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# PROGRAM TRADING—A CRITICAL ANALYSIS

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## INTRODUCTION

“Black Monday,” October 19, 1987, sent many financial experts and investors reeling back to October 28, 1929. Almost fifty-eight years to the day after the first great crash, “Black Monday” saw the Dow Jones Industrial Average (DJIA)<sup>1</sup> plummet 508.32 points in a single day.<sup>2</sup> The DJIA lost approximately \$500 billion of value.<sup>3</sup> This precipitous drop in the stock market greatly exceeded the fall on October 28, 1929, by 22.6% to 12.8%,<sup>4</sup> that led to the “Great Depression.”

In the wake of its devastation, members of Congress, the Securities and Exchange Commission (SEC), the Commodity Futures Trading Commission (CFTC), Self-Regulatory Organizations (SRO),<sup>5</sup> commentators, and market participants alike are deeply divided over the “cause” and the effect of this market crash. One “cause” that has elicited tremendous debate, splitting the financial community, has been the role of certain arbitrage and related trading strategies involving stock index futures and options, commonly

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\*\* Staff Attorney, United States Securities and Exchange Commission, Division of Corporation Finance; Pepperdine University School of Law, J.D. (1988). The Securities and Exchange Commission, as a matter of policy, disclaims responsibility for any private publication or statement by any of its employees. The views expressed herein are those of the author and do not necessarily reflect the views of the Commission or of the author's colleagues upon the the staff of the Commission.

1. The Dow Jones Industrial Average (DJIA) is the most commonly recognized stock index and is comprised of thirty of the most widely traded stocks. To compile the DJIA, the combined price change of all thirty stocks is determined. Next, a constant divisor, a figure to adjust for changes in the average, is divided into that net change to calculate the gain or loss for a given day. LITTLE & RHODES, *UNDERSTANDING WALL STREET* 64-66 (1980).

2. *The Crash of '87: Stocks Plummet 508 Amid Panicky Selling*, Wall St. J., Oct. 20, 1987, at 1, col. 5.

3. *Id.*

4. Sing, *Analysts Look to 1929 for Clues to Direction of Current Bear Market*, L.A. Times, Jan. 12, 1988, Part IV, at 9.

5. Self-Regulatory Organizations are the private corporations that oversee the actual maintenance of the markets under the control of the SEC. The New York Stock Exchange, the American Stock Exchange, and the National Association of Securities Dealers are examples of SROs.

referred to as program trading.<sup>6</sup> Whether program trading, stock index arbitrage,<sup>7</sup> or portfolio insurance<sup>8</sup> caused the dramatic drop in the market may never be known for certain, but its effect is definitely being investigated.<sup>9</sup>

This Article will attempt to set out the prevailing view of program trading from the perspective of (1) the financial community; (2) academic commentators; (3) regulatory bodies, the SEC, CFTC, and other SROs; and (4) Congress. It will attempt to dispel some of the myths surrounding program trading while demonstrating that the financial markets have undergone dramatic fundamental changes with the advent of financial futures, and will certainly continue to do so with the institutionalization and globalization of our capital markets. Regulation of these new and complex derivative investments will prove to be most challenging to Congress and the regulatory bodies as they attempt to maintain fair, orderly, and efficient markets. It is incumbent upon Congress and the regulatory bodies that as they maintain a fair and orderly market, they must not impair the efficiency and liquidity of the market itself.

A major concern of this Article will be the effect of these new derivative products, *i.e.*, program trading, on the individual investor. Does program trading hurt or enhance the individual investor? Does program trading create a market that the individual investor considers too complex and too volatile, and thus, too confusing for him or her to understand? Because Congress passed our securities laws in response to the market crash of 1929 and designed the laws to protect investors, individuals, and corporations, it is important that we keep the role of the securities laws in mind as the financial markets grow in complexity and design.

## I. THE FINANCIAL FUTURES MARKET

### A. *The Development of Financial Futures and Options*

To better understand the role of program trading in today's markets it is helpful to examine the development of program trading. Commodities futures contracts based upon agricultural products have been traded since 1860.<sup>10</sup> A commodity futures contract provides for the delivery of a specific

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6. Program trading refers to a wide variety of trading strategies. For our purposes, program trading means many stock trades done quickly and efficiently. Highly automated trading systems make program trading possible, and institutional investors and securities firms routinely use program trading.

7. See *infra* notes 86-96 and accompanying text (discussing stock index arbitrage).

8. See *infra* notes 64-87 and accompanying text (discussing portfolio insurance).

9. No less than five studies recently have been completed. See *The October 1987 Market Break*, Fed. Sec. L. Rep. (CCH) No. 1271 (Feb. 3, 1988) (Extra Edition); *Stock Market Crash of October 1987*, Fed. Sec. L. Rep. (CCH) No. 1271 (Feb. 3, 1988); *Report of the Presidential Task Force on Market Mechanisms*, Fed. Sec. L. Rep. (CCH) No. 1267 (Jan. 12, 1988) (Extra Edition). In addition, a report is being completed by the CFTC and a report has been commissioned by the NYSE.

10. CHICAGO Bd. OF TRADE, *THE COMMODITY TRADING MANUAL* (1982) [hereinafter *TRADING MANUAL*].

amount of a commodity at a given price at a designated time in the future.<sup>11</sup> An example of a commodity futures contract is a contract to deliver 5,000 bushels of wheat in February 1989 for \$4.00 per bushel. The farmer who sells the contract today is assured of receiving \$4.00 per bushel for the wheat in February 1989. By selling the wheat today the farmer foregoes any increased profit that an increase in wheat prices above \$4.00 per bushel would create. However, the farmer eliminates the risk of wheat prices falling during the life of the contract.<sup>12</sup> The investor (speculator) purchases the wheat because he anticipates that the price of wheat will rise during the life of the contract. The commodity futures contract permits the farmer to transfer the risk of volatile wheat prices to an investor (speculator) who is willing to assume such risk, and presumably, who is in a better position to assume the risk. Thus, commodity futures contracts serve a useful economic function.

Financial futures essentially were developed to provide this same useful shifting of risk. Financial futures were a result of volatile currency and interest rates in the 1960's. Trading in currency futures commenced in 1972, and trading in interest rate futures started in 1975.<sup>13</sup> Currency and interest rate futures allowed the futures contract seller (farmer) to transfer the risk of volatile currency and interest rates to an investor (speculator) whose purchase of the futures contract placed him in a position to assume the present risk of fluctuation in either market.

In February 1982, the Kansas City Board of Trade introduced the first stock index futures contract (index futures) based on the Value Line Index.<sup>14</sup> Later that same year, index futures based on the Standard & Poor's 500 Index (S&P 500) and the New York Stock Exchange Composite Index (NYSE Composite) began trading on the Chicago Mercantile Exchange (CME) and on the New York Futures Exchange (NYFE), respectively. Since their inception, several other stock index futures contracts based on other market indices have been introduced.<sup>15</sup> Index futures are traded actively and

11. 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, (December 1984) [hereinafter FRB/CFTC/SEC].

12. *Id.* at II-1.

13. *Program Trading: Hearings before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce*, 100th Cong., 1st Sess. 3 (July 23, 1987) (testimony of William J. Brodsky, Pres. Chicago Mercantile Exchange) [hereinafter *Brodsky Testimony*].

14. FRB/CFTC/SEC, *supra* note 11, at III-11.

15. The following represents the five most widely used index futures contracts:

<u>Contract Name</u>	<u>Exchange</u>	<u>Number of Stocks in Index</u>
S&P 500	Chicago Mercantile Exchange	500
NYSE	New York Futures Exchange	1,560
Major Market	Chicago Board of Trade	20

used for hedging,<sup>16</sup> speculation,<sup>17</sup> and arbitrage<sup>18</sup> purposes. Thus, like other financial futures and commodities futures, index futures serve important risk management functions.<sup>19</sup>

Index futures contracts are traded on futures exchanges around the country, and are now being traded in some foreign countries.<sup>20</sup> Floor brokers conduct trading in stock index futures auction-style in a pit on the floor of a futures exchange, using open outcries to buy and sell contracts. The dollar value of an index futures contract generally is 500 times its price. The S&P 100 contract (valued at 200 times its price) and the Major Market Index (MMI) contract (valued at 100 times its price) are exceptions to this general rule.<sup>21</sup>

It is important to understand exactly what a stock index futures and a stock index option are, and the difference between the two, to understand the role of index futures and index options in program trading. Both index options and index futures are "derivative" instruments. Index options and index futures are one step removed from the underlying security or commodity to which they relate.<sup>22</sup> Further, both index options and index futures are able to create leverage relative to cash flow.<sup>23</sup>

The first difference between options and futures is the character of the transactions. An option is the "right," which an investor may or may not exercise, to buy or sell something.<sup>24</sup> On the other hand, a futures contract is an "obligation" to buy or sell. The purchase or sale of a futures contract is tantamount to the purchase or sale of the underlying item, except that

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Value-Line	Kansas City Board of Trade	1,700
S&P 100	Chicago Mercantile Exchange	100

SECURITIES AND EXCHANGE COMMISSION, ROUNDTABLE ON INDEX ARBITRAGE (background materials) (July 9, 1986) [hereinafter ROUNDTABLE].

16. Hedging is the avoidance of risk by selling a futures contract while holding the underlying security. The hedger foregoes any opportunity to profit from an increase in the underlying commodity. FRB/CFTC/SEC, *supra* note 11, at II-3.

17. Speculation is the buying or selling of index stock futures on options to profit from moves in the market. ROUNDTABLE, *supra* note 15; see also FRB/CFTC/SEC, *supra* note 11, at II-5.

18. See *infra* notes 86-96 and accompanying text (discussing arbitrage).

19. See ROUNDTABLE, *supra* note 15.

20. Presently, five foreign countries have active stock index futures markets. The markets are in London, Sydney, Hong Kong, Singapore, and Stockholm. Since index futures were introduced on these foreign exchanges, the volume of contracts traded has doubled, and in some instances, quadrupled. *Market Brief: Futures-ology*, THE ECONOMIST, Oct. 31, 1987, at 75.

21. For example, if the S&P 500 stock index were at 250, the initial contract value would be \$125,000 (500 x 250). If the index moved up (down) four points, the investor would gain (lose) \$2,000, depending on whether he or she bought or sold the index futures contract. ROUNDTABLE, *supra* note 15.

22. ROUNDTABLE, *supra* note 15.

23. GOLDMAN SACHS, STOCK INDEX RESEARCH, THE HANDBOOK OF STOCK INDEX ARBITRAGE (June 1985) [hereinafter GOLDMAN SACHS].

24. FRB/CFTC/SEC, *supra* note 11, at II-1.

transfer of ownership is delayed in time. Thus, if an investor is long (buys) or short (sells) futures, the investor is the equivalent of being long or short the underlying commodity or security. Time and cash flow leverage is the difference between owning the underlying commodity or security and owning the futures.<sup>25</sup>

A second difference between index options and index futures is in the method of delivery. Traditional futures contracts are settled by physical delivery of the underlying commodity or security upon expiration of the contract. At expiration of the index options or index futures, the obligation is settled in *cash* by receiving or paying the cash difference between the closing value of the index and the previous day's futures price or strike price of the option.<sup>26</sup> The ending value of the index option or index futures, thus, becomes a function of the value of the index at the contract's expiration. In all markets, then, there will be a convergence between the cash (stock market) and the futures and options markets.<sup>27</sup>

A third difference between index options and index futures is that investors usually purchase index futures on margin that differs significantly from stock margin. An investor purchasing stock in a margin account must deposit fifty percent of the purchase price in cash or securities.<sup>28</sup> The investor will then borrow the remaining fifty percent of the purchase price from the brokerage house and will pay interest on the amount borrowed. The investor owns the stock purchased and will receive all dividends. In contrast, an investor purchasing an index futures contract is subject to two very different types of margin requirements, neither of which involves borrowed funds. The first is "initial margin," which typically ranges from five percent to ten percent of the contract's value.<sup>29</sup> Initial margin becomes, in reality, a good faith deposit or "performance bond," made with the futures exchange to assure the investor's compliance with the contract. An investor must post this initial margin with the futures exchange in cash or Treasury Bills, and the investor receives any interest paid.<sup>30</sup>

The second type of index futures margin is "variation margin." "Variation margin" ensures that upon final settlement the investor will meet his contract obligations.<sup>31</sup> Variation margin is calculated daily and is based

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25. See GOLDMAN SACHS, *supra* note 23, at 3.

26. *Id.* Strike price is the predetermined price at which the option or futures may be exercised. LITTLE & RHODES, *supra* note 1, at 19.

