

Chapter Three

THE EFFECTS OF DERIVATIVE PRODUCTS

Derivative products, particularly futures on stock indexes, play an increasingly significant role in the securities markets. For example, the trading volume of stock index futures has grown spectacularly since their introduction in 1982. By the week preceding the October market break, trading in the Standard & Poor's ("S&P") 500 index futures contract ("SPZ") was averaging 106,400 contracts. ^{1/} This daily contract volume (based on the value of the S&P 500 index during the week preceding the market break) was the equivalent of approximately \$16 billion worth of equity securities, and represented more than two times the average daily dollar volume of trading on the New York Stock Exchange ("NYSE") during September 1987. ^{2/} Similarly, options on stock indexes were the fastest growing segment of the options market in 1987 and, by October 1987, on average accounted for more than 43% of total options contract volume. ^{3/}

The growth of derivative products reflects, in part, the trends toward greater institutionalization of the markets and of market basket trading, coupled with the changing nature of investment strategies. Analysis of these trends sheds light on the growing impact of futures trading in the securities markets.

A. Institutionalization

During the last ten years, institutional investors have held an increasingly large percentage of all outstanding equities. In particular, the growth of United States pension funds and mutual funds, and the accompanying changes in investment policy and asset allocation, primarily are responsible for the increasing institutionalization of the securities markets. ^{4/}

At the end of 1975, institutions held 35.3% of the \$685.1 billion total market value of all NYSE-listed stocks. At that time, pension funds held a total of \$252 billion in assets, \$113 billion of which were equity holdings. ^{5/} By the end of 1980, the market

^{1/} See Divisions of Economic Analysis and Trading and Markets, Interim Report to the Commodity Futures Trading Commission ("CFTC") on Stock Index Futures and Cash Market Activity During October 1987, November 9, 1987, Table 2.

^{2/} See NYSE, Marketing Research Report (November 1987).

^{3/} Total volume for options contracts traded on all exchanges for the period from January to October 1987 was 276,570,000. The volume for index option contracts traded for the same period on all exchanges was 119,535,000 contracts. Index option contracts generally are one-fifth the size of index futures contracts.

^{4/} See Chart 3-1 (overview of pension fund growth and management trends).

^{5/} See J. Light & A. Perold, The Institutionalization of Wealth: Changing Patterns of Investment Decision Making, in Wall Street and Regulation 98 (1987, ed. S. Hayes).

value of all NYSE-listed stocks had increased to \$1.2 trillion, while the institutional investors' share of that market value had remained constant, increasing only .1% to 35.4%. At that time, however, the total value of pension fund assets had increased to \$485 billion, \$220 billion of which were equity holdings, which accounted for 14% of all equities outstanding. 6/ By 1985, pension funds had more than doubled their 1980 level of equity investment, to almost \$500 billion worth of stocks, which accounted for 22% of all equities outstanding. 7/

The 1980s have seen not only a substantial growth in the market value of institutional holdings, but also a surge in the percentage of the total trading volume on the NYSE accounted for by institutional investors. 8/ Large block transactions, 9/ a gauge of institutional participation in the stock market, have increased sharply since 1977. A total of 54,275 large blocks, accounting for 1.2 billion shares (\$34 billion), were traded in 1977. 10/ These transactions accounted for 22.4% of the reported volume on the NYSE for that year. By 1983, these figures had more than doubled. In that year, 363,415 block transactions occurred, accounting for 9.8 billion shares (\$346.92 billion), and representing 45.6% of reported volume on the NYSE. A record average of 2,631 daily block trades occurred in 1986, up from an average of 2,139 daily block trades in 1985, representing 49.9% of reported volume on the NYSE. Moreover, the total number of block transactions on the NYSE increased 23.5% in 1986 from the previous year. This represented a 25.2% increase in the number of shares accounted for by those trades. 11/ As further evidence of the rapid growth of these institutional transactions, on April 10, 1986, a new record was set when 48.8 million shares of Navistar International were traded, which was the largest block transaction in history as of that date. 12/ Prior to April 10, 1986, the largest block transactions in history had occurred on May 25, 1983, when 7.0 million shares of Ramada Inns were traded, and on November 30, 1983, when 6.35 million shares of AT&T changed hands. 13/

B. Market Basket Trading

The types of institutional transactions that occur and the investment decisions made by money managers also have changed as a result of evolving investment and trading strategies. Institutional money managers have made increasing use of passive

6/ Id.

7/ Id.

8/ See Chart 3-2.

9/ Large block transactions are transactions of 10,000 or more shares.

10/ See Chart 3-2.

11/ See Chart 3-2: 539,039 block transactions occurred in 1985, accounting for 14.2 billion shares (\$501.26 billion). In comparison, 665,587 block transactions occurred in 1986, accounting for 17.8 billion shares (\$685.3 billion) traded.

12/ NYSE, Fact Book 12 (1987).

13/ Id.

asset management strategies. In 1980, money managers reported a total of \$9 billion in indexed assets. ^{14/} This figure rose to \$48.2 billion at the end of 1984. By 1985, index fund managers reported \$81 billion in indexed assets, almost a 70% increase over the previous year's figure. As of May 31, 1987, the value of indexed assets for U.S. pension funds grew to \$187.96 billion, \$124.07 billion of which tracked U.S. equity indexes. ^{15/}

As a result of the proliferation of index funds and the growth in indexed assets, along with investment tactics that require the simultaneous trades of large blocks of stocks, institutional investors increasingly have used program trades. Index fund managers began program trading in the mid-1970s. ^{16/} Currently, an estimated 25% of all institutional trading is accomplished by use of program trades. ^{17/} These trades include straight execution of multi-stock orders, as well as index arbitrage and substitution strategies, among others. The increase in this activity appears to have accelerated in 1987. For example, in January 1987, an average of 12.1 million shares per day was executed through the List Order Processing ("LIST") capability of the NYSE's Designated Order Turnaround ("DOT") system but by August 1987, that number had increased to an average of 16.6 million shares.

C. The Effects of Futures

The increasing institutionalization of the markets and the growth of passive investment strategies, such as indexing, ^{18/} have been accompanied by the increasing use by institutional investors of derivative products such as index options and financial futures. By 1984, only two years after the introduction of cash settled stock index options and futures, a number of institutional investors were using or actively considering using derivative markets to earn incremental returns on managed money, allocate assets to adjust for market risk, and manage various commercial and financial risks. ^{19/} Forty of the top 200 pension funds were using stock index futures at that time. Their use of derivative products, however, did not include dynamic hedging or portfolio insurance to any large extent. In 1984, only an estimated \$200 million in

^{14/} Christman, Indexed Assets up 70% in 1985, Pensions & Investment Age 6 (Dec. 23, 1985).

^{15/} Berkowitz, Indexed Assets Top \$187 Billion, Pensions & Investment Age 3 (July 13, 1987).

^{16/} See, e.g., Investment Dealers' Digest 25 (March 2, 1987).

^{17/} Light & Perold, supra note 5, at 110.

^{18/} Indexing involves holding stocks in proportion to a widely followed index like the S&P 500.

^{19/} Board of Governors of the Federal Reserve System ("FRB"), Commodity Futures Trading Commission and the Securities and Exchange Commission ("SEC"), A Study of the Effects on the Economy of Trading in Futures and Options (Dec. 1984) ("Joint Study") at IV-17.

pension fund assets were dynamically hedged. ^{20/} This changed rapidly over the next three years as pension funds expanded their use of dynamic hedging or portfolio insurance strategies. In 1985, portfolio insurance was applied to an estimated \$6 billion of pension fund assets. ^{21/}

By 1986, the amount of pension fund assets committed to portfolio insurance strategies had increased to at least \$8.5 billion, forty times greater than the value of pension fund assets that were dynamically hedged in 1984. ^{22/} By October 19, 1987, stock valued at more than \$60 billion, mostly held by pension funds, was reported to be managed under portfolio insurance strategies. ^{23/}

The Division of Market Regulation ("Division") has attempted to verify the total dollar value of portfolio assets that were subject to some type of portfolio insurance or protective hedging program during the October 1987 market break. Division staff spoke with the major vendors of portfolio insurance programs, with broker-dealers and banks that manage large portfolios, and with many corporate pension plan managers. Based on these interviews, the staff has identified a minimum of approximately \$55 billion in portfolio assets that were committed to some type of portfolio insurance strategy. This figure is a minimum estimate of portfolio assets subject to some type of portfolio insurance or protection plan. ^{24/} Moreover, staff interviews with market professionals indicate that a wider range of institutions actively use the futures markets. While these institutions do not employ the precise trading strategies dictated by portfolio insurance, they do employ the futures market to quickly adjust their relative equity holdings in a manner that can have effects on the market similar to portfolio insurance trading.

I. Benefits

As the staff has noted in prior analyses, the impact of index-related trading on the markets should be viewed in the context of the benefits provided by such trading. Various studies conducted before the October 1987 market break concluded that futures

^{20/} Ring, Funds Watch as Others Try Program Trades, Pensions & Investment Age 1 (April 28, 1986).

^{21/} Ring, Dynamic Hedging Grows Despite Debate, Pensions and Investment Age 3 (April 14, 1986).

^{22/} Id.

^{23/} Ring, Execs Ponder Compatibility of Strategies, Pensions & Investment Age 15 (July 27, 1987).

^{24/} While this figure is smaller than estimates ranging from \$60-\$100 billion that have appeared in the press, we have attempted to the maximum extent possible not to double count portfolio assets. Various portfolio insurance programs are licensed by vendors. As a result, obtaining an accurate estimate of the amount of portfolio assets subject to some type of portfolio insurance strategy is difficult because information obtained from licensees also may have been provided by vendors.

and options on stock indexes offer significant benefits to today's capital markets. ^{25/} These studies found that the markets for these index products, especially the market for SPZ futures, add substantial liquidity and pricing efficiency to equity markets generally. Moreover, using these products, investors are able to control the risks in their portfolios in accordance with their particular needs. As a result, the markets perform their various economic roles more efficiently.

a. Liquidity Efficiencies

As described in Chapter One, an index option or future is a single instrument that can be used as a surrogate for many stocks. Substantial market making capital is concentrated in the more successful of these products, especially the SPZ future and the S&P 100 index option. In addition, market makers and hedgers are afforded favorable margin requirements, enabling them to effect transactions at lower cost. These factors contribute to the futures market's liquidity, allowing investors to execute large transactions with much smaller market effects than is possible in the separate stocks. ^{26/}

b. Transactional and Hedging Efficiencies

The availability of derivative index products has substantially enhanced institutions' and other market professionals' hedging and market timing capabilities. Index futures and options also significantly reduce transaction costs when assets are reallocated among such as stocks, bonds and cash equivalents in a portfolio, or when additional funds are invested. ^{27/} Because commission rates, as well as execution costs, are lower for futures than for stocks, institutions changing the proportion of stocks in a portfolio can do so at lower cost by initially using the futures rather than the stocks themselves. For example, a debt portfolio can be converted rapidly to equity by simultaneously selling bond futures and buying stock index futures. In doing so, managers can increase their equity exposure without incurring the relatively higher transaction costs of the stock and bond markets. Thus, futures not only allow for the rapid reallocation of a portfolio, but create substantial savings in execution and

^{25/} See, e.g., Joint Study, *supra* note 19, at IV-35; H. Stoll & R. Whaley, Expiration Day Effects of Index Options and Futures (1986) ("Stoll Study").

