, while in index futures markets, there are only users (investors) of the stocks that compose the index; and (2) these investors use futures only to hedge against unfavorable price movements, while participants in agricultural commodities hedge against upward and downward price shifts. See id.
91. See id.
92. See id.
for, the underlying commodities, index futures are settled in cash; no actual shares of stock are transferred. For both traditional and index futures, "longs" and "shorts" settle profits and losses daily through the transfer of variation margin until the expiration date of the contract.

In the case of index futures, on the expiration date long and short investors realize their profits and losses in cash instead of by delivery. Final cash settlement for the S&P 500 index contract is based on the difference between the future's settlement price on the last day of trading under the contract and the opening value of the index the next morning.

The value of a stock index futures contract generally moves with changes in the underlying spot index value (which reflects price changes of component stocks), but the futures price is usually different from the spot price. This difference is known as the basis. One theory explaining the equilibrium relationship between futures and cash market prices is based on the cost-of-carry model. This theory suggests that the theoretical "fair value" of a stock index futures contract equals the spot index value plus the net cost of carrying the stocks representing the index until the maturity of the futures contract. The holder of the actual underlying stocks receives dividends on them, but also incurs a financing cost because he must pay full value for the stocks or pay interest on the margined amount. While the futures contract holder receives no div-

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93. See Chicago Mercantile Exchange, supra note 79, at 5.
95. See id.
96. See R. Fink & R. Feduniak, supra note 56, at 504. Until early 1987, S&P 500 index contracts were settled based on the closing value of the underlying index on the last trading day of the futures contract. In April 1987, the NYSE and CME agreed to change this procedure in response to concerns regarding NYSE market volatility associated with so-called triple witching hours (i.e., the last hour of trading on the four Fridays each year when stock options, stock index options and stock index futures all expire simultaneously). The new settlement method, which allows the NYSE specialists to handle order imbalances more effectively, is based on the opening value of the S&P index on the day following the last trading day. Since the change, triple witching hours have not exhibited excessive market volatility. See Katzenbach Study, supra note 4, at 21-22.
98. See Kwast, supra note 74, at 11.
99. See Stoll & Whaley, Program Trading and Expiration-Day Effect, Fin. Analysts J., Mar.-Apr. 1987, at 16-17. A simple model of the fair value of a stock index futures contract ("F*") that does not incorporate transaction costs is given by: F* = S × (1 + r - d), where "S" is the spot index value, "r" is the riskless rate of interest for borrowing funds over the life of the futures contract (e.g., the yield on Treasury bills), 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. See id.; see also Modest, On the Pricing of Stock Index Futures, J. Portfolio Mgmt., Summer 1984, at 51. For example, if the annual yield on Treasury bills is 7% (or 1.75% over three months), the dividend yield is 4% (or 1% over three months), and the spot value of the S&P 500 Index is 240.00, then the fair value of an index futures contract with three months to expiration would equal 241.80 (240.00 × (1 + (0.0175 - 0.01)). Thus, the basis is 1.80 index points (241.80 - 240.00). At the expiration date, the cash settlement feature of stock index contracts ensures that the fair futures price equals the spot index (F* = S) because the effective interest rate and dividend yield are equal to zero. See Stoll & Whaley, supra, at 16-17.
100. See Chicago Mercantile Exchange, supra note 79, at 6.
dends, he also does not incur financing costs. Indeed, because the required margin deposit is relatively small, he can invest the remainder (of the amount he would have otherwise paid for the underlying stocks) in other earning assets, such as Treasury bills. Since yields on Treasury bills have generally exceeded dividend yields on stocks, the net cost of carry has been positive. Consequently, in equilibrium, the fair value of an S&P 500 stock index futures contract is greater than the spot index value, but this difference erodes as the contract approaches its last day of trading, at which time the two values converge.

Prior to the expiration of a stock index futures contract, the current value of the contract may not equal the fair value of the stock underlying the contract. Consequently, there are arbitrage opportunities between the stock and futures markets, which theoretically can yield profit without risk. For example, if the current value of an S&P 500 index futures contract exceeds its fair value (that is, futures are priced at a premium), an arbitrageur would simultaneously buy the stocks composing the index (using the proceeds from borrowing at the risk-free interest rate) and sell the futures contract. In this case, arbitrage forces up the index stock prices and brings down the index futures price. As a result, the process continues until the cost of carry relationship is satisfied. At the expiration of the contracts, the arbitrageur can unwind his positions (sell the stocks and settle the futures) and receive a riskless profit (some rate of return greater than that of a "riskless" instrument such as a Treasury bill) whether prices have increased, decreased or remained the same.  

101. See id.  
102. See supra notes 83-88 and accompanying text; supra note 96.  
103. See Finnerty & Park, How to Profit From Program Trading, J. Portfolio Mgmt., Winter 1988, at 45-46. At expiration, stock index futures contracts are settled at the spot index value, see supra note 99 and accompanying text, and thus the fair value always equals the current value. Until this convergence, the current value of an index futures contract is determined by the forces of supply and demand. The prices of individual stocks (and thus the spot index value) are also determined by supply and demand. However, these two sets of forces do not necessarily operate to maintain an equilibrium net cost of carry relationship between the futures and stock markets. After all, they are separate markets; for example, heavy buying or selling pressure in the futures market can force stock index futures contracts above or below fair value if there is not an equivalent force in the stock market.  
104. See Stoll & Whaley, supra note 99, at 17.  
105. See id. at 16-17. In reality, an arbitrageur would not arbitrage futures against stocks if there was only a very small mispricing between the two markets. Transaction costs (such as fees, commissions, and market impact) incurred by trading affect the profitability of arbitrage. These costs cause the fair value of a stock index futures contract to take on a range rather than a singular value. See Gould, Stock Index Futures: The Arbitrage Cycle and Portfolio Insurance, Fin. Analysts J., Jan.-Feb. 1988, at 48. For instance, if an arbitrageur incurs transaction costs equivalent to 5.00 index points, he would not arbitrage stock index futures against stock unless the current value of a stock index futures contract was trading 5.00 index points above or below the fair value (determined without considering transaction costs) because it would not be profitable.  
107. See id. at 88.
Because the futures contracts are settled at the spot index value, the arbitrageur is unaffected by the manner in which the position in the index stocks is unwound, as long as the opening prices on each of the stocks is received. Thus, the arbitrageur's profit-oriented reaction to mispricing between the futures and stock markets moves the markets toward an equilibrium price. Arbitrage maintains the link between index futures and the underlying stocks composing the index.

B. Program Trading

Program trading refers to the buying or selling of a large number of stocks (called a "basket") simultaneously. For many years prior to the introduction of derivative instruments, institutional investors used program trading to adjust the asset-mix of their portfolios. However, stock index futures have facilitated the growth of program trading by reducing its cost. Moreover, the trend toward investments in index funds has encouraged portfolio size trading. Program trading has been most closely associated with index arbitrage, but it is actually a generic term that encompasses several trading strategies, including asset allocation and hedging, portfolio insurance, and index arbitrage. These strategies require complex computer analyses. Not surprisingly, improvements in communications and data processing technologies have assisted the rapid execution of program trades.

Institutional investors trade portfolios of stocks in order to achieve higher short-run risk-adjusted returns on their investments. Modern portfolio theory indicates that investors in the stock market face two types of risk: unsystematic and systematic. Unsystematic risk is the risk associated with a specific company or industry. The stock price of an individual firm is influenced by such events as lawsuits, strikes, new products, the winning or losing of major contracts, or other occurrences.

109. See id.
111. See Merrick, supra note 82, at 13, 15-16.
113. See infra note 135 and accompanying text.
114. See infra notes 148-53 and accompanying text.
115. See infra notes 154-68 and accompanying text.
116. See infra notes 169-80 and accompanying text.
117. See H. Stoll & R. Whaley, Expiration Day Effects of Index Options and Futures (Monograph Series in Finance and Economics 1986); infra notes 118-21 and accompanying text.
119. See id.
unique to that firm. Because the events affecting a particular stock are generally random, their effects on overall return can be greatly reduced by diversification, the purchase of securities of firms not affected by the same variables. Accordingly, unexpected price increases of one company's stock could be offset by unexpected losses in another. Unsystematic risk decreases quickly as stocks are added to a portfolio. Firm-specific risk, therefore, can be virtually eliminated by properly diversifying a portfolio of stocks.

Although diversification works well at reducing unsystematic risk, it is not effective against systematic (or market) risk, which is associated with the overall movement of the stock market. Market risk stems from factors that affect all firms simultaneously, such as inflation, recession and interest rates. Hence, the systematic risk of stock market participation cannot be reduced by careful stock selection. As a result, investors who engage in a market timing strategy and who perceive a downturn may sell their long positions (get out of the stock market) and purchase money market instruments.

Many investment managers are willing to assume unsystematic risk by not diversifying. They actively trade securities in an attempt to achieve above-average returns on a risk-adjusted basis. In other words, active managers believe that they can beat the market averages consistently. Such a strategy is expensive to implement; costs are incurred researching for mispriced stocks and transactions costs charged for buying and selling individual securities.

Research conducted in the 1960s and 1970s indicated that active management fails to achieve higher returns and lead to skepticism about the effectiveness of active management strategies. Additionally, since the Employee Retirement Income Security Act of 1974 (ERISA) requires pension fund managers to employ "care, skill, prudence, and diligence," achieving diversification at a low cost seems necessary.

This has led some institutional investors to adopt passive portfolio management strategies. Index funds present a passive approach to portfolio management because no individual stock selection analysis is required. Managers purchase the component stocks of the index in the

120. See id. at 160.
121. See id.
122. See R. Fink & R. Feduniak, supra note 56, at 506.
123. See id.
125. See id. at 199-201.
126. 29 U.S.C. § 1104 (1982). See Fabozzi & Garlicki, supra note 124, at 201. ERISA requires that "a fiduciary shall discharge his duties . . . by diversifying the investments of the plan so as to minimize the risk of large losses, unless under the circumstances it is clearly prudent not to do so . . . ." 29 U.S.C. § 1104 (1982).
127. See Fabozzi & Garlicki, supra note 124, at 202.
128. See id.
correct proportions in order to replicate its rate of return.\textsuperscript{129} The growth of these indexed assets has been phenomenal.\textsuperscript{130} In 1980, indexed assets accounted for a total of $9 billion,\textsuperscript{131} but by May 1987, United States pension funds had over $187 billion indexed, of which $124 billion tracked United States equity indices.\textsuperscript{132}

Because equities are only one form of investment, some money managers use a tactical asset allocation strategy.\textsuperscript{133} They balance their investments in stocks, bonds, and money market instruments depending on relative returns and risks.\textsuperscript{134} These institutional investors believe that they can outperform the stock market by proper timing, leaving the market when yields on other investment vehicles are higher. This strategy requires an efficient method of moving in and out of a stock portfolio, which might be an indexed portfolio.

C. Program Trading with Stock Index Futures

Because transactions costs in the futures market are significantly lower than those in the stock market, stock index futures contracts are frequently used for portfolio allocation.\textsuperscript{135} Transactions costs can be separated into four categories: fees and commissions, market-impact, leverage and regulatory constraints.\textsuperscript{136} First, the commissions and fees associated with index futures are between 5 and 10 percent of those for trading in securities.\textsuperscript{137} To illustrate, the commission cost of purchasing $120 million of the stocks underlying the S&P 500 is approximately $161,000; in contrast, the same market exposure could be achieved by purchasing 800 S&P 500 index contracts, but the commission would be only $10,000.\textsuperscript{138} This difference reflects several factors, the primary one being that 500 separate transactions would be made in the stock market, while in the futures market, there could conceivably be only one trade.

Second, the market-impact costs (the price discount or premium incurred to get the trade done), as measured by the spread between bid and offer prices, are lower with index futures than with the actual stocks.\textsuperscript{139} Spreads arise because of the forces of supply and demand in the markets.

\textsuperscript{129} See id. at 202-03.
\textsuperscript{130} See SEC Report, supra note 14, ch. 3, at 3-3.
\textsuperscript{131} See id. (citing Christman, Indexed Assets up 70% in 1985, Pensions & Investment Age, Dec. 23, 1985, at 6).
\textsuperscript{132} See id. (Citing Berkowitz, Indexed Assets Top $187 Billion, Pensions & Investment Age, July 13, 1987, at 3).
\textsuperscript{134} See id.
\textsuperscript{135} See Kling, supra note 53, at 41.
\textsuperscript{136} See id. at 44.
\textsuperscript{137} See Katzenbach Study, supra note 4, at 8.
\textsuperscript{138} See id. at 8, fig. 2.
\textsuperscript{139} See id. The bid price is the price that a potential buyer is willing to pay for a security; conversely, the offer (or ask) price is the price at which a security is offered for sale. The difference between the highest bid and the lowest offer is known as the spread.
For example, securities that are neither widely held nor actively traded will have relatively larger spreads. On the other hand, competitive trading by many market participants produces narrow bid-offer spreads. While the aggregate spread might be $520,000 for the purchase or sale of a $120 million portfolio of S&P 500 stocks, in the futures market the impact would amount to only $20,000.140

Third, there is a lower opportunity cost of obtaining leverage in the futures market than through transactions in the stock market. This leverage derives from two sources—cash settlement and margins.141 Because index futures are settled in cash instead of by actual delivery or payment for the underlying stocks, no costs are associated with obtaining or paying for and then transferring the underlying stocks in the requisite amounts.142 These expenses can be substantial for transactions involving broad indices such as the S&P 500. Equally important is the fact that the opportunity cost of an initial margin deposit is lower in the futures market. For example, with stock index futures contracts, an investor could take a $15 million position in the stock market by depositing only $1.5 million (assuming the margin requirement is $15,000 per contract).143 In the stock market, the investor would have had to put up $7.5 million (an additional $6 million) to control the same amount of stock.144 Hence, the initial margin levels for stock index futures are lower than those for the underlying stocks.145

Finally, although there are various regulatory constraints in both the futures and stock markets, the short-sale restriction in the stock market is notable because of its absence in the futures market. In essence, this regulation—the so-called “up-tick” rule—requires that the short-sale of a stock, the sale of a security that is not owned at the time of the transaction, take place at a price above the last trade.146 No similar rule in the

140. See id. at 8, fig. 3.
141. See id. at 8.
143. Margin requirements are set by futures exchanges and clearing houses as absolute amounts. Generally, the required original margins are approximately 10 percent of the contract value.
144. Under Regulation T, the margin requirement for investors in stocks is 50 percent of the stock's current market value. See 12 C.F.R. § 220.18 (1988). However, for securities broker-dealers trading for their own account, margin is generally between 20 and 25 percent because of exemptions for certain special purpose loans. See 12 C.F.R. § 221.5 (1988); Sofianos, Margin Requirements on Equity Instruments, Fed. Res. Bank N.Y.Q. Rev., Summer 1988, at 47, 51. Brokers or dealers have implicit margin requirements under the Securities and Exchange Commission's net capital rule, 17 C.F.R. § 240.15c3-1 (1988), which prohibits indebtedness from exceeding a computed amount.
145. See supra text accompanying notes 58-64 for a discussion of the difference between the term “margin” in the futures and stock markets. While initial margins may be lower for stock index futures contracts, after considering the effect of variation (or maintenance) margin pays and collects resulting from the daily mark-to-market of open futures contracts, the overall margin requirement may be equal to that of stocks. See infra text accompanying notes 336-44.
THE CRASH OF 1987

futures market prevents the sale of an index contract without owning the underlying component stocks of the index. Consequently, it is easier to sell short on an equivalent stock portfolio in the futures market.