27. See GOLDMAN SACHS, *supra* note 23, at 3.

28. LITTLE & RHODES, *supra* note 1, at 93-95.

29. The exchange upon which the particular index contract trades sets the initial margin requirements. The highest initial margin (typically 10%) is required for "speculator" positions, where an investor simply purchases or sells a contract outright. Smaller initial margins (typically around 5%) are required for "hedged" positions, which entail less risk than speculative positions. FRB/CFTC/SEC, *supra* note 11, at II-14. In response to the market decline of October 19, 1987, most exchanges have increased their margin requirements to 12-15%.

30. See GOLDMAN SACHS, *supra* note 23, at 4.

31. *Id.* at 4. Final settlement for index futures is on the third Friday of the months of March, June, September, and December.

upon the difference between the value of the index futures contract and the previous day's close. The holder of an index futures contract must settle the variation margin in cash daily.<sup>32</sup> For example, if the value of the contract increases, the investor who purchased the contract will receive from the seller of the contract a cash payment for the amount of the increase in value. Conversely, if the value of the contract decreases, the investor who purchased the contract must make to the seller of the contract a cash payment for the amount of the decrease in value.<sup>33</sup> Although index futures are highly leveraged, due to low initial margin, daily variation margin requirements attempt to insure the ability of the parties to meet their obligation under the contract.

The use of index futures in risk management and as a synthetic equity<sup>34</sup> trading vehicle has led to phenomenal growth in trading volume of all index products.<sup>35</sup> The most heavily traded index futures contract is the S&P 500 on the CME. Approximately 100,000 S&P 500 futures contracts exchange hands daily, representing \$15 billion in underlying value. This amount far exceeds the approximately \$7.9 billion in stock traded daily on the NYSE.<sup>36</sup> The enormous growth in index futures has created a derivative equity market liquid enough to accommodate previously impossible large institutional trades.<sup>37</sup>

### B. *The Financial Community and Program Trading*

Investors associate stock index futures with the use of program trading strategies.<sup>38</sup> Investors may use these strategies for index future arbitrage and portfolio insurance.<sup>39</sup> Stock index futures, used in conjunction with program trading, have essentially revolutionized portfolio management by allowing institutional investors to move enormous amounts of capital in the financial

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32. SALOMON BROTHERS, INC., MEMORANDUM FOR JULY 9, 1986 SEC ROUNDTABLE DISCUSSION ON THE EFFECTS OF PROGRAM TRADING (June 23, 1986) (contained in ROUNDTABLE, *supra* note 15) [hereinafter SALOMON BROTHERS].

33. *Id.*

34. Trading synthetic stock is buying or selling of futures or options while simultaneously selling the put. ROUNDTABLE, *supra* note 15.

35. *Program Trading: Hearings before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce*, 100th Cong., 1st Sess. 26 (July 23, 1987) (testimony of R. Sheldon Johnson, principal, Morgan Stanley & Co., Inc.) [hereinafter *Johnson Testimony*]. The combined markets for futures and options on stock indices trade assets representing approximately \$25 billion per day. In contrast, the asset value of stocks traded on the NYSE amount to an average \$8 billion per day. *Id.*

36. *Id.* at 10.

37. *Program Trading: Hearings before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce*, 100th Cong., 1st Sess. 3 (July 23, 1987) (testimony of W. Gordon Binns, Vice President and Chief Investment Funds Officer, General Motors) [hereinafter *Binns Testimony*].

38. Grossman, *An Analysis of the Implications for Stock and Futures Price Volatility of Program Trading and Dynamic Hedging Strategies*, at 1 (May 22, 1987) (unpublished report).

39. *Id.*

markets.<sup>40</sup> Because index futures and index options create greater liquidity, institutions can trade billions of dollars of synthetic equities at a lower cost, and with greater efficiency, than institutions can trade in the underlying stock market.<sup>41</sup>

In actuality, program trading refers to the buying or selling of a large group of securities at a single point in time, as if that portfolio was a single security.<sup>42</sup> Program trades often are placed through the NYSE high-speed order system, DOT (designated order turnaround).<sup>43</sup> Program trading has been around since the early seventies, but until the introduction of stock index futures in the early eighties, and the public's perception that program trading caused the wild gyrations in the market, program trading did not receive any real critical attention.

As institutional investors became increasingly dominant in the market, program trading was introduced in response to the institutions' need for liquidity in the equity market.<sup>44</sup> The growth of employee pension plans with billions of dollars in assets prompted the development of efficient trading methods for large-scale equity transactions. Prior to this time, the illiquidity of the market and the enormous transaction costs effectively foreclosed institutional investors from investing quickly and efficiently in the stock market.

Block trading<sup>45</sup> was introduced to facilitate equity market liquidity. Advances in communication technologies permitted greater participation in the block network. Further advances in computer technologies and pro-

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40. Sebastian, *Linked Deals in Stocks and Futures Contracts Roil Prices, Critics Say*, Wall St. J., Oct. 22, 1985, at 1, col. 6; see also Laderman, *Those Big Swings on Wall Street*, Bus. Wk., April 7, 1986, at 32.

41. Sebastian, *supra* note 40.

42. Sebastian, *How Program Trading Works and Why It Causes Controversy in the Stock Market*, Wall St. J., Jan. 10, 1986, at 19, col. 4.

43. See Russell, *Manic Market*, TIME, Nov. 10, 1986, at 68. The NYSE DOT system is an automated execution and reporting system which allows brokers to enter their orders directly from a computer terminal in their office. *Id.* The DOT system then sends the orders directly to one of fourteen specialist posts located on the floor of the NYSE, where the orders are executed immediately, and the broker receives confirmation of the trade within minutes. *Id.*

44. The growth of the institutional investor is phenomenal, considering that in 1960 the institutional investor and individual investor were about evenly split in terms of equity trading volume. Presently, the institutional investor often is responsible for ninety percent of equity trading volume. One reason for the change is individuals' growing use of mutual funds as the preferred equity investment vehicle. Nearly half of the forty-seven million Americans owning stock do so through mutual funds, and shareholders have increased by approximately three million in the last two years. *See id.* at 65.

45. A block of stock usually is composed of 10,000 shares of a single corporation. A block trader will receive an order and then will check the floor of the NYSE to see if there is sufficient liquidity to execute the block order at, or close to, the current market price. If the price on the floor is not favorable, the block trader will attempt to match the order at a more competitive price with another block trader or an institutional investor. An entire network for buying or selling large blocks of stock developed which was not restricted to the available quotes made by the specialists on the floor of the exchange.



gramming led to an increase in the size of block transactions to include entire portfolios of stocks, or program trades.<sup>46</sup>

Stock index futures now are being used to implement program trading strategies. For example, index futures provide a hedging device which reduces substantially the risk of dealing in large equity portfolio transactions. A trader can trade virtually risk free an entire portfolio of equities held in proportion to the S&P 500 Index by purchasing a S&P 500 futures contract when selling the portfolio, or by selling a S&P 500 futures contract when buying the equity portfolio. Therefore, stock index futures have allowed brokerage firms and professional traders to make markets in large diversified portfolios by substantially eliminating the risk of the market rising or falling as they enter into a transaction to buy or sell the portfolio. As index futures' hedging capability enables investors to execute larger program trades closer to the prevailing market price, liquidity in the equity market increases and risk decreases.<sup>47</sup> This hedging capability allows institutions to buy or sell their portfolios with the same liquidity that individuals enjoy. As a result, institutions with an estimated \$1 trillion in assets have allocated a larger portion of their funds to equity.<sup>48</sup> This willingness to assume greater equity exposure is reflected in the fact that the volume on the NYSE alone has increased 150-fold, from 35.7 billion shares in 1976 to 5.4 trillion shares in 1987.<sup>49</sup>

In addition to liquidity, other benefits flow from the use of stock index futures. The financial community believes that a comparison of the costs of transacting in the futures market as opposed to the stock market, reveals strong incentives to use the former. Commission charges or transaction costs alone yield a 13-1 advantage for trading in the futures market rather than trading in the stock market.<sup>50</sup> Futures produce even greater savings in terms of market impact costs. Market impact costs are costs incurred from buying or selling large quantities of a particular security or a group of

46. See *Salomon Brothers*, *supra* note 32.

47. *Id.*

48. *Id.*

49. *Program Trading: Hearings before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce*, 100th Cong., 1st Sess. (July 23, 1987) (testimony of Charles J. Henry, Pres. and CEO, Chicago Board Options Exchange) [hereinafter *Henry Testimony*].

50. The following table illustrates the commission cost savings of transacting in futures as opposed to transacting in the underlying equities with a portfolio of securities that exactly replicates the S&P 500 stock index:

	<u>S&amp;P 500 PORTFOLIO</u>	<u>S&amp;P 500 FUTURES</u>
Volume:	2,400,000 Shares	1,000 contracts
Cost Per unit:	\$0.07 share	\$12.50/contract
Roundtrip Total:	\$336,000	\$25,000

CHICAGO MERCANTILE EXCHANGE, PROGRAM TRADING: AN ON-THE-RECORD SYMPOSIUM 8 (June 17, 1986) [hereinafter *Symposium*].

securities at a single point in time.<sup>51</sup> Market impact reflects the nature of supply and demand. Market impact will result from an increased bid-asked spread to effect the transaction. In terms of market impact costs, there is the equivalent of a 24-1 advantage to trading in the futures market versus the equities market.<sup>52</sup> By removing both transaction and market costs of large-scale institutional investment in the stock market, market professionals believe that program trading has allowed billions of dollars to enter into the market, thus lowering the cost of capital for our nation's businesses.<sup>53</sup>

In addition to the cost advantages of stock index futures, financial institutions benefit from the use of stock index futures because financial institutions can execute large index futures transactions more rapidly than stock market transactions. For example, an institution can buy or sell 1,000 futures contracts in five to ten minutes, with total transaction costs of approximately \$37,500.<sup>54</sup> For an institution to buy or sell a corresponding amount of equities would take fifteen to twenty minutes with a total transaction cost of approximately \$730,000, and a far greater market impact cost.<sup>55</sup> Thus, the financial community sees a tremendous benefit to transacting in index futures. These benefits have led to numerous applications of index futures to portfolio management.

One application of index futures to portfolio management is the use of index futures as a pure trading vehicle. The use of index futures as a pure trading vehicle allows investors to participate in the movement of an entire stock index rather than in the movement of an individual security. Participants who apply index futures in this way are mostly "locals."<sup>56</sup> Locals, who account for approximately fifty-five percent of index futures volume, primarily trade on fundamentals.<sup>57</sup>

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51. *Id.*

52. The following table represents the market impact cost savings of transacting in futures versus transacting in the underlying equities with a S&P 500 portfolio:

	S&P 500 EQUITIES			S&P 500 FUTURES		
	Last	Bid	Ask	Last	Bid	Ask
Market	242.00	241.40	242.60	243.50	243.50	243.55
Bid/Ask Spread	1.20 Index Point			.05 Index Point		
Dollar Value	\$600,000			\$25,000		

*Id.* at 8.

53. *Brodsky Testimony, supra* note 13, at 6.

54. *Id.* at 14.

55. *Id.*

56. "Locals" are generally floor traders, trading for their own account. Locals typically never hold an open position for more than an hour at a time. *Johnson Testimony, supra* note 35, at 21.

57. *Id.* Technical analysts base investment decisions "on the underlying assumption that investors expect certain buying and selling patterns to repeat themselves with some degree of reliability and regularity. . . . Fundamental analysis attempts to predict future securities prices by examining the historical data. . . ." Kerr, *Suitability Standards: A New Look At Economic Theory and Current SEC Disclosure Policy*, 16 PAC. L. J. 805, § 15-16 (1985); see also Bines, *Modern Portfolio Theory and Investment Management Law: Refinement of Legal Doctrine*, 76 COLUM. L. REV. 721, 722-23 & 789-90 (1976).

A second application of index futures to portfolio management, employed primarily by institutions, is the use of index futures as a cost efficient means of asset allocation and deployment. Mutual funds receiving large inflows of capital from shareholders, or pension funds receiving lump-sum contributions from plan sponsors, immediately can gain equity exposure in a rising stock market by purchasing index futures.<sup>58</sup> To obtain the same equity exposure through direct stock purchases would incur millions of dollars of additional transaction costs, because of the market impact of a multi-million dollar transaction. Likewise, an institution that desires to restructure a portfolio of stocks, bonds, and cash in response to changing economic and financial conditions may do so by buying and selling index futures or bond futures.<sup>59</sup> By using futures to effect the asset shift quickly and efficiently, the institution assures a cost-effective execution, while limiting its exposure to adverse market movements during the restructuring period.<sup>60</sup>

A third application of index futures to portfolio management, employed primarily by institutions, is in the area of risk management. The risk management use of index futures provides a hedging vehicle for controlling the risks associated with holding large equity portfolios.<sup>61</sup> A brokerage house that has contracted to underwrite a large initial public offering can reduce its exposure to a broad stock market decline by selling index futures during the pendency of the offering.<sup>62</sup> Similarly, a specialist on the floor of the NYSE who is obligated to purchase large quantities of stock as a market maker can reduce the risk of holding its inventory by selling index futures.<sup>63</sup> The enormous growth of the use of portfolio insurance by money managers, pension funds, and other institutional investors attests to the ability of index futures to control the risks of holding large equity portfolios.

