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Remarks of  
David S. Ruder  
Chairman  
Securities and Exchange Commission

Before  
The Bond Club of Chicago

October 6, 1987

THE IMPACT OF DERIVATIVE INDEX TRADING  
ON THE SECURITIES MARKETS

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The views expressed herein are those of Chairman Ruder and do not necessarily reflect those of the Commission, other Commissioners or the staff.

REMARKS TO  
THE BOND CLUB OF CHICAGO

DAVID S. RUDER  
CHAIRMAN, SECURITIES AND EXCHANGE COMMISSION

OCTOBER 6, 1987

THE IMPACT OF DERIVATIVE INDEX  
TRADING ON THE SECURITIES MARKETS

I. Introduction

These are my first public remarks as Chairman of the Securities and Exchange Commission, and I am pleased that I am addressing the Bond Club of Chicago. Coming to Chicago is, after all, returning home for me and I welcome the opportunity to speak to so many of my friends. The topic that I have chosen to address today is the impact of derivative index trading on the securities markets. It is particularly appropriate to address this subject here, since Chicago is the home of the largest markets in both index options and futures trading.

One of the most fascinating aspects of my job as Chairman of the SEC is to grapple with the complexities of the securities markets in the late 1980s. As a regulatory agency, the Commission must react to continual evolution in the industry, analyze new market trends, and develop initiatives designed to ensure both the protection of investors and the need for healthy and competitive securities markets. In the area of derivative index trading, the Commission does not work alone, but shares jurisdiction over futures on stock indices with the Commodity Futures Trading Commission ("CFTC"). Although difficulties sometimes arise from the fact that regulatory authority is divided between our

agencies, the SEC and the CFTC have a long history of cooperation, and I am firmly committed to continuing this cooperation during my tenure as Chairman of the SEC.

## II. The Uses and Benefits of Derivative Index Trading

Before turning to problem areas, let me provide a descriptive background of derivative index trading. Over the past few years, active trading has developed in index-related products. In Chicago the two most active equity-related markets are the Standard and Poor's 500 futures market on the Chicago Mercantile Exchange and the S&P 100 options market on the Chicago Board Options Exchange. In general terms, these "derivative" products permit investors predicting market trends to buy or sell a product reflecting the prices of a typical group or index of securities rather than buying the securities themselves.

One starting point for understanding uses of derivative index products is to understand the distinct but frequently related activity called "program" or "basket" trading. These terms are intended to describe the simultaneous purchase or sale of blocks of large numbers of securities, or even of an entire portfolio of securities. In its most basic form, program trading is unrelated to derivative index trading. For example, a fund manager may engage in program trading by buying all of the stocks comprising an index such as the S&P 500.

Despite the possibility of pure program trading, that trading is often coupled with the use of derivative index

products in a strategy known as "index arbitrage." Index arbitrage may most easily be understood by use of an example, as follows: Assume that on December 1 the S&P's 500 future is trading at 318 1/ and the composite value of the basket of stocks underlying that index is 315. On that day a trader might sell the future at 318 and buy the basket of underlying stocks at 315, capturing the three point spread. 2/ When the index future expires, the terms of the futures contract will require that its value be determined by the underlying composite stock values. Therefore at expiration the spread between the future and the underlying stocks will disappear. If in our example the final index value is 320, our trader could let the future expire at 320 at a loss of two points, and close out the stock position by selling the basket of stocks at 320 at a gain of five points. In closing out these positions at a time when the net spread is

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1/ The fair, or theoretical, value of an index future product is a function of four factors: (1) the value of the index itself; (2) the time remaining to expiration and volatility of an index; (3) the brokers' carrying cost; and (4) the dividends to be paid by the stocks in the index through expiration. In addition, investors must consider transaction costs.

2/ Because index traders use computers to monitor continuously stock options and futures prices and calculate pricing discrepancies, there has been much discussion in the media and elsewhere about the "computerized" or "automatic" aspects of index arbitrage. In reality, computers make ongoing calculations and alert traders to potential opportunities. They generally do not automatically initiate or execute trades.

zero, the trader has realized the three point spread captured on December 1. 3/

Index arbitrage requires large amounts of capital and thus is not viable for retail investors. On the other hand, the rewards from such arbitrage flow ultimately to the institutional investors, such as pension funds, mutual funds, and college endowments, whose managers employ this strategy, and these institutions, are after all, trading on behalf of their beneficiaries.