^{26/} A 1985 study by the investment firm of Kidder, Peabody & Co. estimated the difference in costs as follows: the cost of executing a \$20 million stock trade in terms of the effect on the price of the stock would be 0.27%; for a similar futures trade, 0.04%. R. Wunsch, Stock Index Futures (Kidder Peabody & Co., April 23, 1985). More recently, Morgan Stanley estimated the market impact cost of a \$120 million S&P 500 basket as 1.30 index points (or \$520,000) in the stock market versus .05 index points (or \$20,000) in the SPZ. R. Johnson, Program Trading Presentation (Morgan Stanley, July 9, 1987).

^{27/} Of course, the cost of executing a program has changed over time. According to Fredric A. Nelson of Bankers Trust, a \$50 million S&P 500 program would have cost an investor \$290,000 to execute in 1984, \$165,000 to execute pre-October 1987, and \$345,000 to execute after October 1987. F. Nelson, Trading Strategies and Execution Costs (Bankers Trust Company, December 3, 1987).

transaction costs. Of course, when and if the stock transactions take place, commission costs are incurred.

Moreover, as hedging vehicles, stock index products can offer investors substantial benefits. Through the sale of futures contracts, pension, endowment and other institutional investors can quickly, at relatively low cost, shift risk to those more willing to accept it.

2. Price Impacts of Futures

The existence of an active futures market in stock indexes has created, in effect, an alternative or "synthetic" stock market for the growing number of institutional investors who choose to trade passively by investing in funds tied to specific indexes or who are interested in buying and selling stocks in "baskets." The data set forth in the Market Chronology (Chapter Two) demonstrate the substantial impact this alternative stock market can have on the equity market, especially by increasing intra-day price volatility.

When futures on stock indexes were introduced, little attention was paid to the possible "price discovery" aspect of this new product or to its ability to displace the stock market as the preferred vehicle for trading baskets of stock. The primary emphasis was on the significant potential for hedging investment risk that was offered by a cash-settled future. Nevertheless, it is our view that, as a result of the increasing use of the futures market by institutional investors, including investors employing passive investment strategies and dynamic hedging techniques,^{28/} the character of the market has changed to the point where the "price discovery" feature of the derivative market is leading, rather than following, price trends in the underlying equity markets. Moreover, through index arbitrage, the prices "discovered" in the futures pit are quickly transmitted to the floor of the NYSE where prices adjust to the general market sentiment expressed in the futures arena.

There are several reasons for the increased impact of futures. First, low transaction costs, low margin requirements, and normally high levels of liquidity, the very benefits cited by futures proponents, have made the futures market the "market of choice" for many active institutional traders. Many institutional traders who use futures reported to the staff that they did so because futures were a "cheaper" alternative to buying individual stocks. Some believed that they could increase or decrease market exposure virtually instantaneously, with little market or liquidity costs. For this reason, as noted above, the underlying market value of index futures traded daily generally exceeds the dollar volume on the NYSE.^{29/} Accordingly, institution-led market movements are usually observed first in the futures markets.

^{28/} Dynamic hedging involves rebalancing a market portfolio to increase or decrease the proportion of equity exposure depending on market movements.

^{29/} The dollar value of SPZ 500 futures contracts traded daily has exceeded the dollar value of daily transactions on the NYSE since the last quarter of 1983. See N. Katzenbach, An Overview of Program Trading and Its Impact on Current Market Practices, 10 (December 21, 1987).

Second, the capital available for index arbitrage has increased substantially. In the early developmental stages of index arbitrage strategies, large broker-dealer firms trading for their own proprietary accounts dominated the business. These same firms continue to be the major players in index arbitrage, but today much of their business is as agent for institutional customers. Moreover, the availability of an efficient order routing system for baskets of stock (the NYSE LIST system) has decreased the time, and therefore the execution risk, involved in executing program trades. Efficient order routing also has increased the speed with which market movements in futures can be transmitted to the stock market.

Institutional investors also can make greater use of index arbitrage strategies than firms can trading for their own accounts. As noted below, the ability to initiate a so-called "short" arbitrage (i.e., buy futures, sell stocks "short") is limited by the Commission's and exchanges' short sale rules, which require that the "short stock" portion of the arbitrage be executed on "plus" ticks or "zero plus" ticks ^{30/} for each of the stocks comprising an arbitrageur's basket. Many institutional investors, particularly those who manage passive or index funds, already own the stocks underlying the index and, therefore, can initiate an arbitrage transaction involving stock selling without considering the short sale rule, because their sales would be "long" sales and not subject to the "tick" test provisions of the short sale rule. Moreover, because these institutions already own the securities comprising the index, the return they must receive on the arbitrage is less than would be required by other market participants. Accordingly, they are willing to effect arbitrage transactions with a smaller spread between the futures price and theoretical fair value.

The result of all these trends has been to increase the speed and frequency with which index futures price movements are transmitted to the stock market. There is, of course, nothing inherently wrong with index futures providing price discovery for the stock markets. Indeed, such close coordination of two related markets generally enhances pricing efficiency. The emergence of futures as a stock price leader, however, has had a significant impact on the stock market.

First, it increases the difficulty of enforcing marketmaking obligations imposed on specialists. As discussed in detail in Chapter Four, stock specialists are generally expected to buy or sell securities to offset temporary imbalances in supply and demand and to provide price continuity, depth, and liquidity, the general indicia of fair and orderly markets. Interviews with specialists confirm, however, that if the future is trading at a discount or premium to its theoretical value, specialists are unwilling to act aggressively to offset imbalances because the discount or premium indicates that more arbitrage selling or buying will enter the market. ^{31/} Other market participants may be equally reluctant to trade against pricing signals emanating from the futures market.

^{30/} A "plus tick" is a trade at a price greater than the immediately preceding transaction and a "zero-plus tick" is a trade at a price greater than the last transaction at a different price (e.g., a trade at 20 would be a plus tick if the prior trade was 19 7/8, and a zero-plus tick if the two prior trades were 19 7/8 and 20).

^{31/} See Chapter Four, *infra* for a discussion of specialist obligations and performance standards.

Second, the relatively low margins and absence of short sale restrictions in the futures market may encourage additional trading that might not occur if the derivative index products did not exist, in that large stock equivalent positions can be established or liquidated more quickly. The price movements caused by this increased trading velocity are then rapidly assimilated into the stock market through arbitrage, because arbitrage liquidations and index substitution activity again can occur consistent with short sale restrictions.

The staff believes that these two effects of futures price leadership (greater difficulty in maintaining orderly stock markets and an increase in the velocity of trading) have converged to contribute to increased intra-day volatility in the stock market. Indeed, recent studies have indicated that while, prior to 1987, inter-day stock price volatility was not out of line with prior periods, intra-day volatility was increasing. Moreover, by early 1987, inter-day volatility appeared to be increasing as well. ^{32/}

This price impact does not appear to occur because of speculative activity in the index futures market. Neither our examinations of price volatility on September 11 and 12, 1986 and January 23, 1987 nor our analysis of futures trading during the October market break indicates that speculative activity in the futures market was predominant. Rather, as detailed in Chapter Two, institutions, not speculators, were the primary net sellers of futures on October 19, the day of the greatest market decline.

^{32/} See, e.g., Cowan, Whether Swings Will Continue is Uncertain, *N.Y. Times*, January 2, 1988, at 31, col. 3 ("It used to be that, on a given day the [DJIA] moved up or down by more than 2[%] only about once a month. Since May, such swings increased in frequency to almost once every three weeks, and by the fourth quarter of 1987, they occurred almost every other day on average"); N. Katzenbach, *supra* note 29, at 21-23; F. Edwards, Financial Futures and Cash Market Volatility: Stock, Index and Interest Rate Futures 18 (September 1987) ("Beginning in 1986, . . . volatility began to rise, and in 1987 increased even more. This pattern is evident for all measures of volatility, which show similar movements [footnote omitted].") According to Professor Edwards, from 1985 to 1986, the standard deviation of the high-low estimator for the S&P 500 increased from 0.3534 to 0.5832, while the mean of that indicator increased from 0.7809 to 1.1204. It should be noted, however, that Professor Edwards also stated: "It is doubtful that the rise in stock market volatility is due to anything associated with futures trading.")

We would note that some of the studies which have sought to measure market volatility before and after the introduction of stock index futures have done their comparisons using the Spring of 1982 as the relevant "event date" because that is when such futures were first introduced. However, such an "event date" does not accurately capture the full effects of futures trading. The dollar equivalent of stock trading via futures did not exceed NYSE trading volume until late 1983, proprietary index arbitrage did not become significant until Spring/Summer of 1984, index substitution programs only came into play during 1985-86, and dynamic hedging became considerably greater in 1986-87. Thus, whether such pre-/post-studies can ever "prove" that the market has been more or less volatile since the introduction of stock index futures, such studies should, at least, use a more finely textured "event date."

The important issue, therefore, to examine in evaluating institutional futures trading is whether the trading strategies employed by those institutions contributed to a net increase in stock market activity during the October market break. For the reasons discussed below, we believe they did.

D. Analysis of October 1987 Trading

The staff's review of trading patterns during the period October 6 to October 20 leads us to the conclusion that no single factor, economic, structural or psychological, was responsible for the size and breadth of the October 1987 market break. To the contrary, the staff believes that a variety of factors came into play during the key trading days that affected investment and trading decisions.

Analysis of trading during the two-week decline that immediately preceded the October 19 market break suggests that the decline was triggered by changes in investor perceptions regarding investment fundamentals and economic conditions. Market participants interviewed by the staff enumerated a number of fundamental factors which could have contributed to these changed perceptions. As noted above, these included: (1) rising interest rates, (2) persistent United States trade and budget deficits, (3) concerns relating to the possible overvaluation of stock prices generally resulting from the rapid increase in prices during 1986 and the first eight months of 1987, and (4) declines in the value of the United States dollar relative to other currencies. Also cited as a negative factor, particularly with respect to declining stock prices on and after Wednesday, October 14, was a possible adverse change in the tax treatment of interest payments for securities used to finance takeovers.