Portfolio insurance, or dynamic asset allocation or dynamic hedging, refers to a wide variety of hedging<sup>64</sup> strategies that use index futures to protect the existing value of an equity portfolio in a declining market but at the cost of foregoing total participation in a rising market.<sup>65</sup> According to financial experts, portfolio insurance is the fastest growing institutional use of index futures.<sup>66</sup> At the beginning of 1986, portfolio insurance covered approximately \$4 billion of institutional assets.<sup>67</sup> In early 1987, some form

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58. *Binns Testimony*, *supra* note 37, at 3.

59. Bookstaber & Langsam, *Portfolio Insurance: Asset Allocation for Capital Preservation*, at 9 (Morgan Stanley, 1986) (unpublished report).

60. *ROUNDTABLE*, *supra* note 15.

61. *Id.*

62. *Id.*

63. *Id.*

64. *See supra* note 16 (explaining concept of hedging).

65. *See Black & Jones, Simplifying Portfolio Insurance* (Goldman Sachs Research, August 1986); Bookstaber & Langsam, *supra* note 59.

66. Wells, *A Major Index Trader in Stock Crunch*, *L.A. Times*, Nov. 24, 1987, Part IV, at 1.

67. SECURITIES AND EXCHANGE COMMISSION, DIVISION OF MARKET REGULATION, THE ROLE

of portfolio insurance protected an estimated \$80 billion of institutional assets.<sup>68</sup>

Portfolio insurance is, in reality, a misnomer because no actual insurance policy exists that guarantees the value of the portfolio. Portfolio insurance establishes a minimum value for the equity portfolio for some given point in the future.<sup>69</sup> The strategy uses a combination of stocks, futures, and cash to assure that the portfolio does not decrease beyond the selected minimum value. The objective of the strategy is to move progressively more of the portfolio's assets into equities as the stock market rises, or into cash or Treasury Bills as the market declines.<sup>70</sup> Index futures are used to effect the designated asset allocation ratio, because total transaction costs in the index futures market are small compared to transaction costs in the equity market.<sup>71</sup> As the market rises above a predetermined figure, index futures are purchased, giving the portfolio greater equity exposure. Conversely, if the market declines beyond a predetermined figure, index futures are sold and the proceeds invested in money markets or Treasury Bills, thus reducing the risk of the portfolio. This constant readjustment of the portfolio's assets between cash and equities protects the minimal value chosen at a cost of slightly underperforming the stock market as a whole.<sup>72</sup>

By using index futures to implement the desired asset allocation, the portfolio insurance strategy becomes noninvasive.<sup>73</sup> The strategist's decision to reduce the fund's equity exposure will not affect equity portfolios under active management. If and when the market declines, index futures will be sold to hedge the risks of holding the underlying stocks.<sup>74</sup> Thus, this noninvasiveness of portfolio insurance will separate the risk control and active asset management functions.<sup>75</sup> Money managers covered by portfolio insurance will pursue their own investment strategies without the plan sponsor<sup>76</sup> directing them to liquidate part of their equity portfolio to reduce the fund's overall stock exposure.<sup>77</sup>

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OF INDEX-RELATED TRADING IN THE MARKET DECLINE ON SEPTEMBER 11 AND 12, 1986 (March 1987) [hereinafter SEC].

68. See Wells, *supra* note 66.

69. Bookstaber & Langsam, *supra* note 59, at 3.

70. See Symposium, *supra* note 50.

71. See *id.*

72. "A portfolio insurance program with an objective of no loss after three years is expected to enable the investor to capture about 85% of the potential gains from equities, while eliminating loss . . . the cost of portfolio insurance is that less than 100% of equity gains will be captured, if there are such gains over the time horizon of the strategy." *Program Trading: Hearings Before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce*, 100th Cong., 1st Sess. 4 (July 23, 1987) (testimony of Hayne E. Leland, Principal, Leland O'Brien Rubenstein Associates, Inc.).

73. Bookstaber & Langsam, *supra* note 59, at 17.

74. *Id.* at 19.

75. *Id.*

76. A plan sponsor is a corporation who contributes cash to a pension plan.

77. Bookstaber & Langsam, *supra* note 59, at 19.

As this country's longest bull market continued, portfolio insurance seemed almost utopian in nature to large money managers. Institutional money managers with enormous unrealized capital gains that had accrued for the past five years used this innovative hedging strategy to protect their funds.<sup>78</sup> Portfolio insurance permitted institutional funds to participate in the continuing bull market without liquidating their equity portfolios.<sup>79</sup> Therefore, pension funds and other institutional investors, by relying on portfolio insurance, began investing larger portions of their assets in equities, pushing the bull market even higher.<sup>80</sup> Billions of institutional dollars were invested in the equity and futures markets using a strategy never tested during a bear market. Unabashed support for portfolio insurance was shown by the remarks of one corporate money manager who stated that portfolio insurance allowed Manville Corporation to overhaul its pension asset allocation, eliminating fixed income, except in special cases. "Essentially [Manville Corp.] bec[a]me an equity orientated program."<sup>81</sup> Portfolio insurance allowed Manville to reduce its annual pension fund contribution from \$33 million to only \$8 million.<sup>82</sup> This was significant for Manville because it was presently in reorganization under Chapter 11 of the U.S. Bankruptcy Code.

Unfortunately, many institutional money managers did not question the assumptions upon which portfolio insurance was predicated. For portfolio insurance to work effectively, index futures prices must closely track the underlying stock prices in the index. Until Black Monday, stock index arbitrage maintained this vital nexus.<sup>83</sup> Some portfolio insurance strategies failed to maintain their targeted protection levels during the crash, although others were much more successful.<sup>84</sup> The relative success of several portfolio insurance strategies during the crash, and the benefits derived from their use, undoubtedly will assure the survival of portfolio insurance as a risk management strategy. However, the use of portfolio insurance may be

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78. *Id.* at 3.

79. *Id.*

80. In a review of stock market volatility on September 11 and 12, 1986, the SEC Division of Market Regulation concluded:

The Division's review documented the substantial increase in the use of stock market futures by institutional investors . . . other investors, particularly some pension funds that previously had limited investments in equities, may invest a larger portion of their assets in the equity market, in part because of the perceived ability to limit risk through portfolio insurance.

See SEC, *supra* note 67, at 2.

81. Ring, *Manville Slashes Fixed-Income Use Through Hedging*, PENSIONS & INVESTMENTS AGE, Feb. 17, 1986, at 1.

82. *Id.*

83. See *infra* note 88 and accompanying text (discussing role of stock index arbitrage in maintaining link between index futures and underlying equities).

84. While many protected funds felt the brunt of the stock market's decline, others with a maximum target loss of 5% were down only 6-8%. Anders, *Portfolio Insurance Proved Cold Comfort*, Wall St. J., Oct. 28, 1987, at 6.

limited in the near term because of its possible role in the market decline.<sup>85</sup>

Stock index arbitrage is the final form of hedging. Stock index arbitrage attempts to combine a portfolio of stocks with index futures "with the objective of achieving a higher return than that available in other investments of comparable risk."<sup>86</sup> Index arbitrage generally involves the purchase of a portfolio of equity securities (long) that approximates the S&P 500 Index, or one of the other indexes, and the simultaneous sale of futures contracts (short) based on the index.<sup>87</sup> It is in this context that program trading plays a significant role.

Stock index futures and stock index options only will provide benefits to institutions and money managers if the derivative instruments are linked to the underlying index. Stock index arbitrage attempts to maintain this link between the futures and options and the cash markets upon which the futures and options are based.<sup>88</sup> Market participants entering into opposite positions in the two markets create the link. For example, if prices are too high in one market and too low in the other, a participant may sell short in one market and long in the other. Arbitrage will maintain the link between the markets.

The futures price, however, will not necessarily equal the cash price. Instead, the futures price will tend to close at a price higher than the underlying cash price equal to the cost of carrying the "security traded in the cash market until the futures delivery date."<sup>89</sup> Such cost includes interest paid on borrowed funds, transaction costs,<sup>90</sup> and market impact costs.<sup>91</sup> When the futures index moves higher than its equilibrium alignment with its underlying index, index arbitrage by market professionals will force the prices in the two markets to converge.<sup>92</sup> For instance, if the futures index is too high, institutions have an opportunity to sell the futures contract while borrowing funds to buy the underlying securities.<sup>93</sup> Thus, if the arbitrageur holds the securities to maturity he has guaranteed himself a certain profit.<sup>94</sup> As these price differences narrow, only those participants with the lowest costs will profit from stock index arbitrage and the opportunities for index arbitrage will begin to decline. Index arbitrage programs are not continuous, and because there is a great deal of competition among

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85. See *supra* notes 64-82 and accompanying text (discussing role of portfolio insurance in stock market decline).

86. Zurack, *Has the Stock Market Become More Volatile Since The Introduction of Stock Index Futures Contracts?*, at 2 (Goldman Sachs Research, Nov. 1985).

87. *Id.*

88. Sebastian, *supra* note 42, at 18.

89. FRB/CFTC/SEC, *supra* note 11, at II-27.

90. See *supra* note 50 and accompanying text (noting that investors incur lower transaction costs in futures market).

91. See *supra* note 52 and accompanying text (noting lower market impact costs of futures transactions).

92. Sebastian, *supra* note 42; see *Johnson Testimony*, *supra* note 35, at 14.

93. FRB/CFTC/SEC, *supra* note 11, at II-28.

94. *Id.*

arbitraders, arbitradgers only place programs when an opportunity exists to execute a program successfully. Evidence suggests that the "frequency . . . and magnitude . . . of index arbitrage opportunities have declined over time, indicating the beneficial functioning of the arbitrage process."<sup>95</sup>

Many see stock index arbitrage trading strategies as contributing to the short-term price volatility in the securities markets. When stock index arbitrage trading strategies are unwound, large buy or sell orders in the stocks that comprise an index are entered at or near the close on expiration day. Some feel that this influx of orders at the close results in imbalances that contribute to market volatility.<sup>96</sup>

Additionally, significant moves on nonexpiration days, such as Black Monday, have been attributed to stock index arbitrage.<sup>97</sup> Prior to Black Monday the financial community presented evidence indicating that the volatility in the market arising from index arbitrage had not increased overall market volatility.<sup>98</sup> A further study in 1985, by Laszlo Birinyi, Jr. and H. Nicholas Hanson, of Salomon Brothers, Inc. showed that day to day price changes in percentage terms has actually decreased since the mid-1970's.<sup>99</sup> Further, the daily percentage price change in the S&P 500 showed decreasing volatility from 1970 to the third quarter of 1985.<sup>100</sup> The Birinyi and Hanson study also looked at the intraday movement of the DJIA. The research determined that there were times of significant movements, but "no evidence of increased short-term market movements over the past several years."<sup>101</sup> A mid-1986 update to this study did not produce a significantly different conclusion.<sup>102</sup>

Thus, independent research of market volatility, as measured by the average close over close price change<sup>103</sup> in stocks, demonstrates that market volatility has been no higher in recent years than in years prior to the advent of program trading. New derivative investments have merely permitted institutional investors, many of which hold individual investors' funds, to shift or allocate the risk inherent in the marketplace to those more willing and able to bear it. Volatility in the market, in general, may

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95. See SALOMON BROTHERS, *supra* note 32.

96. Sebastian, *supra* note 42.

97. See SEC, *supra* note 67; Sebastian, *supra* note 42; *Program Trading: Hearings before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce*, 100th Cong., 1st Sess. (July 23, 1987) (testimony of R. Steven Wunsch, Vice President, Kidder Peabody & Co., Inc.) [hereinafter *Wunsch Testimony*].

