

Chapter Two

CHRONOLOGY OF TRADING DURING THE OCTOBER MARKET BREAK

A. Introduction

During October 1987, the nation's securities markets experienced an extraordinary surge of volume and price volatility. The most widely followed indicator of the U.S. stock market's movements, the Dow Jones Industrial Average index of 30 NYSE stocks (the "DJIA"), had reached an intra-day high of 2746.65 on August 25, 1987. On October 2, the DJIA closed at 2640.99. During the week of October 5, the index declined by 158.78 points; during the week of October 12, by 235.48 points. On October 19, the DJIA declined 508.32 points, and by its low point mid-day on October 20 it had declined to 1708.70, or over 1,000 points (37%) below its August 25 high. Even with its erratic but substantial recovery over the next few trading sessions, by October 30, the DJIA stood at 1,994, down over 26% from its August high. Broader indexes also declined for the month of October. For example, the Standard & Poor's ("S&P") index of 500 stocks declined 21.8%, the composite indexes for the nation's three principal securities markets, the New York Stock Exchange ("NYSE"), American Stock Exchange ("Amex"), and the National Association of Securities Dealers Automated Quotation ("NASDAQ") system for over-the-counter ("OTC") stock trading, experienced declines in October of 21.9%, 27%, and 27.2%, respectively.

The nation's index futures markets also experienced large declines. Prices for the most actively traded index futures -- the S&P 500 futures contract ("SPZ") ^{1/} on the Chicago Mercantile Exchange ("CME") -- experienced more extreme fluctuations than prices for the underlying stocks (termed the index's "cash" price). During the weeks of October 19 and 26, the SPZ futures experienced an unprecedented period during which it traded significantly below the index's stock prices. The SPZ traded at levels as low as 181.00, down 44.4% for the month and equivalent to the DJIA reaching 1443.53. ^{2/} Although the theoretical value for index futures normally is at a slight premium to the cash price, ^{3/} from October 19 to October 28, the price relationship between the futures and stocks was inverted, with the futures consistently trading (with a few brief

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- ^{1/} The symbol "SPZ" actually refers to the S&P futures contract with a December expiration. Because relevant CME index trading during the October market break was limited almost exclusively to the December futures contract, all references are to this contract unless a different contract is specifically noted.
 - ^{2/} The DJIA closed at 2596.28 on September 30, 1987. Therefore, a 44.4% drop in the DJIA for the month of October 1987 would have the DJIA reach 1443.53.
 - ^{3/} See Chapter One.

exceptions) at large discounts to the stocks. ^{4/} Although the discount eventually disappeared, by the end of October the price of an SPZ contract had fallen to 259.35, roughly in line with the cash market price, and down 24% from its August 25 high point. ^{5/}

The October market break also highlighted the growing interconnections among securities markets internationally. Ripple effects of the market volatility were seen in strong, well capitalized international markets such as London ^{6/} and Tokyo, ^{7/} as well as in fast growing, more speculative markets such as the Hong Kong Exchange, which closed for the week of October 19. Review of international trading by the SEC's Office of the Chief Economist, discussed in Chapter Eleven below, shows that stock price changes in various markets were significantly correlated and that the U.S. appeared to lead other markets during this period.

The extraordinary increase in trading volume in the U.S. markets during the market break contributed to the level of concern by market professionals and individual investors. Projections that trading volume on the NYSE would increase steadily from daily averages of less than 200 million shares to daily averages of more than 300 million shares were shattered by consecutive 600 million share trading sessions on the 19th and 20th of October. The Amex and NASDAQ markets were similarly tested by record trading with average daily volume for the week of October 19 of 31.7 and 244.4 million shares, respectively, compared to average daily volume in September of 12.4 and 148.3 million shares, respectively. Similarly, the CME's market in the S&P 500 futures saw trading volume surge from 82,000 contracts on October 13 to 162,000 on October 19.

As discussed in Chapters Four and Seven through Nine of the Study, the record-breaking sell off during the October market break simply overwhelmed market-making capacity on both the securities and futures markets. Weaknesses were highlighted in

^{4/} Under normal market conditions, any significant deviation from theoretical value for more than a few minutes results in arbitrage programs that act to reduce the premium or discount. While the voluntary restrictions placed by the NYSE on proprietary arbitrage and use of DOT for customer arbitrage eliminated much of this arbitrage activity during this period, this fact, in itself, does not fully explain why futures continued to trade significantly below the prices for the component stocks.

^{5/} The November contract for the Major Market Index ("MMI") futures, traded on the Chicago Board of Trade ("CBT"), declined 20.5% in October, while the December contracts for the New York Composite Index futures, traded on the New York Futures Exchange ("NYFE"), and the Value Line Index futures, traded on the Kansas City Board of Trade ("KCBT"), declined 20.9% and 27.3%, respectively. In addition, the most active index option for retail investors, the Chicago Board Options Exchange ("CBOE") option on the S&P 100 Stock Index ("OEX"), declined along similar lines.

^{6/} The London Financial Times-Stock Exchange ("FT-SE") 100 share index fell 500 points (almost 22%) on October 19 and 20, closing the month at 1749.8, down 26.04%.

^{7/} The Tokyo Nikkei index declined 4456.7 points (16.9%) on October 19 and 20, closing on October 30 at 23,328.91, down 10.31%.

each of the market-making systems: exchange specialists, exchange market makers, the NASDAQ competitive market-maker system, and the futures markets' open outcry system. 8/

After October 19 and 20, the securities and futures markets did not return to a status even approaching "normalcy" until the end of the month. The final eight trading sessions in October included six sessions in which the DJIA moved (as measured by closing prices) more than 50 points, including the largest one-day rise in the index (186.84 points or 10.1% on October 21), and the second-largest point and sixth-largest percentage decline (156.83 points or 8% on October 26). 9/ In addition, although six of these sessions were shortened to close at 2:00 p.m. (Eastern Time), 10/ daily NYSE volume for the remainder of October exceeded 240 million shares (including a 449 million share day on October 21 and a 392 million share day on October 22). Finally, it was not until October 29 that the aberrational discount to cash in the SPZ futures abated.

The increased market volatility from the October market break receded only gradually by year-end. The implied volatility of the options on March expiration S&P 500 futures ("SPH"), which had skyrocketed from around 20 points prior to the break to over 65 points, was still around 30 to 35 points by December 31, 1987. 11/ By some estimates, the 1987 volatility for S&P stocks is roughly equivalent to 35% of the stock

8/ Similarly, while the operational and clearing capacity of the markets met the challenge of this extraordinary trading volume surprisingly well, very real problems were evidenced, particularly for order executions for small investors. Additionally, while the financial integrity protections built into the securities and futures markets over the past decades minimized firm insolvencies and diversions of customer funds, the market break caused strains in this safety net. These areas are discussed in detail in Chapters Five and Ten of the Study.

9/ On October 26, the S&P 500 index also fell 20.55 (8.28%). Total NYSE volume was 308.8 million shares, with 1,791 issues declining, 134 gaining, and 104 unchanged. The Amex and NASDAQ composite indexes declined 9.3% and 9.0%, respectively.

10/ After the 4:00 close on October 22, the NYSE announced that the exchange's trading hours would be temporarily reduced, with the close moved to 2:00, to permit members to process the enormous trading volume during the market break. All major securities and index futures similarly reduced trading hours. Starting on November 2, trading hours were gradually extended and returned to normal on November 12.

11/ There are several methods used to estimate the price volatility of an individual security or group of securities. Unlike the more familiar method which estimates volatility from empirical data, "implied volatility" is a measure of the volatility of the security or security index that is implicit in the actual prices which exist in the market for options in these securities. This method assumes that the actual trade price is representative of the fair price for the option, an assumption more likely to be true for actively traded option series. See L. McMillan, Options as a Strategic Investment, New York Institute of Finance (2nd ed. 1986) at 411.

prices--more than twice the annual level of volatility for 1983 through 1986. ^{12/}

B. Chronology of Trading During the October Market Break

The securities and futures markets experienced massive price declines, record trading volume, and near exhaustion of market-making capacity during the October market break. These events require analyses not only of trading on October 19 and 20, but also of the markets' reaction to fundamental economic news and broad-based market declines during the weeks that preceded October 19. The Division has prepared detailed chronologies of trading on October 6 and from October 14 to October 20 ("Chronologies"), attached as Appendix A to the Study, as a framework for analyzing the factors influencing the October Market Break. This chapter summarizes those Chronologies. ^{13/}

In this chapter, as supplemented by the Chronologies, we present an overview of each day's trading, emphasizing price and volume movements on the primary securities and futures markets. ^{14/} Within this framework, we give a detailed breakdown for October 6 and 14-20, of the information compiled by the Division and the CFTC regarding index-related trading strategies, including index arbitrage, index substitution, and portfolio insurance. Finally, these market movements and index-related trading are placed in the context of other trading including firm proprietary, institutional, and retail trading.

1. October 6

On Tuesday, October 6, the DJIA experienced what was then its largest one day decline, seemingly on little or no fundamental economic news. The DJIA closed at 2,548.63, down 91.55 points (3.47%) on volume of 175 million shares. Although this price decline was relatively broad based, with overall NYSE declining issues leading advancing issues by nearly 4 to 1, the sharp drop in the DJIA resulted largely from price declines in 6 of the 30 index stocks. ^{15/} The overall decline of 1,332 NYSE stocks was

^{12/} One firm has estimated that the representative bid-ask spread on the average S&P 500 stock, which had been 0.45% of market value on September 1, 1987, was still at approximately 0.77% on November 3 as a result of greater market risk from price volatility. Kidder, Peabody & Co., The Impact of October 19 on Transaction Costs in the Equity and Stock Index Futures Markets. A Preliminary Update (November 1987). See also Chapter Three.

^{13/} For additional discussion of market developments in the options, over-the-counter, and international markets, see Chapters Eight, Nine and Eleven, respectively.

^{14/} The Division has focused its reconstruction on trading related to the futures markets because of the substantially smaller amount of index options-related stock trading. For example, our reconstruction of trading on October 6 identified only one arbitrage program out of a total of 72 which used index options instead of index futures.

^{15/} These stocks were International Business Machines (IBM) (close at 151, down 5 1/2), Merck (MRK)(201, down 7), Phillip Morris (MO)(113 1/2, down 4), Eastman Kodak (EK)(101 3/8, down 1 7/8), Procter & Gamble (PG)(99 1/2, down 4), and Du

attributed to investor sensitivity to bearish reports by two influential investment advisors, 16/ arbitrage sell programs, 17/ and general concerns over interest rates. 18/

a. Summary of Market Movements

Shortly after the opening on October 6, the DJIA dropped from the October 5 close of 2640.18 to below 2,620. It quickly recovered about 10 points to 2,627.1 at 10:18, and then declined about 46 points until the last half hour of trading. At approximately 3:30, the DJIA decline accelerated, and it fell over 30 more points to close at 2,548.63. The DJIA's descent was paralleled by an 11 point closing decline (3.3%) in the SPZ futures on the CME. Bond prices climbed abruptly in the last hour of trading. This price rise appears to have been caused, in part, by market professionals reinvesting cash received from stock sales into the Government bond market. 19/

b. Breakdown of Trading

While the DJIA declined throughout most of the day, the sharpest movements were at the opening and close. Over 66% of the decline and most of the arbitrage selling occurred at these times.

1. Portfolio Insurance

Although the SPZ future was trading below theoretical value, portfolio insurance-related trading does not appear to have been a significant contributing factor to that discount. Reported portfolio insurance sales of SPZ futures on October 6 were light, with only 181 contracts sold.

Pont (DD) (118 1/2, down 4 1/4).

16/ Newswires carried reports from interviews with Robert Prechter, the Elliot Wave theorist, and Peter Eliades, editor of the Stock Market Cycles News letter. See Smith & Garcia, Stocks Plunge, Partly in Reaction to Sell Signals from Forecasters, Wall St. J., Oct. 7, 1987, at 3.

17/ Garcia, Stocks Plunge; Interest Rate Fears, Computerized Sell Programs Cited, Wall St. J., Oct. 7, 1987, at 65.

18/ Wiggins, Dow Drops a Record 91.55 Points on Interest Rate and Dollar Fears, N.Y. Times, Oct. 7, 1987, at A1.

19/ Quint, Bonds Rise Abruptly in Final Hour, N.Y. Times, Oct. 7, 1987, at D1.

II. Other Index-Related Trading

Almost all of the index arbitrage sales of stock, totaling 16.2 million shares, ^{20/} were executed as part of SPZ programs. ^{21/} Throughout most of the day, the SPZ contract traded at premiums below theoretical or fair value, ^{22/} at a level sufficient to enable arbitrageurs to close pre-existing arbitrage positions at favorable prices but not sufficient to enable arbitrageurs to execute sell programs to establish new positions. Almost all of the index arbitrage reported in the SPZ contract was for the purpose of closing previously established buy programs (i.e., short futures - long stock positions).

Although arbitrage and non-arbitrage program sales accounted, during the trading day, for only approximately 12% of volume in all NYSE stocks and 16% of volume in the S&P 500 stocks, stock sales associated with these strategies appear to have been significant contributing factors to the declines in stock prices at the opening and at the close. As described in further detail in the Appendices, stock sales associated with these strategies comprised around 37% of total volume in S&P stocks at the close.