Historically there has been a strong inverse relationship between interest rates and stock price performance.^{33/} For over four years during the bull market, short-term interest rates had been trending downward in most of the major financial markets. Short term interest rates in the United States bottomed out, however, in October 1986. As can be seen in Charts 3-4 and 3-5, short-term interest rates reversed their general downward trend in many other countries in the spring or summer of 1987.

Increasing budget and trade deficit pressures and a tightening of the money supply exerted upward pressure on interest rates in late 1986. The increase in monetary aggregates began to slow in the United States about the time that short-term interest rates turned upwards. Charts 3-6 and 3-7 illustrate that the money supply measures, M1 and M2, began to decline compared to the gross national product in the last quarter of 1986.^{34/} Although these pressures eased in subsequent months, they forcefully reemerged by the fall of 1987.

While interest rates were steadily rising, returns on equity investments were on the decline. By August 1987, stock markets in the United States and around the world

^{33/} Chart 3-3 shows this relationship over the past decade for the S&P 500 index and U.S. short-term Treasury bill rates.

^{34/} Heinemann, Placing Bets on the Volatility of Global Casino, American Banker, November 23, 1987, at 9; Stockmarkets Growing Menagerie, The Economist, December 16, 1987, at 80, 82.

generally had experienced five years of dramatic price increases. Further, stock prices increased faster than earnings through much of the period from late 1984 to late 1987. As seen in Chart 3-8, the ratio of common stock prices to earnings declined for two quarters in 1986 but continued after that to approach historical highs in 1987. As a consequence, the yields represented by stocks' dividend payouts declined from levels above 4.5 percent in late 1984 to historically low levels well below 3.0 percent in 1987. By October 1987, stock yields reached record low levels relative to the rate of interest on U.S. government securities.

The further weakness of the dollar, relative to other major currencies, contributed to investors' fears concerning the future prospects for inflation. There was speculation in the financial press that a further decline in the United States dollar could result in the withdrawal of funds by foreign investors from the United States securities markets.

Finally, a tax bill reported out of the House Ways and Means Committee that would have severely limited tax deductions for interest paid on debt used to finance takeover activity may have had an effect on stock prices. ^{35/} Preliminary data prepared by the Commission's Office of Chief Economist ("OCE") indicate a correlation between events concerning the tax bill and stock price movements during the market break. OCE examined movements in the S&P 500 index, the NYSE composite index, and a portfolio of takeover stocks after five significant announcements about the tax bill. OCE preliminarily found that announcements indicating favorable action on the bill (e.g., the announcement that it had been agreed to by the Committee) were followed by drops in stock prices and that announcements indicating that the tax provisions might be dropped, including an announcement by the Committee Chairman that he would agree to a reasonable compromise on the bill, were followed by increases in stock prices. ^{36/}

Data provided by firms to the NYSE and published by the Securities Industry Association ("SIA") ^{37/} indicate that institutional investors began adjusting their portfolios in response to these changes in September 1987. Institutional investors averaged net purchases of 2.8 million shares daily on the NYSE through August; in September, institutional net sales averaged 300,000 shares daily. Institutions' negative outlook toward stocks intensified in the first half of October, with net sales increasing to 4.4 million shares or about \$160 million daily. Observers noted that large accounts raised sizeable amounts of cash by selling equities to lock-in profits earned during the

^{35/} See New Tax Bill Threatens to Kill Most Debt Financed Takeovers, Investment Dealers Digest 16 (Oct. 19, 1987).

^{36/} OCE has not, however, completed its analysis of this issue. Moreover, it should be noted that other factors arguably may have influenced price movements on these days. In particular, as discussed above, there were significant political and economic developments in September and early October that caused considerable uncertainty in the markets about the course of interest and inflation rates. See also Report of the Presidential Task Force on Market Mechanisms (January 1988) ("Task Force Report") at 15-17 and Takeover Issues Soar Over Rostenkowski Tax Comments, Dow Jones News Service, Oct. 29, 1987.

^{37/} The SIA is the trade association representing over 500 securities firms headquartered throughout the United States and Canada.

previous five years ^{38/} and switching to bonds to take advantage of double-digit bond yields.

Just as investor perceptions about fundamental factors appear to have been the "trigger" for the market declines during October 14-16, on October 19, 1987, institutional stock selling was the largest single direct factor responsible for the initial opening declines in the popular stock averages: the Dow Jones Industrial Average ("DJIA") and the S&P 500. Moreover, brokers reported to the staff the presence of significant selling at the opening by foreign investors. Finally, it appears as if panic selling in a broad range of stocks caused by a variety of factors coupled with an absence of buyers (except at distressed levels) were primarily responsible for the free-fall decline that characterized the final hour of trading in stocks.

Accordingly, futures trading, and strategies involving the use of futures, were not the "sole cause" of the so-called market break. Nevertheless, the existence of futures on stock indexes and the use of the various strategies involving "program trading" (i.e., index arbitrage, index substitution and portfolio insurance) were a significant factor in accelerating and exacerbating the declines. ^{39/} For the three critical trading days--October 16, 19, and 20--we have been able to attribute 6.3%, 16.7%, and 25.5%, respectively, of futures trading to portfolio insurance selling. In response to the resulting real or apparent futures price discounts, index arbitrage and portfolio insurance strategies represented significant percentages of volume on the NYSE in the stocks comprising the S&P 500 on each of these days. Moreover, during certain critical trading periods, index arbitrage or portfolio insurance or both accounted for between 30 and 68% of total NYSE volume in the S&P 500 stocks.

On October 16th, the principal direct effect of futures trading on stock prices was in the form of index arbitrage and substitution, which accounted for approximately 37.2 million shares of trading (10.8% of NYSE and 14.8% of S&P 500 volume). Of greater significance, however, was the fact that during the critical last half-hour of trading on Friday, October 16, index arbitrage was a major factor in the significant

^{38/} U.S. Debt Issues Rise Strongly, N.Y. Times, Oct. 20, 1987, at D1.

^{39/} In the Division's September 1986 Report, the staff identified concerns that index-related trading strategies could fuel a market decline severe and rapid enough to create a stock market collapse or "cascade scenario." Briefly, the scenario involves index futures prices responding to bad fundamental news and moving to a sufficient discount to theoretical value to trigger short-side index arbitrage, index fund substitution and unwinding of previously established long arbitrage positions. The resulting stock selling drives equity and futures prices to levels that trigger portfolio insurance programs. These programs further depress futures prices and cause the cycle to repeat itself. The resultant plunging stock prices trigger stop-loss sell orders in individual stocks and force additional liquidations to meet margin calls and broker-dealer requirements, leading to panic selling and a market collapse. As is clear from the discussion in the text, this scenario is far more simplistic than the multitude of factors influencing trading during the October market break. Nevertheless, the effect of futures selling on the stock market is relevant to what occurred. See SEC, Division of Market Regulation, The Role of Index-Related Trading in the Market Decline on September 11 and 12, 1986 (March 1987) ("September 1986 Report") at 21.

decline in the DJIA that occurred during that period. In particular, between 3:40 and 3:50 p.m., approximately 6.6 million shares were sold as arbitrage and index substitution, which, with one million more shares sold in non-arbitrage programs, constituted 52.1% of NYSE volume and 67.9% of volume in S&P 500 stocks.

On October 19, both index arbitrage and portfolio insurance strategies were present and significant. For the day, total index arbitrage selling amounted to 37.6 million shares. This represented 6.2% of total NYSE volume for the day and 8.9% of S&P 500 volume, and was less, both in absolute and percentage terms, than the levels of index arbitrage found in the staff's review of trading during the market decline on September 11 and 12, 1986.^{40/} During several crucial periods, however, index arbitrage represented a significant portion of total S&P 500 stock volume. From 10:00 to 10:10 a.m., index arbitrage accounted for 36.9% of total S&P 500 stock volume. Similarly, between 1:20 and 1:30 p.m., when the DJIA fell sharply after a late morning rally, index arbitrage and substitution accounted for more than 45% of S&P 500 stock volume.

Overall, however, the role of index arbitrage was much less pronounced than was the impact of portfolio insurance strategies effected both in the stock and futures markets. Unlike the findings of our September 1986 Report, portfolio insurance selling in stock and futures was significant, particularly during October 19 and October 20. Most of the program stock trading not attributable to index arbitrage that occurred on October 19 and 20 was accounted for by portfolio insurance selling. Further, much of the portfolio insurance selling was done by a single large institutional investor that executed large trades in both the stock and futures markets.

The impact of the portfolio insurance stock selling combined with the impact of index arbitrage trading was the dominating force in the stock market during certain periods. On October 19, the combination of selling from portfolio insurance and index arbitrage totalled more than 63% of stock volume from 1:10 to 1:20 p.m. and over 60% both from 1:30 to 1:40 and 1:50 to 2:00 p.m.. Likewise, on the morning of October 20, when stock prices began to decline rapidly, more than 6.3 million shares of portfolio insurance selling occurred.

In addition to direct effects, the use of derivative products in program trading strategies had a significant indirect impact on the markets -- particularly on October 19 -- in the form of negative market psychology. Although difficult, if not impossible, to quantify, the staff believes that futures trading during the critical periods had a disproportionately negative effect on the market considering the absolute number of contracts or shares sold in arbitrage or portfolio insurance strategies. First, the knowledge by market participants of the existence of active portfolio insurance strategies created a market "overhang" effect in both the futures and stock markets. Institutional traders were able to anticipate significant selling in futures and stocks coming from portfolio insurance. Thus, they refrained from entering the market as buyers and their absence acted as a damper to price rises. More important, however, was the effect on market psychology of the persistent discount that appeared in the S&P 500 future on October 16 and continued at record levels on October 19 and throughout that week.

^{40/} Index-related arbitrage accounted for 42.1 million shares on September 11, 1986 (18% of NYSE volume) and 41.9 million shares on September 12, 1986 (17% of NYSE volume). September 1986 Report, supra note 39, at 9.

A number of institutional investors have informed the staff that these discounts acted to discourage institutional participation in the stock market on the buy side, particularly in the afternoon of October 19 when the market suffered its steepest declines. To those investors, the persistent, and enormous, discounts between futures and equities indicated that the market was headed lower and thus that buyers should wait to purchase stocks at even lower levels. As we noted, to some extent these discounts may have been illusory on the morning of October 19; nevertheless, they were sufficient to spur substantial arbitrage activity. Moreover, it was not the actual size of the discounts that was significant, but the effect that the discounts had in convincing many institutions to focus their portfolio insurance liquidations on the stock market and in discouraging potential buyers from purchasing stocks.

Persistent discounts in futures not only kept buyers out of the market, but also discouraged participation of block positioning firms, or at least discouraged them from risking their firm's capital, to position large blocks of equities. As discussed in Chapter Four, block positioning firms sharply reduced their activity on October 19 and 20. Moreover, some firms reported in staff interviews that they were willing to position blocks only in relation to the price in the futures market, a level far below stock prices disseminated simultaneously.