98. Zurack, *supra* note 86, at 4.

99. Birinyi & Hanson, *Market Volatility: Perception and Reality* (Salomon Brothers Inc. Research, Dec. 1985).

100. *Id.*

101. *Id.*

102. Birinyi & Hanson, *Market Volatility: An Updated Study* (Salomon Brothers Inc., July 1986).

103. The average close over close is the average change based on closing prices of the index.

result from supply and demand imbalances and from changes in current economic or financial expectations. When futures or options show significant premiums (discounts) to the underlying index, this premium (discount) will reflect current judgments regarding the financial outlook of the stock market. The average yields from stock index arbitrage have been declining in recent years from 200-300 basis points to 50-100 basis points above money market instruments such as Treasury Bills.<sup>104</sup> The decline in yield can directly be attributed to the increasing amount of capital committed to stock index arbitrage. Estimates prior to the crash indicated that when adequate premiums and discounts are available, approximately \$15 to \$20 billion is available for stock index arbitrage.<sup>105</sup> Consequently, stock index arbitrage returns decreased as the number of arbitrageurs competing for the limited opportunities available increased.<sup>106</sup>

Advances in computer and telecommunications technology has increased the timeliness for analyzing economic and financial information. Institutions and portfolio managers can decipher information quickly and revise investment strategies accordingly. Computers merely have provided the mechanisms to implement changes in portfolio strategies in an efficient and cost effective manner. As more market participants understand the technological concepts, market volatility should begin to decrease.

## II. ACADEMIA AND PROGRAM TRADING

In November of 1985, representatives of the NYSE and the American Stock Exchange concluded that an independent, comprehensive study of stock futures and options was required.<sup>107</sup> Since trading in stock futures and stock options had grown tremendously and had drawn substantial investor attention, the SEC asked Professors Hans L. Stoll, of Vanderbilt University, and Robert R. Whaley, of the University of Alberta, and the Graduate School of Business at the University of Chicago, to perform a study.<sup>108</sup> In response, Stoll and Whaley examined in detail expiration day effects on the market. This portion of the Article will discuss their findings, as well as the findings of Professor Sandford J. Grossman,<sup>109</sup> on the effect derivative investments have on the stock market.

Stoll and Whaley began by studying the characteristics and uses of index futures and options. Stoll and Whaley stated that "[t]he widespread trading of options and futures on stock indices . . . attests to the uses of

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104. See *Johnson Testimony*, *supra* note 35, at 16.

105. *Id.* at 17.

106. *Id.* at 16.

107. Letter from John D. Dingell (Mich.), Chairman, House of Representatives Comm. on Energy and Commerce, to John S.R. Shad, Chairman Securities and Exchange Commission (April 16, 1986).

108. Stoll & Whaley, *Expiration Day Effects of Index Options and Futures* (March 15, 1986) (unpublished report).

109. Grossman, *supra* note 38.



options and futures as hedging<sup>110</sup> vehicles, as [a] cost saving means of adjusting positions in underlying assets, and as [a] cost effective means of registering opinions about the value of underlying assets."<sup>111</sup> Stoll and Whaley concluded that a "careful analysis of these instruments shows that they yield benefits not only to private users but also to society as a whole."<sup>112</sup> Private users and society accrue these benefits in four ways. First, stock index futures and options "modify the risk characteristics of a portfolio,"<sup>113</sup> while allowing investors to assume only those risks with which they feel most comfortable.<sup>114</sup> For instance, an investor might purchase a put to guard against a decrease in the market price. Second, index futures and options can help underwriters and market makers.<sup>115</sup> Market makers could either sell futures or buy puts to hedge an inventory position. Third, institutional investors can use index futures and options to decrease the costs assumed when trading the underlying portfolio of stocks.<sup>116</sup> According to Stoll and Whaley, the cost of trading the underlying portfolio decreases "because transaction costs are considerably lower in the futures market than in the stock market."<sup>117</sup> Fourth, institutions "temporarily changing the proportion of stocks in [their] portfolio" could effect the changes by trading in stock futures and options,<sup>118</sup> and at less cost than trading in the underlying stocks.

A major study done before Stoll and Whaley's determined that "very little purely speculative activity is engaged in by institutional investors in new options and futures products."<sup>119</sup> This study found that, on the contrary, institutions have been using options and futures to hedge risk or to efficiently manage their existing investment strategies. Individuals and commercial traders, on the other hand, predominately are taking speculative positions in index options or futures.<sup>120</sup>

The increased use and success of index futures and options, in conjunction with investor suspicion and misunderstanding of futures and options, has led to vocal outbursts that futures and options markets have "a destabilizing effect on traditional stock markets."<sup>121</sup> The major concern, according to Stoll and Whaley, has been that options and futures markets

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110. *See supra* note 16 (explaining hedging).

111. Stoll & Whaley, *supra* note 108, at 3.

112. *Id.* at 3-4.

113. *Id.* at 4.

114. *Id.*

115. *Id.*

116. *Id.* at 5.

117. *Id.* Assuming a commission rate of \$.07 per share, the one way commission cost of selling 100 S&P 500 futures contracts is approximately \$1,250, while the cost of selling a similar amount of stock (\$10 million) is approximately \$17,500. *Id.*

118. *Id.*

119. FRB/CFTC/SEC, *supra* note 11, at IV-A-13.

120. *Id.*

121. Stoll, *Index Futures, Program Trading and Stock Market Procedures*, at 1 (May 1987) (unpublished report).

will decrease liquidity in the underlying markets and, thus, adversely affect prices in those underlying markets.<sup>122</sup> An added concern in this area is that futures and options could affect the capital formation process itself.<sup>123</sup>

A further concern of the financial community is the effect of index futures and options on expiration days in which large price declines have occurred, the so-called "triple witching hour."<sup>124</sup> Stoll and Whaley, however, found that, if linked to the underlying indices, index futures and options provide benefits and liquidity to investors. Index arbitrage maintains the link between the futures and options and the underlying indices, and "through arbitrage, the liquidity of the underlying market is enhanced."<sup>125</sup> Another study also concluded that the continued use of stock futures and options increased the liquidity in the underlying markets.<sup>126</sup>

Stoll and Whaley found "large volume effects and certain price effects on quarterly expirations. . . ." <sup>127</sup> Stoll and Whaley determined, further, that price effects were not significant if stock index options alone expired. No price effect was seen for stocks not in the S&P 500 Index.<sup>128</sup> Experts, however, have expressed concern that the stock market suffers because of the great volatility during the last hour of trading. Individual investors may be buying during an unnatural rise in the market or selling during a temporary low in the market. Stock index arbitrageurs, on the other hand, are unaffected by the direction in which index stocks are unwound "so long as the closing price on each of the stocks is received."<sup>129</sup> Arbitrageurs are unaffected because cash settlement of the stock index futures or options guarantees convergence of the futures and cash price at maturity. "[C]onvergence guarantees a perfectly hedged arbitrageur the arbitrage profit calculated when the position was established regardless of the index value at expiration."<sup>130</sup>

Stoll and Whaley's empirical studies showed that prices were more volatile on expiration day. However, Stoll and Whaley also determined that prices tended to reverse on the day after expiration Friday.<sup>131</sup> Expiration day effects are associated with stocks that are a part of an arbitrage unwinding, not with stocks in a nonarbitrage position. Similarly, evidence clearly shows that the expiration of stock index futures affects stock market

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122. Stoll & Whaley, *supra* note 108, at 6.

123. *Id.*

124. Stoll, *supra* note 121, at 3.

125. Stoll & Whaley, *supra* note 108, at 8.

126. FRB/CFTC/SEC, *supra* note 11, at I-2.

127. Stoll, *supra* note 121, at 3 (noting findings of Stoll and Whaley in 1986 and 1987 studies).

128. *Id.*

129. Stoll & Whaley, *supra* note 108, at 20. If the stock index arbitrageur is in a perfectly hedged position, the loss (gain) on the stock is offset by the gain (loss) on the futures position. *Id.*

130. *Id.*

131. *Id.* at 27-28.

volume.<sup>132</sup> Stoll's study showed that last hour volume averaged 22 million shares in 1986 while last hour volume averaged 77 million shares in 1986-1987.<sup>133</sup>

Price and volume effects associated with expiration days generally are considered undesirable and must be evaluated in terms of whom the volatility hurts and what is the cost of alternative solutions. As with any market phenomenon, the more informed investors are better able to decide when or when not to enter the market. For example, one group of investors whom market volatility may financially hurt is investors who submit market orders<sup>134</sup> to sell when an expiration day effect is pushing prices down, or who submit market orders to buy when expiration is pushing stock prices up. Buying high and selling low is not the age old proverb for making money. According to Stoll and Whaley, and other commentators, however, this expiration day phenomenon has the advantage of occurring at a predictable time. The predictability of the phenomenon gives the small investor the option of staying away.<sup>135</sup> Because a reversal will occur,<sup>136</sup> small investors will have the opportunity to invest upon the reversal.

In a separate study, Stoll found that the expiration day price reversal is directly comparable to and significantly less than the block trade<sup>137</sup> price reversal. The price reversal associated with block transactions usually is interpreted as "the necessary cost of providing immediacy<sup>138</sup> in transactions of that size."<sup>139</sup> Block transaction effects are not as noticeable as expiration day effects simply because different blocks will trade at different times. Expiration day effects, on the other hand, will occur in all index stocks in the last hour of the expiration close.<sup>140</sup> Thus, Stoll contends that the "average expiration day price effect is roughly of the same magnitude as the price

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132. *Id.* at 24.

133. Stoll, *supra* note 121, at 5.

134. A market order is an order to buy or sell at the best possible price as soon as it can be accomplished. LITTLE & RHODES, *supra* note 1, at 17.

135. Stoll & Whaley, *supra* note 108, at 34-35.

136. *See id.* at 26. "Since the unwinding of arbitrage positions could cause price pressures either in an upward or downward direction, the emphasis is on the volatility of prices at expiration . . . [W]e are concerned with abnormal price changes, we seek reversals of prices. If a price change on the expiration day is abnormal and is caused by selling pressure or buying pressure, the price would tend to return to a normal level on the following day. . . . If the price fails to reverse after a decline, the decline is judged to be the result of new information that justifies a new lower price. If the price reverses part of the way . . . the reversal portion of the initial decline [is] judged to be unjustified by new information and is ascribed to the price impact of the transaction. If the price reverses by more than initial decline . . . the entire initial decline is judged to be the price impact and the excess reversal is judged to be the result of information. A corresponding interpretation applies to price reversals after a price increase." *Id.*

137. *See supra* note 45 (explaining block trading).

138. Market participants "provide immediacy to anxious sellers by buying shares at the bid price or to anxious buyers by selling shares at the ask price." Stoll, *supra* note 121, at 7.

139. *Id.* at 12.

140. *Id.*

impacts observed in normal transactions that reflect the cost of supplying immediacy."<sup>141</sup> Stoll does not feel that the concern regarding price and volume effects is warranted.<sup>142</sup> Stoll understands, however, that from a public policy perspective there have been particular days in which "price reversals substantially in excess of the average [expiration day] effect occurred."<sup>143</sup>

Another major study that attempts to ascertain the effect of derivative investments on the stock markets is Professor Sanford Grossman's of Princeton University. Grossman prepared a recent report for the conference on the Impact of Stock Index Futures Trading at the Center for the Study of Futures Markets, Columbia University, held on June 8, 1987.<sup>144</sup> The report, among other things, focused on the informational problems that the use of dynamic hedging strategies, such as portfolio insurance, cause.<sup>145</sup> Grossman postulates that informational problems can affect the volatility of the market. Grossman states that the information flowing from the trading of a real security is different, and less complete, than the information flowing from dynamic hedging strategies where the real security is not traded.<sup>146</sup> To underline these informational disparities, Grossman states:

. . . [i]f everyone in the economy would like to get out of stocks before the price falls by more than 25%, then the price of such a put option would be very high. If only a few holders of stocks desired such protection then the put option's market price would be low. The put's price thus reveals information *now* about the fraction of people with plans to get out of stocks in the *future*. The put's price reveals the extent to which the strategies of people can cohere in the future. By showing people the true cost of their plans, it may discourage people from attempting to purchase too much insurance in exactly those circumstances when the dynamic hedging strategy would cause excessive stock price volatility.<sup>147</sup>

According to Grossman, all information that an investor normally receives when a real security is traded is unavailable when dynamic hedging

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141. *Id.*

142. *Id.*

143. *Id.* at 12.

144. Grossman, *supra* note 38.

145. Grossman states:

Recent advances in financial theory have created an understanding of the environments in which a real security can be synthesized by a dynamic trading strategy in a risk free asset and other securities. . . . The issuer of a new security can price the security based on its ability to synthesize the returns stream of the new security using a dynamic trading strategy in existing securities, futures and options. This use of dynamic trading strategies has been extended even further by eliminating the "new" security altogether and just selling the dynamic hedging strategy directly. Portfolio insurance is the best example of the latter phenomenon.

Grossman, *supra* note 38, at 1.

146. *Id.* at 3.

147. *Id.* at 2-3.

strategies are used alone.<sup>148</sup> Grossman questions how a purchaser of a dynamic hedging strategy<sup>149</sup> can know the cost of using portfolio insurance if the purchaser does not know how many other people are planning to carry out similar stock selling and purchasing plans in the future.<sup>150</sup> The cost of using a dynamic hedging strategy depends on the future investment plans of others. The trading of real securities supplies the necessary informational coherence. As a result of incomplete information gathering, synthetic trading strategies do not provide the necessary informational coherence. Investors must attempt to gather this information, if possible, before an investor can make an informed investment decision about trading strategies and before market reaction can be calculated.