2. October 14-16

During the three day period from October 14 through 16, the DJIA declined 235.48 points, including a 108 point decline on October 16. The Division's review supports the view that the downturn in the markets from October 14 to October 16 was the result of a variety of factors relating to economic news and fears of an impending market correction. The economic news included continuing problems in the nation's trade deficit and its implications for the federal budget deficit, declines in the value of the U.S. dollar, and increases in interest rates. ^{23/} In addition, there was concern among some market participants that proposals that would substantially increase the tax burden on many acquisitions would reduce prices not only for current "deal" or "takeover" stocks but for the market as a whole. ^{24/} These economic developments may have led some securities and futures market participants to anticipate that there would be, during the next few weeks, at a minimum, sharp (if short-term) market "corrections" along the lines of October 6. The series of dramatic, broad-based market declines that developed during the week of October 12 apparently culminated in a widespread shift in investor sentiment.

^{20/} Of the 16.2 million shares of index arbitrage selling, 2.4 million shares (15%) were part of customer programs. Of the total arbitrage selling, only 800,000 shares (4.9%) were sold short. See Tables D-4 and D-5, providing breakdowns of short versus long arbitrage and customer versus proprietary arbitrage for October 6 and October 14-20.

^{21/} Conversely, most of the index arbitrage buy programs were executed with MMI futures.

^{22/} See Chapter One for a discussion of the theoretical value of a stock index futures contract.

^{23/} A more detailed analysis of these developments is provided in Chapter Three of the Study.

^{24/} See *id.*

a. Summary of Market Movements

The massive price declines experienced on October 14-16 affected all of the nation's primary securities and futures markets.

On the NYSE, the DJIA declined steadily on each trading session, with only minor pauses and weak rallies followed by sharp drops at each session's close. On a daily basis, the DJIA lost approximately 95 points (3.81% of its value) on October 14, 57 points (2.39%) on October 15, and a further 108 points (4.60%) on October 16 (the DJIA's first close-to-close decline of more than 100 points). The 235.48 point decline in the DJIA represented a 9.49% decline for the week, and a 17.5% decline from its August 25, 1987 high of 2,722.42. These declines were mirrored in the S&P 500 index, which dropped 9.29 points (2.95%), 7.15 points (2.34%), and 15.38 points (5.16%) on October 14th, 15th, and 16th, respectively, for a total 10.45% decline for the week.

Price declines occurred on each of the nation's primary securities markets. The NYSE composite index declined 2.7%, 2.22%, and 4.97% on these three days, on increasing trading volume of 210, 266, and 344 million shares on October 14th, 15th, and 16th, respectively. The 344 million shares volume was the highest at the time in the NYSE's history. Similarly, the Amex composite index declined by 1.13% on the 14th, 1.44% on the 15th, and 3.66% on the 16th, and the NASDAQ composite index for OTC stocks retreated 1.49%, 1.35%, and 3.83% on these days. ^{25/}

The leading index futures and options markets experienced comparable declines on each of these days. The CME's market in the SPZ futures declined 10.65 points (3.37%), 6.75 points (2.21%), and 16.00 points (5.36%) on the 14th, 15th, and 16th, respectively, a total of 10.94% for the week. The daily graphs in Appendix D illustrate that prices in the SPZ futures anticipated practically every large movement in the DJIA on these days, with futures selling pressure surging near the end of each day, creating discounts to cash that in turn triggered index arbitrage.

b. Breakdown of Trading

The attached Chronologies present a detailed, program-by-program breakdown of index-related trading on the futures and securities markets on the 14th through the 16th, as well as other types of firm proprietary, institutional, and retail activity. Although the level of such trading, particularly index-related trading, varied at different times on each trading session, the following overview of trading is useful to understand its cumulative effects on this week's markets.

^{25/} The price declines experienced in the U.S. securities markets during the week of the 12th were reflected to a much lesser extent in foreign markets. For example, the London FT-SE 100 index declined only 1.16% on October 14 and 0.90% on October 15 (severe weather effectively closed the London market on the 16th). The Tokyo Nikkei index actually rose 0.93% on the 14th, and declined only 0.82% on the 15th and 0.23% on the 16th, although Tokyo, in effect, trades a day ahead (by the calendar) of the NYSE.

While the sell-off was broad based, institutional selling appears to have been the most substantial component. ^{26/} Specifically, the Division's review of the broker-dealer data for daily aggregate purchases and sales on October 14th, 15th, and 16th indicates the following overall breakdown of selling on the NYSE:

	<u>Institutional</u>	<u>Proprietary</u>	<u>Retail</u>
October 14	47%	27%	26%
October 15	36%	40%	24%
October 16	39%	35%	26%

I. Index Arbitrage

On each day, significant price declines were first evidenced in the index futures markets -- most notably in the CME's market in the SPZ futures -- and, as is usually the case, were reflected with a short time lag in the underlying equity securities. ^{27/} This "lag time" provided numerous brief arbitrage opportunities throughout the trading sessions. The index trading information compiled by the Division and the CFTC indicates that a significant amount of arbitrage stock selling occurred on the NYSE in

^{26/} The Securities Industry Association ("SIA") has estimated that institutional accounts consistently constitute the most substantial component of selling on the NYSE, both prior to and during the October market break:

	<u>Institutional</u>	<u>Proprietary</u>	<u>Retail</u>
October 1987	41%	27%	32%
September 1987	40%	28%	32%
January-October 1987	41%	27%	32%
March-December 1986	42%	28%	30%

Similarly, the SIA has estimated that institutional accounts are leading purchasers on the NYSE:

	<u>Institutional</u>	<u>Proprietary</u>	<u>Retail</u>
October 1987	39%	27%	34%
September 1987	40%	28%	32%
January-October 1987	42%	26.5%	31.5%
March-December 1986	43%	28%	29%

See SIA, Investor Activity Report: October Analysis: "The 1987 Crash". (December 2, 1987).

^{27/} Although the SPZ commences trading simultaneously with the NYSE opening, at 9:30 a.m. (Eastern Time), its trading begins immediately, while it takes time to open trading in the index stocks on the NYSE, even on non-volatile days. Similarly, because the futures trade as a single contract, while the index consists of price changes in hundreds of individual stocks, intra-day price declines and rises usually develop first in the futures.

relatively concentrated intervals during almost every period of stock price decline over these three days.

For example, on October 14, the DJIA experienced four periods of sharp price declines: (1) opening to 10:00 (DJIA drops 44 points); (2) 12:30 to 1:30 (drop of approximately 24 points); (3) 2:30 to 2:50 (down 10 points); and (4) 3:50 to close (drop of 17 points). While total arbitrage-related selling on the 14th constituted only approximately 27.4 million shares (or 13% of total NYSE volume), ^{28/} this selling was generally concentrated in these periods of price declines. During the 2:30 to 2:50 decline alone, 3.6 million shares were sold in arbitrage programs, comprising 25% of total NYSE volume in this period and 33% of NYSE volume in S&P 500 stocks. ^{29/}

The concentrated effect of index arbitrage was even more pronounced on October 15. Total arbitrage selling for that day was only 15.4 million shares or 5.7% of NYSE volume. ^{30/} Yet almost 25% of this arbitrage selling hit the market during the period of the DJIA's sharpest decline -- the 3:30 to 3:50 drop of over 30 points. The 2.9 million shares of arbitrage-related selling during this period constituted 18% of NYSE volume and 24% of S&P volume.

Finally, although arbitrage selling occurred on the NYSE periodically throughout the October 16 trading session, increasing to 37.2 million shares or 11% of daily NYSE volume, ^{31/} its effects were most pronounced at the end of the session when the SPZ future developed over a 4 point discount to cash. From 3:30 to 3:50, when the DJIA lost over 50 points (breaking the 100 point close-to-close record), arbitrage-related stock selling comprised 30% of NYSE volume and 38% of S&P volume.

ii. Other Futures-Related Trading

The analysis by the CME staff of SPZ futures trading on the 14th to the 16th indicates that, overall, trading by "floor" or "local" traders consisted of normal levels of buying and selling which tended to even out, maintaining more or less "flat" positions

^{28/} Of this 27.4 million shares, 13.4 million shares (49%) were sold for customer programs, and 5.9 million shares (21.6%) were sold short. See Tables D-4 and D-5.

^{29/} The program data provided to the Division indicates order entry times; obtaining order execution times for each of the hundreds of orders used in each program often requires manually reconstructing trading by reviewing individual tickets, and was impractical for the Study. Therefore, an average time period for order execution (five minutes -- the time period required for DOT orders) was used for the Division's analysis. In the above instance, orders entered from 2:25 to 2:45 were compared with volume figures for 2:30 to 2:50. Similar analyses are used throughout this Chapter and the Chronologies.

^{30/} Of this 15.8 million shares, 3.9 million shares (24.7%) were for customer programs and 4.1 million shares (26%) were sold short. See Tables D-4 and D-5.

^{31/} Of this 37.2 million shares, 18.5 million shares (49.6%) were part of customer programs (including 6.2 million shares sold for index substitution) and 5.4 million shares (14.6%) were sold short. See Tables D-4 and D-5.

by the end of the day. Nor did the CME staff find any unusual level of "speculative" futures trading during this period. Instead, the CME staff indicates most activity in the SPZ futures during these trading sessions appeared to be related to hedging strategies by institutional accounts. 32/

The CME's finding of largely institutional trading in the futures markets during this period is consistent with the index-related trading information obtained by the Division and the CFTC. This information indicates that the level of SPZ futures selling directly attributable to portfolio insurance strategies of institutional accounts was significant, particularly on October 16th. Specifically, the Division was able to identify sales on October 16 of approximately 9,000 SPZ futures, or 6.3% of total volume, (equivalent to approximately 31.7 million shares). 33/

In addition, the Division has identified a small but significant amount of program stock selling directly in the stock market by the afternoon of October 16 that can be directly attributed to portfolio insurance strategies. Although this selling constitutes only roughly 4.6 million shares on the 16th, its significance is that any portfolio insurance related stock selling indicate real or supposed difficulties in selling a sufficient amount of futures economically. Portfolio insurance strategies, under normal circumstances, use sales of index futures to reduce equity exposure in order to take advantage of the lower transaction costs in the futures markets. The fact that the alternative of more expensive stock sales was used late on October 16 suggests lack of liquidity in the futures market and was a precursor of stock selling by portfolio insurers on a massive scale on the 19th. Despite these stock sales, portfolio insurers ended the day with a significant "overhang" of sales of futures or stocks that were called for by the insurance parameters but could not be executed on the 16th. This overhang, and investor knowledge of it, may have contributed to the rapid decline on the afternoon of the 16th and undoubtedly added to selling pressure on the 19th.

Further, the Division also has identified a substantial amount of stock selling, particularly near the close on the 16th, that is attributable to the futures and options expirations on that day. 34/ For example, one firm's customers sold approximately one million shares on the October 16 market close to replace expiring S&P 500 index options traded on the CBOE. Non-program stock selling related to expiring options or futures positions of institutional and retail accounts also may have been significant, but the aggregate selling information available to the Division regarding trading outside of "programs" is not specific enough to allow the Division to reach firm conclusions.

Finally, the Division's review indicates that a significant amount of index-related trading on October 14 to 16 was effected off the NYSE, primarily in the London market, as exchanges-for-physicals ("EFPs"). EFPs have been common for years in the futures markets for agricultural and precious metals commodities, and in recent years have been

32/ See CME, Preliminary Report, at 10-13, 37.

33/ The SPZ closed at 282.25 on October 16, making the value of one contract \$141,125, and 9,000 contracts \$1.27 billion. If an average share price of \$40 is assumed, this would be the equivalent of 31.7 million shares.

34/ See Chapter One discussion of monthly and quarterly expiration cycles for derivative products.

increasingly used in financial futures. As used in this Study, EFPs involve simultaneous transactions in a basket of index stocks (a "cash" commodity) and index futures in a noncompetitive transfer of ownership between the parties; one party buys the stocks and simultaneously sells (or gives up a long) futures contract while the other party sells the stocks and simultaneously buys (or receives a long) futures contract. Investors seek at least two benefits from these EFPs. First, subject to floor official approval, noncompetitive futures sales can be effected, prior to the market opening, off the CME floor without violating the exchange's rules or the Commodity Exchange Act ("CEA"). ^{35/} Second, short sales of millions of shares of stock can be effected in London (either before or after the NYSE session) arguably without violating Exchange Act Rule 10a-1 relating to short sales. ^{36/} On October 15, 6.5 million shares were sold short in London EFPs, and 5.9 million shares were sold short on the 16th. ^{37/}

iii. Risk Arbitrage Trading

Both press accounts ^{38/} and the Brady Report ^{39/} have cited selling by risk arbitrageurs ^{40/} as a significant factor in the week of October 12. The Brady Report ^{41/} and the study by the Commission's Office of Chief Economist ("OCE")^{42/} have confirmed that prices in "takeover" or "deal" stocks did suffer significant price declines prior to the market break, perhaps in reaction to news of possible Congressional taxation proposals for certain takeover transactions. ^{43/} While this negative impact on widely followed takeover securities may have had an adverse effect

^{35/} While Section 4c(a) of the CEA prohibits wash sales, cross trades, and fictitious trades, and CFTC Regulation 1.38 requires that transactions "be executed openly and competitively" in a trading pit on an exchange during regular hours, Section 4c(a) of the CEA provides for exchange rules permitting EFPs. CFTC regulation 1.38(b) requires specific recordkeeping for EFPs, and regulation 16.00 requires that EFP volume be reported.

^{36/} See discussion of trading on October 19, *infra*.