It is difficult to quantify with any precision the overall effect of derivative products on the size of the decline in stock prices that occurred on October 19 and the weeks that preceded it. Other factors were present in the markets at that time, including those fundamental factors that we discussed above. Also, present were such non-economic factors relating to world politics as the attack by U.S. military forces on an Iranian oil platform. And, as we note in other parts of this report, operational breakdowns and stresses, coupled with financial stresses, were a significant part of the overall picture during this period.

Moreover, the conclusion that futures-related trading contributed significantly to selling pressure in the equity markets during the October market break does not diminish the role that futures played in providing liquidity to "synthetic" stock sellers. The availability of futures absorbed some amount of selling pressure that otherwise might have resulted in direct selling in the stock market. For example, on October 19, 162,000 SPZ futures contracts changed hands, the equivalent of nearly \$20 billion of equity securities in the stocks that comprise the S&P 500 index. After deducting the trading engaged in by floor traders, who accounted for about 31% or 50,000 contracts, the futures market traded more than \$14 billion in "synthetic" stock sales, an amount equal to 58% of the NYSE dollar volume for October 19.

At the same time, however, it is important to emphasize that futures liquidity was reduced substantially during the October market break. ^{41/} In fact, it was well below

^{41/} For example, "evidence of the relatively low level of activity in derivative markets is that for the week [of October 19] as a whole, the equity value of index futures traded was only 68% of stock [dollar] value traded, a figure that is usually in excess of 200%. Also, the exercise value of index options traded was 37% of stock value traded, a figure that in the previous week was 298% of stock value traded." J. Hill, Commentary on the October 1987 Stock Market Crash (Kidder, Peabody & Co., October 23, 1987) ("Kidder, Peabody Commentary") at 3. See Toy & Zurack, Stock Index Options and Futures . . . sifting through mid-

the levels anticipated by institutions with portfolio insurance strategies. Indeed, one study indicates that futures transaction costs "exploded" on October 19 and 20. 42/

It is difficult to measure the degree to which portfolio insurance and other institutional trading strategies contributed additional selling that, but for the availability of the futures markets, would not have occurred. In analyzing this question, it is important to note how portfolio insurance diverges from more traditional asset allocation strategies. Many traditional asset allocation strategies attempt to shift fund assets from stock to bonds or other investments based on a determination as to which investment will bring higher returns in the near to intermediate term. Asset allocations are made based on fundamental value indicators and attempt to be predictive of future price increases. As the strategy has been employed, it did not involve adjusting a portfolio so quickly as to require substantial trading in a short period of time. 43/

In contrast, portfolio insurance provides for disciplined and immediate selling after the market turns down. Moreover, most portfolio insurance selling generally is triggered by a single event, a market downturn, rather than widely divergent views as to the future course of the stock market. In interviews with pension plan managers and portfolio insurance brokers, it became clear that their strategies depend on increased and concentrated trading rather than on more gradual stock sales that characterize traditional asset allocation strategies.

The increasing popularity of portfolio insurance has had a number of identifiable effects on the market. First, because portfolio insurance, in effect, acts as undisclosed selling pressure, it has a significant overhang effect. Disciplined portfolio insurance attempts to emulate a put option, limiting the total loss that will be experienced by a portfolio during a downturn. When puts are purchased, however, they send a bearish message to the market, with price increases in the put options being translated into price decreases in the component stocks through arbitrage or options market makers

October's market (Goldman Sachs, 1987) ("During [the] week [of October 12] the December S&P 500 futures contract fell 9.42%, heavy losses forced many locals and other speculators to the sidelines and drained liquidity from the S&P pit."); Szymczak, A Major League Lesson for Floor Traders, Futures 48 (December 1987).

42/ S. Bodurtha, The Impact of October 19 on Transaction Costs in the Equity and Stock Index Futures Markets: A Preliminary Update (Kidder, Peabody & Co., undated). Bodurtha reports that in September the average price change between reported trades in the December S&P 500 was 0.05 index points, 0.02% of the index value, but that "[t]he average price change between reported trades exploded on October 19 to a level of 0.66, and to 0.89 on October 20. In percentage terms, 0.89 represents 0.41% of the average price of the December S&P 500 futures on October 20 [a 487% increase over early October]." In addition, Bodurtha estimates that, in September, the average bid/ask spread in S&P 500 stock was \$0.23 per share, or 0.45% of market value in September, but that, in November, this spread increased to \$0.29 per share representing 0.77% of market value. See Toy & Zurack, supra note 41 ("the bid/ask spread on the futures contract widened dramatically [on October 19] making it very difficult to determine at what price S&P 500 futures could be purchased").

43/ Light & Perold, supra note 5, at 115.

hedging their short positions. With portfolio insurance, on the other hand, no bearish message is sent to the market even though the investment strategy adopted by the institution is essentially identical. Accordingly, instead of a direct message sent through a put purchase, the market becomes generally aware that there is an increasingly large commitment to sell futures, stocks or both, anytime the stock index price moves downward. The market suffers from limited information that does not permit it to calculate selling interest successfully. The impact of this limited information is to discourage buying activity during market downturns because market professionals cannot determine whether any rebound in the market will be overwhelmed by an avalanche of portfolio insurance futures selling and resultant index arbitrage selling in the stock market.

Second, by the very nature of the strategy, portfolio insurance increases the concentration and velocity of institutional trading. As discussed in detail above, portfolio insurers were very active sellers on October 19 and 20, with a single pension fund selling 36 million shares of stock over the two days. The fund also sold almost 7,000 SPZ futures contracts, the equivalent of approximately 19 million shares, over October 16 and 19. In our interview with senior personnel of that pension fund manager, they indicated that their determinations to maintain relatively high equity investments were made, in part, because of reliance on the risk-reduction capability of portfolio insurance. The Task Force Report survey confirms this impression. ^{44/} The survey indicated that institutions employing portfolio insurance had an average of 56% of funds under management invested in equities as compared to 46% for other money managers who did not use this strategy. Moreover, four of the portfolio insurers responding to that survey indicated programs calling for the liquidation of anywhere from 22% to 50% of their equity holdings in response to a 10% S&P 500 index price decline. ^{45/}

While the actual liquidations effected were apparently less than the programs called for (perhaps due to the inability to sell the full amount desired at acceptable prices), our review leads to the conclusion that portfolio insurance dramatically increases the amount and velocity of trading and permits a group of institutions that manage a relatively small proportion of total pension fund assets to have a substantially disproportionate impact on stock market volatility. In contrast, the responses to both the SEC and Task Force Report surveys of institutions suggest that institutions following more traditional investment strategies were not major sellers during the break. The SEC staff surveyed the 23 pension fund managers with the largest amount of money under management. Of the 20 that responded, 14 did not use portfolio insurance and one had not employed the strategy since 1986. During the week of October 19, these managers were relatively inactive. Indeed, on average, these managers sold only 1.4% of their portfolios. Perhaps even more significantly, at least four of these managers were net buyers on both October 19 and 20. ^{46/} The Task Force Report survey shows a

^{44/} Task Force Report, *supra* note 36, Study V: Surveys of Market Participants and other Interested Parties ("Study V"). See also Task Force Report at 9.

^{45/} Study V, *supra* note 44, at V-15.

^{46/} Although a questionnaire was sent to 23 money managers, only 11 entities (47.8%) responded with data regarding net purchases and sales for these days. Thus, while our survey shows 17.4% of the money managers surveyed were net buyers,

similar trend, with 74% and 71% of those money managers not using portfolio insurance taking no action on October 19 and 20, respectively. Moreover, of the remainder, a greater percentage apparently purchased equities than sold.^{47/} Our staff interviews of institutions that were active traders on October 19 provide another example. One manager of a major university endowment reallocated the endowment's portfolio from two-thirds stock to one-third stock during August and September, 1987. During the week of October 19, however, he responded to low stock prices, and the discounts available in the futures markets, by purchasing 4,000 SPZ futures contracts, which is the approximate equivalent of 10,750,000 shares of stock.

In reviewing the events of October 1987, it is important to emphasize that the increased concentration of trading in derivative index products is not attributable only to portfolio insurers. While more difficult to quantify, we believe that low execution costs and margin requirements for derivative index products have encouraged a wider group of institutions to depend on the liquidity of the index futures markets to liquidate substantial portions of their equity portfolio more quickly than they would be able to through the stock market. As demonstrated on October 19, however, the assumed liquidity levels of the futures market become dramatically lower during a market plunge, resulting in large futures price discounts and spillover stock selling.

The third significant effect portfolio insurance, combined with the resultant program selling in declining markets, has had on the market has been to substantially increase the risks for equity specialists. In traditional institutional block trading, the specialist generally is a peripheral player. Blocks are negotiated upstairs by major block positioning firms and crossed on the floor with only limited participation by specialists, who may provide some liquidity for that block. Even when an institution chooses to "work" a block by gradually selling it on the floor, the specialist is not expected to absorb most of the selling interest but, instead, to cooperate in its relatively passive selling.

The impact on specialists of program selling of blocks is very different. The orders arrive through the NYSE's LIST system in rapid succession. The specialist has no means to estimate when the rush will stop. Moreover, block positioning firms, which ordinarily would find both sides to the trade, simply send the programs down to the floor with the expectation that the specialist generally will be on the other side of the program orders, either as principal or agent. Thus, while institutionalization of the markets for years has deemphasized the role of specialist marketmaking, program trading suddenly has reelevated that role and placed the specialist in the position of having to take much greater proprietary positions than ever before. The specialists' difficulties in accommodating institutions' expanded needs during the October market break is discussed in detail in Chapter Four.

E. Summary and Issues Requiring Further Review

In summary, we believe that three dramatic trends have occurred as a result of trading in derivative index products. First, stock index futures have supplemented and often replaced the stock market as the primary price discovery mechanism for stock

this percentage actually could be larger.

^{47/} Study V, supra note 44, at V-18.

price levels. Indeed, due to the linkages between the two markets, the futures market has become the market of choice for many institutions that trade actively. Second, the availability of the futures market has spawned institutional trading strategies that have greatly increased the velocity and concentration of stock trading. Third, the resultant increase in index arbitrage and portfolio insurance trading in the stock market has increased the risks incurred by stock specialists and has strained their ability to provide liquidity to the stock market.

We believe that the result of these three interwoven trends has been to increase the probability of abrupt market price swings. We note that the October market break was not just a dramatic one-time reevaluation of securities markets. The aftershocks of October 19 continue to affect the markets today. As discussed in detail in Chapter Four, quote spreads, liquidity and continuity on the NYSE continue to evidence the decreased liquidity that has characterized the market since the October market break. Moreover, actual market volatility has been substantially higher. Indeed, implied future volatility as measured by options premiums remains at over twice the level set before October 19.