These informational inadequacies, Grossman explains, can affect volatility if market participants lack current information about the future trading plans of others and the cost involved in dynamic hedging strategies, such as portfolio insurance.<sup>151</sup> In the absence of a real traded security, such as a put option, Grossman contends that:

There will be less information about the future price volatility associated with current dynamic hedging strategies. There will be less information transmitted to those people who could make capital available to liquidity providers. It will therefore be more difficult for the market to absorb the trades implied by the dynamic hedging strategies. In effect, the stocks' future price volatility can rise because of a current lack of information about the extent to which dynamic hedging strategies are in place.<sup>152</sup>

Regardless of these informational problems and possible stock price volatility, Grossman concludes that dynamic hedging strategies are valuable because the dynamic hedging strategies increase returns to investors.<sup>153</sup> Grossman questions whether stock price volatility is, in fact, "socially harmful or even worthy of regulation."<sup>154</sup>

Thus, the academic community does not argue that stock index futures and options have not had an effect on the stock market as a whole. These academic commentators, however, suggest that the effect is positive, rather than negative. Most commentators claim that the issue is whether appropriate exchange regulatory procedures presently exist to handle the unexpected imbalances that the use of these strategies may cause. If the imbalances can be avoided, the instances of large price reversal can also be avoided.

Accordingly, commentators propose numerous recommendations and solutions to combat the whipsaw effect of stock futures and options expi-

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148. *Id.* at 3.

149. Grossman uses a synthetic put as an example. *Id.*

150. *Id.*

151. *Id.* at 3-4.

152. *Id.* at 4-5.

153. *See id.* at 29.

154. *Id.* at 29-30.

ration days. Stoll and Whaley examined five of these solutions in their original study. The proposed solutions were: (1) the telescoping of position limits; (2) the delivery of shares; (3) the averaging of index prices; (4) the change in stock market procedures and disclosure; and (5) the shifting of expiration days.

In 1987, with more current information, Stoll discussed the telescoping of position limits, the average index price, the shifting of expiration days, and the disclosure of arbitrage positions. Stoll also discussed three proposals that the SEC made in June, 1985.<sup>155</sup> With these proposals, the SEC intended to modify trading procedures rather than to modify futures contracts. The three SEC proposals were: (1) disclosure of market-on-close (MOC)<sup>156</sup> orders before the close; (2) a trading halt; and (3) a change to opening price.

#### A. *Telescoping of Position Limits*

Telescoping of position limits is the "reduction in allowable futures market positions as the expiration day approaches."<sup>157</sup> The telescoping proposal would require institutional investors with large arbitrage positions to unwind some of these positions early. Consequently, the unwinding of positions on expiration day is reduced significantly. This proposal would "reduce the effectiveness of futures and options in the hedging and risks [sic] management activities of major institutional investors."<sup>158</sup> Stoll believes that this proposal would require "institutional investors to bear additional risk. . . ."<sup>159</sup> Accordingly, some institutional investors may only take positions in stock index futures and options that are below the telescoping limits. The telescoping proposal would limit the effectiveness of stock index futures and options "as hedging and risk management tools in large portfolios."<sup>160</sup>

In his separate study Stoll points out that telescoping may also increase the cost of arbitrage without necessarily reducing arbitrage unwinding at expiration. Stoll believes that new arbitrageurs will enter the market. The new arbitrageur, however, will take only positions that are below the telescoping limits that they can hold to maturity, thus guaranteeing convergence and limiting any kind of basis risk.<sup>161</sup> It is possible that any decline in the size of "individual arbitrage positions" could be offset "by a [corresponding] increase in the number of arbitrageurs."<sup>162</sup> Telescoping would not eliminate this unwinding effect.

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155. Letter from Shirley E. Hollis, Acting Secretary, Securities and Exchange Commission, to John D. Dingell, Chairman Comm. on Energy and Commerce, at 8-22 (June 13, 1986).

156. Market-On-Close is a market order to be executed on the closing price of the day. LITTLE & RHODES, *supra* note 1.

157. Stoll, *supra* note 121, at 13.

158. *Id.* at 14.

159. *Id.*

160. *Id.*

161. *Id.*

162. *Id.* at 15.

### B. Delivery

To avoid expiration day effects, commentators also proposed some type of delivery other than cash settlement.<sup>163</sup> Stoll raises two concerns about delivery proposals. First, if shares are delivered as a result of expiration, transactions in the stock market are not eliminated "since the recipient of shares may wish to sell them."<sup>164</sup> Furthermore, arbitragers may attempt to sell their futures before expiration day. Selling in advance may cause a decrease in futures prices which may require the arbitrageur to unwind his position by selling shares in the stock market. The arbitrageurs' sale of shares into the stock market is not avoided, but simply spread out over time.<sup>165</sup>

The second, and probably most important concern is how to actually make delivery. Stoll suggests four possibilities: "1. Delivery of all stocks in the index. 2. Delivery of 'acceptable' market baskets. 3. Delivery of certificates which are claims on the index stocks. 4. Delivery of mutual fund shares."<sup>166</sup> Presently, the CFTC/SEC Accord permits none of these possibilities.<sup>167</sup> One intuitively can see other regulatory and practical problems that would occur.

### C. Averaging of Index Prices<sup>168</sup>

This proposal does not seek "to achieve a more accurate measure of the current index value, but to reduce the amount of stock market trading at the close by keying futures and options settlement prices to an average of index prices during the day."<sup>169</sup> Stoll is of the opinion that this averaging approach "results in a settlement price not reflective of stock market conditions at the settlement point, the market close."<sup>170</sup> Averaging of the index prices disassociates stock index futures prices from its current cash index price.<sup>171</sup> Stoll suggests that this "can lead to anomalous results."<sup>172</sup>

### D. Shift Expiration Days

Stock index futures expire on the third Friday of every third month, *i.e.*, March, June, September, and December.<sup>173</sup> Index options, on the other

163. Stoll, *Expiration Day Effects of Index Options and Futures*, at 10 (March 15, 1986) (unpublished report).

164. *Id.*

165. *Id.*

166. *Id.*

167. Under the Shad/Johnson Accord, the CFTC could not approve futures contracts calling for delivery of SEC regulated securities. Futures Trading Act of 1982, Pub. L. No. 97-444, § 1, 96 Stat. 2294 (1982).

168. Averaging of index prices would require the use of a "variety of sources in order to achieve a more accurate indication of the value of the underlying item." Stoll, *supra* note 121, at 15.

169. *Id.*

170. *Id.* at 15-16.

171. *Id.* at 16.

172. *Id.* For example, an investor in index futures or options may show a gain based on closing prices, but there would actually be a loss due to settlement prices.

173. See GOLDMAN SACHS, *supra* note 23, at 4.

hand, expire on the third Friday of each month. To accommodate institutional investors, the CFTC adopted common expiration dates for futures and options.<sup>174</sup> Most evidence shows "that expiration day volume and price effects are associated *primarily* with the expiration of futures, not options; and with the S&P 500 futures in particular, which account for a major share of index futures trading."<sup>175</sup> Of all the stock index futures today, the S&P 500 is the most widely arbitrated. Therefore, whatever day is chosen for the S&P 500, expiration day effects generally will occur on that date.<sup>176</sup> Accordingly, Stoll asserts that if the CFTC were to shift expiration dates, there would be no noticeable "effect on the expiration day phenomenon."<sup>177</sup>

#### *E. Stock Market Procedures and Disclosures*

Last hour volume and price effects on expiration day in the stocks comprising the S&P 500 and other indices are the result of unexpected order imbalances. To correct this imbalance, the New York Stock Exchange instituted a new rule requiring members to enter market-on-close orders as early in the day as possible.<sup>178</sup> Theoretically, this should not be a problem if the arbitrager is in a fully hedged position.<sup>179</sup> In practice, however, an arbitrager engaged in nonhedged positions may not wish to disclose his orders.<sup>180</sup> If disclosures are made early, the price effect may not be as great as "if disclosure is delayed until the close."<sup>181</sup>

In his 1987 study, Stoll goes into further detail on this proposal because it is also one of the SEC recommendations.<sup>182</sup> The SEC would require arbitragers to place MOC orders in a manner that will insure that the orders are received one-half hour before the close of trading. An arbitrager would then be guaranteed a trade at the close. For orders placed after the close, the Exchange would not guarantee a closing price.<sup>183</sup> Stoll concurs that this recommendation would have the effect of providing for early disclosure of trading imbalances,<sup>184</sup> which would allow specialist and brokerage companies to assemble necessary buyers or sellers by the end of the trading day. However, this procedure may create three major problems. First, under the current proposal, which the NYSE adopted in September, 1986, arbitragers have the capacity to cancel their orders. Stoll asserts that this may lead to

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174. Stoll, *supra* note 121, at 17.

175. *Id.* at 17 (emphasis added).

176. *Id.*

177. *Id.* at 17-18.

178. NYSE RULE 116.40; *see supra* note 16.

179. Stoll, *supra* note 121, at 18; *see supra* note 16 (discussing arbitragers' practice of hedging).

180. Stoll, *supra* note 121, at 18.

181. *Id.*

182. *Id.* at 19.

183. *Id.*

184. *Id.*



“game playing.”<sup>185</sup> As of late 1987, however, Stoll has not found evidence of such “game playing.”<sup>186</sup>

A second problem with the SEC proposal may be the relationship between most arbitragers and the specialist handling any MOC orders. Stoll feels this relationship is such that specialists will “accommodate market orders at the close even if such brokerage firms fail to place MOC orders at the required time.”<sup>187</sup>

A third problem with the SEC proposal is that the NYSE rule that went into effect only provided a rudimentary picture of order imbalances. Because the NYSE regulation provided only for certain disclosures, arbitragers did not need to announce some MOC orders before the close.<sup>188</sup> A brokerage firm placing a large volume of MOC buy orders eventually could force the market up.<sup>189</sup> The SEC subsequently has asked for modifications in this procedure to require investors to announce all index arbitrage MOC orders one-half hour before closing. Any MOC orders later than one-half hour before closing may not be related to index arbitrage unwindings.<sup>190</sup> Stoll concludes that as these types of regulations “become more complicated the problem of enforcement becomes equally complicated.”<sup>191</sup>

A far more radical approach, and one that Stoll concludes would be a “regulatory and administrative nightmare,” is the public disclosure of arbitrage positions.<sup>192</sup> The public disclosure approach would require institutional investors engaged in stock index arbitrage to disclose their positions if the positions might implicate stock market transactions on the expiration day.<sup>193</sup> This raises two concerns. First, the public disclosure proposal requires the firm, as well as their customers, to disclose confidential and proprietary trading information. Second, the public disclosure proposal would require regulations to specify which positions in futures and options traders would have to report. Related to this reporting requirement would be a requirement on how to make the data available to the investing public in a timely manner “to help insure an appropriate market response.”<sup>194</sup> As a result, Stoll concludes that this regulatory and administrative headache would not be an appropriate response.

#### *F. Trading Halts*

At one time the SEC proposed a trading halt to occur shortly before the close, to allow the market to respond to any trading imbalances. While

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185. *Id.* Arbitragers could signal an order imbalance, cancel the order later and take positions on the other side of the market at more favorable prices. *Id.*

186. *Id.* at 19-20.

187. *Id.* at 20.

188. *Id.*

189. *Id.*

190. *Id.*

191. *Id.*

192. *Id.* at 18.

193. *Id.*

194. *Id.*

Stoll does not see a problem with this proposal "in principle,"<sup>195</sup> it effectively would change the "New York Stock Exchange from a continuous market to a call-auction market"<sup>196</sup> during the triple witching hour. Stoll is more inclined to believe that the trading halts proposal is simply a step toward the SEC's third suggestion, and what has ultimately been enacted, a shift to the opening price on expiration Friday.<sup>197</sup>

### G. Opening Price

In 1987, the CFTC permitted the Chicago Mercantile Exchange to use the "value of the S&P 500 index [futures] at the opening on expiration day as the settlement price for S&P 500 index futures contracts."<sup>198</sup> Accordingly, S&P index futures now terminate trading on Thursday, using the opening price on Friday as the settlement price.<sup>199</sup>

The main argument for the opening price proposal is that using the opening price as the settlement price effectively permits specialists to deal with the large order imbalances occurring in the last hour on expiration Fridays. Essentially, the opening price proposal permits the specialist time "to find the other side."<sup>200</sup> Previously, the specialist had to find the other side quickly and generally at "distressed" prices. The opening price allows the specialist to delay opening a stock or to halt trading, if needed, and disseminate news regarding the order imbalance.<sup>201</sup> Another benefit to using the opening is that "there is no weekend risk."<sup>202</sup> Stoll determined that price effects on expiration day partly reflected the cost of specialists and other market participants providing immediacy.<sup>203</sup> The delay of the opening price would eliminate the cost associated with having to carry inventory through the weekend. In response, specialists and other market participants should be willing to participate on the other side of the order imbalance "at a smaller price concession."<sup>204</sup>

Stoll finds, however, certain negative implications to switching to the opening price as the settlement price. Stoll's first concern is that changing to the opening price as settlement price "will not mitigate expiration day price effects."<sup>205</sup> If the expiration day price effect is a fundamental cost of providing immediacy, change from the closing price to the opening price will not alter that cost and therefore will not alter the price effect."<sup>206</sup> What

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195. *Id.* at 21.