1. Asset Allocation and Hedging

The lower transactions costs associated with stock index futures contracts enable institutions to hedge their equity investment more efficiently. Like a wheat farmer, an institutional investor can implement a hedging strategy to protect itself from a decline in price. If a portfolio manager with a diversified portfolio of stocks believes the market will decline, he can sell the shares and use the proceeds to purchase Treasury bills. However, selling an entire portfolio at once is an expensive proposition, especially when the manager expects to repurchase the shares in the near future when the market turns upward. The same yield might be achieved less expensively by keeping the stock positions and selling S&P 500 index futures contracts against them. This strategy is called non-invasive hedging because the market component of risk in the portfolio is removed without disturbing the stocks themselves.

A simple example will illustrate the principles. Suppose an investor owns a diversified portfolio worth $1,200,000, but he expects the market to fall 15 percent over the next three months. Let us assume that the annual dividend yield on the portfolio is 4 percent, the annual yield on Treasury bills is 7 percent, and the current (or spot) S&P 500 index value is 240.00. By selling ten S&P 500 Index futures contracts at 241.80 (their fair value) and holding them until expiration, the investor will earn the Treasury bill rate over three months instead of losing 15 percent.

By selling futures, however, the investor has not completely eliminated risk; rather, he has substituted what is known as basis risk for market risk. Basis risk is the risk that the stock index futures contracts are not

must be executed at a price that constitutes a plus tick or a zero plus tick. See 17 C.F.R. § 240.10a-1 (1988); A. Pessin, supra, at 240-42.

148. See generally D. Luskin, supra note 94, at 256-63.
149. See supra note 99.
150. To illustrate:

| Value of stocks at end of three months | $1,020,000 |
| Value of stocks at beginning of period | $1,200,000 |
| Loss from stocks | ($180,000) |
| Expiration value of futures | ($1,020,000) |
| (204.00 × $500 × 10) | |
| Initial value of futures | 1,209,000 |
| (241.80 × $500 × 10) | |
| Profit from futures | $189,000 |
| Dividends received | $12,000 |
| TOTAL PROFIT | $21,000 |
| RETURN ON INVESTMENT OVER THREE MONTHS | 1.75% |
| (7% annually) | |
priced at their fair value.\textsuperscript{151} For example, if the ten contracts were initially sold when they were underpriced (that is, at a discount to fair value, such as 237.60),\textsuperscript{152} the portfolio would be underhedged. Consequently, the investor would earn less than the Treasury bill rate and might possibly suffer a loss.\textsuperscript{153}

Assuming the futures are fairly priced, by timing the market correctly, an investor can efficiently reduce his equity exposure, avoid a loss, and earn a risk-free return. If, however, he was wrong and the market rose 15 percent, losses in index futures would offset any gains in the stocks; as a result, the portfolio would still only yield the Treasury bill rate (7 percent). This strategy creates a "synthetic" money market instrument: the Treasury bill.

With futures contracts, an equity investment can be reallocated to other financial instruments as well. In particular, a portfolio manager can effectively invest in Treasury bonds by selling stock index futures contracts against a stock portfolio and buying Treasury bond futures contracts. An investor might prefer this strategy when yields on long-term Treasury bonds exceed those of short-term money market instruments. Thus, the availability of stock index futures and other financial futures contracts allow institutional investors to hedge their stock portfolios and reallocate their investment to other financial instruments.

2. Portfolio Insurance

In the hedging strategy discussed above, the process of risk transfer creates an opportunity cost of lost upside potential in the stock market. While a perfect hedge can avoid a loss when stock prices fall, it also precludes a profit when prices increase. Some institutional investors are willing to pay a fee to limit downside risk to a specified minimum floor


\textsuperscript{152} Stock index futures do not necessarily trade at their fair value. \textit{See supra} note 103.

\textsuperscript{153} To illustrate:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of stocks at end of three months</td>
<td>$1,020,000</td>
</tr>
<tr>
<td>Value of stocks at beginning of period</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Loss from stocks</td>
<td>($180,000)</td>
</tr>
<tr>
<td>Expiration value of futures</td>
<td>($1,020,000)</td>
</tr>
<tr>
<td>(204.00 X $500 X 10)</td>
<td></td>
</tr>
<tr>
<td>Initial value of futures</td>
<td>$1,188,000</td>
</tr>
<tr>
<td>(237.60 X $500 X 10)</td>
<td></td>
</tr>
<tr>
<td>Profit from futures</td>
<td>$168,000</td>
</tr>
<tr>
<td>Dividends received</td>
<td>$12,000</td>
</tr>
<tr>
<td><strong>TOTAL PROFIT (LOSS)</strong></td>
<td><strong>$0</strong></td>
</tr>
<tr>
<td><strong>RETURN ON INVESTMENT OVER THREE MONTHS</strong></td>
<td><strong>0.00%</strong></td>
</tr>
</tbody>
</table>

If the ten stock index futures contracts were sold at a value of less than 237.60, the investor would have suffered a loss. On the other hand, if the investor had sold the stock instead, she could have invested the proceeds in Treasury bills earning an annual yield of 7 percent (or 1.75 percent for the three month period).
but nevertheless participate in upside gains. Portfolio insurance is not an insurance policy, but a dynamic strategy seeking to protect against loss without eliminating profit opportunities.

Portfolio insurance, also known as dynamic hedging, is an asset allocation strategy that continually rebalances a portfolio between a risky investment and a riskless investment so that the portfolio's total return does not fall below some specified minimum over a given time period. As the portfolio's value rises above the value associated with the minimum required return, the asset mix of the portfolio is gradually shifted toward the risky investment. However, as the portfolio's value falls, funds are gradually shifted to the riskless asset to protect the portfolio from falling below the minimum required return. For example, an institutional investor following a portfolio insurance program would sell some of its portfolio of stocks and buy Treasury bills in reaction to a falling stock market, but purchase stocks and sell Treasury bills in a rising market.

As with static hedging, this dynamic strategy can be implemented with less expense and more speed with stock index futures. A stock portfolio can be systematically rebalanced by selling stock index futures (in-

154. Although portfolio insurance is generally not "true" insurance, such a product does exist. Aetna Life developed the Guaranteed Equity Management ("GEM") contract, which guarantees at least a specified minimum return at the end of the covered period. See Tate, The Insurance Company Guarantee, in Portfolio Insurance: A Guide to Dynamic Hedging 183 (D. Luskin ed. 1988).


156. See Ferguson, How to Beat the S&P 500 (Without Losing Sleep), Fin. Analysts J., Mar.-Apr. 1986, at 37, 39, reprinted in Portfolio Insurance: A Guide to Dynamic Hedging 62 (D. Luskin ed. 1988). An investor would specify a zero percent minimum return to ensure that there will be a probability of zero that the return on her portfolio will be less than zero percent. Similarly, an investor who is willing to incur no more than a 5 percent loss on his portfolio during the investment period would specify a minimum return of negative 5 percent. By analogy to real insurance, a minimum return of less than zero percent (e.g., where an investor is willing to risk a loss) represents a deductible. See Clarke & Arnott, Patterns of Reward for Portfolio Insurance, in Portfolio Insurance: A Guide to Dynamic Hedging 31 (D. Luskin ed. 1988).

157. The minimum required return can be no greater than the expected return from the riskless asset. See Ferguson, supra note 156, at 37, 39.

158. Portfolio insurance is a strategy that reacts to price movements, but does not anticipate them.

159. Conventional dynamic hedging, which involves buying and selling stocks and Treasury bills, generates transactions costs of 0.56 percent of the spot index price per year. If index options are used instead, the annual cost is approximately 0.48 percent of the spot index price. Dynamic hedging with futures is the cheapest—only 0.18 percent of the spot index price. See Rubenstein, Alternative Paths to Portfolio Insurance, Fin. Analysts J., July-Aug. 1985, at 50, reprinted in Portfolio Insurance: A Guide to Dynamic Hedging 23 (D. Luskin ed. 1988). As a result, most portfolio insurance programs are
stead of selling the actual stock) after a market decline and by easing those positions when the market advances. Such a strategy dynamically shifts the investor's exposure between stocks and Treasury bills.

The computation of when and by how much to change the portfolio's allocation in order to achieve a specified minimum return is based on option pricing theory. A put option on a diversified stock portfolio with a strike price equal to a minimum required return can be synthetically replicated by continuously adjusting the market exposure (for example, selling and buying S&P 500 index futures contracts). One measure of the cost of portfolio insurance—the "premium" paid for the "synthetic" put option—is the return differential by which the total return lags behind the performance of the risky component. In effect, the cost of portfolio insurance equals the extent to which the strategy fails to capture up-turns in the stock market. The investor, therefore, pays for eliminating the risk of losses below the specified minimum return by accepting an increased likelihood of modest returns.

Portfolio insurance is not a riskless strategy. First, as the volatility of the stock market increases, the cost of portfolio insurance will also increase. The seminal articles developing the theory are Black & Scholes, The Pricing of Options and Corporate Liabilities, 81 J. Pol. Econ. 637 (1973), reprinted in Portfolio Insurance: A Guide to Dynamic Hedging 226 (D. Luskin ed. 1988), and Merton, Theory of Rational Option Pricing, 4 Bell J. Econ. & Mgmt. Sci. 141 (1973). A discussion of option pricing is beyond the scope of this Article. Because of the complexity of financial models and the amount of information that must be processed, computers are important tools in performing the required calculations.

For example, assume that an institution wants to invest in a diversified portfolio of stocks and wants to avoid a loss over one year. Assume in addition that the S&P 500 index's expected return is 16%, the volatility of the S&P 500 index is 20% annually, and the interest rate is 10%. A dynamic hedging program that incorporates these assumptions will call for an initial portfolio allocation to S&P 500 stocks of 59.7% and an allocation to Treasury bills of 40.3%. This allocation is achieved by fully investing in stocks and selling S&P 500 index futures against them. If the S&P 500 index rises, the program will call for a greater allocation to stocks (which can be achieved by offsetting some of the short futures position with purchases of futures contracts), and because only part of the portfolio is allocated to stocks, the return of the total portfolio will fail to capture the full appreciation of stocks. Therefore, if the S&P 500 index rose 35% over the year, the return on an insured portfolio would only be about 28.9%. Accordingly, the upside capture is 95.5% (1.289/1.350). Hence, in return for the assurance that the portfolio would not lose money, the institution passed up the opportunity to earn an additional 6.1% without insurance. See Ferguson, supra note 156, at 40.
crease. When the stock market drops, portfolio insurance sells; when the market advances, portfolio insurance buys. Accordingly, higher volatility generates more trading, which produces greater transactions costs. Second, portfolio insurance is based on the assumption that the index price will fluctuate smoothly. However, if there are discontinuities in stock or futures prices because of trading halts, proper portfolio adjustments may be impossible. Furthermore, portfolio insurance assumes that the market for stock index futures contracts remains liquid even when stock prices are falling. That is, there must be a sufficient number of buyers of stock index futures contracts such that the portfolio insurers can sell futures contracts at a fair price. If sufficient buying power does not exist, there can be no “insurance.” Finally, mispricing securities can make dynamic hedging unexpectedly very expensive. If the market declines, but S&P 500 index futures contracts are priced at a discount to stocks (below fair value), it will become expensive to sell stock index futures and thus implement a dynamic hedging strategy.

3. Index Arbitrage

Index arbitrage is another program trading strategy. Investors using index arbitrage attempt to profit from occasional mispricings between stock index futures and the underlying basket of stocks. If the prices of equivalent financial assets that are traded in different markets are known, then arbitrageurs act on their knowledge to earn profits when the prices diverge. Arbitrageurs are only concerned with basis and not with the intrinsic value of stocks. For example, if futures were priced at a premium to their fair value, and thus at a premium to stock price, an index arbitrageur would simultaneously sell index futures and buy an equivalent amount of the basket of stocks underlying the index in the same proportion that the stocks are weighted in the index (long arbitrage). The arbitrageurs would continue to sell index futures (forcing the price of stock index futures down) and buy the underlying basket of stocks (forcing stock prices up) until the disparity vanishes. Thus, index arbitrageurs make the markets efficient by recognizing mispricing be-

164. See Clarke & Arnott, supra note 156, at 31.
165. See id. at 41.
167. See D. Luskin, supra note 94, at 286; Rubenstein, supra note 166, at 38, 40.
168. See CME Report, supra note 5, at 26; Hill, Jain & Wood, Insurance: Volatility Risk and Futures Mispricing, J. Portfolio Mgmt., Winter 1988, at 23; Donnelly, Is Portfolio Insurance All It’s Cracked Up to Be?, Institutional Investor, Nov. 1986, at 132; Rubenstein, supra note 166, at 38; Voorhees, Can Portfolio Insurance Make a Comeback?, Institutional Investor, Jan. 1988, at 58; see also supra note 152-53 and accompanying text. Selling a low priced futures contract can lead to the possibility of “missing the floor” (for example, not achieving the specified minimum return). To avoid such a result, a portfolio insurer should sell the actual (relatively higher priced) stock instead. See CME Report, supra note 5, at 26.
169. See supra text accompanying notes 108-11.
between the markets and moving them toward an equilibrium price.\textsuperscript{170}

Index arbitrage maintains the link between the futures and stock markets and consequently benefits market users.\textsuperscript{171} As previously described, institutional investors attempting to time the market or dynamically hedge their portfolios using index futures may encounter a basis risk because of inefficient pricing of futures and stocks. The arbitrage process, by keeping the futures and stock markets aligned,\textsuperscript{172} reduces some of the uncertainty borne by users of futures markets.\textsuperscript{173}