We cannot confidently conclude that the impact of futures trading will be reduced substantially because of lessons learned during the October market break. Although the Task Force Report survey and our interviews indicate that a significant number of pension plan managers have reevaluated the use of portfolio insurance, we believe it is inevitable that many institutions will continue to rely on the futures market to liquidate large amounts of stock positions after market downturns have commenced. Moreover, while the reduction of portfolio insurance may make individual sellers more restrained, the steadily increasing number of institutions employing the futures market for other strategies may, in the aggregate, continue to increase the impact on the stock market of futures trading. The market will, of course, "self-correct" to some degree. However, continued volatility, such as the 140-point drop in the DJIA on January 8, 1988, suggests that any self-correction has not as yet been sufficient to prevent large price swings that do not appear to be fully explained by economic fundamentals.

The Division continues to believe that derivative index markets provide valuable hedging and market timing benefits to institutions. As a result, any changes to the regulation of those products must be effected with great care. Nevertheless, we believe a number of responses should be thoroughly explored. In particular, we believe that the Commission should weigh the costs and benefits of (i) initiatives that might increase the capacity of the stock market to provide liquidity for more concentrated institutional trading, and (ii) actions that might retard the increased velocity and volume of intermarket trading. The following discussion considers certain initiatives that might address these goals.

1. Market Basket Trading

We remain concerned over the impact of market basket activity on the liquidity of the stock market. To some extent, it may be possible to address liquidity concerns by increasing the capital of stock specialists. While we favor steps to encourage such an increase, we are doubtful that increased capital alone will result in greater liquidity under present trading conditions. Irrespective of the amount of capital, specialists are unlikely to provide greater liquidity when they are unable to identify the nature and amount of additional index-related selling that will hit them. This is particularly true

if, as occurred during the October market break, upstairs block positioning firms substantially reduce their capital commitments during market price drops.

We suggest that an alternative approach be examined. Presently, program trades must be broken up and distributed around the stock floor with the resulting substantial transaction costs and effects discussed above. The creation, however, of one or more posts where the actual market baskets could be traded might alter the dynamics of program trading. The availability of basket trading on the NYSE would, in effect, restore program trades to more traditional block trading techniques. The basket specialists would be able to identify the nature of each trade and we are hopeful that this would encourage block positioners to again become active in providing capital to position the program blocks. While arbitrage would continue to flow directly to the individual stocks to maintain their pricing efficiency, other institutional trades could be focused on the basket posts where the specialist and trading crowd could provide an additional layer of liquidity to the system and cushion somewhat the individual stocks from the intra-day volatility caused by program activity. 48/

The feasibility and design of basket trading would require substantial analysis. To be useful, it would require an extremely well-capitalized specialist, perhaps affiliated with a major block positioning firm, and perhaps additional supplementary market makers. While the product would require physical settlement of the basket, this would not appear to impose greater burdens than exist in settling program trades today. A requirement that any participant have the capability to settle the trade through automated book-entry delivery of the securities, however, may be appropriate. In addition, the design and need for more than one basket raises difficult questions. There are already a number of futures and options now trading based on a wide variety of indexes. Moreover, many educational institutions are prohibited from purchasing certain stocks that logically might be included in any basket because of social and political policies. While these issues are substantial, we believe the concept of basket trading warrants consideration. 49/

48/ Similar ideas have been discussed in S. Grossman, *An Analysis of the Implications for Stock and Future Price Volatility of Program Trading and Dynamic Hedging Strategies* (Working Paper, CSFM - #158, June 1987); N. Katzenbach, *supra* note 29, at 29; H. Stoll & R. Whaley, *Program Trading and the Monday Massacre* (November 4, 1987); H. Stoll, *Portfolio Trading* (September 1987, Working Paper No. 87-14); and H. Stoll, *Index Futures, Program Trading and Stock Market Procedures* (Revised, September 1987, Working Paper No. 87-13, forthcoming *Journal of Futures Markets*).

49/ It is beyond the scope of this study to consider changes that might be made in the futures markets to better accommodate portfolio trading and its effects. The Division notes, however, that there is an ongoing debate in the futures community regarding how, if at all, the futures markets can more efficiently handle large, block-size transactions. *See, e.g.,* K. Pierog, *How Will the Futures Industry Handle Block Trading?*, *Futures* 78 (October 1987). The securities markets have facilitated the execution of such trades by establishing special procedures both in the stock [NYSE Rule 127] and options [Chicago Board Options Exchange ("CBOE") Rule 6.74(b)] markets that provide a mechanism, including size precedence, to allow upstairs block positioner capital to interact with the floor so that trades can be executed with minimum price impact and maximum public participation.

2. Derivative Product Leverage

The evolution of futures trading strategies has increased the degree and concentration of institutional trading, which in turn has increased the probability of wide price swings such as occurred during the October market break. While increased institutional trading is not something the staff believes should be discouraged, it does raise concerns when it becomes so concentrated that it overwhelms the ability of any organized market to maintain orderly trading. For this reason, we believe that thought should be given to harmonizing the available leverage of derivative products with the leverage permitted for stocks. ^{50/} We believe this leverage derives from two sources--cash settlement and margin.

The availability of cash settlement eliminates the risk that a market participant must liquidate its position prior to the termination of the future or accept delivery (and make payment for) a market basket of stocks. The absence of this risk may increase the willingness of market participants to take larger positions with accompanying tighter triggers for the sale of those positions if the market reverses direction. In particular, portfolio insurers, who often have segregated their futures trading in a different firm from the one that handles their stock portfolios, may be reluctant to take such large futures positions if they faced the risk of accepting delivery of the actual basket of stocks.

Requiring physical settlement of index products, while an obvious remedy, raises a number of practical problems. First, unless some cash settlement exception was made for public investors holding small futures positions, physical delivery would be unwieldy and expensive. Second, a physical delivery requirement might impose extremely high risks on options writers who, unlike futures holders, would be subject to exercise (and

Similarly, to the extent some of the large discounts to cash in the futures market reflect the price effect of block trades, efforts by the futures markets to provide better systems for integrating block trading may help ameliorate these price effects. Accordingly, it may be appropriate for the CFTC and futures markets to consider amending their rules to permit block positioning. Such efforts by the futures markets would complement NYSE efforts to facilitate portfolio trading in that both efforts would provide additional procedures and capital for the trading of portfolio-sized transactions (e.g., 200 SPZ futures are roughly equivalent to a \$25 million stock program).

^{50/} Our analysis has focused on futures trading because index futures, not index options, have been the primary tool employed by portfolio insurers and index arbitrageurs. Nevertheless, index options could be employed as a substitute for futures. Indeed, increased usage of protective put programs has been discussed as an alternative to dynamic hedging models designed to create a synthetic put, although high put premiums apparently have made such an alternative uneconomical. Accordingly, we believe that any consideration of regulatory changes should apply equally to the index options and the index futures market.

therefore required to take or provide delivery) at any time. ^{51/} Nevertheless, the staff will continue to review the feasibility and desirability of physical settlement for index products.

The other primary difference in leverage between the stock and derivative product markets is margin. For example, before October 19, a purchaser (or seller) of an SPZ futures contract trading at an index value of 300 was able to acquire (or sell) approximately \$150,000 worth of stock for an initial margin payment of \$10,000 (6% of the contract's value). An investor who qualified as a hedger had to put down only \$5,000, which was only 3% of the contract's value. Index options margin is computed on a percentage basis, imposing a margin requirement for short options positions of 5% of the index value plus the premium paid. As demonstrated by Chart 3-9, the resulting options margin, as well as the margin for the other actively traded index futures contract, the Chicago Board of Trade's ("CBT") Major Market Index ("MMI") future, was comparable to margin on the SPZ 500 future.

After October 19, the value of the SPZ dropped and the amount of margin was raised in a series of steps to \$20,000 (\$15,000 for hedgers). In December, however, SPZ margin levels were reduced to \$15,000 (\$10,000 for hedgers) so that today an investor buying or selling an SPZ futures contract need only put down approximately 12% of the contract value (8% for hedgers). Similarly, index options margin has been increased to 10% of the index value plus premium. Thus, the futures and options markets have increased margins to a level more consistent with the higher volatility of the markets. Nevertheless, these margins are far lower than the 50% margin requirement for investors in stocks, as well as the effective 20-25% levels at which specialists and self-clearing broker-dealers generally are able to finance their stock positions.

The impact of current margin levels is that an institution could use the SPZ futures contract to establish a speculative long position in order to increase quickly its stock portfolio position or a speculator could buy or sell the SPZ futures contract, and, with a margin deposit of \$1 million, could control a stock-equivalent position of over \$8 million. Similarly, a portfolio insurer or other institution wishing to adjust its portfolio quickly through the sale of futures could create a hedged short futures position with a market value exceeding \$12 million, with the same \$1 million deposit. This is significantly higher leverage than can be achieved under stock margin requirements. Moreover, the increasing popularity of index substitution, index arbitrage, and portfolio insurance, has resulted in an increasingly greater percentage of futures positions being taken precisely for the purpose of replicating cash market stock positions. Yet these positions require significantly less cash to establish than would the equivalent position in the stock market.

Leverage historically has been a fundamental concern underlying federal margin regulation. ^{52/} Section 7(c) of the Securities Exchange Act of 1934 ("Exchange Act"),

^{51/} We also note that the only index future providing for physical delivery, the Osaka 50 Stock Index, did not meet with initial success, although trading volume recently has increased.

^{52/} See, e.g., H.R. Rep. No. 1383, 73rd Cong., 2nd Sess. 8 (1934); S. Rep. No. 1455, 73rd Cong., 2d Sess. 11 (1934); Stock Exchange Practices, Hearings on S.2693 Before the Senate Comm. on Banking and Currency, 73rd Cong., 2nd Sess. 6494

which applies to extensions of credit by broker-dealers on other than exempted securities, was part of the original legislation adopted by Congress in 1934 as a means to regulate credit in the securities markets. Section 7(c) generally requires that any extension of credit made by a broker-dealer to permit a customer to purchase securities must be made in conformity with rules promulgated by the FRB. 53/

In contrast to the securities markets, futures markets are not subject to federal margin levels. The CFTC has authority to prescribe margin levels for futures only in emergency situations. Otherwise, margin levels are set by the commodities exchanges. 54/

The Division recognizes the distinctions between futures and stock margin. Futures margin is, in effect, a performance bond that does not include an extension of credit. 55/ Futures margin has focused entirely on ensuring that both parties satisfy their respective obligations under the futures contract. Futures positions are marked to the market daily 56/ and all margin calls usually are required to be paid on a same day basis.

The Division believes, however, that low derivative product margins may contribute to the increased velocity of institutional trading in two ways. First, the Division believes that present margin requirements permit institutions to buy and sell larger futures positions without being required to substantially increase the amount of

(1934). See also FRB, A Review and Evaluation of Federal Margin Requirements (December 1984).