196. *Id.*

197. *Id.*

198. *Id.* at 27-28.

199. *Id.* at 28.

200. *Id.*

201. *Id.* at 29.

202. *Id.*

203. *Id.*

204. *Id.*

205. *Id.* at 30 (emphasis added).

206. *Id.*

will occur, however, is that price effects will not exceed the cost of providing the immediacy. A second concern about the opening price proposal, and a substantial one, is that "individual investors participate more heavily at the opening than at the close."<sup>207</sup> If volatility simply is shifted from the close on Friday to the opening, individual investors bear a greater burden. A third, and equally important concern is the role of the specialist in setting the opening price. As Stoll pointed out earlier, the specialist has a great deal of "discretion and power" in setting the opening price at the opening of the stock market.<sup>208</sup> Stoll's concern is that the specialist may be inclined to take advantage of order imbalances for his own account. When closing prices are used for settlement, the weekend risk may deter the specialist from buying for his own account.<sup>209</sup>

A final concern posed by Stoll that the transfer of the settlement price for stock index futures to opening prices is that the transfer merely switches the "expiration day price effects to the Thursday close."<sup>210</sup> If unhedged market positions cause expiration day price effects, transferring the settlement price simply will switch the price effects to Thursday. Thus, arbitrageurs will now unwind positions on Thursday at the close in order "to avoid overnight uncertainties and uncertainties with respect to the Friday expiration price."<sup>211</sup> Furthermore, if there can be "no guarantee that futures contracts and stock prices will converge on Thursday," arbitrageurs will unwind early.<sup>212</sup> If no convergence is possible the stock index arbitrageur has no reason to maintain his position until Friday.

### III. SEC, CFTC AND SRO'S

Congress established a statutory framework for the regulation of futures markets in 1936 by enacting the Commodity Exchange Act (CEA).<sup>213</sup> Congress intended the CEA to regulate trading practices in the agricultural commodities markets. In 1974, the Commodities Futures Trading Commission Act (CFTC Act) dramatically changed the CEA.<sup>214</sup> The CFTC Act established the Commodities Futures Trading Commission (CFTC), an independent regulatory agency to oversee enforcement of the CEA provisions.

The CFTC has exclusive jurisdiction over "accounts, agreements . . . and transactions involving contracts of sale of a commodity for future delivery, traded or executed on a contract market . . . or any other board of trade, exchange or market."<sup>215</sup> The CFTC Act broadly defines the term

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207. *Id.*

208. *Id.* at 30-31.

209. *Id.* at 31.

210. *Id.*

211. *Id.*

212. *Id.* at 32.

213. 7 U.S.C. §§ 1-24 (1976).

214. Commodity Futures Trading Commission Act, Pub. L. No. 93-463, § 1, 88 Stat. 1389 (1974).

215. 7 U.S.C. § 2 (1976).

“commodity” to include “goods, . . . services, rights, and interests in which contracts for future delivery are presently or in the future dealt in.”<sup>216</sup> The definition of a commodity is so broad that almost any tangible or intangible item that is the subject of a futures contract will fall within the exclusive jurisdiction of the CFTC, unless specifically excluded.

The CFTC consists of five Commissioners who are appointed by the President, subject to Senate confirmation.<sup>217</sup> The Commissioners have numerous duties under the CEA. The CFTC regulates the futures markets, and is authorized to designate contract markets for various types of futures contracts.<sup>218</sup> This power allows the CFTC effectively to determine the type of futures contracts that may be traded, and the specific board of trade (exchange) upon which trading will take place.

The CFTC’s exclusive jurisdiction over all futures contracts came into question with the development of financial futures. In 1975, with minimal input from other regulatory bodies, the CFTC approved the initial interest-rate futures contract. However, the rapid growth of interest-rate futures soon aroused the attention of the Federal Reserve, the U.S. Treasury, and the SEC. In 1979, the U.S. Treasury and Federal Reserve completed a special joint study that recognized the benefits of interest rate futures and set the stage for the introduction of other financial futures contracts.<sup>219</sup>

The success of interest rate futures prompted the introduction of stock index futures. However, before approving stock index futures contracts, the CFTC wanted to resolve a highly emotional jurisdictional dispute concerning these instruments that had arisen between the CFTC and SEC. CFTC chairman Phillip Johnson and SEC Chairman John Shad negotiated an agreement, known as the “Shad/Johnson Accord,” that effectively resolved the dispute over index futures between the two regulatory agencies. The agreement provided:

The SEC would have jurisdiction over options on all securities.

The CFTC would have jurisdiction over all futures contracts based on broadly based and widely accepted stock indexes which were settled in cash.

Neither agency would have jurisdiction over futures contracts based on narrow stock indexes, or on stock groups which were settled by the actual delivery of stock.

The CFTC would have jurisdiction over options on all futures contracts, and options on physical commodities which were not securities.<sup>220</sup>

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216. *Id.*

217. 7 U.S.C. § 4(a)(1) (1976).

218. 7 U.S.C. § 7 (1976).

219. *See, e.g.*, U.S. TREASURY DEPT. FED. RESERVE SYS., TREASURY/FEDERAL RESERVE STUDY OF TREASURY FUTURES MARKETS.

220. *See* TRADING MANUAL, *supra* note 10.

Congress codified a substantial portion of the Shad/Johnson Accord in the Futures Trading Act of 1982 (FTA).<sup>221</sup> The FTA resolved the jurisdictional dispute between the SEC and CFTC, and provides the SEC an opportunity to comment on the approval of any futures stock index contracts. Section 2(A) of the CEA was enacted by the FTA, and provides that:

(i) [t]he Commission [SEC] shall have no jurisdiction to designate a board of trade as a contract market for any transaction whereby any party to such transaction acquires any put, call, or other option on one or more securities, . . . including any group or index of such securities, or any interest therein or based on the value thereof.

(ii) [t]he Commission [SEC] shall have exclusive jurisdiction with respect to accounts, agreements . . . and transactions involving, and may designate a board of trade as a contract market in, contracts of sale (or options on such contracts) for future delivery of a group or index of securities (or any interest therein or based upon the value thereof).<sup>222</sup>

The FTA specifies three minimum requirements for CFTC approval of any new index futures contracts.<sup>223</sup> First, the CFTC expressly must find that the contract provides for settlement in cash or by means other than the receipt or transfer of a security. Second, the contract cannot readily be susceptible to manipulation, nor cause the manipulation of the underlying security or index of securities. Third, the group or index of securities upon which the contract is based must reflect a substantial segment of the market for all publicly traded equity or debt securities. The FTA further obligates the CFTC to "provide an opportunity for public comment on whether such contracts meet the minimum requirements. . . ."<sup>224</sup>

221. Futures Trading Act of 1982, Pub. L. No. 97-444, § 1, 96 Stat. 2294 (1982).

222. 7 U.S.C. § 2(a) (1976).

223. 7 U.S.C. § 2(a), as amended by the Futures Trading Act of 1982, provides in relevant part:

(ii) [N]o board of trade shall be designated as a contract market . . . unless . . . the Commission expressly finds that the specific contract . . . meets the following minimum requirements:

(I) Settlement of or delivery on such contract (or option on such contract) shall be effected in cash or by means other than the transfer or receipt of any security, except an exempted security. . . .

(II) Trading in such contract . . . shall not be readily susceptible to manipulation of the price of such contract, . . . nor to causing or being used in the manipulation of the price of any underlying security, option on such security or option on a group or index including such securities; and

(III) Such 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.

224. *Id.*

The FTA also requires the CFTC to consult with the SEC on any application for new index futures contracts.<sup>225</sup> If the SEC objects to the contract, the CFTC must afford the SEC an opportunity for an oral hearing. If the oral hearing does not resolve the SEC's objection to approval, the CFTC may enter an order approving the contract.<sup>226</sup> However, the FTA entitles the SEC to judicial review of the CFTC order.<sup>227</sup>

Another important issue that arose with respect to stock index futures concerned margins. The CFTC has never had authority to set margin requirements for futures contracts. Instead, the futures exchange upon which the contract trades has sole discretion in setting margin requirements.<sup>228</sup> Some members of Congress felt that the Federal Reserve System or the CFTC should be allowed to set margins on index futures contracts. The issue was resolved temporarily when CFTC Chairman, Philip Johnson, agreed with Federal Reserve Chairman, Paul Volker, "that while the Fed could officially exert jurisdiction over setting margins on equity index futures contracts, . . . the Fed would not exert such jurisdiction if the exchanges being approved for such contracts would agree to set their initial speculative margins at levels equal to at least 10<sup>0</sup>% of the value of the contracts."<sup>229</sup> All futures exchanges complied with the agreement, and presently continue to set margin requirements on all futures contracts. Although the informal agreement temporarily settled the margin issue, the Black Monday crash has resurrected the debate.<sup>230</sup>

The stock market crash also raised the issue of whether the CFTC was capable of regulating the financial futures markets in light of the futures markets' substantial growth in recent years.<sup>231</sup> Because of the CFTC's perceived inability to regulate effectively the powerful futures exchanges, which detest regulation, the CFTC has been referred to as a "tail-wagging watch dog."<sup>232</sup> Although such allegations appear harsh, evidence shows that the CFTC often has adopted lenient postures in dealing with the exchanges.<sup>233</sup>

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225. *Id.*

226. *Id.*

227. *Id.*

228. See TRADING MANUAL, *supra* note 10, at 20-21.

229. *Id.* at 10-22; see also *supra* note 29.

230. See, e.g., Melloan, *The Market Meltdown Made Phelan A Prophet*, Wall St. J., Oct. 27, 1987, at 34, col. 3; *Chicago's Merc Offers No Meltdown Mea Culpas*, Wall St. J., Nov. 3, 1987, at 35, col. 3; McMurray, *Chaotic Week Illustrates Widening Rift Between Stock and Stock-Index Exchanges*, Wall St. J., Oct. 26, 1987, at 18, col. 1; *Panel Probes Role of Futures, Index Arbitrage in Market Crash*, 19 Sec. Reg. & L. Rep. (BNA) No. 44, at 1686 (Nov. 6, 1987).

231. Representative Edward Markey commented, "I think the world as the CFTC knew it permanently changed as of 4 p.m. Monday afternoon." See Ingersoll, *Market Collapse Could Redefine the Roll of U.S. Futures Agency*, Wall St. J., Oct. 26, 1987, at 17, col. 1.

232. See, e.g., Jehl, *Regulatory Panel Scored for Inaction as Market Plunged*, L. A. Times, Oct. 28, 1987, § 4, at 1, col. 2.

233. The CFTC's lenient posture in regulating the futures exchanges is reflected by the fact that the CFTC had never invoked its power to deny an application for an index futures

If the CFTC survives the crash intact, its survival undoubtedly will depend upon the CFTC's adoption of a more stringent regulatory approach.

Since the introduction of these derivative investments, the SEC, the CFTC, and the SROs have conducted studies to determine the investments' overall effects on the stock market and the capital formation process.<sup>234</sup> Prior to Black Monday, the SEC and the CFTC consistently held that significant increases or decreases in the market resulted from changing investor attitudes regarding fundamental economic conditions.<sup>235</sup> The market volatility that resulted from index trading strategies did not cause or precipitate the market's increases or decreases. The SEC's Division of Market Regulation determined that "index-related futures trading was instrumental in the rapid transmission of these changed investor perceptions to individual stock prices and may have condensed the time period in which the decline occurred."<sup>236</sup> The Division's review of the market decline determined that stock index arbitrage created more efficient markets.<sup>237</sup> An efficient market, linked by index futures, permitted large portfolio managers to make large, rapid shifts in their equities. The study suggests that if the decline had resulted from technical factors and not fundamentals, "the market should have quickly reversed a significant portion of its decline."<sup>238</sup> The Division study showed that price reversals occur on Mondays following an expiration Friday, when the market reverses itself in the direction opposite to that observed at Friday's close.<sup>239</sup> On September 11-12 the DJIA maintained its current level. "The absence of a reversal suggests that technical factors related to index trading were not the primary source of the September 11-12 decline."<sup>240</sup> Indeed, the Division concludes that the significance of index futures may have been to transcend price changes that would have occurred, "into a shorter time period."<sup>241</sup>

On January 23, 1987, the stock market once again experienced extreme volatility with record volume at that time of 302,390,000 shares. The DJIA increased 64 points during the morning before falling approximately 115 points in little more than one hour. The DJIA reversed itself twice more during the afternoon, only to close 44.15 points down.<sup>242</sup> In response to

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contract, prior to the stock market crash. *Id.* However, after the crash the CFTC refused indefinitely to approve eleven new stock index futures contracts. In reaction presidents of two of the largest futures exchanges stated, "[t]he move was too sweeping," and "[i]t's a shame to have to send out a blanket action." Ingersoll, *CFTC Blocks 11 New Index Products, Cites Need for More Trading Safeguards*, Wall St. J., Dec. 2, 1987, at 55, col. 2.