Index arbitrage affects stock prices because the futures market reacts more rapidly to new information than does the stock market. The lower transactions costs of index futures allow institutional investors to make portfolio adjustments more inexpensively than by trading the underlying stocks.\textsuperscript{174} Consequently, changing investors' expectations will be more quickly reflected in the price of an index futures contract than in stock prices. This discrepancy between the markets creates arbitrage opportunities. For example, if futures begin to trade at a discount to stock, arbitrageurs will buy futures and sell short stocks (short arbitrage), which will lead to a fall in the stock market. Index arbitrage transmits negative expectations in the futures market to the underlying stocks. This relationship—index futures price movements affecting stock prices—has been referred to as "the tail wagging the dog."\textsuperscript{175} Over time, the swings in the stock market will become less pronounced as additional arbitrageurs enter the markets, but arbitrage opportunities will persist because of the difference in transactions costs between the two markets.\textsuperscript{176}

Index arbitrage generates nearly riskless returns in excess of the yields on Treasury bills. Drawing from the numbers developed during the discussion of asset allocation and hedging, an arbitrageur could earn riskless profit if futures were not fairly valued.\textsuperscript{177} For example, if index futures were trading at discount, 237.00 instead of the "fair" 241.80, an arbitrageur would purchase the "cheap" index futures contracts and sell short the relatively expensive stocks composing the index, investing the proceeds in Treasury bills.\textsuperscript{178}

\textsuperscript{170} See Congressional Research Service, supra note 110, at 5.
\textsuperscript{171} See H. Stoll & R. Whaley, supra note 117, at 22.
\textsuperscript{172} See Merrick, supra note 82, at 13, 17-18.
\textsuperscript{173} See id. at 18.
\textsuperscript{174} See supra text accompanying notes 135-47.
\textsuperscript{175} Kerwin, \textit{Is the Tail Wagging the Dog?}, Barron's, Dec. 10, 1984, at 11.
\textsuperscript{176} Cf. H. Stoll & R. Whaley, supra note 117, at 28; Merrick, supra note 82, at 19-21.
\textsuperscript{177} See supra notes 148-50 and accompanying text.
\textsuperscript{178} One form of index arbitrage is known as index substitution, which involves arbitrage against an already existing portfolio of stocks. Institutional investors such as pension and mutual fund managers are therefore likely candidates to use index substitution. In the example developed during the discussion of asset allocation and hedging, it was assumed that the investor sold index futures at their fair value. Hence, the portfolio manager ensured a risk-free return equal to the Treasury bill yield. If futures were under-priced, the investor would earn less than the yield on Treasury bills or even lose money. What if index futures were over-priced instead (i.e., they are sold at a price in excess of
Although index arbitrage is referred to as a strategy that generates "riskless" profits, some risks actually are involved. One risk is that the dividend yield on stocks will not develop as expected. If companies increase or cut dividends unexpectedly, the fair value relationship changes. Thus, if dividends are cut, the long arbitrageur's return will also be reduced. Another risk is tracking error. Arbitrageurs frequently purchase or sell a basket of stocks that does not include all the component stocks in the index. Thus, an arbitrageur exposes himself to risk because the futures contracts do not perfectly hedge price changes in the basket of stocks. Finally, the arbitrageur takes the risk that the transaction will not be executed at the proper prices to make the strategy profitable. Trade execution of the index futures contract is relatively simple. An arbitrageur can buy or sell ten contracts simply by calling his trader in the pits. However, the other side of the transaction—stocks—is more difficult. Trading ten S&P 500 index contracts requires the equivalent of selling or buying thousands of shares of 500 different stocks at once. Moreover, for profitable arbitrage, the stock transactions must be done at certain prices. Advances in transaction processing technology permit this to occur.

4. Technology—The Automation of the New York Stock Exchange

In the 1960s, orders to purchase or sell stocks were listed on the New York Stock Exchange (NYSE). A customer would call a registered representative at a brokerage firm's branch office and place the order to buy or sell. In turn, the order would be telephoned to the firm's order desk. The order desk would then telephone the order to the firm's booth on the floor of the NYSE, and a floor broker would take the order (a physical paper ticket) to the trading post for that listed stock and

their fair value? For example, if the ten futures contracts were initially sold at a value of 244.00, the investor would have earned an additional $11,000. This would result in a three month return of 2.67%, or 10.67% annually, which is clearly superior to earning an annual Treasury bill yield of 7%.

181. See generally SEC Report, supra note 14, ch. 7, at 7-16.
182. There are basically three types of orders: market, limit and stop. A market order is an order for immediate execution at the best price available at the time the order reaches the market; it is the most common type of order. A limit order is an order to execute a trade only at a specified price (or better). A stop order is a memorandum that becomes a market order when the price equals or passes the specified memorandum price. See A. Pessin, supra note 146, at 203-04.
183. NYSE members rent booth space, located around the perimeter of the NYSE's floor.
184. Floor brokers are members of the securities exchange who execute orders on the exchange floor.
185. A post is a location on the NYSE floor at which assigned securities are traded. Several securities may be assigned to trade at a single post.
execute the trade with either the specialist\textsuperscript{186} responsible for that stock or with another broker who was willing to take the other side of the trade. The procedure for reporting the transaction back to the customer followed this pattern but in reverse.

This manual system could not handle the increasing transaction volume on the NYSE.\textsuperscript{187} The massive paper work\textsuperscript{188} required by this system overwhelmed NYSE member firms in the late 1960s, resulting in a “back office”\textsuperscript{189} crisis. Consequently, the inefficiencies associated with the manually intensive process, as well as NYSE member firms’ demands for faster executions of their trades, led the NYSE to introduce its Designated Order Turnaround System in 1976 and an improved version called SuperDot in 1984, both in turn known popularly as “DOT.”\textsuperscript{190}

The DOT system, an automated order processing and post trade system, links member firms directly to the trading floor of the NYSE. It permits a broker (through his firm’s computer system) to electronically route an order to the proper trading post on the floor of the NYSE, where it is executed by the specialist or another floor broker.\textsuperscript{191} The system then reports the execution of the trade back to the broker over the same electronic circuit. Moreover, DOT automatically submits the executed transaction to the comparison cycle and settlement process.

The computerized DOT system has several advantages over the manual process. Because DOT bypasses member firms’ floor booths, it eliminates the commission fees usually paid to their floor brokers on each trade.\textsuperscript{192} DOT achieves a faster trade execution because telephone calls and the walking back and forth from the trading post are unnecessary. Finally, because executed trades are submitted directly to the comparison systems, uncompared trades (errors) and manual “back office” process-

\textsuperscript{186} Trading posts are staffed by specialists, who are exchange members, not employees of the NYSE. Specialists are assigned securities by the exchange and are expected to maintain a fair and orderly market in those securities. They perform four distinct functions: agent, dealer, auctioneer and market catalyst. See New York Stock Exchange, Inc., The Capital Market 18 (1987).

\textsuperscript{187} See SEC Report, supra note 14, ch. 7, at 7-16.


\textsuperscript{189} The operations department of a brokerage firm, which processes securities transactions, is known as the back office. See generally D. Weiss, After the Trade is Made (1986).

\textsuperscript{190} See Katzenbach Study, supra note 4, at 12. The introduction of DOT was also a competitive response by the NYSE to the development of small-order execution systems by other stock exchanges. These systems include the American Stock Exchange’s PER system, the Midwest Stock Exchange’s MAX system, the Pacific Stock Exchange’s SCOREX system, and the Philadelphia Stock Exchange’s PACE system. See SEC Report, supra note 14, ch. 7, at 7-24 to 38.


\textsuperscript{192} Nevertheless, the specialist may charge a floor brokerage fee on certain orders. Unless the order is a sell short market order, the specialists may not charge this fee on pre-opening market orders up to 5,099 shares, on post-opening market orders up to 2,099 shares, or marketable limit orders up to 2,099 shares executed through DOT. (A marketable limit order is a limit order that is immediately executable because the price of the security is equal to or better than the specified limit price of the order.) See id.
ing costs are essentially eliminated.\textsuperscript{193}

The use of DOT has increased since its introduction in 1976. Initially, its usefulness was limited because of its slowness and the small order eligibility size. In 1976, only orders up to 199 shares could be accepted by DOT while the average size of a trade on the NYSE was 559 shares.\textsuperscript{194} But, by September 1987, both the order eligibility size and the average size of a trade were 2,099 shares.\textsuperscript{195} The DOT system’s execution speed has also increased. In 1982, “80\% of the market orders transmitted through DOT were executed and reported back to the originating firm within two minutes.”\textsuperscript{196} This figure rose to 92 percent in 1986 and to 94 percent by the second quarter of 1987.\textsuperscript{197} Over two-thirds of the average daily volume at the NYSE is now routed through the DOT system.\textsuperscript{198}

The rapid, inexpensive and reliable order executions available through the DOT system make it the preferred method for implementing program trading strategies in stocks.\textsuperscript{199} Indeed, the NYSE developed the List Order Processing feature (“LIST”), which allows member firms to send orders through DOT in a list of securities.\textsuperscript{200} For example, LIST

\textsuperscript{193} Without DOT, when a trade is executed at a post, the two floor brokers to the transaction “give-up” the names of the brokerage firms they represent. This information, the number of shares, and the price at which they agreed is recorded on a floor ticket. Later that day, the clearing brokerage firms enter this information into data processing facilities that compare trades between brokerage firms and provide reports indicating unmatched trades. For example, if broker Z executes a trade with broker F, but inadvertently records the trade on the floor ticket as one with broker E, an unmatched trade report will indicate the absence of a match. However, with DOT, there is no opportunity for human error; the computer system already matches the trades and then submits them to the comparison system.

\textsuperscript{194} See SEC Report, \textit{supra} note 14, ch. 7, at 7-17 n.52.

\textsuperscript{195} See \textit{id}. DOT will accept pre-opening market orders up to 5,099 and post-opening market orders up to 30,099; however, orders larger than 2,099 are not guaranteed a timely execution. DOT will accept limit orders up to 99,999 shares. \textit{See New York Stock Exchange, Inc.}, \textit{supra} note 191.

\textsuperscript{196} J. Seligman, \textit{supra} note 188, at 26.

\textsuperscript{197} See SEC Report, \textit{supra} note 14, ch. 7, at 7-19 n.61. The DOT system has an automatic execution feature. When “the NYSE quote equals the best quote disseminated by any participant in the Intermarket Trading System and the spread between the bid and asked is no more than one eighth of one point, . . . the DOT system will automatically execute the order and immediately report the trade back to the member firm.” \textit{Id}. at 18. In addition, the NYSE has a reporting feature where a market order transmitted through DOT receives a reference price when it reaches the DOT system. If the specialist does not report an “execution of a . . . market order of up to 2,099 shares within three minutes of its reaching the DOT system,” DOT automatically confirms an execution at the reference price, and, “if the trade has not been made with a third party, the trade is taken by the specialist’s own account.” Task Force Report, \textit{supra} note 11, Study VI, at 11. However, it is rare that a specialist fails to act within the three minutes. \textit{See SEC Report, \textit{supra} note 14, ch. 7, at 7-18 n.59.}

\textsuperscript{198} See SEC Report, \textit{supra} note 14, ch. 7, at 7-15. In September 1987, on average, 128 million shares per day (or 73 percent of the average daily volume of 175 million shares) were routed through DOT. \textit{See id}. ch. 7, at 7-15 n.48.


\textsuperscript{200} See SEC Report, \textit{supra} note 14, ch. 1, at 1-6; \textit{id}. ch. 7, at 7-19.
permits index arbitrageurs to enter buy or sell orders quickly in a large number of specific securities (up to 500) that they have previously identified as part of a package. Thus, an arbitrageur could have his computer program assemble the exact proportions of stocks to buy or sell based on his specific strategy and the real-time arbitrage opportunities existing between his package of stocks and the index contracts in the futures market. For instance, if the program detects such an opportunity during the day, the arbitrageur’s personal computer would make a beeping noise, and then with one keystroke, market orders on 250 stocks totalling $150 million would be transmitted through DOT to the appropriate trading posts for rapid execution. Similarly, the LIST feature of DOT enables managers of index funds to conduct portfolio insurance and index substitution strategies by moving their whole portfolios efficiently in or out of the stock market.

Program trading strategies can be implemented without the assistance of DOT, but the process is more costly and cumbersome. Without the electronic link to the specialists’ posts, floor brokers must physically walk to the trading posts to execute the trades. Moreover, each trade requires a handwritten, pre-printed floor ticket. Therefore, if an index arbitrageur’s program indicates that the brokerage firm should sell futures contracts on the S&P 500 index and buy 200 (in certain proportions) of the 500 underlying stocks, 200 tickets must be completed. Furthermore, since the 200 stocks are traded at various posts on the floor of the NYSE, many floor brokers would be needed to execute the trades. The brokers must be quick because the profitability of the arbitrage depends on the broker getting an execution at the price or very near the price at which the computer program was triggered. Because of the number of floor brokers required to implement program trading strategies without the use of DOT, only the large brokerage firms with many floor brokers can continue to profit from its use.

In conclusion, the NYSE’s DOT system is one example of a technological innovation that has improved the functioning of the markets. Trade executions are quicker, more accurate and less expensive. This greater order-handling efficiency benefits both issuers and investors. In the case of index arbitrageurs, it allows them to profit from the elimination of pricing inefficiencies between the stock and futures markets, and the fair pricing which results is a necessary condition for pension funds to imple-

201. See id. ch. 1, at 6.
202. See supra text accompanying notes 169-76.
203. See SEC Report, supra note 14, ch. 1, at 1-6 n.20.
204. See SEC Report, supra note 14, ch. 1, at 1-7.
205. Because not all of the stocks included in the S&P 500 are traded on the NYSE (some are traded at the AMEX, others are OTC), in this example, it is assumed that the 200 stocks are traded on the NYSE.
ment strategies that hedge their equity investments with stock index futures.

Advancements in securities transaction processing, such as the DOT system, and the introduction of stock index futures have facilitated program trading and brought the stock and futures markets closer together. This new relationship between the markets has produced a jurisdictional "turf battle" between financial regulators.

III. REGULATION OF DERIVATIVE INSTRUMENTS: A JURISDICTIONAL DISPUTE

Until recently, the futures industry and the securities industry operated as separate markets. Originally, the futures industry traded futures and options contracts on agricultural commodities, while the securities industry primarily focused on stocks and bonds. As a result, the federal regulation of these industries has developed along two distinct paths, with the Commodity Futures Trading Commission (CFTC) responsible for one and the Securities and Exchange Commission (SEC) responsible for the other. However, trading strategies employing derivative instruments have linked the futures and securities markets. This new contact between the two industries has raised questions concerning who should regulate these new products and what regulatory standards should apply.