53/ The FRB is responsible for setting margin regulations, while enforcement of the regulations is the responsibility of the Commission. The FRB rules that regulate securities margin are Regulations T, U, G, and X. Regulation T governs the extension of credit for securities by broker-dealers. See 12 CFR Sec. 220. Although the FRB has authority to set both initial and maintenance margin levels, it has to date chosen only to set initial margin requirements. Regulation T currently requires that upon purchasing a stock a customer of a broker-dealer must post 50% of the security's value as margin. A short seller must post initially 150% of the value of the security sold.

Broker-dealers also are subject to the maintenance margin requirements of the NYSE or NASD. NYSE Rule 431 and Appendix A to the NASD's Rules of Fair Practice require that a broker dealer maintain at least 25% of the value of all long securities in the customer's margin account. More detailed formulae establish the minimum maintenance margin requirements for short positions.

54/ See Secs. 8a(a) and 5a(12) of the Commodity Exchange Act ("CEA"), 17 U.S.C. Secs. 12a(9) and 7a(12) (1982).

55/ Margins required of short stock sellers and of uncovered options writers also could be characterized as "performance bonds", although they are regulated as "extensions of credit" under current securities margin regulation.

56/ The phrase "marked-to-market" refers to the exchange and clearing entity practice of updating margin requirements based on intra-day movements in the asset's price.

their assets maintained in cash equivalents. ^{57/} Second, low margins contribute to speculative trading that, under normal market conditions, contributes to the illusion of almost unlimited liquidity in the futures market. During a market break, however, that liquidity disappears at a rate geometrically larger than liquidity in the lower leveraged stock market. ^{58/} For these reasons, the Division believes that there should be a review of the impact on the stock market of present index futures and options margin levels.

The Division makes this suggestion, however, with the recognition that higher margin requirements would increase the costs of trading futures and options. Accordingly, any analysis of margin requirements also must consider whether any benefits obtained from reducing the liquidity demands on the stock and derivative markets outweigh the costs and potentially lower derivative product liquidity during periods of normal market activity. ^{59/} In making this observation, we would note two points. First, the development of equivalent index futures margin does not require that those margin levels be identical to stock margin requirements. The mark-to-the-market requirements for futures act as a leverage limit by forcing market participants to make arrangements to have sufficient cash to meet those marks in volatile periods. Second, stock and options regulation always has permitted lower margin requirements, and thus greater leveraging, for market makers in order to enhance market liquidity. In light of the indications that futures floor trading did not directly contribute to the selling pressure during the October market break, we would expect that even if futures margins are increased for investors, similar exceptions might be appropriate for futures floor traders. This would limit the liquidity cost of any increase in futures margins.

^{57/} The Division recognizes that the futures exchanges permit top-tier institutions to employ letters of credit to meet initial margin requirements. Also, portfolio insurers and other hedgers could borrow against their stock positions to obtain the cash required for higher futures margin deposits, although presumably collateral would have to be deposited for such borrowing. Thus many institutional investors would not necessarily be affected substantially by higher margin levels. Nevertheless, given the segregation of stock and futures management effected by many portfolio insurers and the usual bank requirement that any such letter of credit be fully collateralized, we believe that increased futures margins would reduce the concentration and velocity of futures trading by institutions employing strategies such as portfolio insurance.

^{58/} See Kidder, Peabody Commentary, *supra* note 41.

^{59/} In this regard, it may be desirable, to review alternative means to address the leverage differences of the derivative and stock markets and to ameliorate concentrated liquidity demands during periods of price volatility. Chairman Ruder has suggested that it may be appropriate to consider system-wide position limits for stock index products -- both futures and options. D. Ruder, *The Impact of Derivative Index Trading on the Securities Markets*, Address Before The Bond Club of Chicago, dated October 6, 1987 ("Ruder Speech") at 16. Such an approach would recognize the functional equivalence of index futures and options and the potential cumulative impact of such products on the stock market.

3. Price Limits

Price limits historically have been employed in the futures markets to address extreme price volatility. Price limits operate by prohibiting trading outside the limits for the remainder of the trading day. ^{60/} Price limits attempt to address two concerns. First, during periods of extreme volatility, the futures trading floor may be unable to maintain an orderly market with acceptable depth and liquidity. Second, unlimited price movements may expose futures clearing corporations to greater loss exposure. ^{61/}

On October 23, the CME established price limits for the SPZ contract. ^{62/} The limit was set to, in effect, cause trading to cease if the future moved 30 points in one day, roughly a 12% move. The only times in the history of the SPZ in which a move of that magnitude occurred were on October 19 and also on October 22, when the future opened down approximately 55 points, at a dramatic 21% discount to the cash value of the index.

The Division believes that price limits may be a rational response to the present leverage levels in the index futures market. Nevertheless, we believe that there are substantial problems with their effectiveness. Price limits on index futures when there is an active alternative pricing mechanism in the stock market are somewhat self-defeating. The ability of institutions to shift their liquidations to the stock market was amply demonstrated on October 19 and 20. Price declines in the stock market after the future hit the price limit and trading in the futures ceased would place futures traders at substantial risk because of the inability to adjust their futures positions.

^{60/} The price limits instituted by the CME on October 23, 1987 work on a three-day cycle using daily up or down limits of 30 and 45 points. A daily limit up or down of 30 points from the previous day's settlement value exists. If on any two consecutive days, the price limit is reached, the limit would increase to 45 points. If trading on the third day reaches the 45-point limit in the same direction, trading would cease and the next day's limit would remain 45 points. If, however, the 45-point limit was not reached on the third day, the limit on the following day would revert to 30 points.

^{61/} See generally Brennan, A Theory of Price Limits in Futures Markets, 16 *J. Fin. Econ.* 213 (1986); S. Khoury & G. Jones, Daily Price Limits on Futures Contracts: Nature, Impact and Justification, 3 *Rev. Research in Futures Markets* 22 (1984).

^{62/} In response to the market events of October 19-20, other futures exchanges adopted price limits for their stock index futures. The CBT implemented a daily 40-point price limit for its MMI contract on January 13, 1988. This 40-point price limit would increase to 60 points if a contract closed at the 40-point limit in three or more delivery months on two consecutive trading days. The CBT also established daily price limits for its Institutional Index futures contract. Similarly, the New York Futures Exchange implemented a 25-point limit, which would increase to 35 points if the 25-point limit were met for two consecutive days, for all its stock index futures contracts. These were effective through January 21, 1988. The Kansas City Board of Trade also has a 30-point price limit for the Value Line futures contract it trades. This limit remains in effect.

Moreover, we do not believe, as a general matter, that price limits should be imposed on stock trading, although brief trading halts based on pre-set standards may warrant further consideration. The automatic closure of stock trading for the remainder of the day, in our view, imposes unacceptable burdens on those market participants who wish to liquidate their positions and increases the potential that a volatile market situation can slide into panic. ^{63/} As discussed in more detail in Chapter Eleven, the closure of the Hong Kong Stock Exchange provides a graphic example of the risks entailed in closing a stock market. ^{64/}

While we do not favor stock price limits, we do believe that greater coordination of stock and derivative index trading warrants further review. The CME price limit action was taken, in part, in response to concerns expressed by the Division to the CFTC and CME over the impact that substantial discounts of opening futures prices to the previous day's closing stock prices, as on October 22, could have on the opening of stocks composing the index. We believe that the dominance of the future as the price setting mechanism is most dramatic at the opening. The existence of a substantial futures price discount discourages specialists and other market participants from offsetting sell imbalances. Moreover, ongoing trading in the futures may hinder the opening of the component stocks by encouraging additional waves of sell orders. Finally, as discussed in a later section of this Chapter, the ability to trade futures before the component stocks have opened provides opportunities for firms to "front run" their customers' stock orders, possibly to the detriment of those customers.

We believe further review should be made as to whether these concerns might be addressed by prohibiting the opening of index futures and options contracts until a set percentage in value of the stocks comprising the index commenced trading. Similarly, such a review should evaluate whether derivative products should automatically stop trading when trading in an identified percentage of the stocks comprising the index has been halted. ^{65/}

4. Short Sale Restrictions

Restrictions on short sales (e.g., selling an index future without owning the underlying component stocks) have never been imposed on options and futures products. Moreover, the difficulties of extending such restrictions to options and futures products would be substantial. The Commission's short sale rule, Rule 10a-1 under the Exchange

^{63/} Such automatic limits should be distinguished from the temporary trading halts imposed by the NYSE and other equity markets in response to order imbalances. An order imbalance halt is in response to the particular need to seek additional liquidity for a particular stock.

^{64/} We acknowledge that price limits on individual stocks may have reduced price drops on the Tokyo Stock Exchange ("TKE") on October 19. This was accomplished, however, at the cost of eliminating any ability of market participants to adjust their positions on most TKE stocks for the day. Moreover, the dominance of four broker-dealers, as well as a greater propensity to hold stocks longer term, may make it easier to stabilize the Tokyo market.

^{65/} In this connection, we note that index options presently are required to halt trading if 20% of the stocks composing the index are halted.

Act, prohibits persons from selling stocks short at a price below the last sale price ("minus tick") or when the last trade involving a change in price was a minus tick ("zero-minus tick").^{66/} Yet index futures or options quotations normally would respond to downward movements in the cash index by adjusting downward. To restrict a futures or options trader from selling short on a minus tick when he is simply responding to price declines in the cash index imposes unacceptable risks on that person. To design a short sale restriction that takes into account movements in the underlying cash index would be extremely complicated and impose substantial compliance burdens.

Nevertheless, the absence of short sale restrictions, coupled with the greater leverage of futures, arguably presents the potential for greater speculative selling than could occur in the stock market. Moreover, through index arbitrage, that selling activity generally can be transferred to the stock market. Accordingly, it appears appropriate to review the manner in which index arbitrage is treated under short sale regulation.

Rule 10a-1 contains a number of exceptions to permit certain types of trading activities that are believed to be beneficial to the markets or that carry little risk of the kind of manipulative or destabilizing trading that the Rule was designed to address. For instance, paragraphs (e)(7) and (e)(8) of the Rule exempt certain bona fide arbitrage transactions from compliance with the provisions of the Rule. Moreover, paragraph (e)(13) of the Rule allows a block positioner who is selling a security in that capacity to disregard, in determining whether it is long or short, a proprietary short position in that security to the extent such short position is the subject of one or more offsetting positions created in the course of bona fide arbitrage, risk arbitrage or bona fide hedge activities. The definition of "bona fide arbitrage," however, does not include index arbitrage involving the short sale of stocks against long futures positions. As a result, short index arbitrage generally is subject to the "tick" requirements of Rule 10a-1.