234. See *supra* note 9 (noting recent studies of derivative investments' effect on market and on capital formation process).

235. *Id.*

236. *Id.* at 2.

237. *Id.*

238. *Id.*

239. *Id.*

240. *Id.*

241. *Id.*

242. Crudele, *The Dow Average Swings 114 Points; Closes Down by 44*, N.Y. Times, Jan. 24, 1987, at 1, col. 5.

continued concern over price volatility, especially on nonexpiration Fridays, the SEC, the CFTC, and the NYSE initiated reviews regarding securities and index futures trading on that day. As a result of these reviews, certain measures were taken to curb expiration day volatility.<sup>243</sup> The NYSE required all market-on-close orders to be submitted by 3:30 p.m. on expiration Friday.<sup>244</sup> Additionally, NYSE specialists were to disseminate order imbalances of 50,000 shares or more in 50 pilot stocks.<sup>245</sup> The CME modified the settlement date for its S&P 500 index futures contract, which the majority of stock index arbitrageurs utilize.<sup>246</sup> Finally, settlement for the S&P 500 contract was changed to the opening value of the S&P 500 index, instead of the closing value on expiration Friday.<sup>247</sup> The change in expiration time is significant because it allows the NYSE to use its Opening Automated Report Service (OARS) to process the surge of orders associated with the closing of stock index arbitrage positions upon expiration of the S&P 500 contract. The OARS system matches buy and sell orders entered into DOT prior to the commencement of trading, and disseminates any order imbalances to each specialist, who uses the figure to determine an opening price for the particular stock.<sup>248</sup> By changing the settlement of the S&P 500 contract to the opening index value, the OARS system can now process the enormous stock orders that are entered just prior to expiration.<sup>249</sup> June 19, 1987, was the first expiration date on which all corrective measures were in place. The quarterly expiration of index futures and stock index arbitrage caused nominal stock market volatility that day.<sup>250</sup>

The SROs attempted to deal responsibly with the unwarranted stock market volatility on triple witching days. However, a repercussion of Black Monday may be the erection of substantial barriers to the efficient use of stock index arbitrage.<sup>251</sup> Broad constraints placed on stock index arbitrage

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243. See Rose, *Big Board and Chicago Merc Set Plan to Reduce Triple-Witching Volatility*, Wall St. J., June 8, 1987, at 31, col. 1.

244. See NYSE, CME & NYFE, *Special Notice Expiration Procedure for June 19, 1987* (June 5, 1987).

245. Rose, *supra* note 243, at 31, col. 1.

246. Donnelly, *Playing the Stock-Index Arbitrage Game*, INSTITUTIONAL INVESTOR, Feb. 1, 1985, at 153.

247. See Special Notice, *supra* note 244.

248. See, e.g., Letter from Shirley E. Hollis, Acting Secretary of the SEC, to Congressman Dingell, Chairman, Comm. on Energy and Commerce (June 13, 1986); see also Wunsch, *Stock Index Futures* (Kidder Peabody & Co. Research, May 5, 1987).

249. *Id.*

250. See *Program Trading: Hearings before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce*, 100th Cong., 1st Sess. (July 23, 1987) (testimony of Charles J. Henry, Chicago Board Options Exchange); see also SEC, *SEC Says Program Trading Changes Greatly Reduced Volatility Woes*, 19 Sec. Reg. & L. Rep. (BNA) No. 30, at 1083 (July 24, 1987); Garcia, *Triple-Witching Day Doesn't Roil Stocks as New Trading Procedures Curb Volume*, Wall St. J., June 22, 1987, at 32, col. 1.

251. See Angrist, *Assessing Blame*, FORBES, Nov. 30, 1987, at 254; Norris, *Villain or Scapegoat? The Heat's On Program Trading*, BARRONS, Oct. 26, 1987, at 6; Wunczinger, *Confusion Follows SEC Reaction to Stock Crash*, Nat'l L. J., Nov. 9, 1987, at 20, col. 1;



as a direct result of the crash seriously may impair the efficiency and use of the index futures market. Major constraints on stock index arbitrage also would be ironic because the volume of stock index arbitrage on October 19, 1987, was half of its normal volume.<sup>252</sup> The Securities and Exchange Commission submitted a report of the Black Monday market decline in early February 1988.<sup>253</sup> The SEC determined that the markets have become more volatile and risky, and more individual investors may be frightened away from the market unless changes are made. This conclusion that the markets have become more volatile encompasses the time since the market crash, and not the period prior to the crash. In their 900-page report, however, the SEC was unable to determine precisely what caused the DJIA to plunge 500 points in one day.<sup>254</sup>

The SEC stated that one basic factor in the plunge was investors' realization that stocks were overvalued. Thus, futures trading and strategies involving futures were not the "sole cause" of the market break. However, the existence of stock index futures and the various trading strategies involving program trading was a significant factor in the market break.<sup>255</sup> The report concluded that computer driven trading programs contributed substantially to the suddenness of the plunge.

The report suggested that regulators and the exchanges increase the size of the down payments (margin) that investors must have on hand when buying stock. The report further recommended that regulators and exchanges increase the capital requirements for the specialists. The report concluded that while the specialists, as a whole, performed competently, there was a significant inability of some specialists to perform their duties.<sup>256</sup> Consequently, the SEC believes that whatever relationship program trading and the institutionalization of the markets had to the market decline, the NYSE must assume greater responsibility in monitoring the performance of individual specialists.<sup>257</sup> This could be made possible by increasing the market's capacity to handle an onslaught of orders and the establishment of new specialists' posts at the exchanges to cope with institutions' computer program trading strategies.

The SEC report, while aiming to decrease volatility, did not prescribe any concrete recommendations to counter institutions' increasing dominance of the market through the use of computer driven programs and derivative

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Rosenblatt, *Program Trades Will Likely Be Suspended, Say Industry Experts*, L. A. Times, Oct. 24, 1987, § 4, at 1, col. 5; McMurray, *Washout Poses Threat to Future of Stock-Index Markets*, Wall St. J., Oct. 22, 1987, at 6, col. 1.

252. Ingersoll, *CFTC Reports On Index Arbitrage In Market Crash*, Wall St. J., Nov. 11, 1987, at 39, col. 1.

253. *The October 1987 Market Break*, Fed. Sec. L. Rep. (CCH) No. 1271 (Feb. 9, 1988) (Extra Edition).

254. *Id.* at xii.

255. *Id.* at 3-11.

256. *Id.* at 4-27.

257. *Id.* at 4-28.

investments. The SEC warned that failure to address the full range of factors that precipitated the market plunge may prompt small investors to stay away from the market. The SEC feels that this may have serious economic consequences in the long run.

The enormous public outcry since the market plunge has prompted the SEC to give temporary approval to a NYSE rule that curbs the use of program trading whenever the Dow Jones Industrial Average moves fifty points or more in one direction, in one day.<sup>258</sup> The rule bars securities dealers for the rest of the day from conducting index arbitrage program trading through the exchange's automated order system (DOT). The rule's goal is to tone down the volatility in the market and return investor confidence.<sup>259</sup> The dealers still will be permitted to use their own traders to perform the functions previously accomplished through the DOT system.<sup>260</sup>

In response to these curtailments and mounting pressure from clients, regulators, and Washington, five major securities firms temporarily halted the use of program trading for their *own* accounts.<sup>261</sup> All of the firms said that they would continue to use stock index arbitrage for customer accounts. An official at one of the firms stated that his firm had withdrawn because there had been too great a "loss of confidence in the markets."<sup>262</sup>

There are, however, those who feel the withdrawal and the NYSE 50 point curbs are unfortunate and that the long term effect may be to make the U.S. securities markets less competitive with other markets.<sup>263</sup> The financial community, Washington, and the SEC are still struggling with the effects of October 19, 1987. The debate regarding stock index arbitrage has only increased. Washington continues to demand reforms to bolster smaller investors' confidence in the market. The SEC commissioners are not sure whether any of the reforms instituted will be beneficial in the long run. Additionally, the financial community seems divided about the effect of program trading or stock index arbitrage on the market.

#### IV. CONGRESS AND PROGRAM TRADING

Congress, in contrast to academic commentators, the SEC, and the financial community, has not been as expansive in its praise for the new derivative investments. Beginning in 1984, Congress expressed some concern regarding program trading and what was occurring on expiration Friday, the "triple witching hour." In fact, since that time Congress has pressured for a monitoring of the effects of stock index futures and options on the

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258. Ricks, *Outcry Grows Against Program Trading; SEC Provisionally Backs Big Board Curb*, Wall St. J., April 21, 1988, at 4, col. 2.

259. Smith, *Big Board Mulls New Trade Bans If Market Swings*, Wall St. J., April 13, 1988, at 3, col. 1.

260. See *supra* note 43 (explaining how DOT system operates).

261. Swartz & Salwen, *Five Companies Decide to Halt Index Trades*, Wall St. J., May 11, 1988, at 3, col. 1.

262. *Id.*

263. *Id.*

stock market and, most importantly to Congress, the effects on the individual investor.

In April, 1986, the House of Representatives' Committee on Energy and Commerce through its chairman, John D. Dingell of Michigan, began to ask the SEC specific questions regarding program trading.<sup>264</sup> After reviewing the 1986 Stoll and Whaley study, the Committee sought specific answers from then Securities and Exchange Commission Chairman John S.R. Shad.<sup>265</sup> The Committee was concerned with why the Stoll and Whaley Study merely focused on the effects of program trading on expiration Friday and not on program trading's "impact . . . outside of that narrow context."<sup>266</sup> The Committee wanted the SEC to answer questions regarding a perceived shift in the market away from trading stocks "on fundamentals such as a company's earnings and dividends" to trading "on technical, computer strategies that swing the market drastically. . . ."<sup>267</sup> More specifically, the Committee wanted the SEC to address "whether the marketplace will lose *credibility* with the public because of 'artificial' or 'distorted' prices and volume; whether program trading *concentrates* too much power in the hands of big investment firms; and whether it *undermines* the traditional function of stock analysts and the capital-raising function of the stock market."<sup>268</sup>

The Committee based these concerns on the understanding that program trading could hurt anyone caught on the wrong side of the trading.<sup>269</sup> The Committee's concerns were heightened by three dramatic swings in the DJIA. Two of the three swings did not involve an expiration Friday. The Stoll and Whaley Study suggested to the Committee "that the market might have a less volatile triple witching hour and that the effect on stock prices appears to be diminishing as more traders become aware of how the programs work."<sup>270</sup> In the Committee's opinion "it was wrong."<sup>271</sup>

Legislation twice has been proposed to alleviate uncertainties created by these financial instruments that seem so foreign to individuals. H.R. 1487 was Iowa Representative Neal Smith's attempt to amend the Securities Exchange Act of 1934.<sup>272</sup> The bill prohibited an individual who trades for his own account to "own, control, have a beneficial interest in, or enter into any contract or contract for future delivery in any financial instrument, *stock index, securities index, and any contract for future delivery. . . .*"<sup>273</sup> The bill's primary focus was on brokerage firms trading for their own

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264. See *Johnson Testimony*, *supra* note 35, at 16.

265. *Id.*

266. *Id.* at 2.

267. *Id.*

268. *Id.*

269. *Id.*

270. *Id.*

271. *Id.*

272. H.R. 1487, 100th Cong., 1st Sess. (1987).

273. *Id.*

accounts. The bill attempted to reconcile the inherent conflicts raised by firms that trade in these products not only for themselves but on behalf of institutional clients and individual investors. The question raised was: Whose orders get handled first, the firm's, the clients', or the individual's? To Congress, this was an important question as it attempted to maintain fair and orderly markets for the institutional investor and, more importantly, for the individual investor.