Trading in futures contracts is governed by the Commodity Exchange Act (CEA).207 In 1974, Congress extensively amended the act by expanding the scope of the CEA to include non-agricultural commodities and by creating the CFTC. The CEA now defines the term "commodity"208 to include "all other goods and articles . . . and all services, rights, and interests in which contracts for future delivery are presently or in the future dealt in," as well as certain specified agricultural products.209

The CFTC replaced the Commodity Exchange Authority, an agency within the United States Department of Agriculture, as the principal regulator of the futures industry. The role of the CFTC is broader than its predecessor since Congress expanded the definition of a commodity. Congress also gave the agency exclusive jurisdiction over all transactions in futures contracts and commodity options210 to facilitate the development and implementation of a cohesive regulatory structure in the fu-

208. Congress expanded the definition because by 1974 a number of futures contracts traded in the United States were unregulated because they fell outside the narrow scope of the CEA. See, e.g., S. Rep. No. 1131, 93d Cong., 2d Sess. 18-19, reprinted in 1974 U.S. Code Cong. & Admin. News 5843, 5858-59. For example, these unregulated futures contracts included contracts on coffee, lumber and foreign currencies. See id. Moreover, Congress realized that futures trading would expand to a variety of other instruments and believed that such new products should be regulated. See id.; H.R. Rep. No. 975, 93d Cong., 2d Sess. 41-42, 62 (1974).
tures industry "and to prevent the costs and confusion associated with multiple regulators." 211

Jurisdictional conflicts between the SEC and CFTC arose shortly after the CFTC's creation. In 1975, the CFTC approved the trading of futures contracts on Government National Mortgage Association mortgage-backed pass-through certificates (GNMAs) and U.S. Treasury bills. 212 These contracts were clearly commodities for purposes of the CEA under CFTC jurisdiction, but the instruments underlying them were obviously securities under the securities laws, thereby coming within SEC jurisdiction. In a 1975 letter to the CFTC, the chairman of the SEC set forth the SEC's concerns about overlapping regulation and urged the CFTC to refrain from authorizing additional futures-securities contracts. 213 The CFTC replied that Congress had given it exclusive jurisdiction over commodity futures contracts on securities, even though the underlying security might be within the purview of the SEC. 214 This controversy between the agencies continued as new derivative financial products were developed. 215

The CFTC and the SEC did not resolve their jurisdictional dispute until 1981. 216 At that time, the chairmen of the agencies negotiated the so-called Johnson-Shad Accord, which Congress subsequently enacted through amendments to the federal securities laws and the CEA. 217 This legislation grants the CFTC exclusive jurisdiction over all futures contracts and options on futures contracts. 218 Additionally, while trading in futures (or options on futures) on individual corporate or municipal securities is prohibited, the CFTC has jurisdiction over futures on stock indices and municipal bond indices, and over futures on individual government securities (and over options on such futures contracts). 219 On the other hand, the SEC retains jurisdiction to regulate options on securi-

211. 1 T. Russo, supra note 47, § 10.03, at 10-7.
214. See Seeger, supra note 212, at 8.
215. Following the SEC's approval of a proposal by the Chicago Board of Options Exchange ("CBOE") to trade options on GNMAs, the Chicago Board of Trade ("CBOT") sued the SEC, contending that options on GNMAs fell within the CFTC's exclusive jurisdiction and that the SEC therefore lacked authority to approve CBOE's proposal. The CFTC filed an amicus curiae brief supporting the CBOT. See Chicago Board of Trade v. SEC, 677 F.2d 1137 (7th Cir.), vacated, 459 U.S. 1026 (1982).
219. See id.
ties, including groups of securities or indices based on the value of the securities (which includes exempt securities and exempt securities indices).

Index futures and options received special attention in the resolution of the jurisdictional dispute. Once an index futures contract or option on such contract (whether based on equity or debt securities) has been approved by the CFTC, the CFTC exercises exclusive jurisdiction to regulate its trading. Prior to approving such a contract, however, the CFTC must determine that it meets all of the following minimum requirements. First, the settlement or delivery must be in cash or by means other than the transfer or receipt of a security. Second, trading in such contracts must not be readily susceptible to manipulation, or use in the manipulation, of the price of the security. Finally, "[s]uch group or index of securities shall be predominantly composed of the securities of unaffiliated issuers and shall be a widely published measure of, and shall reflect, the market for all publicly traded equity or debt securities or a substantial segment thereof, or shall be comparable to such measure." Moreover, the CEA provides that even if the CFTC finds an index futures or options contract acceptable, the SEC can veto the CFTC's approval if it believes that the contract does not meet the statutory requirements.

In addition to the jurisdictional disagreement between the SEC and the CFTC, the Board of Governors of the Federal Reserve System ("Fed") and the CFTC have argued over who has the authority to prescribe margin requirements for stock index futures. Margin authority over futures is vested in the private sector—the futures exchanges and their clearing houses. Generally, the CFTC has no authority to review the margin rules established by the individual futures exchanges. However, if the CFTC has reason to believe an "emergency" exists, it has the authority

220. See id.; Connolly, A Review of the Futures Trading Act of 1982, 6 Corp. L. Rev. 342, 345 (1983). In addition, the SEC has jurisdiction over options on foreign currencies traded on a national securities exchange, but the CFTC has exclusive authority in all other instances. See 7 U.S.C. § 2 (1982). Moreover, the CFTC regulates futures contracts on foreign currencies. See id.


222. See id.

223. See id.

224. In analyzing a stock index future contract's susceptibility to manipulation, the regulators focus on the number of stocks composing the index, the capitalization, the depth and liquidity of the secondary market for the component stocks, the degree to which the prices of component stocks move together, and the system of calculating the index value. See Edwards & Edwards, A Legal and Economic Analysis of Manipulation in Futures Markets, 4 J. Futures Markets 333, 360-61 (1984).


226. Id.

227. See id.

228. See 7 U.S.C. § 7a(12) (1982). However, the CFTC has authority to establish margin levels for options. See 7 U.S.C. § 6c(b), (c) (1982).
to establish temporary margin levels for any futures contract. An emergency is defined to include not only "threatened or actual market manipulations and corners, [but also] any act of the United States or a foreign government affecting a commodity or any other major market disturbance which prevents the market from accurately reflecting the forces of supply and demand for such commodity."

The Fed claims margin-setting authority over stock index futures and options and other derivative instruments because such authority is necessary to limit the use of credit for speculative purposes and to assure competitive equality among functionally equivalent instruments. To date, however, the Fed has neither exercised its presumed authority, nor decided whether it should have joint authority with the CFTC and the SEC over margins on derivative instruments. This current, bifurcated framework, where stocks are regulated by the SEC and stock index futures are regulated by the CFTC, came under critical examination after it failed to prevent the crash of 1987.

IV. THE ROLE OF DERIVATIVE INSTRUMENTS IN THE CRASH OF 1987

Following five years of unprecedented growth, the stock market began to decline in August 1987 after the Dow Jones Industrial Average (DJIA) peaked at 2722. The fall accelerated during the week of October 12th and the market eventually crashed on "Black" Monday, October 19th, when the DJIA dropped 508 points to 1738: the bull market had ended. In retrospect, the dramatic increase in stock values and their eventual collapse on Black Monday can be attributed to a variety of economic and psychological factors, as well as to the use of program trading strategies based on derivative instruments. Thus, the run-up in stock prices between 1982 and 1987 set the stage for an eventual correction.


The Fed's rationale is that since stock index futures contracts are functionally equivalent to options on stock indexes (on which the Fed has margin-setting authority because such options are defined as securities), it has authority to impose margin requirements on stock index futures as well. More specifically, if similar margins levels were not imposed, "there would be both unequal regulation of market participants in similar products and a potential for erosion in the board's margin requirements for securities credit." Seeger, supra note 212, at 21.

234. See id.
235. See GAO Report, supra note 8, at 36.
Several economic conditions contributed to the bull market in which the DJIA rose from 777 to 2722 between August 1982 and August 1987.237 Low interest rates and rising employment characterized the period following the 1981-1982 recession.238 This favorable economic climate pushed stock prices upward. From 1984 through 1987 the growth in the nation’s money supply, which the Fed permitted to occur, created the liquidity that allowed the stock market to be bid up further.239 Despite increasing stock prices, stocks remained relatively inexpensive and offered higher returns than other capital assets because of the low level of inflation in the economy.240 Consequently, instead of being net issuers of securities, corporations became purchasers through mergers and acquisitions.241 Moreover, in response to the “merger mania” of this period, corporations announced recapitalizations and stock repurchases as defensive measures.242 Thus, takeover activity (and the rumor of takeover activity) fueled higher stock prices.243

The United States was not the only country experiencing economic growth: both the United Kingdom and Japan participated in the “global bull market.”244 Moreover, because of the ability to shift capital around the world, transnational financial activity increased. In the first half of 1987, foreign institutions bought as many shares of United States equities as did domestic institutions.245 In summary, an improvement in economic conditions, the availability of cash, takeover activity, and the supply of foreign money fostered a demand for stocks that spurred the bull market on between August 1982 to August 1987.

Investor psychology also played an important role in the rise of stock

239. See id.
[T]he money supply grew 12% in 1985 and 15% in 1986, unprecedented back-to-back increases. In late 1986, the Fed opened the credit spigot to accommodate a huge wave of sales of businesses and financial assets as investors rushed to beat the Dec. 31 revision in capital-gains tax rates. The money supply soared about $18 billion in December 1986 alone . . . .

Id.
240. See Task Force Report, supra note 11, Study I, at I-2. The perception that stocks were cheap was strengthened by takeover specialists, who valued stocks based on their liquidation value (i.e., the value of a company if it is broken up and its assets are sold off), which was higher than traditional valuation methods based on future earnings potential of a continuing business. See GAO Report, supra note 8, at 38; Stewart & Hertzberg, supra note 238, at 1, col. 6; cf. J. Brooks, The Takeover Game 253-55 (1987) (the takeover activity of the 1980s has been driven by investment bankers who “sell” M&A deals to corporate executives and thereby earn high fees).
242. See id. at I-3.
243. See Stewart & Hertzberg, supra note 238, at 1, col. 6.
244. See Task Force Report, supra note 11, Study I, at I-1, I-5 to 11.
prices. As the bull market advanced, many financial analysts and publications indicated that stock prices, although at historically high levels, were justified in light of the favorable economic climate. In retrospect, these estimates were not based on a rational, traditional valuation. At the time, however, investors believed that the market would continue to rise even if it were overvalued. Hence, the mass psychology of a large number of investors, who would gladly pay three times what a stock was worth with the expectation of selling it for six times its worth, helped fuel the bull market.

Even sophisticated institutional investors succumbed to the psychology of the bull market, but many expected to hedge against a market decline by availing themselves of portfolio insurance. For several months preceding the crash there was a general concern that the market was overvalued in light of the downturn in various economic conditions such as rising interest rates, persistent trade and budget deficits and the declining value of the dollar. Ordinarily, such conditions would prompt the sale of stocks. Nevertheless, many pension fund managers, specifically those employing a portfolio insurance strategy, hesitated to sell until prices fell. They reasoned that they could get out of the market quickly, and thus cushion the impact of a drop, by selling stock index futures. Consequently, believing that their portfolios were “insured,” institutional investors continued to buy and/or hold equities. Therefore, all other things being equal, stock prices were higher than they would have been if investors had not relied on dynamic hedging utilizing stock index futures.

Just as no single factor can explain the incredibly high stock prices of the bull market, no single factor, economic, psychological, or structural alone accounts for the size and breadth of the crash of 1987. First, “the two-week decline that immediately preceded the October 19 market break . . . was triggered by changes in investor perceptions regarding

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246. See Stewart & Hertzberg, supra note 238, at 1, col. 6.
247. See Task Force Report, supra note 11, Study I, at I-3. Stock prices were overvalued relative to bond yields and asset values. See id.
248. See GAO Report, supra note 8, at 38. After all, based on past experience, the market had continued upward for nearly five years.
249. See B. Malkiel, A Random Walk Down Wall Street 24 (4th ed. 1985); Stewart & Hertzberg, supra note 238, at 1, col. 6.
251. See GAO Report, supra note 8, at 39-40; Task Force Report, supra note 11, Study I, at I-11 to -14; SEC Report, supra note 14, chap. 3, at 3-9 to 10; cf: Melloan, supra note 250, at 37, col. 3.
253. See id.
254. Just a couple of weeks before the crash, it is estimated that $68 billion of assets were hedged using portfolio insurance. See Ring, Management Approaches: What Worked What Didn’t, Pensions & Investment Age, Nov. 2, 1987, at 50.
investment fundamentals and economic conditions." Second, on October 19, "institutional stock selling was the largest single direct factor responsible for the initial opening declines" in the Dow Jones Industrial Average and the S&P 500 Index. Finally, "panic selling in a broad range of stocks caused by a variety of factors coupled with [a complete] absence of buyers (except at distressed levels) was primarily responsible for the free-fall decline that characterized the final hour of trading in stocks" at the NYSE on October 19th.

In the weeks before October 19th, investors' sentiments grew bearish in the face of increasingly negative economic news and uncertainty as to the sustainability of high stock prices. As interest rates rose, fears of inflation returned. Consequently, non-equity investments offering higher yields became more appealing. Although the budget deficit had persisted for several years, concern grew that foreign investors, who held a disproportionately large share of U.S. government debt securities, would not finance the deficit forever. Moreover, the United States government appeared to be making little progress at reducing it. The value of the dollar fell as the United States trade deficit persisted. As a result, "[t]he only way to induce foreigners to continue to invest in [United States government] debt securities denominated in a deteriorating currency was to offer them a higher interest rate." Consequently, the "imminent" arrival of higher rates brought a fear of recession, induced by a tightening of credit by the Fed. Hence, an impending recession meant stocks were overvalued.