^{37/} An additional one million shares were sold long and 1.6 million shares sold short on October 14.

^{38/} See, e.g., Smith, Swartz & Anders, Black Monday: What Really Ignited the Market's Collapse After Its Long Climb, *Wall St. J.*, Dec. 16, 1987, at 1.

^{39/} Report of the Presidential Task Force on Market Mechanisms (January 1988) ("Brady Report"), at III-2.

^{40/} Risk arbitrageurs purchase securities of issuers in which there are reported (or in some cases, rumored) takeover-related transactions pending. The arbitrageurs seek to capture the price appreciation from the time of the reports or rumors to the time of major developments in these transactions.

^{41/} Brady Report, at III-2, Figures 5 and 6.

^{42/} See Chapter Three.

^{43/} See the discussion of this and other news during the market break in Chapter Three.

on the psychology of market participants, the volume of selling by risk arbitrageurs^{44/} does not appear to have been sufficient to depress market prices other than those of specific takeover securities. Nor did selling by these entities appear significantly different in the weeks of October 5 and October 12:

<u>Date</u>	Millions of NYSE <u>Shares Sold</u>	<u>Date</u>	Millions of NYSE <u>Shares Sold</u>
Oct. 5	1.7	Oct. 12	1.9
Oct. 6	2.6	Oct. 13	2.5
Oct. 7	1.1	Oct. 14	0.8
Oct. 8	1.8	Oct. 15	2.9
Oct. 9	4.3	Oct. 16	4.0

While this data does not include liquidations for other arbitrageurs not included in the sample, it does not suggest extraordinary risk arbitrage sales on October 14-16.

3. October 19

On Monday, October 19, the nation's securities and index futures markets suffered their worst decline in history. The negative investor sentiment created over the previous week was reflected in a broad-based selloff throughout the day, and developed into near panic selling by the end of the trading session. As the data detailed below demonstrates, institutional accounts provided the most consistent source of selling pressure throughout the day on the 19th.

On the NYSE, massive sell orders inundated specialists and shattered records set just the week before. The daily volume of 608 million shares almost doubled the October 16 record, and the 16th's record 108 point drop in the DJIA was exceeded in the first hour of trading. For the day on the 19th, the DJIA sustained a 22.6% loss, falling 508.32 points to close at 1,738.40. The NYSE composite index declined by 19.2%. The selloff was so widespread that declining issues led advancing issues by an unprecedented 40-to-1 margin.

This heavy sell pressure was not confined to the NYSE. On the Amex, volume surged to 35.4 million shares, and the exchange's composite index plunged to 282.5, a drop of 41 points or 12.7%. Similarly, the NASDAQ composite index dropped 46 points to close at 360.2, a loss of 11.35%, on volume of 222.9 million shares.

In the derivative markets, the selloff was even greater. The SPZ futures plunged 80.75 points to close at 201.50. This 28.6% decline outpaced even the 22.6% drop in the DJIA. The MMI futures declined 24.38% and the most popular index option for retail investors, the CBOE's S&P 100 index ("OEX") contract, experienced a loss of 21% of the value of the underlying index. ^{45/}

^{44/} These figures are derived from data obtained by the Division from 13 major broker-dealers with risk arbitrage operations.

^{45/} Because the October contracts in the MMI futures (and options) expired on October 16, the decline discussed above refers to the November contracts.

a. Summary of Market Movements

The markets' turmoil was evidenced first in heavy selling on foreign markets prior to the opening of trading in the U.S. On the Tokyo Exchange, the Nikkei index closed down 2.35%, and selling gained momentum during the trading session in the London market, with the FT-SE 100 index 46/ closing down 10.84%.

This heavy sell pressure was evidenced first in the U.S. in the index futures markets. On the CME, the SPZ futures opened at 261.50, down 20.75 points from Friday's close. In the stock markets, large sell order imbalances at the NYSE overwhelmed specialists, delaying openings for a number of bellwether stocks, and making calculations of most major stock indexes virtually impossible. By 10:00, 95 S&P stocks, representing 30% of the index value, were still not open. By 10:30, 11 of the 30 stocks in the DJIA were still closed. While some calculations using prices for stocks already opened showed a 94 point drop in the DJIA to 2153.55 by around 10:30, the actual decline was probably closer to 200 points. 47/ The markets stabilized somewhat by 11:00, and the SPZ discount receded to a slight premium to cash while the DJIA recovered over 60 points by noon to 2103.79. However, the SPZ discount reappeared and prices on the NYSE deteriorated somewhat between 12:00 and 1:00, and again between 1:30 and 2:15. Finally, a 51 point rally around 2:15 to 2:45 was followed by the SPZ discount spiking to approximately 19 points 48/ after 2:50 while a precipitous 252 point plunge in the DJIA resulted in its closing at 1738.40.

Until about 11:00 to 11:30 a.m. on the 19th, the difficulty in obtaining firm stock prices and the resulting unreliability of index valuations made trading in the derivative markets chaotic. Although the SPZ futures appeared to have opened at over a 20 point discount to cash, most market professionals indicate that they recognized that the actual discount was considerably less because of the number of NYSE stocks that had not opened. Nevertheless, as demonstrated by the daily graphs in Appendix D, the SPZ discount throughout the remainder of the 19th was of a different dimension from the week before; the October 19 discount was chronic and much larger than the discount during the preceding week. 49/

46/ The trading session on the International Stock Exchange ("ISE") in London overlaps that of the NYSE. On October 19, therefore, the price declines on the NYSE contributed to the negative investment sentiment on the ISE.

47/ See the discussion of discrepancies between the reported and actual values of the S&P 500 stock index on October 19, contained in infra note 49.

48/ Again, for perspective, prior to the market break any futures discounts to cash were aberrational, discounts of 1 or 2 points were extremely rare, and discounts greater than 5 points were considered extraordinary.

49/ It has been widely suggested that the apparent substantial discounts in the futures market on October 19 and 20 were more apparent than real once the number of delayed openings are taken into account. In an effort to evaluate this view, the Commission's Directorate of Economic and Policy Analysis ("DEPA") analyzed the "reported" S&P 500 value in half-hour increments during October 19 and 20 in comparison to two implied S&P 500 values, i.e., S&P 500A recomputed the S&P 500 value assuming that halted stocks declined in value equal to those

While the volatility of the markets on 19th made any comparison of futures and stock prices difficult, the trading strategies of market professionals on that day clearly were based on the assumption that there was a significant (if indeterminate) discount in the futures market. Significant numbers of index arbitrage programs were effected throughout the day. In addition, as discussed below, many users of portfolio insurance strategies shifted from futures transactions to liquidation of their stock portfolios directly.

b. Breakdown of Trading

It is not possible to reconstruct all selling that occurred on October 19. The data received by the staff indicate that the selling on the NYSE was broad based, with institutions accounting for approximately 50.7%, retail public for 33.3%, and proprietary trading for 16% of the total activity surveyed. ^{50/}

A number of factors, however, can be identified that were significant on that day.

stocks that had opened and S&P 500B recomputed the S&P 500 value using the value at which the halted stocks actually did open. See Charts 2-1 and 2-2 at the end of this Chapter. The data, as set forth in these charts, demonstrate that between 9:30 and 11:30 on October 19 the "reported" S&P 500 value overstated the degree of the discount. For example, at 10:00 the "reported" S&P 500 value was 273.17, although the SPZ was trading at 261.50. If, however, the reported value is adjusted for the 95 stocks that were not yet opened (representing 38% of the S&P 500), the adjusted S&P 500 value was 259.88. By 11:30 the "reported" value (263.85) had achieved approximate parity with the SPZ (265.50) and the adjusted value (263.33) was roughly equal to the "reported" value, with only 1.8% of the S&P value (12 stocks) not yet open. Thus, from 11:30 on (when all the SPZ 500 stocks were open) the SPZ discounts were real and substantial. Indeed, by 1:30 the SPZ was trading at a 22 point discount to cash.

The persistence of these discounts is highlighted by activity on October 20. At 9:30, the SPZ opened at 225.00; by 11:30 it had declined 15.1% to 192, a 30 point discount to cash, even adjusted for the 38 S&P 500 stocks (11.4% in value) that had not opened.

We are not suggesting that, for purposes of arbitrage trading, the difference between the "reported" and actual S&P value was insignificant on October 19th. The differences, in conjunction with wide bid/ask spreads in the futures markets, impaired the ability of index arbitrageurs to effect arbitrage transactions.

^{50/} The Division was able to use the trading information submitted by 20 of the most active broker-dealers during the October market break to account for approximately 378.3 million shares of selling (62.2% of NYSE volume) on October 19. A substantial component not accounted for by these numbers is trading activity by specialists. The percentages of institutional, retail, and proprietary selling cited above and throughout the Chapter and the Chronologies are derived from this sampling of broker-dealer data (cross-checked against audit trail data).

i. Portfolio Insurance

First, portfolio insurance related futures selling was significant throughout the trading day, accounting for at least 16.7% of SPZ volume. Significantly, while selling pressure directly attributable to portfolio insurance strategies that we have been able to identify represented only 5.6% of SPZ volume from 9:30 to 10:00, it grew to 32% from 10:30 to 11:00, and 25% from 12:00 to 1:00. While futures selling emanating from portfolio insurance providers was not particularly concentrated, this persistent sell pressure appears to have acted as an "overhang" on the market throughout the day, making a sustained price recovery in the futures difficult. §1/

In addition, significant direct stock selling hit the NYSE periodically on the 19th in "programs" as part of portfolio insurance strategies. As discussed above, portfolio insurance strategies generally employ sales of futures contracts as the preferred vehicle to reduce equity exposure in a declining stock market because transactions in futures normally have lower transaction costs. Some strategies, however, provide for the alternative of reducing equity through stock sales, either in lieu of futures transactions or as a supplement, if this alternative appears more efficient. The chaotic conditions on the futures and securities markets near the close on October 16 and on October 19, including persistent discounts of futures to cash, evidently influenced some users of these strategies to implement this alternative. §2/ The Division identified one major pension fund that sold 27.3 million shares on October 19 to supplement its futures sales (the fund also sold a total of approximately 7,000 SPZ contracts, equivalent to approximately 17.6 million shares, with a dollar value of \$705 million, on the 16th and 19th). §3/ Stock selling by this institution was spread throughout the day (after 10:30) as thirteen 2 million share programs. In fact, had market conditions permitted, the fund's insurance strategy would have indicated sales of at least an additional 27 million shares, or their futures equivalent, in the final hours of the 19th. §4/ Overall, the Division's review found that at least 39 million shares of institutional selling hitting the NYSE floor as programs, in fact, were attributable to portfolio insurance strategies--

§1/ The daily graphs in Appendix D show the relationship between portfolio insurance futures selling and total SPZ volume on the CME throughout the trading session.

§2/ The money managers interviewed by the Division indicated that they recognized at the time that the apparent "discount" in the futures markets on the morning of the 19th was at least partially a function of the failure of many S&P stocks to have opened on the NYSE. Nevertheless, this situation influenced their decision to employ stock sales as a prudent supplement to futures transactions. The discounts on the afternoon of the 19th do not appear to reflect non-trading stocks to any significant degree, because most major stocks were trading frequently throughout this period.

§3/ On October 19, the SPZ settlement was 201.50, making the value of one contract \$100,750 -- giving 7,000 contracts a value of \$705 million. If an average share price of \$40 is assumed, this would equal 17.6 million shares.

§4/ Instead, this program was halted shortly after 2:00 on the 19th. Market conditions, however, permitted the sale of an additional 9.9 million shares of stock on the NYSE on October 20.

and that this form of selling was at least as significant (in terms of aggregate sell pressure) as selling programs from index arbitrage strategies. 55/

II. Other Futures-Related Trading

The Division's findings concerning the significant level of portfolio insurance futures selling on the 19th are consistent with the CME's analysis of this activity. Overall, the CME found that most of the selling in the SPZ futures on October 19 was institutional in nature. While there was a considerable amount of activity by floor members and more speculative accounts, 56/ this activity encompassed both buying and selling and, as during the week of 12th, resulted in most of these accounts maintaining more or less flat positions.

III. Index Arbitrage

The discounts between the price for the SPZ futures on the CME and the underlying S&P stocks on the NYSE also brought in significant sell arbitrage programs. Overall arbitrage programs accounted for selling of approximately 37.6 million shares (6.1% of total NYSE volume, and 8.8% of NYSE volume in S&P stocks) on October 19. Of this arbitrage-related selling, 9.4 million shares (25%) were sold short, 57/ and 19 million shares (50%) of the 37.6 million shares were sold for customer accounts, including 2.8 million shares sold as index substitution. 58/

While the aggregate amount of arbitrage-related selling was smaller on a percentage basis than during October 14-16, arbitrage programs may have played a significant role in the market decline. Because the discounts that appear during market downturns are calculated and acted upon almost simultaneously by a number of well-capitalized firms and some large institutional investors, arbitrage programs often hit the market as highly concentrated selling pressure which may further speed the drop in

55/ In combination with index arbitrage and other programs identified, the Division has been able to account for approximately 98.9% of the 79.7 million shares of sell volume on the 19th routed to the NYSE through DOT using the List Order Processing System ("LIST"). Of the total of 89 million shares of program selling on the 19th identified by the Division (including volume sent through DOT with proprietary systems other than LIST or sent by phone to the NYSE floor) 77.5 million shares (87%) were sold either as part of portfolio insurance strategies or index arbitrage. The remaining 13% of program selling consists of additional institutional activity.