The Division has taken an interpretive position that provides a narrow exception to Rule 10a-1 for certain liquidations of index arbitrage positions. Specifically, the staff has permitted the "unwinding" of existing index arbitrage positions involving long baskets of stock and short index futures or options without aggregating short positions in these stocks with other proprietary accounts if those short positions are fully hedged.^{67/} The Division took this position because the unwinding of an existing long arbitrage position did not create a new short position, nor should any price decline resulting from the selling benefit the firm because its remaining positions are "fully hedged." Nevertheless, this no-action position did facilitate the ability of firms to take

^{66/} See discussion at 3-7 and note 30, *supra*. The Commission's short sale rule generally is tied to the consolidated tape (i.e., the stream of last sale prices from all equity markets in NYSE securities). On the NYSE, pursuant to an exchange rule authorized under Exchange Act Rule 10a-1, compliance is measured with regard to the last sale on the NYSE.

^{67/} See letter to Merrill Lynch, Pierce, Fenner & Smith, Inc. (December 17, 1986).

index arbitrage positions by reducing restrictions on their ability to liquidate those positions. 68/

Several commentators have argued that the restrictions on short index arbitrage that result from application of the short sale rule hinder pricing efficiency. Moreover, these commentators suggest that if short sale restrictions had not applied, short index arbitrage would have eliminated the large discounts on October 19 and ameliorated price volatility on that day. 69/

The Division is not in a position to conclude whether the absence of restrictions on short index arbitrage would have eliminated the index futures price discount on that day. Given the risks in executing arbitrage on October 19, however, we believe it likely that substantial, although perhaps smaller, discounts would have remained. We also cannot determine whether increased arbitrage on October 19 would have reduced stock market volatility on that day. Arbitrage closes index futures discounts by raising the price of the future (through buying) and lowering the price of the stock (through selling). While reduction of the index futures discount might have encouraged portfolio insurers and other institutions to continue selling in the futures markets rather than shift to stocks, and might have encouraged specialists and other potential stock buyers to purchase stocks, it also might have encouraged portfolio insurers to liquidate a larger portion of their portfolio, as called for by their insurance programs. Moreover, we have no basis to conclude that the "billboard" effect of the futures discount had a larger or smaller negative impact on stock market prices than would have occurred from additional stock selling resulting from short arbitrage activity.

In summary, the Division does not believe that the extension of short sale restrictions to the derivative markets is operationally feasible. Nor do we believe that the staff interpretive position providing for a narrow exemption from the Rule for certain bona fide arbitrage activity substantially contributed to price volatility during the market break. We do believe, however, that the ability of institutions to engage in index substitution activity without being subject to the short sale rule in combination with exchange for physical stock/futures transactions effected in London, has impacted the effectiveness that rule may have had in reducing stock market volatility. The Division believes the Commission should review whether reducing price volatility should remain a goal of the Rule and, if so, whether steps should be taken to increase its effectiveness.

5. Reporting Requirements

While the topics discussed above relate to questions regarding how to better integrate the stock index futures and stock markets, other matters also warrant further

68/ In response to a survey sent to 13 brokerage firms, only one firm quantified its transactions in reliance on the no-action position in unwinding index arbitrage positions in October. The most significant unwinding transaction by this firm occurred on October 16th. Other firms have been unable to quantify the extent to which they relied, or have advised as that they did not rely, on the no-action position during October.

69/ See, e.g., Crossen, Program Traders Find an Unlikely Ally in Bid to Abolish Uptick Rule on the Big Board, Wall St. J., Jan. 11, 1988, at 53.

consideration. Specifically, the Commission's recordkeeping and reporting rules may be inadequate to maintain effective oversight of the increasing level of portfolio trading.

In its September 1986 Report, the Division noted the need to develop a "cost-effective, routine means of identifying and maintaining easily accessible records of index-related trading." ^{70/} Since then, the Division staff has worked with the staff of the NYSE to design such a reporting system. Although such a reporting system was not in place before October, since the October market break the NYSE has required its members to provide a variety of information regarding their program trades. Moreover, because many, if not all, program trades are effected through the NYSE's LIST system and because broker-dealer firms must be able to monitor program trades for billing and other purposes, the ability of firms and the exchange to identify such trades has improved.

Despite these improvements the staff still experienced substantial difficulties in reconstructing trading during the October market break. First, the firms had no uniform procedures for reporting program trades, and some firms failed to provide, in response to the Division's initial data request, details concerning index-related trading effected outside the United States. Second, there was considerable definitional difficulty in identifying portfolio insurance activity. Third, unlike the futures market's large trader reporting system, there was no readily available means to identify quickly the large stock customers who bought and sold on October 19 and 20. ^{71/} These difficulties substantially impaired the ability of the staff to fulfill its oversight responsibilities and to coordinate gathering of trading information with the CFTC. Accordingly, the staff believes it would be appropriate to revisit the desirability of creating more specific recordkeeping rules at the broker-dealer level and developing a system, similar to the CFTC's large-trader reporting system, for rapidly identifying large traders in the stock market.

As a separate matter, it also may be appropriate to consider how to integrate program trade reporting within the current systems of last sale reporting. Today there is a well-developed system for reporting securities transactions on a real-time basis. These systems have readily accommodated the development of block trading because such transactions can be reported as easily as smaller-sized trades. Indeed, because of the importance of block trades, which may contain new information, the various securities information processors have developed systems for monitoring block trades on a real-time basis. The leading financial publications regularly report the breakdown of such trading activity.

In contrast, there is no regularized reporting of program trades. Only those broker-dealers and other professionals with sophisticated computer techniques (or floor

^{70/} September 1986 Report, *supra* note 39, at 3. See Ruder Speech, *supra* note 59, at 17-18.

^{71/} Although certain institutional money managers have to report their quarterly stock holdings pursuant to Section 13(f) of the Act, the so-called Section 13(f) reporting system was not designed to provide regularized access to trading activity by those money managers. See Lemke & Lins, *Disclosure of Equity Holdings by Institutional Investment Managers: An Analysis of Section 13(f) of the Securities Exchange Act of 1934*, 43 *Bus. Law.* 93 (1987).

traders in the futures and securities markets) can estimate the activity related to such trading. Thus, only the leading broker-dealers, based on their own trading activity (both proprietary and agency) and estimates (or reports) of other trading activity, readily can identify the amount of program trading. The Division believes it would be appropriate to consider how to integrate program trading within the context of traditional transaction reporting. If, as some have suggested, program trading is the "block trading of the 1980s," then it is appropriate to consider whether the more accurate and timely reporting of such trades can be made more readily available on a widespread basis. The development of a market basket trading of stocks would, of course, facilitate such a reporting system.

F. Manipulation and Frontrunning

The continuing rapid expansion of trading in index products also raises significant surveillance and enforcement concerns. These concerns focus primarily on the potentials for intermarket manipulation and frontrunning. This section of the Chapter provides a general description of each of these areas of concern and an overview of the findings of the reviews by the Division, the CFTC, and securities and futures self-regulatory organizations ("SROs") as to each of these concerns during the October market break. Finally, there is a discussion of recent regulatory initiatives to address intermarket abuses.

1. Market Manipulation

a. Regulatory Concerns

In the Division's September 1986 Report, we discussed concerns by some market commentators that if firms, through their trading, could push the index futures price out of line with the cash index prices, opportunities could be created to execute programs for their clients' and their own proprietary accounts. ^{72/} Under these hypothetical scenarios, if trading volume in a futures index contract was relatively light, and there was no significant news pending, an entity could begin purchasing or selling the futures contract. This buying or selling, in turn, could induce local traders to cover their short positions or close out their long positions, thus increasing the futures price disparity. As this pricing disparity increases, an index arbitrage opportunity would be created, resulting in arbitrageurs selling, for example, the overpriced futures and buying the stocks that comprise the index. This buying activity would increase the price of the individual stocks, permitting entities holding pre-existing long positions to liquidate their positions at a profit. ^{73/}

Since the October market break, there have been renewed concerns that index products could be used to manipulate the securities markets. While there generally has

^{72/} See, e.g., Dean Witter Reynolds, Equity Trading Bulletin Technical Market Comment, No. 1936 (December 15, 1986).

^{73/} It is important to note that the scenario requires the manipulator to take an extremely large risk as the result of maintaining the futures price at a disparity to the underlying stock prices. If the manipulator is unsuccessful in attracting a large market response as a result of his activities, substantial losses could be suffered.

been a consensus that the market downturn itself was initiated by changed investor sentiment based upon a variety of factors, including economic news and anticipation of a market correction, there have been allegations that manipulation using index futures may have occurred once the market break was underway. In particular, at least one press account 74/ has referred to possible manipulation in the MMI futures around mid-day on October 20 (the low point of the market break) to manipulate the stock market into a dramatic turnaround that precluded closing the NYSE.

b. Overview of Findings

Neither the futures trading data and reports provided by the CFTC and CBT nor the trading data compiled by the Division provide evidence to support allegations of manipulation of MMI futures between 12:00 and 1:00 on October 20.

A recent report by the CFTC's Division of Trading and Markets identified three CBT clearing member firms that reported the largest purchases over this period. 75/ These firms purchased 513 MMI contracts on a net basis all for customer accounts. More significantly, however, these trades were not executed during the more limited period between 12:30 and 12:50 p.m. when the November MMI contract rallied by approximately 80 points (27%) to 375. 76/ Identified purchasers over this period were even more dispersed, consisting mostly of small lot transactions between CBT locals. Two floor traders and one foreign investment firm were identified in the CFTC report as the largest purchasers between 12:30 and 1:00 p.m.; however, these purchases were not inconsistent with other trading activity during the day. 77/

There also have been press accounts that question the integrity of the trading data supplied to the CFTC and some fine points in the methodology of the CFTC analysis of this material. 78/ The Division's review of trading in the MMI futures on October 20 has used the trading data supplied by the CFTC. The Division's analysis of this surveillance material has, however, focused on the ten-minute period in which the MMI premium first appeared, as well as the 30-minute period reviewed by the CFTC. The CFTC/CBT surveillance information reviewed by our staff indicates that buying

74/ Hertzberg & Stewart, *Terrible Tuesday -- How the Stock Market Almost Disintegrated a Day After the Crash*, Wall St. J., Nov. 20, 1987, at 1.

75/ See CFTC Division of Trading and Markets, Analysis of Trading in the Chicago Board of Trade's Major Market Index Futures Contract on October 20, 1987 (January 4, 1988) ("CFTC MMI Report").

76/ See CFTC MMI Report at 9-12. Thereafter, the November MMI contract fell to 350.00 by 1:30 p.m.

77/ CFTC MMI Report at 12-14. The report also noted that the foreign investment firm traded in the December MMI rather than the more active November MMI contract during this period.