Another factor contributing to the crash of 1987 may have been legislation that threatened the continuation of corporate takeover activity. On October 13, 1987, the House Ways and Means Committee proposed to limit tax deductions for certain interest expenses incurred in leveraged acquisitions. Consequently, the prospect of more takeovers, leading to

257. Id.
258. See id. at 11.
259. See id.
261. See Task Force Report, supra note 11, Study I, at I-12.
262. See id. at I-13.
263. See GAO Report, supra note 8, at 39. On October 14, 1987, the yield on thirty-year Treasury bonds was over 10 percent. In contrast, stocks were only yielding 3 percent. See Smith, Swartz & Anders, supra note 260, at 1, col. 6.
264. See Task Force Report, supra note 11, Study I, at I-12.
265. See GAO Report, supra note 8, at 39. At the same time, worldwide instability in the currency markets added to the market anxiety. See Task Force Report, supra note 11, Study I, at I-12.
266. See Task Force Report, supra note 11, Study I, at I-12.
267. Id. at I-14.
268. See id.
269. See id. at I-13.
270. See id.
higher stock prices, diminished severely.\textsuperscript{271}

Because of this growing bearish sentiment, institutional and individual investors from the United States and abroad began to sell their stock portfolios heavily during the week before Black Monday.\textsuperscript{272} While program trading was not solely responsible for the crash, program trading strategies may have exacerbated the price decline.\textsuperscript{273} As portfolio managers saw the market drop, they attempted to put more "insurance" into place by selling stock index futures.\textsuperscript{274} The magnitude of these transactions drove down the price of futures below fair value.\textsuperscript{275} Index arbitrageurs, recognizing the discount between the futures market and the stock market, bought futures contracts and sold the underlying stocks—sending stock prices down further.\textsuperscript{276} Thus, as a result of direct selling and derivative instrument-related strategies, the Dow Jones Industrial Average declined 235.48 points between October 14 and 16, including a drop of 108 points on October 16.\textsuperscript{277}

With a weekend to ponder these developments and a newspaper report on Sunday that the Treasury Department might allow the dollar to drop even further,\textsuperscript{278} investors decided to sell from the opening on Black Monday.\textsuperscript{279} The institutional investors rocked the market. For example, Fidelity Investments, a large mutual fund group that keeps many of its stock funds fully invested in the market, faced redemption requests from its customers. Consequently, Fidelity sold approximately $800 million worth of stocks on October 19th.\textsuperscript{280} General Motors' pension fund was also one of the biggest sellers on that day. It sold at least $1.1 billion in stock.\textsuperscript{281}

Amid the uncertainty and price declines, portfolio insurers sold stock index futures to hedge stock values. For example, Wells Fargo Investment Advisers, a major portfolio insurer, sold $1.56 billion in futures on
October 19th. These sales were partially absorbed by speculators in the futures market, but purchases by index arbitrageurs also transmitted the selling pressure to the stock market. As a result, additional stock price declines precipitated further sales by portfolio insurers. This spiraling effect is known as the "cascade scenario."

After mid-day on October 19th, the linkage between the futures market and the stock market was practically disconnected by information delays and execution problems at the NYSE. Because so much institutional investor trading was done through NYSE's SuperDot, the system strained and resulted in one hour delays for order execution. Moreover, the increased volume of trading caused computer malfunctions and printer delays. This overload resulted in the consolidated tape reporting stale prices. Faced with execution and price uncertainty, index arbitrageurs, who would have purchased stock index futures that had been driven to a discount by portfolio insurance selling pressure, stayed out of the market. Consequently, the discount between futures and underlying stocks persisted and widened. Since a portfolio insurance strategy becomes more expensive as the discount gets deeper, some managers stopped selling stock index futures and began unloading their equity positions directly on the stock market. Thus, portfolio insurance, designed to hedge against losses in stock values, failed to provide adequate coverage when stock prices fell precipitously.

Institutional investors' awareness of active portfolio insurance strategies created an "overhang" effect in both the futures and stock markets. Some institutions anticipated portfolio insurance related selling of futures and the arbitrage linked selling of stocks. Accordingly, institutional investors not employing portfolio insurance attempted to sell their stocks before the programs hit the markets. Moreover, other institutional traders refrained from entering the market as buyers because

282. See id.

283. Division of Market Regulation, Securities and Exchange Commission, The Role of Index-Related Trading in the Market Decline on September 11 and 12, 1986, 21-22 (1987). However, after approximately 1:30 p.m. on Black Monday, the cascade effect became less of a factor in the price fall. See CFTC Final Report, supra note 6, at 23.

284. See Smith, Swartz & Anders, supra note 260, at 20, col. 4. Under normal conditions, market orders processed through DOT are executed within two minutes. See supra note 196 and accompanying text.

285. See GAO Report, supra note 8, at 73-75.


287. See supra text accompanying note 168.


290. See SEC Report, supra note 14, ch. 3, at 3-12.

291. See id. at 12; Task Force Report, supra note 11, at 29.

of the anticipated heavy selling pressure, which was "billboarded" by the persistent discount between stock index futures contracts and the underlying stock index.\footnote{See SEC Report, supra note 14, ch. 3, at 3-12.}

Program trading affected the depth and speed of the decline. Index arbitrage selling amounted to 37.6 million shares of stock.\footnote{See id.} This represented 6.2 percent of the NYSE volume on October 19.\footnote{See id.} Moreover, for a while that day index arbitrage selling accounted for more than 45 percent of S&P 500 stock volume.\footnote{See id.} Additionally, the availability, for part of the day, of nearly instantaneous price information and SuperDot to rapidly execute transactions made the collapse in stock prices more concentrated than it would otherwise have been. However, because program trading related selling only accounts for a small percentage of total volume, other factors must be responsible for the free-fall decline in prices that occurred during the last few hours of trading on October 19th.

Panic may also have contributed to the drop in stock prices. Stocks plummeted because of a "self-feeding cycle of investor fear that [the] day of economic reckoning [was] at hand."\footnote{Shiller, Crash Course, Wash. Post, Apr. 10, 1988, at B1, col. 1.} The institutions wanted to sell, so price declines fed on previous price declines.\footnote{"[G]iven the volume of funds in the hands of institutional investors, simultaneous decisions to sell will find no one on the buy side with comparable financial muscle." Katzenbach Study, supra note 4, at 21.}

In summary, the existence of derivative instruments and the use of related program trading strategies may have been a means for rapidly reducing prices, but they clearly were not the underlying cause of the break. Economic and psychological factors that aided the bull market’s climb also contributed to its collapse.

V. POLICY ISSUES

Changes in the financial markets, whether initiated by market forces or regulation, have important economic consequences. Accordingly, decisions concerning the structure and regulation of financial markets must be made in the context of their economic impact.\footnote{See Staff of the Subcomm. on Telecommunications, Consumer Protection, and Finance of the House Comm. on Energy and Commerce, 99th Cong. 2d Sess., Restructuring Financial Markets: The Major Policy Issues 254 (Comm. Print 1986) [hereinafter Restructuring Financial Markets].} Preserving the economic functions of financial markets should be a primary objective of financial policy making.\footnote{See id.} Only with these primary functions in mind can financial policy makers evaluate whether changes are needed in the securities and futures markets.

\footnotesize{293. See SEC Report, supra note 14, ch. 3, at 3-12.  
294. See id.  
295. See id.  
296. See id.  
298. "[G]iven the volume of funds in the hands of institutional investors, simultaneous decisions to sell will find no one on the buy side with comparable financial muscle." Katzenbach Study, supra note 4, at 21.  
300. See id.}
The securities markets exist to facilitate capital formation.\textsuperscript{301} In the primary (or new issue) securities market, businesses that need capital for the creation of productive facilities sell securities to persons willing to lend them money, or participate in ownership, for the opportunity to earn a return on their investments.\textsuperscript{302} Crucial to the willingness of investors to purchase securities in the primary market is their ability to sell them at some point in the future.\textsuperscript{303} A secondary (or trading) market such as the New York Stock Exchange provides a place for buying and selling securities in an organized manner.\textsuperscript{304} It furnishes a mechanism for the pricing of securities and supplies the liquidity necessary for capital formation.\textsuperscript{305} Accordingly, in theory the stock market encourages the efficient allocation of capital resources to those firms who will use it in the most productive fashion.

The economic purpose of the financial futures markets is to facilitate the mutually desired transfer of risk.\textsuperscript{306} Derivative instruments such as stock index futures contracts allow investors to hedge against possible stock market losses. The price risk of ownership or potential ownership of stocks can be shifted to those who are willing to carry this risk in return for a potential profit. Because risk adjustments can be accomplished in the futures market at a lower transactions cost than in the securities market, the use of stock index futures promotes "a more efficient and preferred distribution of risk bearing in society."\textsuperscript{307}

Following Black Monday, several studies commissioned by the government and the exchanges investigated the causes of the stock market crash and recommended ways to avoid a similar occurrence. Many of these suggestions, if implemented, will have an important impact on the current structure and regulation of the financial markets. Additionally, because of the significant role of these markets in the economy, such changes have potentially large implications that extend far beyond the financial markets themselves.\textsuperscript{308}

Many recommendations of the various studies appear to address the same issue: After Black Monday, how can investors' confidence\textsuperscript{309} in the

\textsuperscript{301} See L. Loss, Fundamentals of Securities Regulation 591 (2d ed. 1988).
\textsuperscript{302} See id. at 591-92.
\textsuperscript{303} See id. While investors may be willing to buy shares of a company's stock, they usually are unwilling to commit their funds to that company indefinitely.
\textsuperscript{304} See id.
\textsuperscript{305} See id.
\textsuperscript{306} See Interagency Study, supra note 35, ch. I, at 8.
\textsuperscript{307} See id. ch. II, at 22.
\textsuperscript{308} See generally Task Force Report, supra note 11, Study VII, at VII-1 to VII-4 (describes interrelationship between significant stock price decline and economic activity and fiscal policy).
\textsuperscript{309} The state of investors' confidence and the volatility of stock prices are related. While investors may expect large changes in stock prices, it is the uncertainty of the precise form of these changes that weakens confidence. See J. Keynes, The General Theory of Employment, Interest, and Money 148 (1936 & photo. reprint 1964). The greater the uncertainty, the greater the investment risk (i.e., the possibility that expectations will
stock market be restored? In particular, the focus is: What should be
done to curb the "excessive" stock price volatility associated with deriva-
tive instruments and related program trading strategies? The difficulty
with many of these remedies is that they are "quick fixes," aimed at
treating symptoms rather than appropriately addressing the long-run
structural problems of the markets. Policymakers should make a care-
ful diagnosis before prescribing market regulations because inappropriate
medication can have unwanted side-effects and not cure the illness.

A. Proposed Prescriptions for Treating the Symptoms

1. The Fed as Intermarket Regulator

From an economic perspective, the markets for stocks, stock options,
and stock index futures are in fact one market though they have been
traditionally considered as separate financial markets. These markets
not be realized). Consequently, assuming investors are risk averse, all other things being
equal, "unpredictably" large price movements may discourage investment in stocks and
thus capital formation.

310. It seems as though "volatility" of stock prices only became an important issue to
investors when prices dropped and not when the market was climbing: "volatility" has
apparently become a buzzword for "down." See Bleiberg, Don't Ban Program Trading,
Barron's, May 16, 1988, at 9; Cowan, Market Volatility: Who is the Culprit?, N.Y.
Group on Financial Markets recommends coordinated trading halts across equity and
equity related markets only when there is a 250 point decline in the Dow Jones Industrial

The Division of Market Regulation of the Securities and Exchange Commission adopts
the fundamental assumption that extreme price volatility, such as occurred during the
market break, is undesirable. See SEC Report, supra note 14, at xii. Because greater,
unpredictable volatility (and therefore uncertainty) can reduce investors' confidence in
holding stocks, U.S. corporations may find it difficult to raise capital efficiently through
the sale of equity securities. See id. Considerable debate exists over whether the intro-
duction of stock index futures and their use in program trading strategies have increased
the volatility of stock prices. Despite a perception that they do, empirical research indi-
cates that derivative instruments and program trading have not increased day-to-day
market volatility. See C. Davis & A. White, Stock Market Volatility 1 (Bd. of Governors
of the Fed. Reserve System Staff Study No. 153, 1987); Task Force Report, supra note 11,
Study II, at 5 ("it is difficult to argue that the recent increases in volatility represent
anything more significant than normal cyclical fluctuations"). But see SEC Report, supra
note 14, ch. 3, at 3-8 & n.32 (spring of 1982 event date does not accurately capture the
full effect of futures trading). However, it is uncertain whether intra-day volatility has
increased because of program trading. C. Davis & A. White, supra, at 1.

Hanssell, The Wrong Villain?, Institutional Investor, Jan. 1988, at 48; Reich, After the
Fall, Institutional Investor, Jan. 1988, at 33, 35.

312. See J. Grundfest, Regulating the International Capital Markets: A New World
and A New Perspective 5 (Nov. 11, 1987) (advance text of the City Association lecture,
given by the Commissioner of the Securities and Exchange Commission to the Chartered
Association of Certified Public Accountants) (available in the files of the Fordham Law
Review).

313. See Task Force Report, supra note 11, at 59. Stock index options and options on
stock indices are also part of the single market. But see M. Mayer, Markets 231 (1988)
(The markets are quite separate; it is computerized trading that allows participants to
behave as though the markets are one).
are driven by the same economic forces. Many of the same institutions dominate trading in all three markets, and these markets are linked through computer-assisted trading strategies involving similar financial instruments. Consequently, the purpose, structure, and performance of each market influences the others.

In response to this economic reality, one study recommends that a single federal agency should have full intermarket oversight authority. The current regulatory structure—with the Securities and Exchange Commission responsible for stocks and the Commodity Futures Trading Commission responsible for stock index futures—may destabilize the stock market and thus undermine public confidence. Each agency has its own style, with the SEC taking a more interventionist and conservative regulatory approach than the CFTC. No overall integrated cross-market authority exists. When each agency regulates its respective market independently of each other, different and conflicting signals can be sent to market users. Thus, one federal agency with authority over both markets may be more efficient for coordinating operating rules and procedures in the separate markets and for making timely decisions based on information from all markets. A single agency could coordinate intermarket issues such as clearing and credit mechanisms, margin requirements, “circuit breaker” mechanisms (such as price limits and trading halts) and information systems. Moreover, one agency with consolidated regulatory authority and responsibility is likely to engender public confidence in a time of financial crisis.

Some have suggested that the Board of Governors of the Federal Reserve System should have intermarket regulatory authority. The Fed is a logical choice because its span of control exceeds that of the other financial regulators. The SEC and CFTC have comparatively narrow policy missions when contrasted with the Fed’s responsibility for macroeconomic, financial stability. Specifically, the integrity of the securities and futures markets is also related to money flows in the economy. Hence, there is an additional advantage of giving the Fed, as the central bank, overall intermarket authority.