56/ For example, on October 19 one large speculative account bought almost 5,000 SPZ futures, considering them underpriced. The CME's analysis shows that speculators were both buyers and sellers of futures on the 19th and 20th. See CME Preliminary Report, chart of change in positions of large traders, following p. 28.

57/ An additional 3.3 million shares were sold short for two customer accounts as a hedge for short index futures and options positions which were "frozen" pending liquidation.

58/ See Tables D-4 and D-5.

stock prices. Such concentrated selling occurred at several market downturns on October 19, accounting for 14% of S&P volume from 9:30 to 10:00 (when the reported DJIA had declined approximately 68.10 points, or 3%, from the 2246.70 opening), 59/ 27% from 10:00 to 10:30 (as the DJIA dropped another 26 points or 1.2%), and 45% around 1:20 to 1:30 (at the same time that a minor market rally evaporated).

The periodic sell pressure from portfolio insurance related programs and more concentrated arbitrage sell programs sometimes hit the NYSE simultaneously. In particular, total program selling constituted 63.4% of NYSE volume in S&P stocks from 1:10 to 1:20 and exceeded 60% for two intervals from 1:30 or 2:00. 60/ After 3:00, however, arbitrage programs became less significant as order execution problems on the NYSE mounted. 61/ Short-sale restrictions also limited index arbitrage on the afternoon of the 19th, because upticks were infrequent and unpredictable. Nevertheless, non-arbitrage sell programs, primarily for portfolio insurance strategies, continued to be entered, with total program selling constituting approximately 16% of S&P volume from 3:00 to the market close as volume surged and the DJIA plunged over 200 points.

During this last hour, the large discount of futures to cash may have affected stock prices even though direct transmission of the selling pressure in the futures market to the stock market through index arbitrage was limited in scope. Stock traders may have reacted to the discounts by selling stock in the belief that the futures markets were accurately signalling further stock declines. Potential buyers of stocks also may have reacted to the discounts either by purchasing cheaper futures instead or by withholding buy orders until stocks had retreated further.

Especially during the afternoon of the 19th, it was also common knowledge that portfolio insurers had substantial unexecuted sell orders that had been postponed temporarily due to market conditions. This "overhang" could be expected to diminish buying interest in both the stock markets and the futures markets.

iv. Mutual Fund Redemptions

The Investment Company Institute ("ICI") conducted a survey of its members' shareholder redemption experience and trading activity during the market break. While the data indicated that redemptions increased on October 16 and 19, only approximately 2% of equity mutual fund shares were redeemed on these days and at most funds redemptions were met from available cash reserves. However, there was a significant

59/ The only London EFP reported on the 19th also contributed to concentrated arbitrage selling at the opening. That EFP was for 3.25 million shares, which a customer sold short to a major U.S. broker-dealer prior to the NYSE opening. This broker-dealer then sold this position (viewing it as a long position) as part of an index arbitrage program on the NYSE opening.

60/ The daily tables and graphs in Appendix D provide a breakdown (in 10-minute and 30-minute intervals) of index-related trading on the NYSE and its relationship to total NYSE volume and volume in S&P stocks. Copies of these graphs also are reproduced at the end of the Chapter.

61/ Order-entry problems on the NYSE and other markets are discussed in more detail in Chapter Seven of the Study.

amount of selling by one major mutual fund complex. This fund complex sold a total of 25.8 million shares on October 19, with orders to sell 17.5 million shares entered before 10:00. ^{62/} This major fund, had a policy of being fully invested. Therefore, it was forced to effect substantial sales to respond to weekend redemptions as well as additional redemptions on Monday. Data regarding other funds on October 19 indicated that they were, in the aggregate, net buyers. ^{63/}

v. Margin Calls

Relatively little selling occurred throughout the day as a result of forced liquidations of customer margin accounts. As discussed in detail in Chapter Five, the staff's survey of the 28 most active firms indicates that the responding firms sold at most around 7 million shares (1% of NYSE volume) ^{64/} on October 19 as liquidations to meet unpaid customer margin calls. In addition, some customer stock positions may have been sold by customers (as opposed to firms) in order to raise cash for both securities and futures margin calls, although the level of this selling could not be quantified by the firms contacted by the Division.

vi. Foreign Selling

Finally, a number of persons interviewed by the staff from the firms' institutional sales and block trading desks indicated that they believed there was substantial,

^{62/} Unlike most program orders, which are sent to the NYSE floor in concentrated packages via the exchange's automated order-routing systems, this fund expected the firms handling the orders to "work the orders" in segments to maximize the prices received to raise cash for redemptions. The impact on stock prices of these sell orders, therefore, is more difficult to quantify for selected 10 minute or 30 minute intervals than is the case for program orders. For example, the fund estimates that slightly less than one-half of its sales entered before 10:00 were actually executed before 10:00. In addition, the fund has represented that the level of its trading on the 19th, under 4.5% of total NYSE volume, was not aberrational since the fund's transactions constituted roughly 3.6% of NYSE volume in October 1987 and ranged up to 4.4% in July 1987. Nevertheless, the magnitude of this fund's sell orders on the 19th and the fact that most of this activity was concentrated on the sell-side indicate that it did play a significant role for the day, and particularly in the morning.

^{63/} See Letter to David S. Ruder, SEC Chairman, from David Silver, ICI President, dated November 24, 1987. More detailed fund information was separately sent by the ICI to the Division. The Commission staff conducted limited inspections of 52 non-ICI member funds and found that the redemption and portfolio sales activities of these funds were generally less, percentage-wise, than that reported by the ICI for its member funds.

^{64/} Firms reported that margin liquidations on the 19th totaled \$293 million, but could not determine which types of stocks were sold in these liquidations. Accordingly, the Division is unable to determine what percentage of margin liquidations involved sales of NYSE stocks. If the assumption were made that all of this \$293 million involved NYSE stocks, and a \$40 per share average price were used, this translates to only 7.3 million shares sold for this reason.

although not extraordinary, foreign selling on the morning of October 19. Although a few firms indicated that there was significant selling by Japanese investors, most firms stressed that most of the foreign selling came from European investors, a trend that had begun earlier in the month and accelerated on the 19th and 20th. ^{65/} Quantifying the amount of such foreign selling is extremely difficult because much of the activity is settled through U.S. banks, and, therefore, cannot be easily distinguished from activity by U.S. institutions. Nevertheless, through examining settlement information from the Depository Trust Company ("DTC"), the staff identified four major sell programs in U.S. stocks through foreign banks totalling over 9 million shares.

Perhaps as significant as any foreign selling during October 19, was the drying up of foreign buying interest. Traders at one major firm indicated that buying interest from Japan had been a significant support to the market during 1987. On October 19, however, they indicated that Japanese buying interest disappeared.

c. Summary

While it is not possible to reconstruct all trading during October 19, the above breakdown permits the Division to reach the following determinations.

Overall, the predominant source of selling pressure throughout the day was from institutional accounts, including portfolio insurance selling, mutual fund liquidations, margin liquidations, and selling by foreign accounts. In particular, this institutional selling, when combined with index arbitrage-related selling, accounts for the vast majority of opening volume on the NYSE. This early institutional selling, in turn, appears to have developed as a direct result of the market decline of October 14-16.

The most significant factors during the afternoon downturn appear to have been the convergence of stock selling from index arbitrage and portfolio insurance strategies around 1:30 to 2:00, and continued selling from a broad range of sources including portfolio insurance strategies thereafter. While the Division's review is unable to provide the same level of specificity for trading in the final hour of the October 19 trading session, it appears that continued institutional selling, combined with the near exhaustion of market-making capacity on the securities and futures markets and the uncertainty created by the number of DOT orders lacking "fill" reports, ^{66/} contributed to the panic selling before the close.

4. October 20

Tuesday, October 20, saw a continuation of the extraordinarily high volume and volatility of Monday. Unlike October 19, however, price movements resembled a roller coaster -- demonstrating both tremendous nervousness on the part of market participants and the exhaustion of market-making capacity in virtually all stock and derivative markets. As a result, the securities and futures markets reached a point,

^{65/} In a news account, a trader indicated that the level of selling by both Japanese and European investors required pre-clearance by his firm. See Smith, Swartz & Anders, Black Monday, What Really Ignited the Market's Collapse After Its Long Climb, Wall St. J., Dec. 16, 1987, at 20.

^{66/} See Chapter Seven.

around mid-day, when heavy sell pressure overwhelmed market-making capacity in both the securities and futures markets. At about noon, trading in a large number of NYSE securities were halted and most derivative markets ceased trading. Around this time, however, the convergence of a number of factors, including news of pending corporate buy-backs of stocks and assurances of sources of liquidity for NYSE specialists, as well as the dissipation of stock selling and the return of investors seeking to buy at "bargain" prices, resulted in a remarkable market recovery. The DJIA gained around 118 points (6.8%) from 12:20 to 1:00, maintaining a 102.27 point (5.88%) recovery for the day, and closing at 1,841.01 on record NYSE volume of 613.7 million shares. ^{67/} This recovery, however, did not extend to the Amex and NASDAQ markets, which closed down 8.64% and 9%, respectively.

a. Summary of Market Movements

The bearish investor sentiment of the 19th was not limited to the U.S. markets. Major foreign markets suffered record or near-record percentage declines. The Tokyo Nikkei index closed down 14.90% (and very likely would have dropped further except for the fact that price limits were reached on many individual stocks) and the London FT-SE 100 index closed down 12.22%.

Notwithstanding downward trends in the foreign markets, prices on both the leading U.S. index futures market (the CME) and securities market (the NYSE) opened sharply higher. The SPZ futures on the CME opened up 23.50 points at 225, and quickly rose another 16 points to 241 by 9:53, trading at an apparent premium to the index stocks of up to 10 points. Trading on the NYSE began with the DJIA rising to 1,935.7, up 197.30 by 10:28.

Heavy sell pressure on the CME, however, caused SPZ prices to decline, trading by about 10:00 at a slight discount to cash as the DJIA peaked. Despite the relatively low level of index arbitrage, ^{68/} the DJIA fell 227 points by 12:21. As discussed in more detail in Chapter Four of the Study, this renewed sell pressure severely strained market-making capacity on the NYSE. By 12:30 p.m. (Eastern Time), trading had been halted due to order imbalances in 145 NYSE stocks (including 77 stocks in the S&P 500, representing 24.6% of the index value), and the NYSE informed the Commission that it was considering closing the Exchange. Meanwhile, selling pressure on the SPZ was heavy, ^{69/} halts in trading for significant numbers of SPZ stocks continued, and the CBOE had halted trading in the S&P 100 index. The CME halted SPZ trading at 12:30 p.m. (Eastern Time). At this time, trading of most other index futures and options also was at a halt, with the exception of the MMI futures traded on the Chicago Board of Trade ("CBT").

^{67/} This volume figure, which is larger than the often cited volume of 608,120,000 shares, is derived from NYSE audit trail tapes.

^{68/} The Division's review indicates that the voluntary restrictions placed by the NYSE on member firms' use of the Exchange's automated order-routing systems for both proprietary and customer index-arbitrage program trading resulted in these strategies playing negligible roles on this day. See discussion, *infra*, at 2-22.

^{69/} The SPZ had fallen 57 points from its early peak to 183.00 by 12:15.

During an interval of about 20 minutes, beginning at approximately 12:30, the MMI futures staged an extraordinary 90 point rally, rising from a discount of about 60 points to a 12 point premium. The DJIA recovered 126.2 points to 1834.9 by 1:12 p.m. ^{70/} About the same time, renewed buying interest appeared in the stock markets, causing the NYSE to decide to remain open. While the rise in the MMI may have had a psychological impact on stock prices, it appears to have had no direct effect on trading on the NYSE. During that time period only one small arbitrage program was effected employing the MMI.

After the CME re-opened at 1:05 p.m., the rally on the NYSE faded, with the DJIA falling back 80 points in 27 minutes. The SPZ opened at a discount to cash of more than 16 points, increasing quickly to over 31 points with the onset of the decline in stock prices. Shortly after 2:00, the DJIA, despite continued discounts on both the SPZ and MMI futures, staged a third rally of nearly 170 points to 1,920.3 by 3:55. It then declined about 80 points to close the day at 1,841.01, up 102.27 points for the day.

b. Breakdown of Trading

1. Portfolio Insurance

Overall, it appears that portfolio insurance futures and stock selling played a significant role on October 20th in dampening price recoveries in both markets. In particular, selling pressure on the CME from portfolio insurance strategies reached its highest level for the October market break, accounting for approximately 28,000 contracts, or 25.5% of total SPZ volume on October 20. Portfolio insurance appears to have been a substantial factor in moving the SPZ price to a discount to cash value a number of times during the trading day. For example, while the SPZ opened at a substantial premium to fair value, that premium dramatically reversed to a slight discount by approximately 10:00. During this period, portfolio insurance strategies accounted for sales of at least 4,885 contracts, or roughly 26% of SPZ volume. Portfolio insurance strategies accounted for at least an additional 2,621 sales of SPZ contracts (25% of volume) between 10:00 and 10:30, as the apparent discount to the cash value increased in excess of 16 points and the DJIA began its plunge from the high of 1935.70. For the next hour, while the DJIA declined by over 170 points, portfolio insurance accounted for more than 34% of SPZ sell volume. While many portfolio insurance sales were cancelled after the 19th and never executed, portfolio insurers appear to have used periods of strength in the futures market, such as the opening price surge, to sell some of their "overhang" of sales from the prior day.