More important, index arbitrage transactions benefit other strategies involving derivative index products by creating closer price correlations between the underlying stock prices and the derivative products. In our illustration, when the trader seeking to capture the three-point spread bought the index stocks at 315 and sold the future at 318, the buying activity most likely would have pushed the stock prices up and the selling activity would have pushed the futures price down, thus narrowing the spread between the index and the composite basket of stocks.

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3/ This strategy also could be employed in reverse: a trader could buy a future trading at a discount to the index and sell a basket of stocks. So-called short arbitrage often involves the "short sale" of the underlying stocks, i.e., the sale of stock which, at the time of sale, is not owned by the seller. Short side arbitrage, particularly in a declining market, can be difficult because exchange rules and Rule 10a-1 under the Securities Exchange Act of 1934 generally preclude such sales if the short sale is at a reduced price from the last preceding transaction.

By helping to achieve closer price correlations between the derivative index and the stocks underlying that index, traders engaged in index arbitrage will be facilitating the "hedging" uses of derivative index products. The most obvious of these hedging uses is that an investor owning a portfolio of securities may obtain protection against a decrease in the market by selling a futures product or by purchasing a put option on an index. That investor will be protected against market decreases without having to sell portfolio securities.

Close correlations between derivative index prices and underlying stock prices also are important in the use of derivative index products to accomplish portfolio adjustments. Derivative index products permit institutional money managers to adjust quickly and at low transaction costs the debt and equity holdings in the portfolios they manage. For instance, a debt portfolio can be converted rapidly to equity by simultaneously selling bond futures and buying stock index futures. Likewise the amount of equity investment can be increased or decreased by buying or selling a derivative product. Purchase or sale of derivative index products permits changes in the degree of equity investment without incurring the relatively higher stock transaction costs.

If you have followed my explanation of index arbitrage and hedging, then you should have no trouble understanding two other uses of derivative products: "swapping" and "portfolio insurance." "Swapping" is a form of index-related trading that is similar

to index arbitrage because it attempts to profit from pricing discrepancies between the component stocks in an index and the derivative index product. Swap or "substitution" strategies are employed by "index funds" that seek to replicate the performance of an index by holding each of the component stocks in proportion to its weighting in the index. When a derivative product is selling at a discount to the index, the fund can sell stocks and buy futures contracts on the index the fund is designed to replicate. It will then be "swapping" stocks for futures. The stocks would be repurchased and the futures sold when the discount abates, at or before expiration. This strategy may permit the index fund to out-perform the replicated index in a risk-free fashion.

"Portfolio insurance," sometimes called "dynamic hedging," is an example of a hedging use of derivative index products. The term portfolio insurance is used to describe a range of strategies designed to control against failure to predict the magnitude of market changes by increasing the proportion of a portfolio's stock investments in a rising market and decreasing that proportion in a falling market. In a rising market the manager wishing to enter the market without engaging in portfolio transactions will buy a futures product. In a falling market a manager desiring to leave the market without engaging in portfolio transactions will sell a futures product. Portfolio insurance strategies thus permit the portfolio manager to accomplish market objectives by purchasing and selling stock index futures

rather than stocks. In utilizing index products the manager achieves increased speed and also reduces the transaction costs associated with trading individual stocks. 4/

Of course index products are also used by speculators whose sole motive is to make a profit by predicting market directions. Even this individually oriented trading provides benefits. Speculators often take the other side of transactions from hedgers, and thus assume the risk that hedgers are avoiding. Speculators add liquidity to the index markets, making it easier for hedgers, or for that matter program traders, to enter and exit these markets.

### III. Problems Associated with Program Trading

A relatively positive view of derivative index trading must, of course, be tempered by an examination of the problems associated with such trading, particularly the problem of increased market volatility that we have experienced on several so-called "Expiration Fridays," and on other days as well. As I am sure you know, Expiration Friday or "triple witching" day are the names given to the quarterly expiration of stock index futures, stock index options, options on individual stocks, and options on stock index futures.