315. See Task Force Report, supra note 11, at 59-60.
316. See Kane, Regulatory Structure in Futures Markets: Jurisdictional Competition Between the SEC, the CFTC, and Other Agencies, 4 J. Futures Markets 367, 374 (1984).
317. See Task Force Report, supra note 11, Study VI, at VI-78. In part, the split regulatory scheme accounts for differences in margin requirements, clearing and settlement procedures, and other trading rules. See id. at VI-78 to VI-80.
318. See id. at 63-67.
319. See id. at 69; cf. H.R. 4997, 100th Cong., 2d Sess. 6-8 (1988) (The proposed Securities Market Reform Act of 1988 gives exclusive jurisdiction over securities derivative instruments to the SEC and gives margin setting authority to the Fed.).
320. See Kane, supra note 316, at 377.
321. See id.
322. See Task Force Report, supra note 11, at 62. For example, because of the poten-
Several disadvantages to this proposal are apparent. At present the Fed lacks the regulatory expertise that the CFTC and SEC have developed over the years in their respective markets.\(^3\) This temporary problem could be overcome in time, but it would require a period of adjustment. If the Fed assumes a dominant role, many market participants (such as securities firms and clearing houses) might take additional risks, presuming that the Fed will bail them out of financial difficulty.\(^3\) Therefore, although the Fed is strategically positioned in the current regulatory framework to assume the responsibility of intermarket regulator, such a choice may have the unfavorable impact of institutionalizing the perception that it is also the lender of last resort to the securities industry.\(^3\) Hence, while potentially instilling investor confidence in the near term, the rush to create an intermarket regulator could have undesirable, long-run effects on the economy.\(^3\)

2. Raising Margin Requirements in the Futures Market

Another group recommends raising margin deposit requirements on stock index futures to match the margins on the stocks themselves.\(^3\)
Free of federal regulation, futures exchanges have established their margin levels to achieve one objective: to protect clearing houses and brokers and thus assure the integrity of the marketplace. On the other hand, initial margin ratios in the stock market are in place to prevent excessive volatility in share prices, and the "protection of market integrity is seen as a beneficial by-product of these other objectives." Excessive price fluctuations can occur because of increased speculative trading. If leveraged trading in stocks has the potential for accentuating movements of stock prices above or below the fundamental values, then leveraged trading in stock index futures would seem to have this same potential because taking a margined position in stock index futures is a close substitute for assuming a margined position in securities. Index arbitrage trading between the two markets makes this so. In summary, since stocks and derivative instruments compose one market, in an economic sense, there should be a "level playing field" across markets. Accordingly, margins for futures based on stock indexes should be equalized with margins on stock.

While it is theoretically consistent to raise futures margins to bring them in line with margin requirements for stock, this proposal is not necessarily a proper solution to the questions of reducing volatility. Implicit in the argument that margins on stock index futures are too low is the presumption that the margin level for stocks is "correct." The minimum margin requirements on stock, which the Fed established to curb the excessive speculation that lead up to the crash of 1929, may actually have little impact on the behavior of stock prices. Thus, despite across markets demands some serious thought about why there are margin requirements at all." Id. at 69. Even if the regulators want to make margins consistent, consistency can be difficult to define or evaluate. See id. at 69-70. Furthermore, massive changes to the operations of stock, futures, and option markets would be necessary. See id. at 70.

328. See Review of Margins, supra note 64, at 16.
329. Id. The staff of the Federal Reserve cited two other objectives of margin requirements: (1) to prevent the securities markets from unduly diverting credit away from "productive" uses such as loans extended in connection with investments in new plants and equipment, see id. at 9, and (2) to protect unsophisticated investors from assuming risks associated with owning securities (i.e., high margin requirements will discourage an investor of limited means from buying stocks). See id. at 11. However, the staff generally concluded that the historical concerns over diversion of credit were false or marginal, see id. at 9-11, and that investor protection could be better achieved through means other than prescribing margin levels. See id. at 12. See also Figlewski, Margins and Market Integrity: Margin Setting for Stock Index Futures and Options, 4 J. of Futures Markets 385, 389-91 (1984) (reducing excessive price fluctuations has come to be the most widely cited purpose of federal margin regulation).
330. Both the stock market crash of 1929 and the crash of 1987 illustrate markets driven to "speculative excess."
331. See Review of Margins, supra note 64, at 17-18.
332. See id. at 45-50.
333. See id. at 165-67. Although not conclusive, there appears to be a "lack of any positive demonstration that margin regulation has served to dampen stock price fluctuations." Id. at 163. But see Hardouvelis, Margin Requirements and Stock Market Volatility, Fed. Reserve Bank N.Y. Q. Rev., Summer 1988, at 80. A study by the Federal
its historical justification, margin regulation of the stock (or futures) markets may no longer be the appropriate method for curbing short-term speculative trading and resulting price volatility. Accordingly, it may be that margins on stock should be lowered rather than futures margins raised.

Even if minimum margin requirements are maintained for the purpose of ensuring market integrity, instead of the original objective of dampening price volatility, "consistent" margins for stock and stock index futures do not imply "equal" margins. There are principally two factors relevant in setting margin requirements that will provide an assurance against default: first, the level of default risk exposure that is acceptable; and second, the amount of time expected to lapse between the request for payment and the actual payment by the investor. Accordingly, it follows that "the lower the level of exposure (i.e., the higher the desired level of protection against price changes), the higher the level of margins," and "the longer the grace period, the higher the necessary margin level for a given level of exposure." Therefore, since broad stock indices such as the S&P 500 index exhibit less price volatility than do individual stocks, lower margins on stock index futures are justified. Different margin requirements are also justified by the fact that settlement in the futures markets occurs daily, whereas settlement may take as long as five days in the stock market.

Finally, if stocks and derivative instruments are viewed as one market,
then cross-margining must be permitted. Cross-margining involves the calculation of a single margin amount, in recognition of an investor's hedged position in two offsetting investments that are made in separate markets. Without cross-margining, margin deposits are made against each investment. For example, a market participant who wants to establish a short index futures position should be able to use margin deposits on long positions in stocks or options to satisfy the futures margin requirement. Cross-margining focuses on the whole picture (that is, the hedge created by economically offsetting positions) rather than on each market separately. Analogously, when viewed as an economic whole, hedged positions taken by institutional participants, such as pension funds and index arbitrageurs, do not generate leverage and are considerably less risky than unhedged positions. Thus, under a cross-margining system, overall margin deposits may tend to be lower. While cross-margining is generally impermissible, it is being considered as a method of simplifying payment structures and reducing the necessity of money flows in order to reduce the strain on the financial system during periods of volatility.

In summary, the "quick fix" of raising margins on stock index futures contracts is probably an inappropriate response when the objective is to curb the price volatility of the stock market that is perceived to be associated with program trading strategies. In any event, margin deposits for stock index futures are justifiably lower than those required for stocks. Higher margins on stock index futures would only raise transactions costs and therefore reduce the number of futures market participants who would be willing to assume risk. Consequently, stock index futures would become a less effective instrument for hedging stock portfolios.

3. Establish Price Limits and Trading Halts

"Circuit breakers" such as daily price limits, which establish price ranges in which transactions may occur, and temporary trading halts have also been proposed as a way of reducing volatility. The only ma-

344. See Working Group Report, supra note 16, app. D at 10-11 (the implementation of cross-margining may require profound changes to current clearance and settlement payment systems).
345. See Task Force Report, supra note 11, at 66; see also SEC Report, supra note 14, ch. 3, at 3-23 to 24 (Generally, price limits should not be "imposed on stock trading, [but] brief trading halts based on pre-set standard may warrant further consideration."); Working Group Report, supra note 16, at 4, app. A at 1 (recommends the establishment of a downward price limit on stock index futures and options at levels comparable to a 250 point decline in the Dow Jones Industrial Average and a coordinated temporary trading halt on all U.S. markets for stock and derivative instruments if the Dow Jones
Major stock market that employs price limits is the Tokyo Stock Exchange. Price limits have long been in place for many futures contracts in the United States, but such limits had not been used for stock index futures until shortly after the October 1987 crash. The price of a futures contract that is subject to a daily limit is permitted to rise or fall "only within a prescribed range from the previous day's settlement price." The market does not close when price limits are reached; rather, trades cannot be made at a price above the upper limit (if the upper limit is reached) or below the lower limit (if the lower limit is reached).

On the other hand, temporary trading halts, which are prompted when prices advance or decline more than a pre-established magnitude, do stop the market and serve the same purposes as daily price limits. If the bounds set in connection with daily price limits or trading halts are broad enough so as not to interfere with "normal" trading, these circuit breaker mechanisms may provide an important pause in the stock and futures markets, allowing market participants time to rationally evaluate "excessive" price movements. Because price limits and trading halts can provide a time-out from frantic trading, they may curb credit risk by giving broker-dealers, clearing houses, and customers an opportunity to settle...


347. Actually, some index futures contracts initially had maximum daily price fluctuation limits when they were introduced, but these limits were subsequently removed. See CFTC Final Report, supra note 6, at 184-85. In an emergency action "[o]n October 23, the CME instituted a daily price limit of 30 points above or below the previous day's settlement price . . . in the S&P 500 contract." CME Report, supra note 5, at 50. Subsequently, the CME adopted a 15 index point (up or down) limit on a permanent basis. See CFTC Final Report, supra note 6, at 185; Chicago Merc Says CFTC Cleared Daily Price Limit, Wall St. J., Mar. 28, 1988, at 24, col. 2; see also CFTC Final Report, supra note 6, app. C Exhibit C-1 (listing price limits on other actively traded stock index futures contracts).

348. F. Horn, supra note 24, at 32-33. For example, in wheat the daily limit may be 20 cents per bushel. R. Teweles & F. Jones, supra note 42, at 68. If wheat closed at 300 cents per bushel on one day, then 320 would be the upper daily limit and 280 the lower limit. Hence, the maximum daily range of price movement is 40 cents per bushel.

349. See F. Horn, supra note 24, at 35.

350. The Working Group on Financial Markets has recommended that all U.S. markets for equity and equity-related products halt trading for one hour if the Dow Jones Industrial Average (DJIA) declines 250 points from its previous day's closing level. See Working Group Report, supra note 16, app. A at 1-3. When the markets reopen, if the DJIA declines 400 points below the previous day's close, trading should halt for two hours. See id. at 3.
up accounts.351 Thus, price limits and trading halts can impose an important cooling-off period on overreacting stock and futures market participants.352

Despite these beneficial features, daily price limits and trading halts have considerable negative side-effects. First, the existence of pre-announced artificial limits, which restrict continuous trading, may create a "gravity effect"—accelerating price movements toward a limit.353 "The very movement of the price toward the boundary can sometimes itself assure that the boundary will be reached."354 Second, uncoordinated price limits or trading halts, imposed without coordination between markets, are of questionable effectiveness.355 For example, suppose the price of stock index futures reaches its daily lower limit, and therefore no further trades can be made beyond that limit on that day.356 If limits and halts are not coordinated across markets, portfolio managers, who were selling futures to hedge losses in the stock market and are now unable to do so, will simply begin selling their portfolios directly on the stock market, thus potentially exacerbating a market decline.357 Third, halting trading in the United States markets may simply serve to transfer business to foreign markets.358 Finally, "trying to control price movements, and hence risks, can only diminish the ability of the markets to reflect external realities."359 Artificial constraints may prevent investors from engaging in transactions in equities that reflect their assessments of macro and microeconomic events. Hence, price limits and trading halts may impair the ability of the stock market to allocate capital resources efficiently to those firms who will use them in the most productive fashion.360

One year after the crash, the stock, options, and futures exchanges adopted "circuit breakers," which are generally coordinated across the markets.361 For example, all stock trading on the NYSE will halt for one

351. See Task Force Report, supra note 11, at 66.
352. See CFTC Final Report, supra note 6, at 182.
353. See CME Report, supra note 5, at 51.
354. Id.
356. The futures market is likely to hit the boundary earlier. Lower transaction costs in the futures markets (as compared with the stock market) allow changing investor expectations to effect sales more rapidly. See supra text accompanying notes 135-47.
357. In other words, in linked markets, uncoordinated price limits and trading halts defeat the primary economic purpose of the futures markets, which is to facilitate the mutually desired transfer of risk. A similar scenario occurred during the crash of 1987 as a result of trading halts and jammed communication systems. See Task Force Report, supra note 11, at 66-67.
360. See supra text accompanying notes 302-06.
361. See Order Approving Proposed Rule Changes, Exchange Act Release No. 26,198 (Oct. 19, 1988), 53 Fed. Reg. 41,637 (1988); Letters from Jean A. Webb, Secretary, CFTC to Paul J. Draths, Vice President and Secretary, Chicago Board of Trade; Todd E. Petzel, Vice President, Chicago Mercantile Exchange; Michael Braude, President, Kan-
hour when the DJIA declines 250 or more points from its previous day's closing.362 Comparable trigger values are established in the futures markets. Trading on the S&P 500 futures contracts at the CME will halt for one hour if there is a 30 point decline in futures prices.363 Once stock trading has been reopened, trading would halt for an additional two hours if the DJIA declines 400 points from the previous day's close.364 Similarly, the CME will suspend trading on S&P 500 futures contracts for two hours if there is also a 50 point decline in futures prices from the previous day's closing.365 The futures exchanges also agreed to set daily price limits that are comparable to the 250 and 400 point DJIA trigger levels.366 The new rules do not impose trading halts in the stock market when the DJIA increases "excessively." There are upward price limits, in the futures markets, however, that are comparable to a 400 point increase in the DJIA.367 Thus, in a wildly bullish market, there is no coordinated circuit breaker.

4. Limited Access to SuperDot

In an effort to limit stock price volatility, the NYSE adopted a rule (the so-called "Collar Rule") for a six-month pilot period. The rule prohibits member firms from using the SuperDot system368 for index arbitrage when the DJIA has moved more than fifty points from the previous day's close.369 The restriction applies to both customer and proprietary
orders and remains in effect for the remainder of any trading day on which it is triggered.370 Because SuperDot allows arbitrageurs to rapidly execute purchases or sales of many stocks, many market participants perceive that index arbitrage accelerates price changes. Theoretically, in the short run, such a rule is beneficial because it might reassure investors by slowing price swings.

Restricting access to SuperDot did not stop index arbitrage, but it did not make trading less efficient and more expensive to execute. When the DJIA moves more than fifty points, arbitrageurs at large securities brokerage firms simply switched their method of doing index arbitrage.371 They substituted a few key strokes on their computers for screaming brokers running up to the posts with handfuls of orders.372

The NYSE rule, which reduces the efficiency of index arbitrage, can adversely affect the usefulness of stock index futures as a hedge against unfavorable price movements. Index futures provide benefits to their users only if market participants are confident that these derivative instruments are linked to the underlying indices. Arbitrage maintains these links.373 Because the NYSE rule tends to disconnect the stock market from the futures market at the very time that efficient pricing between the two markets is needed—when the market is volatile—pension fund managers may hesitate to use stock index futures to adjust the risk of their portfolios. For example, portfolio insurance may become too expensive.374 In short, a lack of confidence in this arbitrage linkage greatly reduces the hedging value of index futures.375

With Collar Rule in place, on April 14, 1988, the DJIA fell 101 points, the fifth worst decline in history.376 The SEC has concluded that the rule

when the transaction is part of an index arbitrage strategy. Consequently, “straight” program buys or sells can still be routed through the system. However, the NYSE is considering a rule that will completely bar access to SuperDot when the DJIA moves 150 points. See Smith, Big Board Mulls Trade Ban If Market Swings, Wall St. J., Apr. 13, 1988, at 3, col. 1.