78/ Stewart & Ingersoll, *CFTC Report on Major Market Index Spurs New Questions on Its Oct. 20 Surge*, Wall St. J., Jan. 7, 1988, at 3. The CBT has denied the allegations reported in this article. See *CBOT Denies Giving False Data for CFTC Inquiry*, Wall St. J., Jan. 8, 1988, at 3.

activity in the MMI futures was not unusually concentrated in any one entity; nor were purchases effected for the proprietary accounts of any major registered securities broker-dealer. In sum, the Division's analysis has found no evidence of manipulation of the MMI futures.

This determination is reinforced by the Division's review of index-related trading on the NYSE during this period of time. Our review was based upon the detailed program-by-program trading information compiled by the Division in conjunction with the CFTC's Division of Economic Analysis. As discussed in Chapter Two, this information was obtained directly from the major broker-dealers who are active in index trading. ^{79/} This information indicates that one of the essential elements of the manipulative scenario raised in the September 1986 Report appears to have been absent on October 20. Specifically, although a premium of 3 to 5 points appeared around 12:40 to 12:50 p.m., only one resulting index-arbitrage program was identified by the program data from the broker-dealers. This arbitrage program consisted of the purchase of 40,000 shares of stock and the sale of 25 MMI contracts executed at 12:49 p.m., and constituted less than 0.10% of NYSE volume from 12:30 to 1:00 p.m. While we do not minimize the potential impact on market psychology of any futures premium at that critical moment, the information presently available to the Division does not appear to support the proposition that manipulation of the MMI futures was present in the market turnaround on October 20.

2. Frontrunning

a. Regulatory Concerns

The Division also is concerned over the potential for other types of cross-market trading abuses such as frontrunning. Frontrunning in the options markets occurs when a broker-dealer effects options transactions with the knowledge of non-public information about an impending block transaction in the underlying stock(s). Securities exchanges have issued written statements to their members advising them of the exchanges' policies against such frontrunning. ^{80/} Recently, exchanges have reminded their members that the prohibition against frontrunning applies to index products as well as to individual equity options. ^{81/}

^{79/} This trading information has been cross-checked against other trading and position data routinely compiled by the securities and futures SROs.

^{80/} Although none of the exchanges has a specific rule proscribing frontrunning, each exchange's policy prohibits this activity as conduct inconsistent with just and equitable principles of trading rules. *See, e.g.*, Philadelphia Stock Exchange ("Phlx") Rule 707.

^{81/} The options exchanges have issued circulars stating that trading in index options by persons possessing material, non-public information concerning imminent transactions in component stocks of an index may violate exchange rules regarding just and equitable principles of trade. *See, e.g.*, CBOE Circular No. 23, Revised July 1987; NYSE Information Memorandum No. 85-36, November 6, 1985. Circulars from the CBOE, NYSE, Phlx, National Association of Securities Dealers ("NASD"), and the American ("Amex") and Pacific ("PSE") Stock Exchanges were filed with the SEC as rule changes, and became effective upon filing, pursuant to

Frontrunning in the futures markets is not subject to the same regulatory scheme as exists in the options markets. Nevertheless, officials of the CME and CBT have stated to the Division staff that their rules also prohibit frontrunning of customer orders. In addition, the CFTC has indicated that the antifraud provision of the CEA may, in certain cases, prohibit such activity depending on the circumstances of the case and the persons involved. 82/

b. Overview of Findings

1. Frontrunning of Customer Futures Sales

Division staff reviewed surveillance data supplied to the Commission by the CME. This review sought to determine whether CME member firms known to be active portfolio insurance vendors or executing brokers traded ahead of customer orders implementing portfolio insurance strategies on October 16, 19, and 20, 1987. While the Division's review of this surveillance data indicates that some further inquiries appear justified in a few instances, most of the trades reported for CME member firm proprietary accounts in the data reviewed did not support the conclusion that portfolio insurance vendors or brokers traded ahead of customer orders. 83/

Specifically, the Division's review concentrated on an examination of SPZ sales reported for those CME member firms known to be active portfolio insurance vendors or brokers. The Division identified proprietary transactions effected shortly before or simultaneously with sell orders executed by the same CME firm for customer accounts. 84/ Since portfolio insurance trading was active during the last hour of trading on October 16 and the first hours of trading on October 19 and 20, the Division chose these periods as representative samples for examining whether frontrunning of agency orders occurred on these days.

A total of 1,997 SPZ contracts were sold for the proprietary accounts of these firms in 104 transactions during the last hour of trading on October 16. In seven transactions, firm proprietary orders were executed at prices higher than substantial

Section 19(b)(3)(A) of the Exchange Act, in October 1987. Securities Exchange Act Release No. 25233 (December 30, 1987), 53 FR 296.

82/ See Joint Study, supra note 19, at VII-40 to VII-41.

83/ However, because proprietary trades executed through another CME member clearing firm would be reported as customer trades, the Division is not able to exclude the possibility that some firms may have traded ahead in this manner. In addition, the Division is not able to identify from the data supplied to the Commission the trading of portfolio insurance vendors who are not CME member firms.

84/ The Division generally reviewed those agency orders executed within one minute of the proprietary trade because data on the times customer orders were received by CME member firms were not available to the Division. Of course, using a one minute time-frame may artificially narrow the scope of identified activity. It appears reasonable to assume that, in light of the firms' fiduciary obligations, most agency orders were entered and executed shortly after the orders' receipt.

customer orders executed by the firm in the following minute. The number of contracts sold for customer accounts by these member firms varied from 33 to 149 contracts. Similarly, during the first hour of trading on October 19 and October 20, the Division identified six and three proprietary transactions, respectively, executed immediately before substantial institutional sales handled by the firm as agent.

While these trades raise troubling questions, it should be noted that only three of the suspect trades involved transactions of ten or more contracts. Moreover, without further analysis, the Division cannot determine whether the reported times of execution are correct. Finally, on days such as October 19 and 20, there were legitimate reasons for firms to buy or sell for proprietary accounts in the futures markets, as well as in the stock and options markets, at the same time as conducting transactions for customers accounts.

Nevertheless, questions remain as to the propriety of firms possibly trading ahead of agency orders, such as the massive portfolio insurance transactions on those days, to the detriment of customers. The incidence of the questionable trades identified by the Division argues for careful review by the securities and futures SROs of potential frontrunning transactions by their member firms. §5/

ii. Firm Selling at the Opening

The Division also attempted to identify instances of firms trading in the futures markets ahead of customer activity in the stock market. The Division previously has been concerned over frontrunning in conjunction with Expiration Friday activity where a single firm might be aware of a large number of customer arbitrage programs that must be closed out before the opening. Similar concerns existed at the opening on October 19 and 20, when firms had information of massive customer sell (on October 19) and buy (on October 20) imbalances. Accordingly, the Division focused on firm proprietary activity at the opening on October 19 and 20 to determine whether firms may have sold futures (or bought futures on October 20) based on the knowledge of large institutional stock orders they were attempting to execute at the opening.

The Division's review again raised some troubling questions. Specifically, 13 firms included in the Division's survey sold 771 SPZ futures (4% of total CME volume) between 9:30 and 10:00 on October 19 before most of the component stocks had opened. Two major firms accounted for 57% of this proprietary selling activity. Similarly, on October 20, these same 13 firms purchased 484 SPZ futures (3% of total CME volume) between 9:30 and 10:00, with 3 firms accounting for 74% of that buying activity.

It is important to underline that this activity is not classic frontrunning. There were many indicators in addition to a firm's particular customers' orders that may have indicated that the market would open particularly low on October 19 (or higher on the 20th). Nevertheless, the impact of the firms' trading activity on those days inevitably was to somewhat increase the futures discount on October 19 (premium on the 20th) and contribute to delayed openings and customers receiving executions at lower prices on

§5/ In addition, questions have been raised, which are being reviewed, concerning firms buying futures on October 20 in anticipation of announcements of corporate customer buy-back activity. See Ricks, Practice of "Intermarket Front-Running" Faces Scrutiny After Task Force Study, Wall St. J., Jan. 14, 1988, at 6.

October 19 (higher on the 20th) than might otherwise occur. Accordingly, the Division believes that proprietary trading by firms at the opening in the derivative markets that may disadvantage customer orders they represent in the stock market should be thoroughly reviewed.

3. Regulatory Initiatives

In the September 1986 Report, the Division noted that, because index-related trading entails functionally equivalent investment instruments and involves trading across markets that are regulated by different federal agencies and SROs, existing market surveillance capabilities needed to be enhanced. Since the September Report, the Commission, the CFTC, and the various securities and futures SROs have been developing enhanced surveillance capabilities and lines of communication among the various regulators.

Detection of manipulation and frontrunning requires the identification of the parties to individual trades and the specific times at which trades occurred. For this purpose, all major securities exchanges have developed and use detailed, automated audit trails. ^{86/} In addition, effective October 1, 1986, ^{87/} the CFTC required all futures exchanges to have in place systems designed to capture trade data for all transactions effected on their floors within one minute of execution. ^{88/} Audit trails permit accurate reconstruction of trading in an accurate and timely manner, thereby facilitating surveillance.

The availability of futures audit trail information greatly enhanced the Division's and the CFTC's capability to reconstruct trading in order to review potentially manipulative or abusive trading during the market break. Enhanced audit trail information alone, however, is not sufficient to ensure detection of manipulative activity and frontrunning. It is important that all of the futures, options, and stock exchanges refine their surveillance programs to detect, on a routine basis, suspicious trading activity that may indicate manipulation or frontrunning.

Equally necessary to accomplish this goal is the efficient sharing of surveillance information and coordination of investigations and, in appropriate instances, enforcement actions by the various regulators. In 1981, under the Commission's auspices, the senior surveillance staffs of the major stock and options exchanges formed the Intermarket

^{86/} An "audit trail" is a time sequenced compilation of trading activity including certain characteristics of the trade (i.e., price, quantity, time, principal/agency designations, and identification of clearing firms and executing brokers) obtained from trade tickets submitted by the executing parties.

^{87/} See 51 FR 2684 (January 21, 1986).

^{88/} CME audit trail data include the following elements of each trade: (1) futures contract identification; (2) transaction price; (3) transaction size; (4) time bracket; (5) buy/sell designation; (6) executing brokers; (7) clearing member organizations; and (8) type of account. All trades must identify the account category for which the trade was executed as either for a CME floor trader or local, for a clearing member proprietary account, for another local present on the floor or for any other customer, member firm or broker not present on the floor.

Surveillance Group ("ISG") to facilitate this information sharing and regulatory coordination. Since the September 1986 Report, staff members of the CFTC and futures SROs have participated in several ISG meetings, and consideration is being given to expanding the ISG framework to include, on a formal basis, the futures markets. The Division intends to work closely with the ISG to ensure that futures exchanges have full access to securities information necessary to detect intermarket manipulations and frontrunning. Similarly, we believe that the securities exchanges must have efficient access to futures trading information.