In addition, the portfolio insurance stock selling, which had reached 39.9 million shares on the 19th continued on October 20. The selling, however, was at a reduced level, totaling 10.5 million shares or 1.7% of NYSE volume and 2.4% of S&P volume on the 20th.

^{70/} As discussed in detail in Chapter Three of the Study, the Division's analysis of index-related trading during this period does not provide any direct evidence to support press allegations that MMI futures were used to manipulate the prices for bellwether NYSE stocks to turn the market around. It is not possible to quantify the effect on market psychology, however, of the price rise experienced at that moment of time in the MMI index.

ii. Index Arbitrage

Prior to the opening of trading on October 20, the NYSE requested that its members refrain from using the DOT LIST processing feature to route index arbitrage programs to the NYSE floor. On October 21, the NYSE also requested that firms refrain from effecting proprietary arbitrage programs until further announcement. As a result, the index futures and stock markets were effectively decoupled and relatively little index arbitrage was effected the remainder of the week. ^{71/} Given the relatively low level of index arbitrage reported to the Division, ^{72/} it does not appear that arbitrage, itself, was instrumental in transmitting futures price movements to the equity market on the 20th. ^{73/} Nevertheless, as on the 19th, the persistent futures price discounts may have had the effect of encouraging additional speculative stock selling and discouraging buying by market professionals and institutional investors. ^{74/}

iii. Margin Calls

The level of firm liquidations of customer stock positions to meet outstanding margin calls increased from a value of approximately \$292.6 million on October 19 to approximately \$425.8 million on the 20th. At most, this would account for approximately 10.5 million shares of selling (1.7% of NYSE volume). ^{75/} As on the 19th, however, on October 20 customers also may have voluntarily sold stock to raise cash for actual or anticipated margin calls.

^{71/} Effective on November 3, 1987 the NYSE permitted programs entered for customer or proprietary accounts to be routed through the DOT system if entered prior to the opening. On November 6, the NYSE announced that commencing November 9, 1987, members firms would be allowed to use DOT to execute orders for program trades throughout the day.

^{72/} This low level of arbitrage is consistent with the results of the NYSE's monitoring of "program" orders sent through the Exchange's automated order-routing systems.

^{73/} No EFPs were reported for October 20.

^{74/} See Chapter Three.

^{75/} As noted in the discussion of October 19, this maximum number of shares assumes that all selling involved NYSE (versus Amex and NASDAQ) stocks -- an assumption which is almost certainly unrealistic.

iv. Dividend Capture Strategies

Press accounts 76/ and the Brady Report 77/ have cited selling related to dividend capture strategies 78/ as possibly contributing to selling pressure during the market break. The Division's interviews with major market participants confirmed that at least one firm active in these strategies did suffer significant reverses due to forced liquidations of stock and options positions. Nearly its entire portfolio of approximately \$600 million was liquidated from October 20 to 22. Overall, however, the Division did not find direct evidence that dividend-related selling was a significant factor during the market break. For example, only two of the 30 DJIA stocks went ex-dividend beginning October 19 and 20. While these securities experienced trading volume surges and sharp price movements during the break, volatility for the two ex-dividend issues on key dates was not significantly different from that on other trade dates in October. 79/

v. Other Trading

The Division's review of trading on the 20th has not identified dominant sources of selling pressure during the mid-morning market downturn. This selling appears to have been broad-based, with the largest segment of selling derived from institutional accounts (45% on the 20th, compared to 50.7% on the 19th) and only slightly higher levels of selling from retail and proprietary accounts (37.4% retail and 17.5% proprietary on the 20th, compared to 33.3% retail and 16.0% proprietary on the 19th). 80/ Some sellers, especially portfolio insurers, may have sought to take advantage of the morning's price recovery as an opportunity for liquidations prior to another market drop.

Similarly, the trading information available to the Division does not highlight any particular sources for the resurgence of buying interest that precipitated the mid-day market recovery on the NYSE. Again, this buying appears to have come from all types

76/ Crossen, Dividend-Capture Plans Came Up Short, Wall St. J., Nov. 3, 1987, at 6.

77/ Brady Report, at III-21.

78/ Dividend capture strategies involve the short-term purchases and sales of securities and options on those securities (of available) to obtain dividends (subject to favorable tax treatment for corporate clients) with minimal commitment of funds.

79/ The two stocks were Proctor & Gamble Co. ("PG") (the stock went ex-dividend on October 19 and declined 6% on October 16, 28% on October 19) and McDonalds Corp. ("MCD") (stock went ex-dividend on October 20 and declined 17% on October 19 and gained 8.25% on October 20). While these figures indicate that PG declined more than the DJIA on the 16th and 19th and MCD declined less on the 19th and gained more on the 20th, these discrepancies are consistent with the stocks' performance relative to the DJIA on other days such as October 6, when PG lost 4% while the DJIA lost 3.5%.

80/ The sampling of broker-dealer data used for these percentages accounted for 386 million shares (63% of NYSE volume).

of accounts (45.9% institutional, 38.1% retail, and 16.0% proprietary). Nor does it appear that buying by corporate issuers on the 20th (although announced for the near future) accounted for a significant segment of this buying interest. Our survey of issuers in the S&P index with outstanding repurchase programs indicates that those issuers only accounted for 21.94 million shares or 3.57% of buying on the NYSE (or 5.14% of volume in S&P stocks). We cannot ignore, however, the psychological significance of the announcement of issuer repurchase programs during October 20. For example, during the critical period between 11:30 and 1:00 that day, eight issuers in the S&P 500 index announced repurchase programs. ^{81/}

C. Commission Regulatory Actions During the Market Break

The following section of the chapter provides an overview of Commission actions during the October market break.

1. Commission Monitoring and Supervisory Activities

Under the federal securities laws, primary supervision of the operations and trading in the securities markets resides in the self-regulatory organizations -- the exchanges and the National Association of Securities Dealers ("NASD") -- with active oversight by the Securities and Exchange Commission. ^{82/} Thus, the NYSE, the Amex, the NASD, the CBOE, and the regional stock exchanges maintain systems and procedures to monitor trading and to handle operational problems (such as order imbalances) in their markets. Moreover, the markets, in close cooperation with the major clearing corporations, regularly monitor the financial and operational conditions of the brokerage and trading firms.

The Commission's direct monitoring role is more limited. The Commission relies in part on the extensive systems, procedures, and expertise of the self-regulatory organizations ("SROs") to monitor trading and financial health in the securities markets. The Commission performs its oversight function through regular and frequent communication with the SROs and through a program of regular inspections of the various SRO program areas. The Commission also maintains a market surveillance staff in the Divisions of Market Regulation and Enforcement as a further oversight measure.

When markets are more volatile, or suffer significant declines, the staff oversight role increases to provide the Commission with information concerning reasons for the volatility (to assist decision making on regulatory and market issues) and concerning any financial or operational difficulties of firms subject to Commission jurisdiction. Because the two weeks preceding the October 19 market decline were periods of increased volatility and market price erosion, the staff had already stepped up its market oversight functions.

For example, following the October 6, 1987, drop in the market, the Commission immediately contacted the NYSE and the CFTC to initiate a review of trading activity on that day. In addition, the Commission staff interviewed market participants to

^{81/} For a more complete discussion of issuer repurchase programs, see Chapter Six.

^{82/} See, e.g., Sections 6(b)(2) and 15A(b)(2) of the Securities Exchange Act of 1934.

determine who engaged in trading on that day, for what purposes, and in what amounts. The Commission also requested the NYSE to supply trading data that would allow reconstruction of the day's events. The actions that we took in response to the October 6 decline were subsequently repeated for October 14, 15, and 16, in response to the precipitous drops in the DJIA on those days. Beginning on October 14, Commission staff also began to canvas the various SROs concerning the financial condition of the broker-dealers that they examine. At the time the SROs advised the Commission that their firms were not experiencing any financial difficulties.

Because of the significant declines that occurred during the week of October 12, 1987, and in particular the then-record 108 point decline in the DJIA on Friday, October 16, 1987, preparation was begun over the weekend for possible disruptions in Monday's markets. For example, at the Commission Chairman's request, senior staff of the Division of Market Regulation held weekend discussions to plan for market monitoring on Monday, October 19; previously scheduled business travel was postponed to ensure adequate senior staff supervision of market conditions on Monday; and the Commission arranged with the NYSE to receive pre-opening indications for major stocks on Monday morning to get a sense of market conditions in advance of the opening. This last procedure had been used previously in unusual market environments -- such as in connection with monitoring "Expiration Friday" trading. ^{§3/}

On October 19 the Commission received indications of steep price declines in Tokyo and London prior to the opening on the NYSE. In addition, the Commission received indications from the NYSE of significant order imbalances on the sell side--indicating a significant market decline at the opening. The Commission requested the NYSE surveillance department to keep it informed on an on-going basis of any operational problems at the Exchange. The Commission also requested information on specialist positions and up-dates on order imbalances. Immediately after the opening, Chairman Ruder spoke with John Phelan, Chairman of the NYSE, and was briefed as to the size of sell order imbalances that morning. In response to the early sell-off, Division of Market Regulation staff, using in-house automated market information systems, began to monitor the securities and futures markets minute-by-minute.

Throughout the day, and continually, day-by-day, for the next two weeks, Commission staff, working in specialized teams, kept in close contact with the stock exchanges, options markets, clearing agencies, major broker-dealers, and order-routing firms. The Commission monitored the operation of each market's order entry and automatic execution systems; the operation of the NASDAQ computerized quote system; the capacity of the major stock and options clearing operations to process a record number of transactions; the financial condition of broker-dealers and clearing agencies; and the capacity of order-routing firms to handle unprecedented volume. In addition, the Commission staff conducted a series of on-site reviews of broker-dealers and a major service bureau which had reported delays in public customer order executions due to increased volume. The staff also responded to numerous questions from market participants, including issuers, investors, and members of the securities bar.

The Commission also monitored, through its Division of Investment Management, the effects of market activity on the investment company industry. Division staff in

^{§3/} See discussion of Commission monitoring of expiration market volatility in Chapter One.

Washington and SEC regional office staff contacted fund and fund transfer agents in their regions by phone or visit. These monitoring efforts focused on the level of mutual fund shareholder inquiries and redemption requests, as well as the capacities of the fund to keep up with the extra paperwork generated by the crisis and to price their shares on a timely basis.

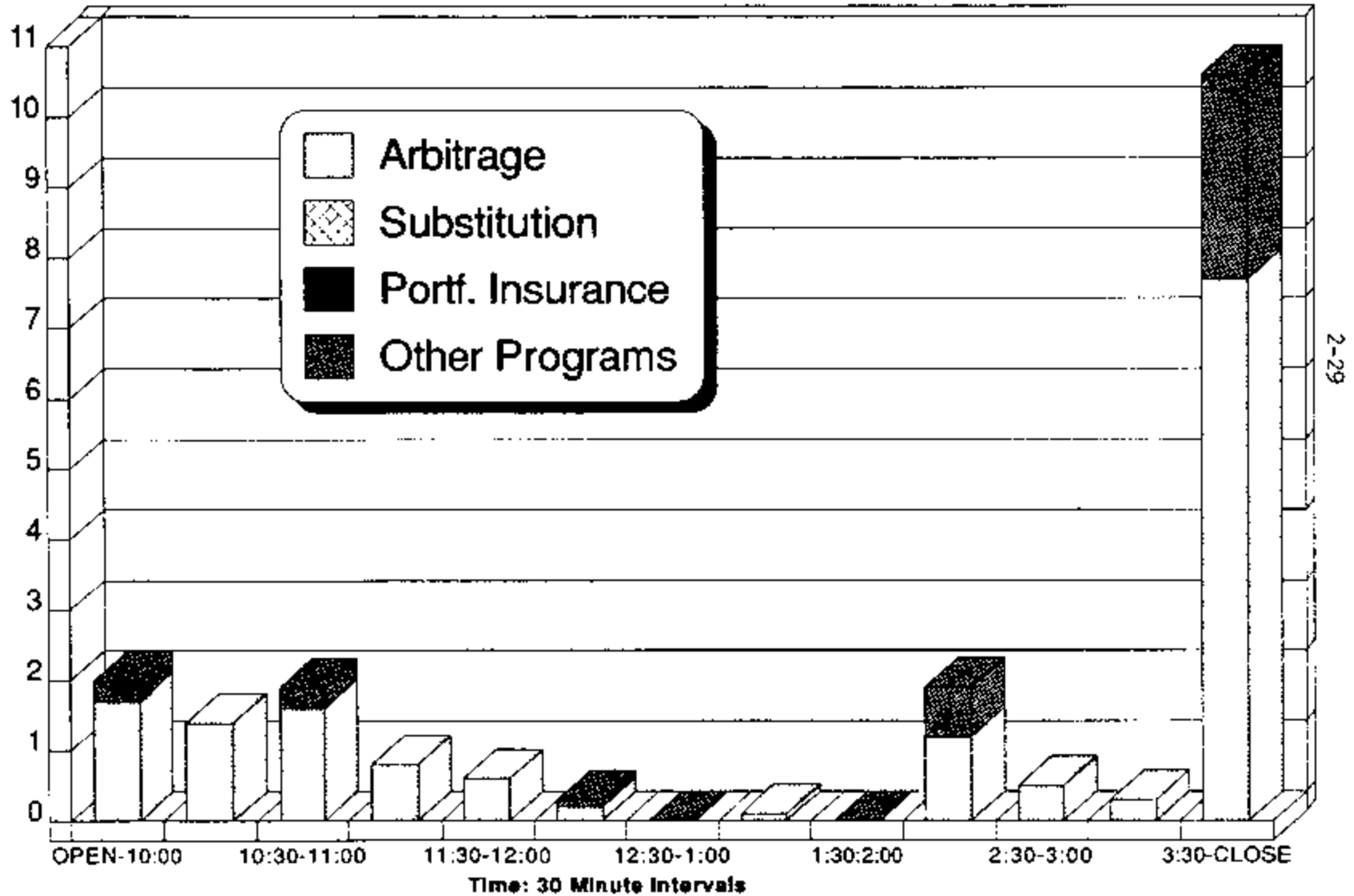
2. Commission Consultation and Decision Making Activities

In addition to these monitoring functions, the Commission played a primary role in consultation with the NYSE, other major securities exchanges, the NASD, and the CFTC and other governmental agencies, in making certain key decisions throughout the weeks of October 19 and October 26. These significant activities related to, among other matters, curtailing program trading on the NYSE; the NYSE's order imbalance problems on the 20th; early closing of the exchanges; assuring financial viability of certain specialists; the liquidity problems of options market-making clearing firms; increasing margin requirements on stock index options contracts; clarifying interpretive questions relating to the acquisition by corporations of their stock; and dealing with problems raised in the area of mutual fund regulation.