A second effort to regulate the financial markets was H.R. 2668, which would have been known as the "Securities Trading Reform Act of 1987."<sup>274</sup> The bill was another attempt to amend the Securities Exchange Act of 1934. The bill would have provided the SEC and the CFTC the power to institute trading halts on all markets.<sup>275</sup> Congress specifically found that it may be necessary at times to halt trading "for an appropriate period of time . . . for the purpose of facilitating the orderly dissemination of material information concerning the issuer, the security, or the market for the security."<sup>276</sup> Congress also found that there may be days when "excessive volatility may occur" when stock index futures and options expire.<sup>277</sup> Congress also found that trading halts should extend to these markets to enable "the public interest to moderate the effects of certain *program trading*."<sup>278</sup> The amendment would have permitted the SEC and the CFTC to suspend trading "for not more than one business day."<sup>279</sup> The SEC could have renewed or extended the trading halt.<sup>280</sup>

Congress intended this amendment to return some stability to a market that they felt was becoming extremely volatile. This perception of increased volatility on expiration Friday, and also on nonexpiration days, may impair investors' confidence in the fairness and integrity of the securities market. It would appear that this provision within the amendment is Congress' attempt to strengthen the SEC's power to stabilize the financial markets in times of crisis. If the SEC's power to stabilize the markets were increased, investors again could rely on the market process to the fullest.

To ascertain the role of program trading in the stock market, the House Subcommittee on Telecommunications and Finance held hearings during the summer of 1987. Representatives of regulatory bodies, market participants, and experts in the field of derivative investments testified and expressed their views on "program trading." Their opinions are discussed in more detail in sections III and IV, dealing with the brokerage industry and the regulatory community, respectively.

Representative Edward J. Markey (Mass.), Chairman of the Committee on Energy and Commerce, declared in his opening statement to the panel

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274. H.R. 2668, 100th Cong., 1st Sess. § 1 (1987).

275. *Id.* § 110.

276. *Id.* § 110(a)(1).

277. *Id.* § 110(a)(3).

278. *Id.*

279. *Id.* § 110(b)(2)(B)(i).

280. *Id.* § 110(b)(2)(B)(iii).

that the meeting was being held to discuss "one of the most important new phenomena affecting our financial markets today: 'program trading.'" <sup>281</sup> Representative Markey explained that the Subcommittee on Telecommunications and Finance became aware of program trading in April, 1984, mainly because of investor complaints regarding "triple witching" expirations. On the date of these hearings volatility of the markets on non-expiration days caused increased alarm. The September 11-12, 1986, drop in the DJIA and the January 23, 1987 swing in same day trading were both attributed to program trading. What the Subcommittee attempted to determine was whether "'program trading' [was] a source of increased short-term price volatility in the securities markets?" <sup>282</sup> Again, Congress expressed its concern for the individual investors' exposure as a nonparticipant in program trading. The Subcommittee asked these market professionals for "measures" to protect the integrity of the markets and prevent loss of investor confidence. Ironically, Representative Markey wondered in his opening statement whether the true test for the use of advanced technology in intermarket trading will come not in a rising market but "in a situation we have not yet witnessed: the impact of program trading during a failing market." <sup>283</sup> Representative Markey's prophecy came true less than three months later.

The market professionals' testimony to the Subcommittee reflected their common belief that the inherent benefits of the new derivative products have enhanced the system. <sup>284</sup> Congress now is reconciling this view with the current knowledge of October 19, 1987, and its effects on the market. Congress must address these differing views to regulate the financial markets further.

Accordingly, Congress is beginning to wade through the wealth of information, opinions, and concerns that are being made available and expressed on a daily basis. Senator Donald Riegle, Jr., of Michigan, chairman of the Subcommittee on Securities of the Committee on Banking, Housing, and Urban Affairs, issued a statement on October 22, 1987, expressing his views regarding the recent turbulence in the financial markets. <sup>285</sup> Senator Riegle asked that the committee move to establish an International Securities Regulatory Commission to regulate and coordinate international securities markets to help avoid future panics. <sup>286</sup> He also asked that the SEC reconstruct the events of the October 19, 1987 fall in the DJIA to determine the nature and volume of selling by institutions, mutual

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281. See *Program Trading: Hearings Before the Subcomm. on Telecommunications and Finance of the House Comm. on Energy and Commerce*, 100th Cong., 1st Sess. (July 23, 1987) (opening statement of Representative Edward J. Markey).

282. *Id.*

283. *Id.* at 2.

284. See *supra* notes 47-57 and accompanying text (discussing benefits from new derivative trading strategies).

285. Statement of Donald W. Riegle (October 22, 1987).

286. *Id.*

funds, portfolio insurance strategies, futures selling, and program selling.<sup>287</sup> Furthermore, Senator Riegle asked that the Administration establish a new Special Advisory Committee to study the securities markets.<sup>288</sup> Senator Riegle expressed these same concerns in a letter to David Ruder, Chairman of the SEC. Senator Riegle expressed a further concern about the treatment of the individual investor. He wondered, for example, whether brokers gave individuals the same consideration in placing orders that the brokers gave large traders.<sup>289</sup>

The Administration appointed a panel, headed by Wall Street executive and former New Jersey Senator Nicholas Brady, to study the market.<sup>290</sup> Representative Markey, Chairman of the House of Representatives Subcommittee on Telecommunications and Finance of the Committee on Energy and Commerce, asked for a bipartisan investigation into the causes of the decline of October 19, 1987.<sup>291</sup> Markey requested that the investigation focus on both "macroeconomic causes such as the budget and trade deficits which dictated the direction of the market and technical factors such as program trading. . . ."<sup>292</sup>

Several House and Senate committees also are investigating actively the recent market decline and its overall effect on the market and market participants. Congress wishes to maintain the integrity of the marketplace that the securities laws were designed to protect. Efforts currently are being made to determine the "cause" of the market decline and what regulation is needed to best serve market participants.<sup>293</sup>

The Report of the Presidential Task Force on Market Mechanisms (Brady Report) was given to the President on January 8, 1988.<sup>294</sup> The Brady Report blamed the automatic trading programs for generating massive sell orders that resulted in the market decline of October 19, 1987. The report expressed concern that reactive selling by institutions, that followed portfolio insurance strategies and that sought to liquidate large fractions of stock holdings regardless of price, played a major role in the market crash. The Brady Commission expressed concern about the large concentration of trading potential that resulted from portfolio insurance. The Brady Commission also determined that stock index arbitrage did not account for the kind of volume some experts had believed, but such trading occurred at particularly sensitive times during the market's downward spiral, significantly worsening the drop.

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287. *Id.*

288. *Id.*

289. Letter from Donald W. Riegle, Jr. to David S. Ruder, Chairman, Securities and Exchange Commission (Oct. 22, 1987).

290. See *infra* notes 291-92 and accompanying text (discussing Brady Commission's findings).

291. Markey Announces Bi Partisan Probe into Causes Collapse of Stock Market, 19 Sec. Reg. & L. Rep. (BNA) No. 42, at 1604 (Oct. 30, 1987).

292. *Id.*

293. See *supra* note 9 (noting several studies of market crash).

294. Fed. Sec. L. Rep. (CCH) No. 1267 (Jan. 12, 1988) (Extra Edition).

Ironically, however, the Brady Report did not recommend any curbs on computerized program trading. Instead, the Brady Commission recommended a four-part solution. First, the Brady Commission recommended the creation of a super-regulatory agency to oversee the markets. The Brady Commission argued that the stock, options, and futures markets can no longer be considered separate markets. Rather, because price swings in one immediately will affect prices in another, the markets essentially comprise one unified market. The Commission nominated the Federal Reserve Board as the most appropriate central authority.

Second, the Brady Report asked that there be one standard for margins to control speculation. To control speculation, there should be consistent margin requirements for purchasing all financial instruments. Raising margin requirements, though, may dampen speculation. On October 19, 1987, the futures market needed more speculators, not fewer. Speculators would have bought contracts that portfolio insurers were attempting to sell. Raising the cost of speculation could spell the end of portfolio insurance using index futures.

Third, the Brady Commission suggested "circuit breakers" that would halt trading in certain stocks and futures instruments if selling pressure becomes too intense. However, dangers exist in creating new circuit breakers. At the present time, the market contains mechanisms to halt tradings. One such mechanism is an order imbalance. Another mechanism is the NYSE's decision to close the small order execution system to program traders.<sup>295</sup> That decision, however, closed the market to index arbitrageurs whose activities may have narrowed the huge gap between futures and stock prices and halted the decline.

Lastly, the report asked for a single clearing and settlement system for all stocks, bonds, and futures. This system would insure the financial integrity of the markets. In line with this recommendation, the Brady Report asked that the exchanges install better information systems to monitor the markets.

The report made many observations but often did not offer suggestions on how to solve the problems. The Brady Commission, though, did conclude that both stock index arbitrage and portfolio insurance pushed the market down.

#### SUMMARY AND CONCLUSIONS

The financial markets have undergone a dramatic change due to program trading. When one is deciding whether regulation is necessary, one first must weigh the benefits flowing from the use of program trading strategies against the potential harm.

The benefits or advantages which seem to be most commonly mentioned in this Article are those that typically are enjoyed by financial institutions

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295. See *supra* note 43.

engaging in these strategies. The advantages are increased execution efficiency, liquidity, risk management, a decrease in transaction and market impact costs, enhanced asset allocation and deployment, and the rapid buying and selling of baskets of stocks. Institutions, more so than the small investor, have enjoyed these benefits because of the advanced telecommunications and computer technology of which only large institutions with their vast financial holdings can take advantage. The small investor is not entirely precluded from these benefits. Participation in mutual funds and pension plans enables small investors to reap many of the same benefits as large institutions, although indirectly.

The potential harm of program trading strategies is the apparent or actual volatility that takes place in the market. The studies conclude that there is volatility on expiration days and some nonexpiration days. However, overall volatility on the stock market and the S&P 500 Index, in percentage terms, is no more volatile than ten years ago. Volatility may affect the small, individual investor more than the financial institutions because individual investors do not understand the underlying complexities. Therefore, the investor cannot circumnavigate periods of volatility in the market as well as institutions that have a more sophisticated understanding of the strategies and the technology to implement the strategies.

A second potential harm relating to volatility is the order imbalances that occur with a sudden influx of buy or sell orders, "causing" much of the perceived or actual volatility. Because institutions are concerned only with the stock price and the index converging on expiration date, this is not a major harm to institutions. The harm may be to the small investor who is placing orders during a temporary rise or fall in the market. By placing these orders, small investors may be paying more or receiving less than they anticipated.

The major harm, therefore, seems to be in the area of volatility. The concern, however, may be focused inappropriately on "program trading instead of on those responsible for the free flow of trading and market makers."<sup>296</sup> The real problem may be with specialists who are charged with the responsibility of insuring an orderly and efficient market. Several reports, including the Brady Commission report, have characterized the specialist system as being "primitive, often chaotic and very susceptible to human error." Basically, the Brady Commission found that the system did not work on October 19. Likewise, the market making system of the NASD, the NYSE specialist system counterpart, also did not work.

Specifically, the Brady Commission found that only about forty percent of the specialists effectively tried to keep the market orderly on October 19. The other sixty percent of the specialists worsened the crash by joining the stampede. Many market makers in the OTC followed suit and refused to answer their phones.

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296. For a different position see Hazen, *Volatility and Market Inefficiency: A Commentary on the Effects of Options, Futures, and Risk Arbitrage on the Stock Market*, 44 WASH. & LEE L. REV. 789 (1987).



The record volume of trading on October 19 exposed two major problems with the specialists and market making systems: undercapitalization and out-dated trading technology. The undercapitalization problem is already being addressed. One reform which was suggested last year is being executed rapidly. After a long history of prohibition, large brokerage firms may now own specialist firms. Chairman Ruder suggests a possible future reform. He mentioned the possibility of assessing the exchange's member firms a certain amount, which would be put into a pool from which specialists could draw in certain unusual circumstances.

The low-tech problem of the specialist system is apparent if one considers the specialists' official means of communication. The official means are "slips of paper with stock symbols and prices scrawled on them." Additionally, prequotation data is hand fed into a reader through the use of antiquated IBM punch cards, marked with a No. 2 pencil.

Exchanges must implement high technology systems. Possible proposals that would ultimately replace the specialist system are electronic trading, where brokers and investors directly deal with each other, using mutual video screens. The London Exchange, as well as NASDAQ, are already moving toward electronic trading.

Clearly there are benefits to "program trading" and the harms associated with it appear to be related to an inability of those responsible for trading to handle the excess of volume and increased capital demands that are often concentrated in a short period of time. The emphasis on long term regulation of program trading is unwarranted. Instead, interim regulation of program trading strategies may be necessary until the specialist and market making systems are appropriately capitalized and are updated to meet the technology available to the institutions.