As I have described, index arbitrage depends on the ability of a trader to capture the price differential between a derivative

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4/ The effectiveness of the hedge is reduced to the extent that price movements in the portfolio do not, under all circumstances, track the index.

index product and the market value of the underlying stocks. The arbitrage is riskless because the futures expiration value is determined by the closing value of all of the stocks composing the index. In the last hour of trading on Expiration Friday traders who hold index contracts that settle based on closing stock prices will seek to execute their orders as close to the last trade of the day as possible in order to ensure that the stock and derivative product portions of their position are valued at the same time. Consequently, on Expiration Friday large numbers of buy or sell orders in the underlying stocks often are entered as "market-on-close" orders, that is, to be executed at the closing price. These orders, combined with other orders brought to the floor in the final minutes of trading, may result in order imbalances that, in turn, can contribute to dramatic market movements. 5/ On some of the earlier expiration Fridays large market movements were followed by substantial "bounce backs" of prices on the opening on the following Monday, 6/ indicating the probable existence of contra-side interest that would have counteracted the market-on-close imbalances. The belief is that these contra-side orders were not getting to the market in time to participate at the close.

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5/ See H. Stoll and R. Whaley, Expiration Day Effects of Index Options and Futures (1986) ("Stoll Study"), reprinted in, N.Y.U. Salomon Brothers Center for the Study of Financial Institutions, Monograph Series in Fin. and Econs. No. 1986-3.

6/ Id.

The various exchanges, the CFTC, and the Commission have considered numerous possible responses to price volatility on Expiration Fridays, including staggering the expiration dates of various index products, halting trading at expiration, and reducing the size of index positions that traders may hold at expiration. These and other ideas were explored at length in July of 1986, when the Commission hosted a Roundtable on Index Arbitrage.

Since then, the Commission and the exchanges have taken several steps to address order imbalances and resulting price volatility at expiration. One of the Commission's first initiatives, taken in September of 1986, was a request to the New York Stock Exchange that on Expiration Friday its members submit all index-related market-on-close orders in selected stocks thirty minutes before the close of trading, so that the exchange could then publicly disseminate the resulting net order imbalances. The purpose of this procedure is to allow contra-side trading interest to be attracted to the market to offset index-related order imbalances, and thereby reduce price volatility.

The suggested procedures were followed, and in the five subsequent expirations we believe they contributed to reducing price volatility at the close. Substantial volume existed on a number of these expirations--typically in the range of roughly 40 million shares in the thirty minutes prior to the close of trading--but, with one small exception, moderate to little volatility.

This past spring, the New York Stock Exchange, in conjunction with the Chicago Mercantile Exchange, agreed to alter the settlement valuation procedures of their index futures and options contracts, including the heavily traded S&P 500 index futures contract, so that they would be based on opening rather than closing prices of underlying securities. These two exchanges believe that using opening prices and opening-of-trading procedures to determine settlement values provides a greater opportunity for market professionals and investors to react to disseminated order imbalances and better allows stock exchange specialists to handle order imbalances.

Not all the markets agree, however, on the desirability of changing the settlement terms of their contracts, and several futures products and most options products continue to expire on the close. As a result, products expiring at the open now coexist with products expiring at the close, creating the potential for disruptive activities. The Commission is concerned about possible market disruption or manipulation, and at its request the exchanges have issued notices to their members emphasizing that arbitrage liquidations at the morning and afternoon expirations will be carefully scrutinized. 7/

In order to accommodate the increased volume anticipated at the opening on the June 19 and September 18 expirations,

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7/ See, e.g., NYSE Information Memorandum to members concerning split expiration of index options and futures on June 19, 1987.

the New York Stock Exchange required that all stock orders related to positions in derivative index products that settle at the opening be received at the Exchange one-half hour before the opening. The Exchange then disseminated order imbalances in 50 designated securities prior to the opening of trading, and conducted, with some minor modifications, its standard opening procedures. 8/

The two morning expirations thus far conducted under the new procedures have occurred without incident. Volatility at both the open and the close was negligible on both occasions, with approximately 54 and 35 million shares traded at the opening, on less than 10 point moves, and with approximately 44 and 23 million shares traded at the close, on less than 3 and 4 point moves.

While major progress has been made to address Expiration Friday volatility, we should not be too quick to declare that the wicked witch is dead! Instead of closing out his positions on Expiration Friday an arbitrageur may, if market conditions permit, 9/ "roll" the futures position forward by buying (or selling) the expiring futures previously sold (or purchased) and selling (or purchasing) the next month's series of futures

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8/ See Securities Exchange Act Release No. 24596 (June 16, 1987), 52 FR 23618.