371. See supra text accompanying notes 205-06.


373. See supra text accompanying notes 170-73.

374. When stock index futures prices fail to predictably track their underlying index (i.e., basis risk), which would be the case when there is no arbitrage between the two markets, selling stock index futures as part of a portfolio insurance strategy may be more expensive than selling the stocks themselves. See supra note 168 and accompanying text.

375. See H. Stoll & R. Whaley, supra note 117, at 22.

376. See A Wider Trade Deficit Jolts a Fragile Market; Shares Off 101 Points, Wall St. J., Apr. 15, 1988, at 1, col. 6. The Collar Rule will probably be phased out at the end of the six-month pilot period. See Swartz & Ricks, Big Board Reportedly Will End its Curb on Program Trading in Volatile Sessions, Wall St. J., July 6, 1988, at 3, col. 1. While the NYSE plans to drop the Collar Rule, it is going forward with the other measures. See Salwen, Program Traders See No Big Obstacles in Plan to Limit Stock, Futures Decline, Wall St. J., July 11, 1988, at 30, col. 1.
has relatively little effect at reducing market volatility.\textsuperscript{377} Eventually the Collar Rule was deleted and replaced by a new NYSE proposal.

New Rule 80A, the so-called "sidecar" file proposal, imposes certain trading limitations when the price of the primary S&P 500 futures contract on the CME falls twelve points below the previous day's closing value (the approximate equivalent of a 96 point drop in the DJIA).\textsuperscript{378} If this trigger value is reached, for the next five minutes market orders involving program trading in each of the stocks underlying the S&P 500 entered into the NYSE's DOT system will be routed into a separate file for each such stock.\textsuperscript{379} After this time period has elapsed, the orders in the file for each stock and the order imbalance, if any, will be reported to the public and the specialists and will be eligible for executions, but if there is insufficient trading interest to allow for an orderly execution of a transaction in a stock, the NYSE will halt trading in that stock.\textsuperscript{380} Thus, unlike the Collar Rule, the sidecar file will not prohibit program traders from utilizing the SuperDOT system.\textsuperscript{381} However, its effectiveness for reducing volatility remains untested.

In summary, some of the quick fixes that have been recommended as treatment for curing "excessive" stock price volatility and restoring investors' confidence in the markets appear to be myopic responses to the nature of and changes in the financial markets.

\textbf{B. Diagnosis: Long Run Structural Problems}

In the aftermath of the October 1987 stock market crash, regulatory efforts have focused on curbing stock price volatility. In general, however, these endeavors will not be constructive in the long run because they fail to consider adequately the current (and future) structural environment of the financial markets. Stock price volatility is likely to continue due to three factors characteristic of the financial markets: the short-term focus of "institutional investors"; continuing innovations in technology; and the globalization of money flows.

\textsuperscript{377} See Memorandum from Richard G. Ketchum, Director of the Division of Market Regulation to David S. Ruder, Chairman of the Securities and Exchange Commission (July 6, 1988).


\textsuperscript{379} See id. The entry of new stop orders by professional investors will also be restricted when the trigger value is reached.

\textsuperscript{380} See id.

\textsuperscript{381} In addition to the establishment of a sidecar file, the NYSE also proposed to add a new feature to SuperDOT: the Individual Investor Express Delivery Service ("IIEDS"). Under IIEDS, market orders of individual investors (not institutional investors) of up to 2,099 shares entered on the SuperDOT system will be given priority in delivery to the specialist's post ahead of other orders being routed over the SuperDOT system. IIEDS is activated when the DJIA rises or falls 25 points from the previous day's closing value; it then remains in effect for the remainder of the trading day. See id. at 41,640.
1. The Short-term Focus of Institutional Investors

"Institutional investor" has become a contradiction in terms. As the share of corporate securities held by institutional investors grows larger and as the percentage of trading volume accounted for by these institutions surges, the objectives of securities and commodities regulations and the objectives of institutional investors come into conflict and may contribute to the undermining of the economic functions of the financial markets. In particular, while traditionally some may consider the stock market as a market for long-term investing and the futures market as a market for hedging portfolio values (or initiating readjustments), many major institutional investors view stocks and futures as interchangeable instruments used for the purpose of implementing short-term trading strategies designed to earn quick profits.

The major financial sectors are dominated by a few, very large institutions that manage an enormous amount of financial assets. Institutional investors (pension funds, mutual funds, insurance companies, foundations and endowments and securities broker-dealers) control approximately 35 percent of the total market value of all New York Stock Exchange-listed stocks. Institutional investors dominate trading although they do not own the majority of stocks. They probably account for more than 80 percent of the volume on the NYSE, up from 20 percent in 1960. This trading by institutional investors causes the vol-

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382. See Rohatyn, Institutional 'Investor' of 'Speculator', Wall St. J., June 24, 1988, at 18, col. 4; J. Brooks, supra note 240, at 134-35 (Institutional investors have become traders; "'long-term holding' in institutional portfolios no longer exists.").


385. See CFTC Final Report, supra note 6, at 138. "It is the definition of the time period for the investment return and the predictability of the returns that often distinguish an investment from a speculation." B. Malkiel, supra note 249, at 18. Investment is characterized as a strategy for purchasing stock in order to gain profit in the form of reasonably predictable dividends and/or appreciation over the long term. See id.

386. See Restructuring Financial Markets, supra note 299, at 227. At the end of 1984, less than 1 percent of the total number of firms in the securities, banking, and life insurance industries controlled half of the resources in those industries. See id. at 226. Thirty-seven firms managed half ($1.2 trillion) of all assets of beneficiaries. See id. at 227.

387. See SEC Report, supra note 14, ch. 3 at 3-2; Restructuring Financial Markets, supra note 299, at 269. At the end of 1987, the market value for all shares listed on the NYSE was $2.2 trillion. New York Stock Exchange, Inc., Fact Book 1988 81 (1988) [hereinafter NYSE Fact Book].


389. See Light & Perold, supra note 383, at 108; Restructuring Financial Markets, supra note 299, at 269. The annual turnover rate on the NYSE (share volume as a percentage of the average number of listed shares) has increased over the years, but most sharply in the last decade: 12% in 1960, 21% in 1977, 36% in 1980, 49% in 1984, and 73% in 1987. See NYSE Fact Book, supra note 387, at 73 (1988).
Pension funds are the largest and fastest growing segment within the group of institutional investors. In 1975, pension funds held 13 percent of all outstanding equities, but by 1985, they controlled 22 percent. The passage of ERISA, which requires that employee benefit plans be adequately funded, probably accounts for much of this growth. "This requirement led to a higher level of capital formation in the 1970s than would otherwise have taken place because it mandated an increase in purchases of assets by pension funds and, in that period, their acquisitions were primarily long-term corporate bonds and stocks." Nevertheless, the equity markets have failed to provide a significant new net source of capital for business. The fiduciary responsibilities imposed on pension fund managers by ERISA may conflict with investment strategies that promote the primary economic function of the securities market. Traditionally, providing funds for capital formation assumes long-term investment strategies on the part of both investors and issuers that are intended to assure returns over time. Capital formation may also involve a significant amount of risk. However, the fiduciary responsibility of pension fund managers implies a different investment strategy: achieving the maximum return for beneficiaries with minimal risk.

If plan fiduciaries focus on reducing risk, they may discourage pension funds from investing in new issues of small companies and those in emerging growth industries. New ventures are generally more risky than established businesses. Consequently, pension managers may view such

390. See Light & Perold, supra note 383, at 98. In comparison, individual household ownership fell from 74% to 60% during the same period. See id. Notably, in 1965, pension funds held only 6% of all outstanding equities, while households controlled 84%. See id.


393. Restructuring Financial Markets, supra note 299, at 270 n.54 (citing The Future of Financial Markets: Hearings Before the Subcomm. on Telecommunications, Consumer Protection and Finance of the House Comm. on Energy and Commerce, 98th Cong., 1st Sess. 256 (1983) (statement of Professor Benjamin M. Friedman, Harvard University)). "Between 1953 and 1983, the net addition to the available funds of all nonfinancial U.S. corporations provided by the excess of new stock issues over retirements of outstanding stock, averaged just $4 billion per year, compared to $38 billion per year in net proceeds from borrowing." Task Force Report, supra note 11, Study VII, at VII-2. Moreover, from 1984 through the first half of 1987, the wave of corporate restructurings (e.g., leveraged buyouts, mergers and acquisitions) has resulted in the net retirement of equity, on average, in the amount of $78.4 billion per year. See Task Force Report, supra note 11, Study II, at II-13.


395. See Restructuring Financial Markets, supra note 299, at 270; ERISA requires that "a fiduciary shall discharge his duties . . . by diversifying the investments of the plan so as to minimize the risk of large losses, unless under the circumstances it is clearly prudent not to do so . . . ." 29 U.S.C. § 1104 (1982).
investments as imprudent. Moreover, even if potential returns were high, pension funds would not invest in small companies because each fund is unable to buy enough shares of these companies to have an affect on its portfolio return. Not only may the business risks associated with these companies be higher, but their stocks are likely to be illiquid—pension funds may find it difficult to sell the stock in a short period of time. Consequently, institutional investors, including pension funds, generally purchase only actively traded "blue chip" stocks such as those that form the Dow Jones Industrial Average or the broader S&P 500 index. Thus, the increasing amount of funds under the control of institutional investors may not be channelled to new companies that desire equity financing.

A considerable amount of institutional trading in stocks is performed by pension fund managers who follow "short-term investment strategies even though pension funds represent long-term commitments of funds with relatively little requirement for liquidity." Some corporate pension funds, particularly defined benefit plans, encourage managers to maximize returns during a short period of time, because high earnings in one year allow the employer-sponsor to reduce contributions to the fund in the following year. Moreover, recent changes in financial reporting standards for pension funds may reinforce this emphasis. Under a new accounting rule, expected pension liabilities must be computed annually using market interest rates. If this amount exceeds the market value of fund assets under management, then the unfunded liability must be disclosed on the company's balance sheet. Consequently, corporate executives, concerned about the potential negative effect of such a disclosure on the price of corporate stock, favor short-term investment goals rather than a long-term strategy that may not immediately achieve high returns. Thus, managers of pension funds are rewarded for following short-term trading strategies as a method of obtaining quick profits.

Money management is a competitive business, and the performance records of money managers are compared against those of their peers and the market averages. Plan sponsors use these quarter-to-quarter or year-
to-year measurements to determine whom to hire and whom to fire, in a kind of "performance derby." Accordingly, in order to retain clients or to attract new ones, investment managers strive to achieve superior performance in the short-run. In an environment where performance is judged from quarter-to-quarter, there is little incentive to look for "long-term winners."

This "performance derby" of the 1980s, which is characterized by speculation in individual stocks and with whole portfolios, induces stock trading. For example, some institutions in making their investment decisions focus on factors affecting the temporal price of a stock rather than on fundamentals and the long-term worth of the company. Mere rumor of takeover triggers buying sprees and propels stock prices upward. Meantime, "[d]ay-to-day fluctuations in the profits of existing investments, which are obviously of an ephemeral and non-significant character, tend to have an altogether excessive, and even an absurd, influence on the market." Institutional investors are prone to over-react to new information, and negative events receive a more than proportional share of attention. Consequently, portfolio managers are likely to sell stocks quickly in response to unfavorable news.

Economic news (as compared with news about an individual company) can have an especially profound effect on the stock market in this "knee-jerk" environment. Because many institutional portfolios are well diversified, they are only exposed to systematic (market) risk. Accordingly, an unfavorable news report about one company may not induce an institution to sell that company's stock. On the other hand, an unfavorable economic report, which affects all companies in the portfolio, could spark a sell off of the whole stock portfolio. This outcome will not

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403. See Light & Perold, supra note 383, at 107.
404. See M. Mayer, supra note 313, at 261-62.
407. J. Keynes, supra note 309, at 153-54. "It is said, for example, that the shares of American companies which manufacture ice tend to sell at a higher price in summer when their profits are seasonally high than in winter when no one wants ice." Id. at 154.
409. See J. Brooks, supra note 240, at 134. For example, on Oct. 15, 1983, Digital Equipment Corp. announced a quarterly earnings drop of 72%. See id. Its stock price proceeded to drop 22% in one day and 40% within two weeks. See id.

Did this mean, as it seemed to, that Digital as a company had suddenly fallen out of the sky, and was no longer a worthy institutional investment? Not necessarily; most leading companies suffer such temporary reverses at one time or another, for one reason or another. It meant, rather, that institutional investors knew that they themselves would cause the stock to take a nosedive on the bad news, and fulfilled their own prophecy by stampeding to be the first out. Indeed, three months later Digital came out with a favorable report; then the stampede was in the other direction, and the stock price rose 30% in three days. Id. at 134-35.
410. See supra text accompanying notes 118-23.
411. Of course, selling stock index futures contracts can serve as a substitute for selling
have a large effect on stock prices if the amount of selling pressure is balanced to some extent by the buyers in the market.\footnote{See Reilly and Wachowicz, How Institutional Trading Reduces Market Volatility, J. Portfolio Mgmt., Winter 1979, at 11, 16-17. If there is an absence of institutional buyers, however, stock prices will plunge. See Rosenberg, Institutional Investors: Holdings, Prices, and Liquidity, Fin. Analysts J., Mar.-Apr. 1974, at 53, 58.}{12} However, institutional investors are inclined to run in a pack and sell at the same time.\footnote{See J. Brooks, supra note 240, at 134.}{13}

Institutional investors have homogeneous expectations because of their herd instinct. "They may not always invest rationally, but they may behave rationally. The reason is simple: there is safety in numbers."\footnote{M. Johnson, The Random Walk and Beyond 166 (1988).}{14} To illustrate, a perceptive institutional portfolio manager in 1986 and early 1987 notices two things. First, stock prices are greatly overvalued based on fundamental analysis.\footnote{Fundamental analysis (as compared to technical analysis) focuses on the intrinsic value of stocks. Intrinsic value is "the value which is justified by assets, earnings, dividends, definite prospects, and the factor of management." S. Cottle, R. Murray & F. Block, Graham and Dodd's Security Analysis 41 (5th ed. 1988).}{15} The high prices being paid for stocks are not supported by the companies' expected future earnings and dividends. Second, competing portfolio managers continue to buy stocks and are profiting as the market is pushed even higher.