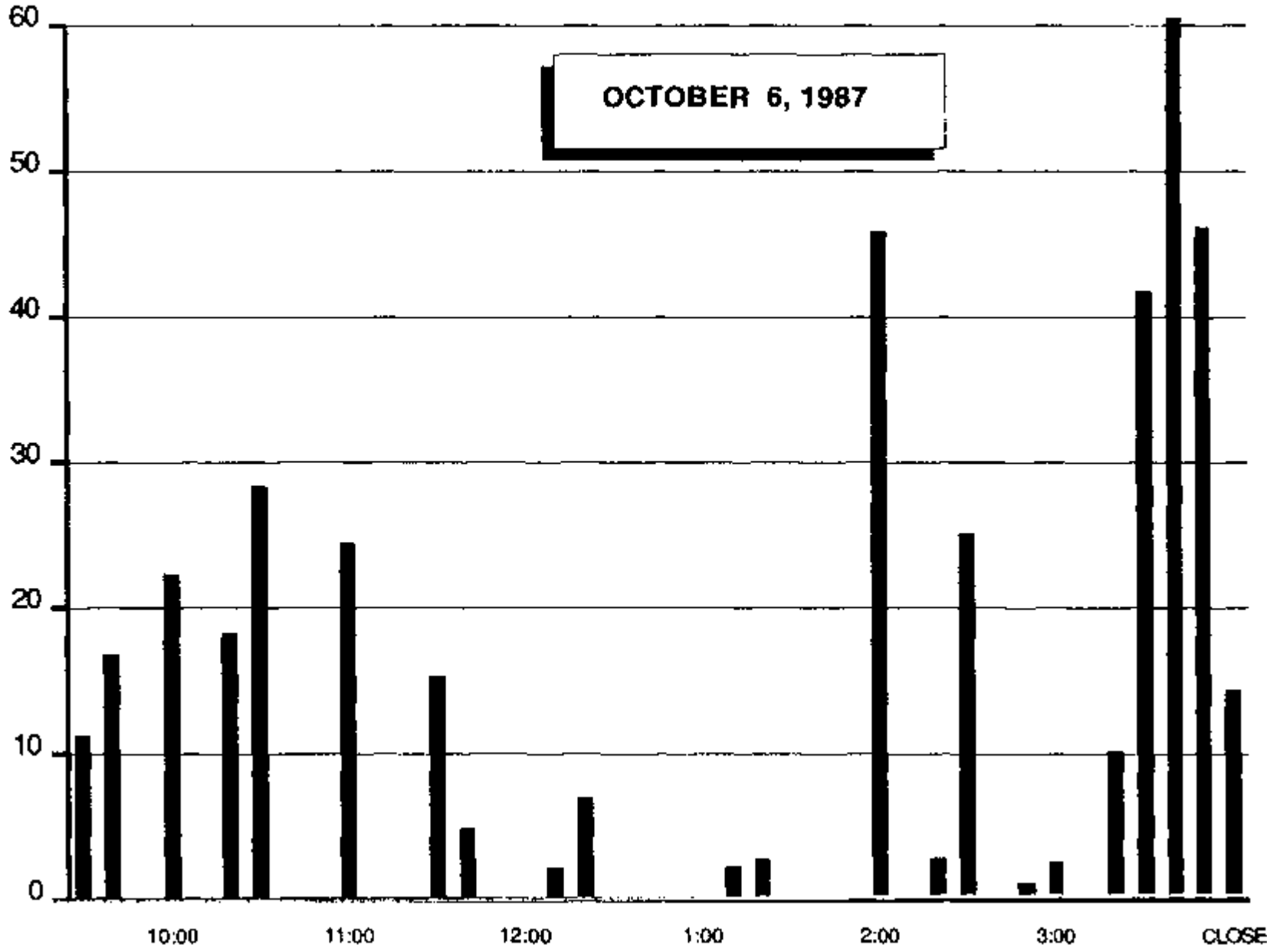
**CHARTS
AND
GRAPHS**

Thirty Minute Breakdown of Index-Related Selling on NYSE (October 6, 1987)

Millions of Shares

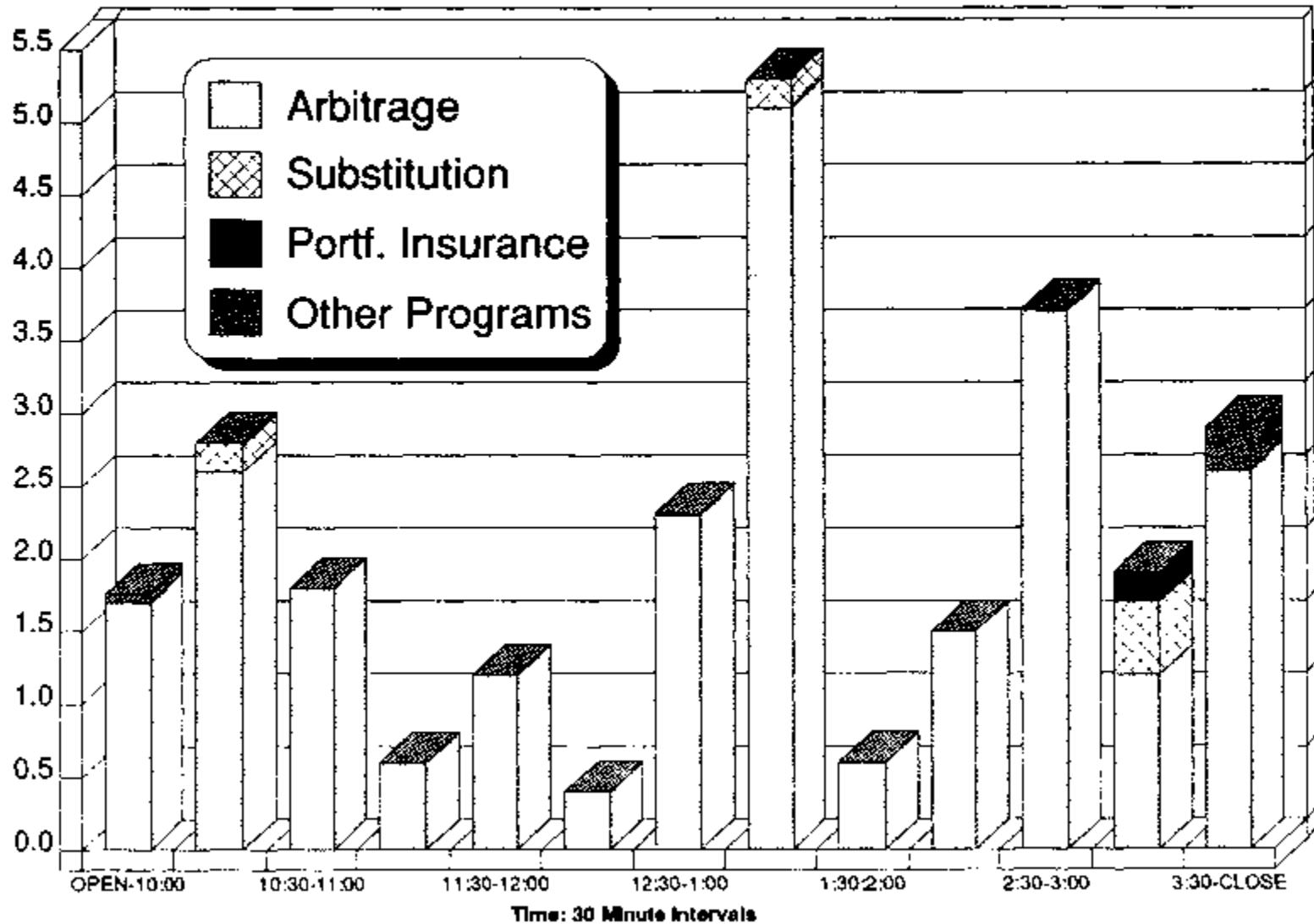


Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)

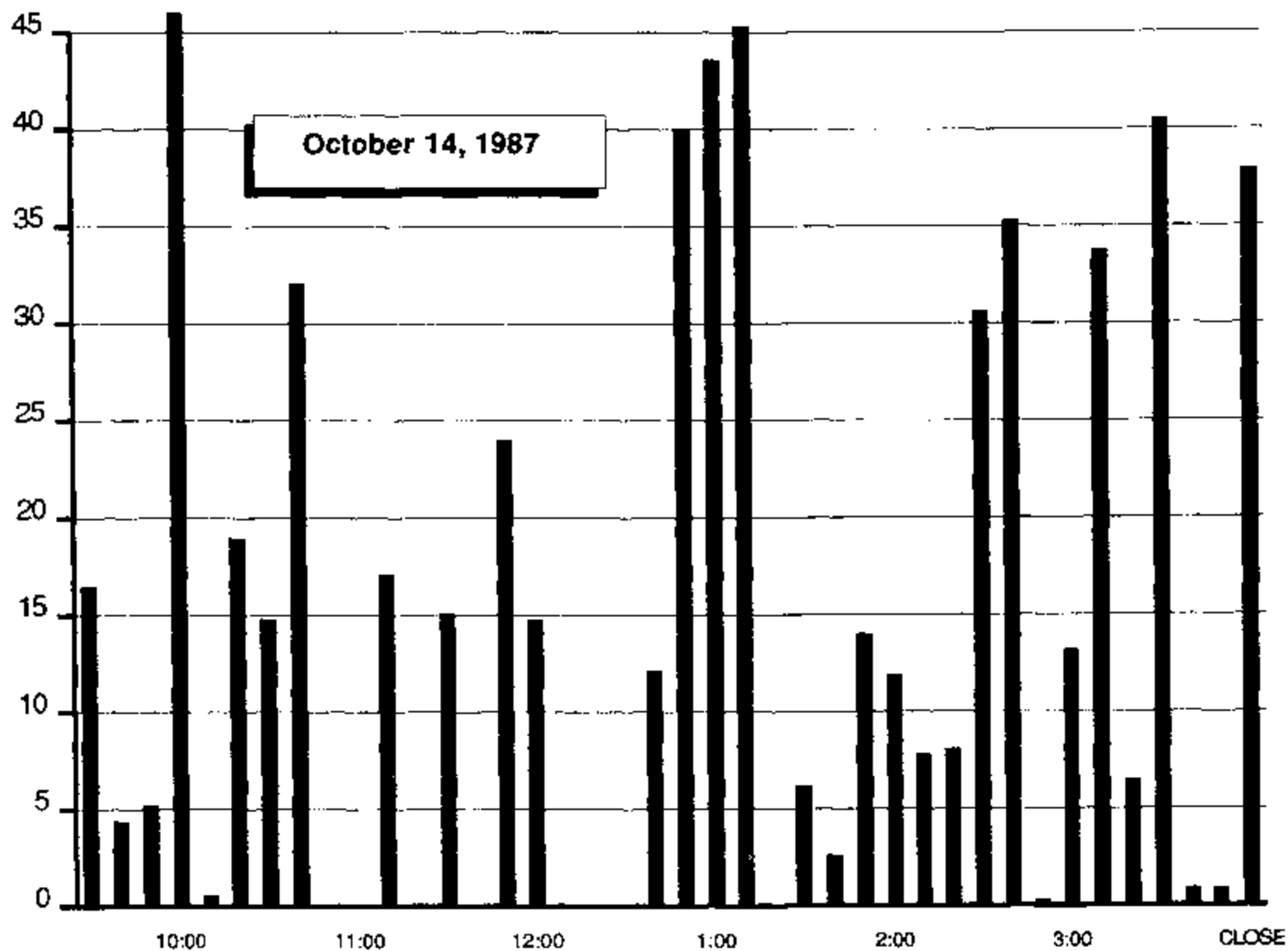


Thirty Minute Breakdown of Index-Related Selling on NYSE (October 14, 1987)