9/ Rolling forward is possible where the next month's contract trades at a sufficient premium (or discount as the case may be) to the underlying index.

while maintaining the same stock position. Evidence indicates that in the weeks prior to the June and September expirations many market participants, particularly those trading S&P 500 futures, did just this, thereby eliminating the need to sell or buy shares on June 19 and September 18. As a result, volume was less than may be expected at future expirations.

While it is not clear whether overall market volatility has increased as a result of the use of index products, there is evidence that certain measures of short-term market volatility may have increased in 1986 and early 1987. 10/ At least some of the public perception of this heightened volatility may be attributed to the unprecedented, high absolute levels of current stock prices. The seventy-three point move in the Dow Jones Industrial Average (the "Dow") on September 22, 1987, may appear huge, but the relative significance of such a move is lessened when one considers that the Dow was at approximately 2500 on

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10/ See, e.g., L. Birinyi & H. Hanson, Market Volatility: Perception and Reality, and Market Volatility: An Updated Study (Salomon Brothers Inc., December 1985 and July 1986); M. Zurack, Has the Stock Market Become More Volatile Since the Introduction of Stock Index Futures Contracts? (Goldman Sachs Research, November 1985); F. Edwards, Stock Index Futures and Stock Market Volatility: Evidence and Implications (Columbia Futures Center, Graduate School of Business, Columbia University, 1986); Cowan, Awash in Dow Ebb and Flow: Fluctuations Stir Jitters, N.Y. Times, May 14, 1987, at D1, col. 3.; Garcia, An Appraisal: Volatility of Stocks May Be Easing, Studies Indicate, Wall St. J., May 27, 1986, at 61, col.3. and C. Davis and A.P. White, Staff, Board of Governors, Federal Reserve Board, Stock Market Volatility (September 1987). See also M. Belkin, Equity Options and Futures Commentary (Salomon Brothers Research, July 6, 1987) (containing up-dated statistics on foreign and domestic index market volatility).

that date. Nevertheless, the Commission recognizes that the introduction of index products as well as advances in computers and telecommunications now allow professional and institutional investors to implement multi-million dollar index-related trading strategies that can result in dramatic, short-term price effects in the stock market.

In response to public and Congressional concerns over these effects, the Commission staff, in cooperation with the CFTC and securities and futures exchanges, has reviewed trading during two recent market declines: the 120-point decline in the Dow on September 11 and 12, 1986, 11/ and the price volatility on January 23, 1987, including a 115-point drop in the Dow.

After review of the September 11 and 12 market decline the Staff concluded that the magnitude of the September decline was a result of changes in investors' perceptions of fundamental economic conditions, rather than artificial forces arising from index-related trading strategies. Nevertheless, index-related trading was instrumental in the rapid transmission of these changed investor perceptions to individual stock prices, and may have condensed the time period in which the decline occurred.

In contrast, after review of trading on January 23, 1987, the Staff could not identify a single, principal cause for that day's price volatility. When the Dow broke the 2,200 level

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11/ See Division of Market Regulation, Report on the Role of Index-Related Trading in the Market Decline on September 11 and 12, 1986 (March 1987) ("September Report").

around 1:39 p.m., buying interest evaporated and was replaced by heavy institutional profit-taking which appears to have strained market-making capacity in both the stock and futures markets. While some index-related arbitrage took place, it was less significant than on September 11 and 12. Therefore, the January 23 market decline appears to have been a short-term, internal market correction to the 250-point rise in the Dow in the first three weeks of January. 12/

The market declines on September 11 and 12 and January 23 raise important regulatory concerns and questions. Some commentators have expressed concern that these events portend a market collapse fueled by index trading. In one scenario, significant economic developments would cause index futures prices to move to a large discount to underlying stock prices. This discount would trigger massive block sales of stocks as part of short-side arbitrage, index fund substitutions, and the unwinding of previously established long-side arbitrage positions. The block sales in turn would depress the equity market to levels triggering substantial selling of index futures in portfolio insurance programs. Index futures selling would then further depress futures prices to a discount to underlying stock prices. This discount might then cause the cycle to repeat itself. In addition, the resultant falling stock prices

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12/ In contrast to the September decline, which was followed by several sessions of relatively stable market prices, the January 23 correction was shortly followed by a resumption in the rise in the Dow.

might then trigger stop-loss sell orders in individual stocks and force additional liquidations to meet margin calls and broker-dealer capital requirements. The grand finale of this scenario would be a dramatic market collapse. 13/

Understandably, the Commission is not anxious for this scenario to occur. It is in the process of considering a range of potential responses to this "melt-down" scenario. In addition to the market-on-close procedures now in place, we are analyzing possible responses that we believe would reduce the likelihood of a market "cascade" without significantly reducing the benefits derived from index products.