Because he cannot risk falling behind in the "performance derby," he will probably follow the trend and also buy stocks (or at least continue to hold them). Even if his fundamental analysis is correct, he does not know when the buying frenzy will end. However, if he withdraws from the stock market and it keeps rising, his reputation and even his job are in jeopardy. In contrast, suppose he stays in the market. If his analysis proves correct and the market drops, the worst that can happen is that his performance will be about as poor as most of his competitors, something he can live with. Thus, for an institutional portfolio manager, there was more "risk" in shunning the market than in joining it, even if one's investment analysis indicates otherwise.\footnote{See M. Johnson, supra note 414, at 166-67; see also J. Keynes, supra note 309, at 158 ("[w]ordly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally.").}{16}

Of course, when this speculative bubble finally bursts, the institutional investment managers sell their stock holdings—quickly; no one wants to come in last place in this race. Thus, many institutional managers play a market timing game.\footnote{See B. Malkiel, supra note 249, at 171-72 (move money between cash, equities, and bonds).}{17} They move whole portfolios in and out of the stock market, trading thousands of shares at the touch of a key,\footnote{The NYSE's DOT system permits such computer-assisted trading.}{18} "largely concerned, not with making a superior long-term forecast of the probable yield of an invest-
ment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public” and other portfolio managers.419

The following situation prevails in the securities markets: the majority of institutions are investing in the same few hundred stocks, in which they dominate the market; they have access to the same information, and they process and react to that information in essentially the same way. However, the winners in the performance game are those institutional investors who can think like everybody else, only a few minutes sooner.420 This game encourages speculation rather than investment. Portfolio managers are more concerned with changes in investors' attitudes about the stock market than with valuing the underlying companies.

This “pursuit of price appreciation within a few weeks or even months is not consistent with a proper concept of investment, because its success depends more on a prompt change of attitude in the market than on anything in the underlying business.”421 Consequently the job of the securities markets—to direct new investment to those companies who will use the funds in the most productive fashion—is not advanced.422

On the whole, “stock prices are nothing more than a mirror of reality, and if reality is that the market is predominantly engaged in playing out a short term, market-timing game, then the mirror will not reflect anything better.”423 Therefore, when new information enters the market or sentiments reverse, the behavior of a few institutional investors may cause a large price change in the stock market—whether directly or through the index arbitrage link. If the change is bearish, the aggregate shift in investor expectations can lead to an ensuing panic to avoid expected losses. This instability is due to fundamental characteristics of human behavior: greed, fear, and the desire for quick results.424 Thus, a change from short-term trading to “long-term ‘investing' seems as unlikely to occur as any other real change in human nature.”425

2. Continuing Innovations in Technology

Technological innovations coupled with the greater presence of institutional investors have changed the structure of the financial markets. Today, while still owning the underlying securities, derivative instruments allow investors to transfer price risk inexpensively to those willing to assume it. The introduction and application of financial theories have pro-

419. J. Keynes, supra note 309, at 154.
421. L. Lowenstein, supra note 405, at 15.
422. See J. Keynes, supra note 309, at 159.
423. L. Lowenstein, supra note 405, at 53.
425. Id.
vided investment managers with a framework for assessing risks and returns and have spawned various program trading strategies. Through modern data transmission and information processing, investors can follow events as they unfold and respond rapidly. In part, the sharpness of the October 1987 crash reflected these innovations. Despite the events of Black Monday, innovations will continue to evolve in response to various changes in our environment and may therefore enhance the efficiency of the markets and contribute to the general welfare. However, innovation in the financial markets is “reflexive” while instability causes innovation, it is likely that innovation produces instability.

Innovations in the financial markets generally take two forms, product innovation and process innovation. Product innovation is the development of new products such as stock index futures contracts, foreign currency options, and zero coupon bonds. By contrast, process innovation is responsible for new methods of processing financial activity such as the creation of linked exchanges, electronic trading, and portfolio-level trading. Both forms of innovation, particularly during the 1980s, have proceeded at a rapid pace.

Financial innovation is driven by a demand for new products or processes that perform certain functions aimed at managing the uncertainty of changes in the environment. Sources of instability that have prompted such innovation include: the volatility of interest rates, currency exchange rates and stock prices; intensifying competition among financial institutions; regulation and the circumvention of regulation; the level of economic activity; tax changes; and technological advances. Thus, innovation and instability are intertwined.

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428. See Bank for International Settlements, Recent Innovations in International Banking 208-09 (1986) [hereinafter BIS].
429. See Van Horne, supra note 426, at 621.
431. See J. Walmsley, supra note 430, at 4-6; Van Horne, supra note 426, at 625; Grundfest, The New Technology of Finance, Fin. Executive, Sept.-Oct. 1987, at 44, 45-46. Examples of process innovation include: the creation of an Intermarket Trading System that links all regional stock exchanges; electronic trading, which can be done through the National Association of Securities Dealers’ Small Order Execution System; and the trading of whole portfolios of many securities instead of individual issues.
432. See J. Walmsley, supra note 430, at 4-6.
433. See BIS, supra note 428, at 171, 174.
435. See J. Walmsley, supra note 430, at 8-11; Van Horne, supra note 426, at 622. Besides equities, the increased volatility in interest rates and foreign exchange has brought about innovations such as interest-rate swaps and foreign currency options. See Finance Brief: A Risky Business, Economist, May 28, 1988, at 81-82.
Finance is a technology, and some innovations in finance have integrated markets previously separated by geography and differences in regulatory treatment. The development of new financial products and trading strategies are inevitable because such innovations are responses to the needs of the market participants. For instance, the introduction of a price-risk-transferring innovation such as stock index futures contracts can be attributed to the perception of an increased volatility in stock prices. When an institutional investor is worried about falling stock prices, it can reduce its portfolio’s equity exposure without selling the underlying stocks by selling stock index futures instead. This hedging strategy is a cheaper and more efficient method of temporarily investing in “synthetic” Treasury securities particularly if the portfolio manager wants to participate in the equity market when it rises but quickly get out when it falls. Similarly, institutions wanted to trade whole portfolios of stocks cheaply and quickly; program trading and stock index futures were the answer. Consequently, the futures and stock markets became linked through index arbitrage.

If an innovation becomes unnecessary, it will be discarded, or if it fails to achieve its purpose, financial “engineers” will go back to the drawing board and re-address the problem. For example, after portfolio insurance did not function at the very time it was supposed to (when stock prices were plunging on October 19th), portfolio insurance users discontinued the strategy. Although this particular implementation did not work, people in the financial services industry are now busily developing better methods of program trading. Therefore, regulatory efforts

436. Grundfest, supra note 431, at 44.
437. See BIS, supra note 428, at 174.
438. The commission expense and market impact cost associated with selling the underlying stocks composing the S&P 500 index and then buying the stocks back are much greater than selling and buying stock index futures. See supra text accompanying notes 137-40.
439. See supra text accompanying notes 133-35. “[T]he futures market has grown as it has because it meets a need in the overall investment picture. Even if the market were to close, ‘there would still be a demand to trade baskets of stocks.’” Salwen, Pros See Fall in Stock Prices If Index Futures Are Ended, Wall St. J., June 14, 1988, at 37, col. 3 (quoting Robert R. Glauber, a member of the Presidential Task Force on Market Mechanisms).

Another example of necessity impelling innovation is illustrated by block trading. In the 1960s and 1970s institutional investors started trading tens of thousands of shares of individual securities (block trades), but this task was difficult because New York Stock Exchange specialists were unable to execute these large transactions cheaply and quickly. As a result, investment firms (block positioners) began to arrange these trades in their own firms (“upstairs”) away from the NYSE and the comparatively undercapitalized specialists. Thus, the institutional investors found a better way of doing business. See M. Mayer, supra note 313, at 38-39; J. Walmsley, supra note 430, at 18.
440. See supra text accompanying notes 103-11.
441. See Anders, Four Stock Exchanges Vie to Develop Trading Method to Ease Large Orders, Wall St. J., Aug. 3, 1988, at 4, col. 2 (portfolio-level trading); Norris, Maligned or Malign?, Barron’s, Mar. 21, 1988, at 30 (portfolio insurance).
should not discourage the development of new financial products and strategies. The market will eventually recognize its own limitation.

Technological advances in communications and information processing systems are beneficial. The ability of the financial markets to gather information about the economy, corporations, and government policies has been greatly enhanced by the new technology. The introduction and rapid assimilation of computers and data communication networks have enabled investors to gather more information and process it faster than ever before, responding to changes in the marketplace. For example, from computer terminals investors can inexpensively access historical financial data or monitor current news events. They can then utilize systems such as the NYSE's DOT to execute transactions. Accordingly, these innovations have resulted in more rapid investment flows: new information is disseminated faster and investors are able to respond by quickly buying or selling.

While technological innovations have increased the efficiency of the markets, they render the market more susceptible to volatility. The use of such technology by over-reactive, short-term oriented, trend following, institutional investors may result in “excessive” stock price movements. Thus, we have come full circle: while innovations may develop as a response to volatility, these same innovations have also fostered volatility. Because technological advances, both in finance and information processing, are “powerful long-lasting forces . . . even in a stable environment,” innovation and hence volatility are here to stay.


Innovation has not only integrated the United States financial markets, it has linked them with foreign markets as well. Institutional investors from around the world are diversifying their portfolios on a global basis, and they can rapidly move their capital internationally in the hope of achieving higher risk-adjusted returns. As a result, the frequency of abrupt and unpredictable shifts in international money flows have a considerable impact on the United States financial markets. Therefore, the globalization of financial markets contributes to the volatility of stock prices, the loss of investors’ confidence, and therefore exacerbates the instability of the domestic economy.

442. The major suppliers of news and financial information are Reuters, Telerate, and Quotron. See Finance: From Foreign Desk to Foreign Exchange, Economist, July 23, 1988, at 63, 63-64.

443. The widespread availability of inexpensive and timely information has improved the market's ability to price securities.

444. The sharpness of the crash of 1987, in part, reflected the market's use of and reliance on these modern computer technologies. See GAO Report, supra note 8, at 75.

445. See BIS, supra note 428, at 184.


447. See M. Mayer, supra note 313, at 266-71; see also SEC Report, supra note 14, ch.
Communication technology has linked the world's markets so as to encourage global, twenty-four hour trading. Shortly after the New York Stock Exchange closes at 4 p.m., the Tokyo Stock Exchange begins trading at 7 p.m., New York time. Tokyo has stopped trading by 1 a.m., but at 4 a.m. the London Stock Exchange opens. A couple of hours before London's market closes, the NYSE resumes activity at 9:30 a.m., and the cycle repeats. Futures trading has also gone around the world and around the clock as these markets expand through electronic links.

The international mobility of capital makes United States financial regulators less effective at influencing the domestic markets. Globalization means that capital can leave the United States markets for foreign ones whenever investors perceive that the benefits of trading overseas (after taking into account the risks) exceed those domestically available. If United States regulatory agencies adopt rules that constrain the trading activities of institutional investors (sufficiently raising margins on stock index futures so as to make them very expensive hedging instruments) when costs exceed benefits, the institutions may move their transactions to other markets that have a more favorable regulatory environment.

Possibly North America's first experiment at intercontinental trading occurred in 1896.

William Jennings Bryan had been nominated for president by the Democrats on a platform of "bimetallism," a bid to adopt a gold and silver standard that would break what was seen as the sinister world dominance of Britain's single standard of gold. Investors were nervous. So on election night, New York brokers tried something new. They stayed open to the early morning hours at special offices in midtown Manhattan, giving wealthy clients the chance to trade American securities in London, via undersea telegraph cable, basing their decisions on early election returns.


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A consequence of the globalization of money flows is that the national economy, as a whole, must compete internationally for capital. "The integration of national financial markets is related to, and supported by, the broader force of the global integration of overall economic structures. These linkages through increased trade, investment and travel are a long lasting process."456 The instability of United States and foreign institutional investors' expectations concerning the economic health of the nation vis-a-vis that of other countries may result in frequent and unpredictable shifts of funds in and out of the United States financial markets. Therefore, the globalization of financial markets may contribute to the volatility of stock prices, and this trend is likely to continue.457

CONCLUSION

One year has now passed since the crash of 1987. The volatility of a year ago is gone; many institutions are now holding cash instead of equities.458 Fear temporarily dominates the minds of institutional investors. While the markets are calm, financial policymakers should take this time to address the long-run structural problems of the markets: the short-term focus of institutional "investors"; continuing innovations in technology; and the globalization of money flows. Program trading is only one recent consequence of these long-run characteristics of the markets.

London Market. See SEC Report, supra note 14, ch. 2, at 2-10 to 11. Sales of equities and futures contracts can take place outside the U.S. exchanges in the London market through exchanges-for-physcials (EFPs). EFPs "involve simultaneous transactions in a basket of index stocks . . . and index futures in a noncompetitive transfer of ownership between the parties; one party buys the stocks and simultaneously sells (or gives up a long) futures contract while the other party sells the stocks and simultaneously buys (or receives a long) futures contract." Id. ch. 2, at 2-11.

A further example of institutional investors going abroad took place in the U.S. Treasury bond futures contract market. On October 19, 1987, these contracts hit their upper price limit on the Chicago Board of Trade. As a result, on the next day the volume of Treasury bond futures contracts traded on the London International Financial Futures Exchange was eight times the previous day's volume in Chicago. See America's Capital Markets, Economist, June 11, 1988, at 24 (survey).

456. BIS, supra note 428, at 185.
457. Two authors forecast that:

[W]ithin the next 10 years, capital and financial markets will be linked electronically through a network of depository and custodian banks and centralized clearing organizations to create a Global capital and financial system for clearing and settling transactions. The exchange of securities and derivative instruments will occur as book entries and journaled credits and debits. Physical securities and their transfer will be eliminated. Securities will be registered at a Global registry and depository trust. Universal banks and multinational brokerage firms will execute orders and perform record-keeping procedures for their clients as usual. The difference will be that clients can trade listed securities, options, and financial futures contracts on any world exchange from their primary exchange—whether it be New York, London, Paris, or Toronto.


Because of the long-term nature of these problems and their synergy, we may have to live with greater financial volatility.

Is another financial crash likely to occur? Yes. Speculative trading by short-term oriented institutional investors will cause stock prices to rise to insupportable levels, and when the bubble breaks few will be left unscathed. In the long run, market regulations will not prevent declines in stock prices, and in the short run, these measures have undesirable effects such as retarding the ability of investors to adapt to changes in the global marketplace and sending capital overseas. Therefore, if the nation's policymakers do anything, they should take steps to ensure that the financial system can withstand the effects of these inevitable price shocks instead of focusing only on increasing the regulation of the markets.459