Millions of Shares

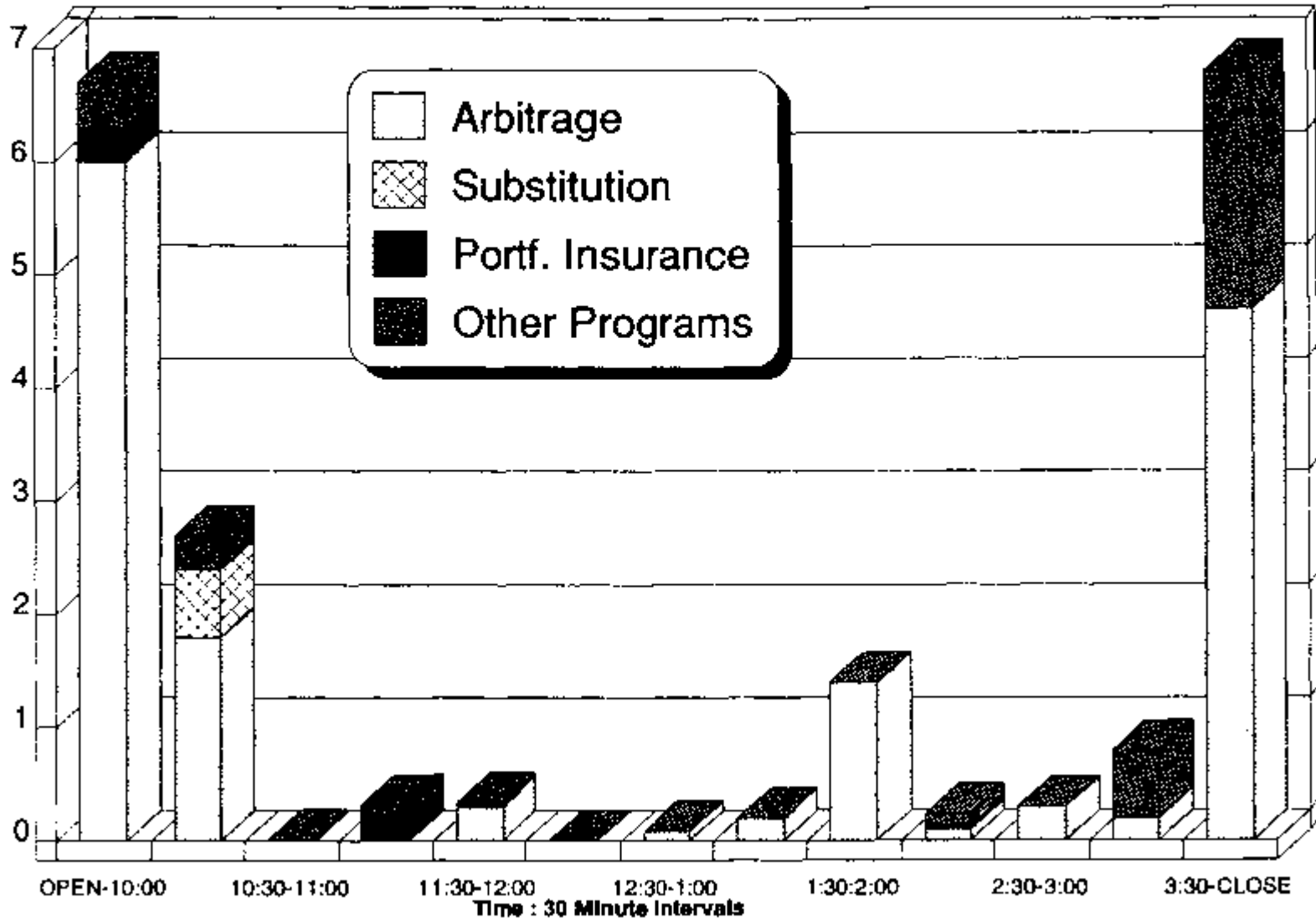


Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)

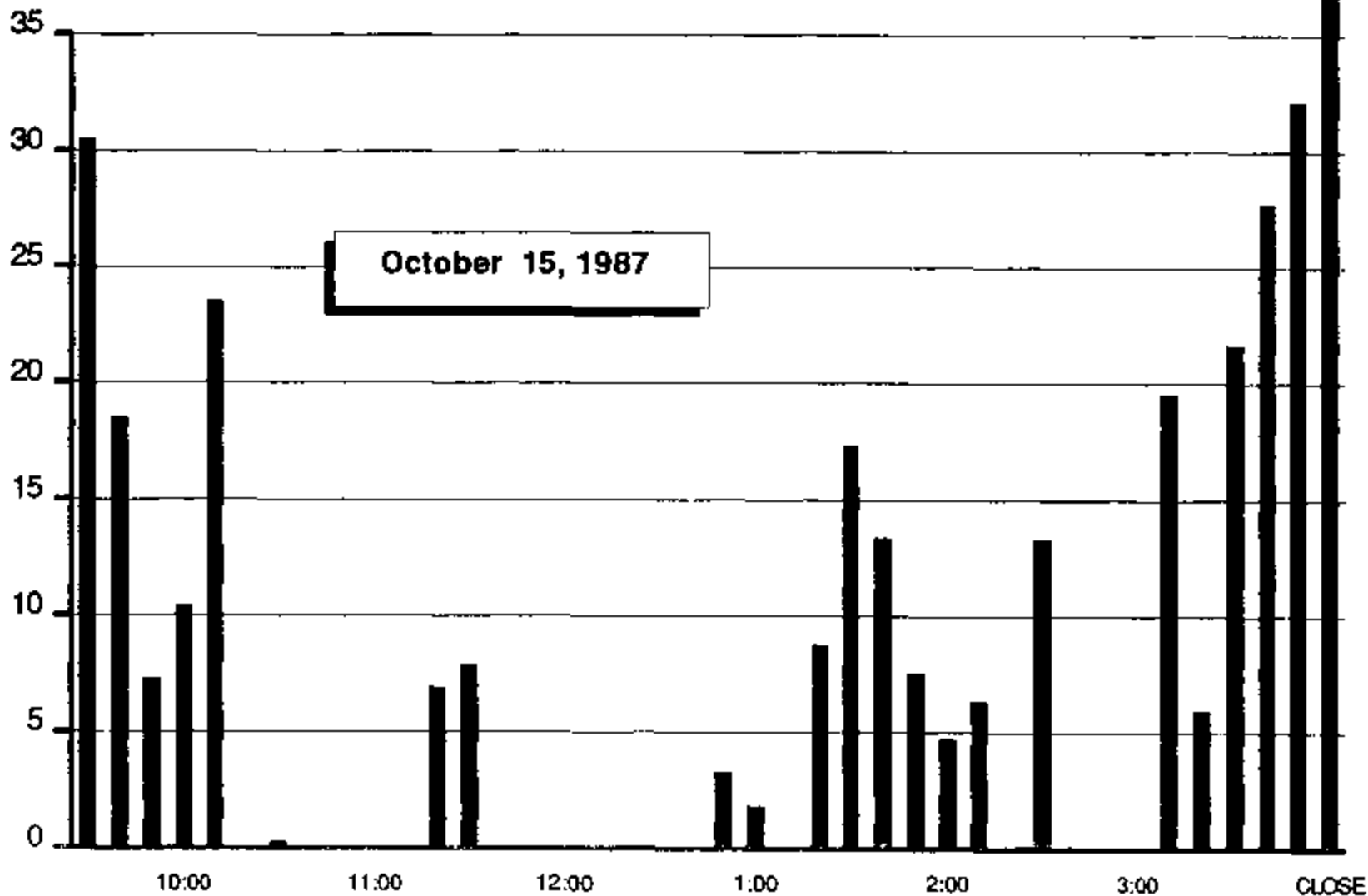


Thirty Minute Breakdown of Index-Related Selling on NYSE (October 15, 1987)

Millions of Shares

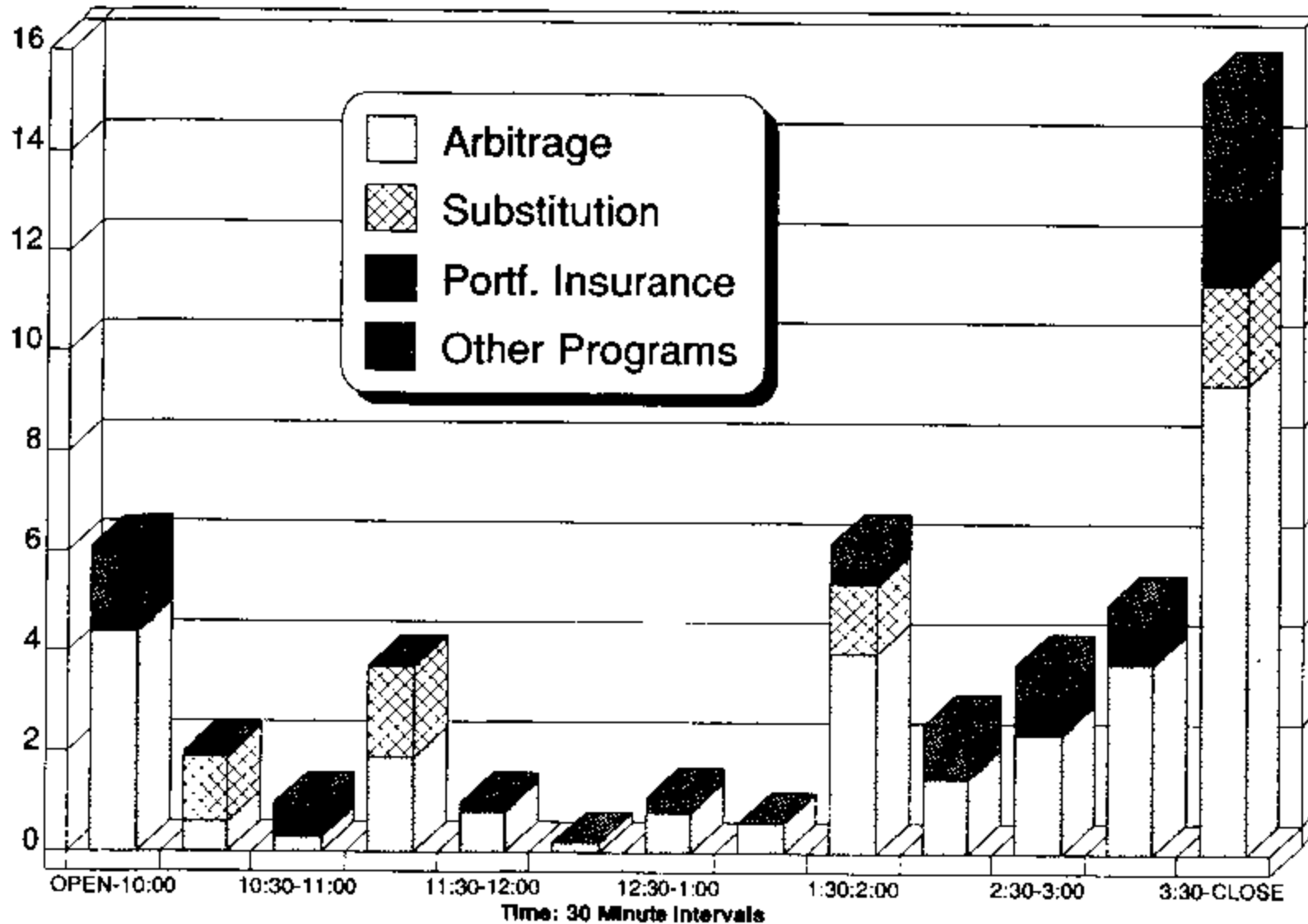


Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)

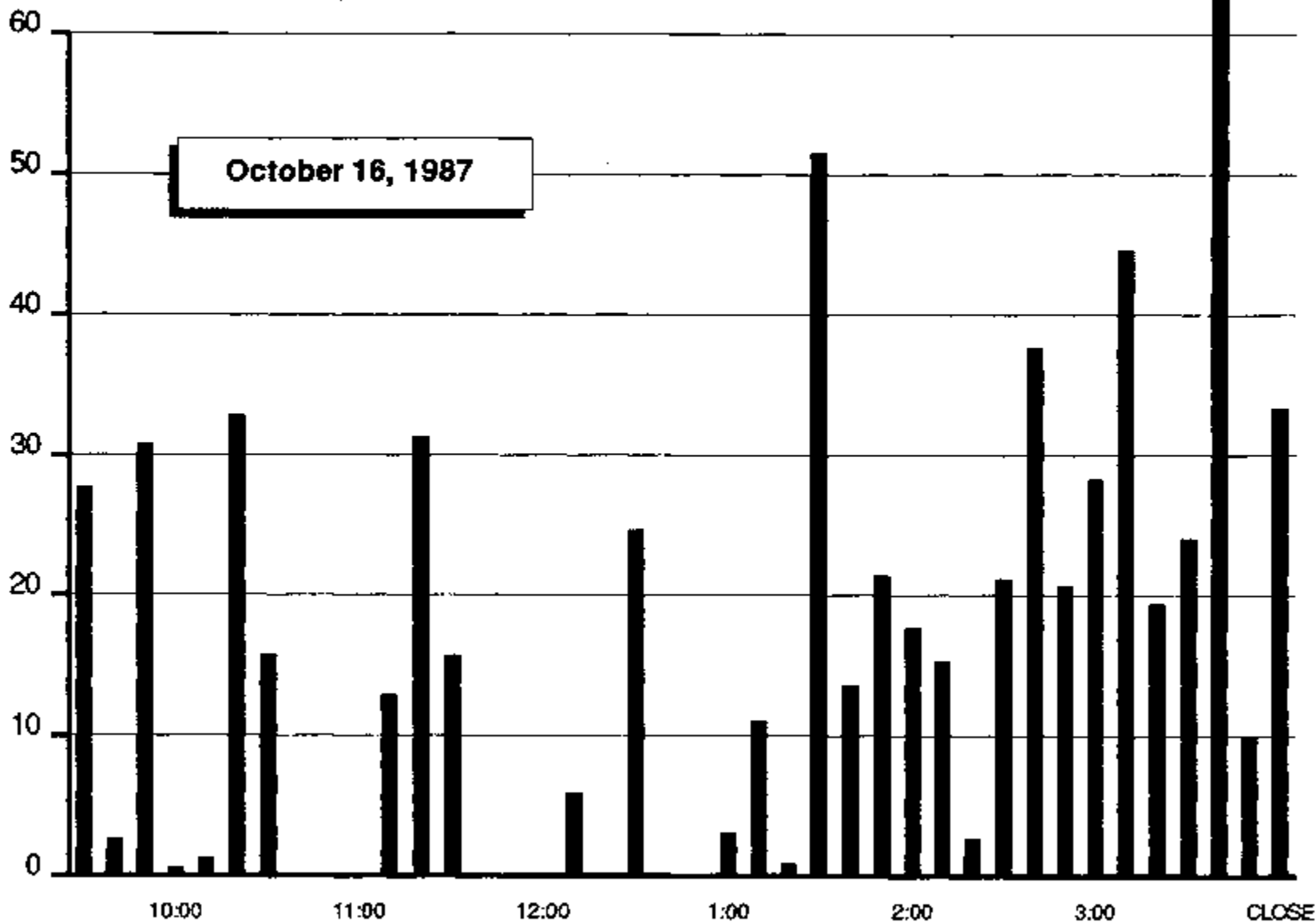


Thirty Minute Breakdown of Index-Related Selling on NYSE (October 16, 1987)