The first of such possible responses is the concept of a coordinated system-wide trading halt in the equity and derivative markets. Such a halt could last only a short period of time, perhaps 30 minutes to an hour, but would provide time for the New York Stock Exchange to disseminate quote indications and perhaps indications of order imbalances. We currently believe that action in ordering a halt would decrease panic, increase market awareness of the real size of market imbalances, and encourage market professionals to offset those imbalances, thus retarding further volatility. The New York Stock Exchange is currently conducting a study of questions related to increased market volatility. I look forward to reviewing that study, and believe it will help us to confirm our tentative conclusion

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13/ See September Report, supra note 9, at 21.

that such a trading halt would be useful. It should be noted that recent legislation introduced by Congressmen Lent and Rinaldo 14/ includes a systems-wide trading halt provision. The bill, however, only makes explicit the New York Stock Exchange's existing authority to call a floor-wide trading halt to prevent large, sudden market rises or declines.

Another possible regulatory response would be to require the aggregation of position limits for all index products. Stock index options and futures are functionally equivalent products. Nevertheless, position limits currently are imposed only as to each index derivative product. As a result it is possible for one investor to hold several billions of dollars in index options and futures. An aggregate, across the board, position limit for all index products, both options and futures (or at least for the major indexes), would eliminate the current ability of traders to assume excessively large positions on one side of the market in several index products.

I have no magic answer to volatility concerns. What is clear is that index futures and options are valuable products and that measures to address potentially destructive market volatility must be developed. While the SEC and CFTC have responsibilities to seek solutions to market volatility, the futures and options exchanges must share this responsibility. The Commission has been highly pleased with the cooperative

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14/ H.R. 2668.

attitude of the exchanges in seeking solutions in this area. We hope that we may rely upon their future cooperation in helping to avoid volatility problems that could lead to limitations on the use of derivative index products.

#### IV. Surveillance Concerns

One other area deserves comment. Although derivative index trading is a beneficial force in today's market environment, index trading strategies may provide opportunities for sophisticated schemes to manipulate the market. More specifically, extremely well capitalized traders, or traders using customers' money, could attempt to engage in intermarket manipulation. While there is no evidence of widespread abuses of this sort occurring to date, the exchanges, the Commission, and the CFTC must remain vigilant in their efforts to detect and punish such activity. It is no secret that the Commission relies to a great extent on the exchanges for surveillance. In recent years, the exchanges have responded by implementing audit trails, automating surveillance, and forming an Intermarket Surveillance Group. I expect these efforts to continue to expand in the future to keep pace with increasingly complex trading strategies.

Additionally, because the Commission believes that continued careful monitoring of index-related trading is necessary, it is exploring cost-effective reporting and recordkeeping procedures that might enhance intermarket surveillance for possible manipulation and allow improved monitoring of market developments.

Due to the lack of complete, easily accessible index-related trading data, weeks of effort were required to reconstruct millions of dollars worth of trading by numerous proprietary and customer accounts on September 11 and 12 and January 23. Therefore, the Commission is working with the SROs to develop routine procedures to record essential data on index-related transactions. This reporting process, supplemented by enhanced recordkeeping by member firms and the CFTC's requirement that futures exchanges establish more detailed audit trails, should greatly enhance surveillance of intermarket trading and the Commission's ability to monitor the effect of index-related trading on market volatility.

V. Conclusion

The trading strategies and their causes and effects that I have discussed with you this afternoon are, without question, complex, and, like so many other matters in the securities business, do not lend themselves to easy solutions. All of you in the industry, and those of us on the regulatory side of the aisle, must roll up our sleeves and continue work on volatility concerns caused in large measure by the tremendous growth and popularity of index products.

I may add that addressing investors' perceptions of market volatility may ultimately be as important as dealing with objectively discernible market impacts. Maintaining investor confidence in our markets is an important regulatory concern, and that confidence will be bolstered if investors learn that

those regulating the markets, including the exchanges, are paying close attention to possible problems. All of us should take steps to explain as clearly as possible the values of derivative index trading, to make clear that steps have been taken to reduce related market volatility, and to note our continuing efforts in this regard. By working together I believe we can assure continued confidence in our markets as well as their continued health and growth.