Millions of Shares

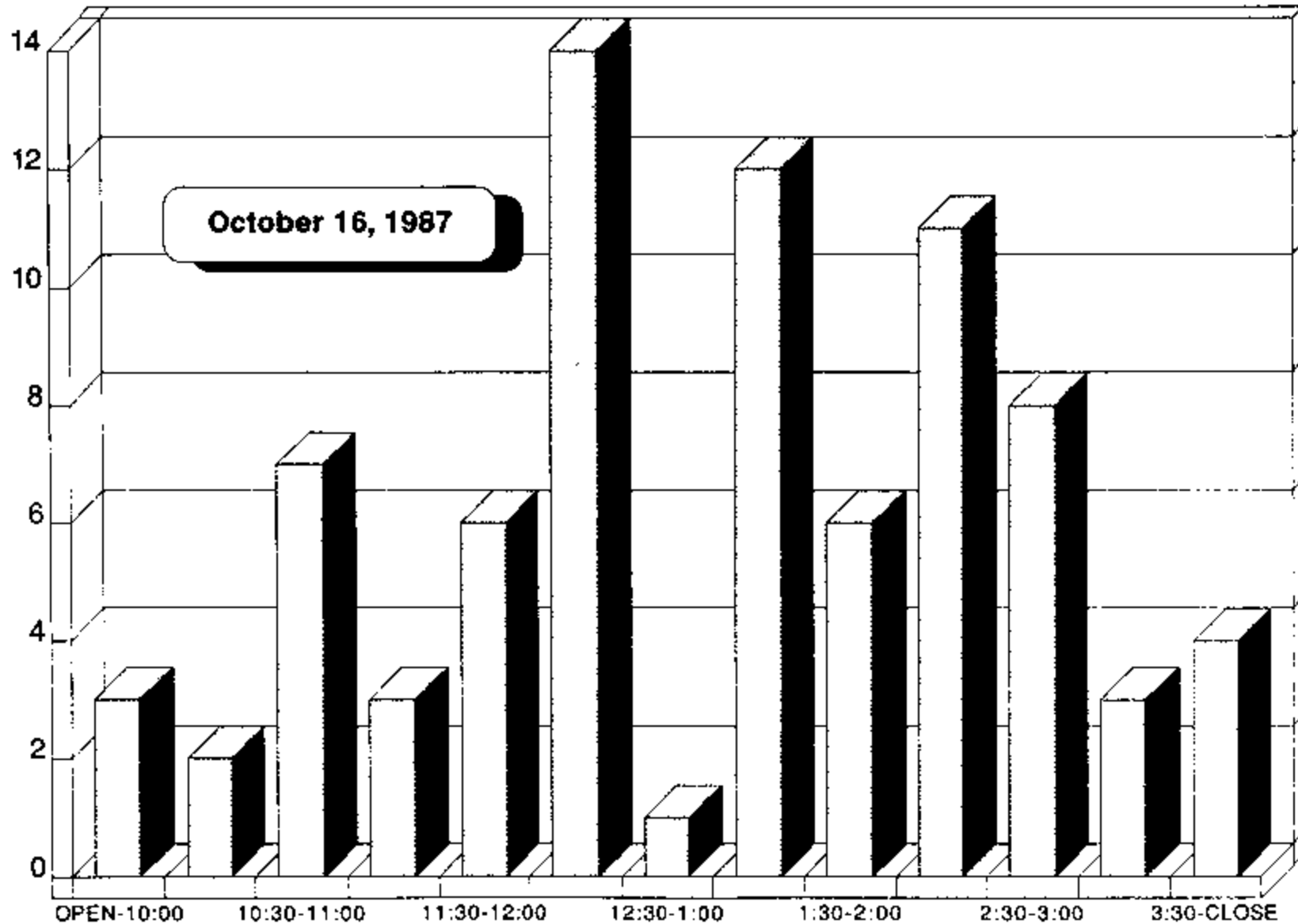


Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)



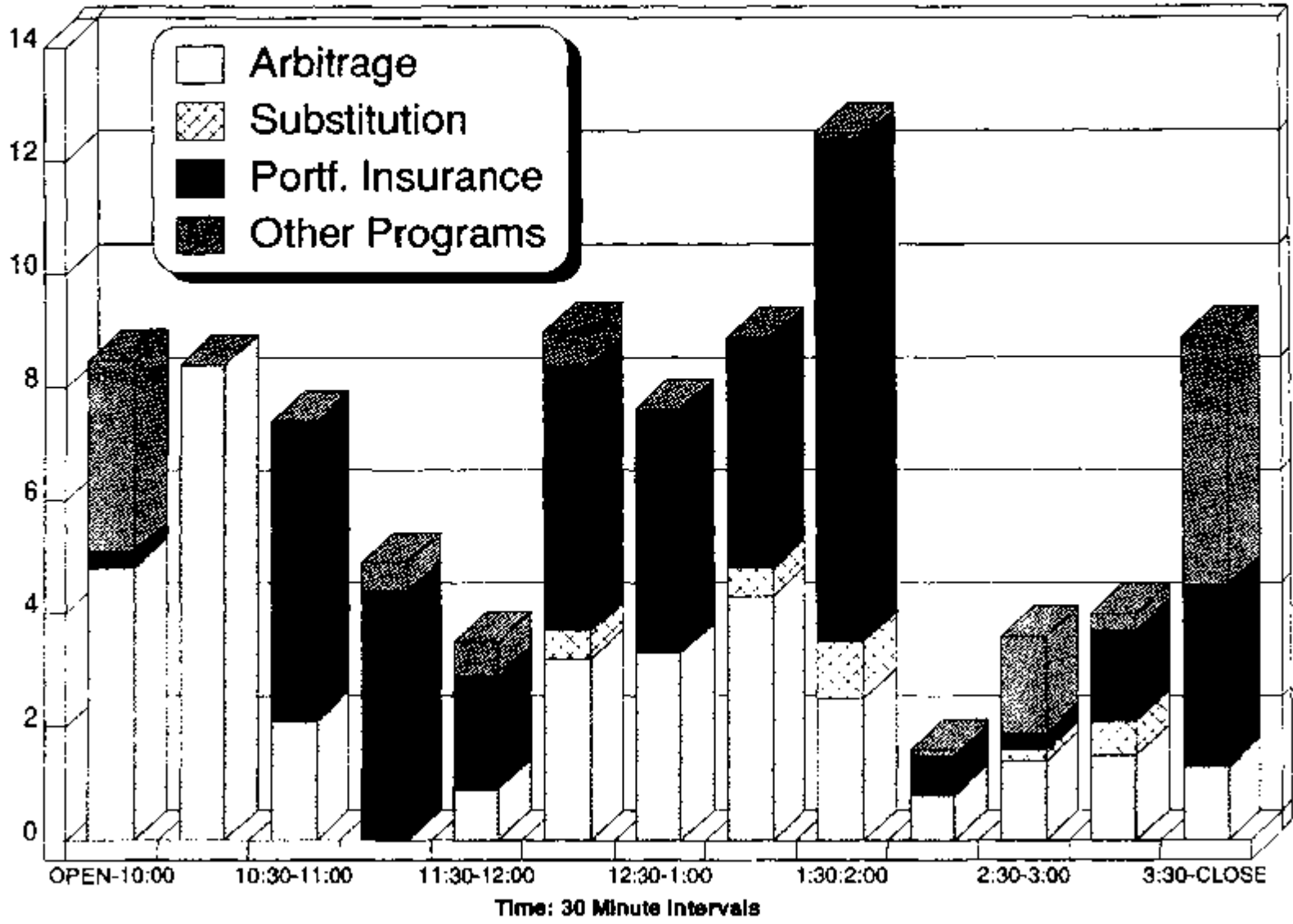
Portfolio Insurance Futures Selling Percentage of CME Volume

Percentage of
Total Volume

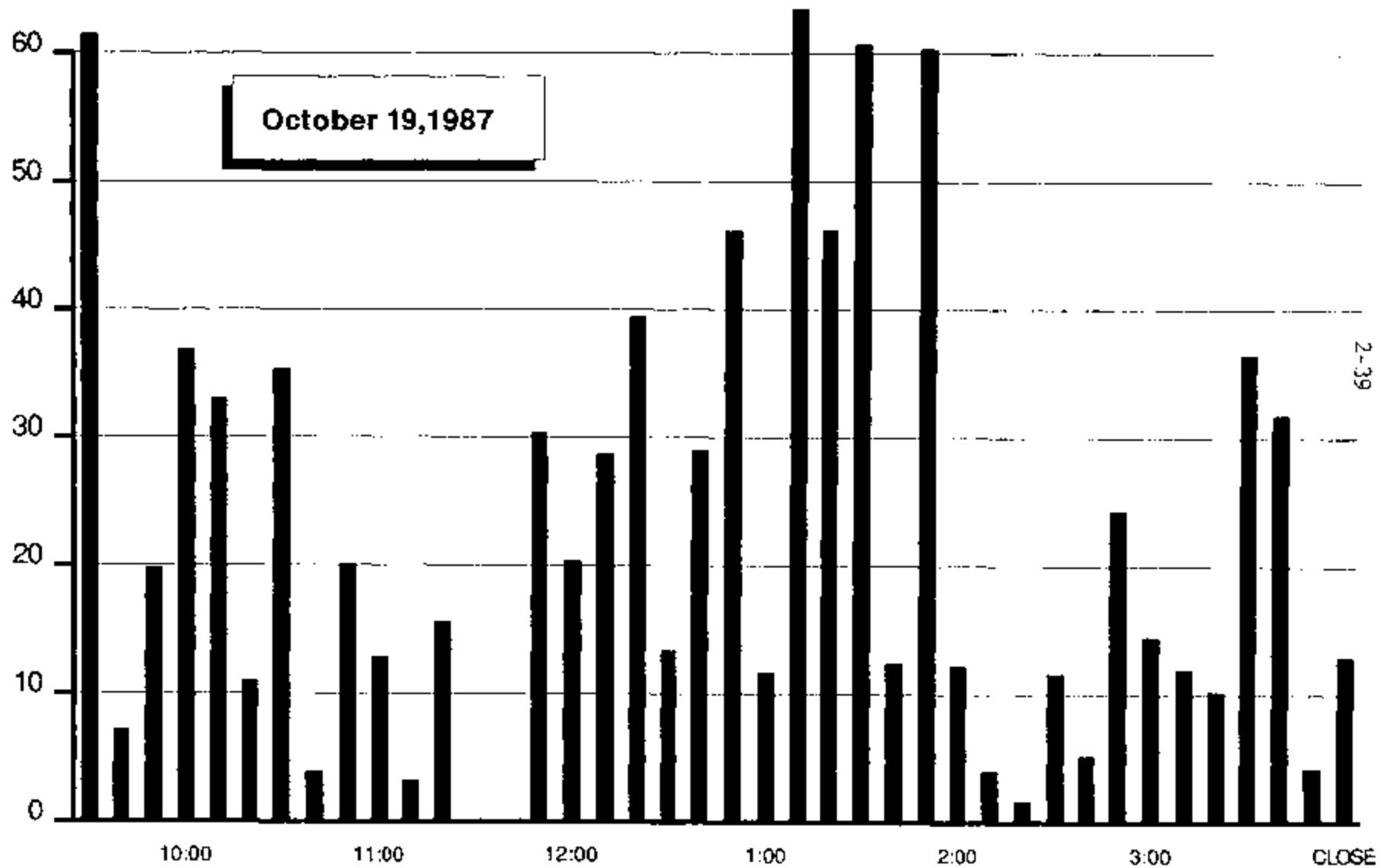


Thirty Minute Breakdown of Index-Related Selling on NYSE (October 19, 1987)

Millions of Shares

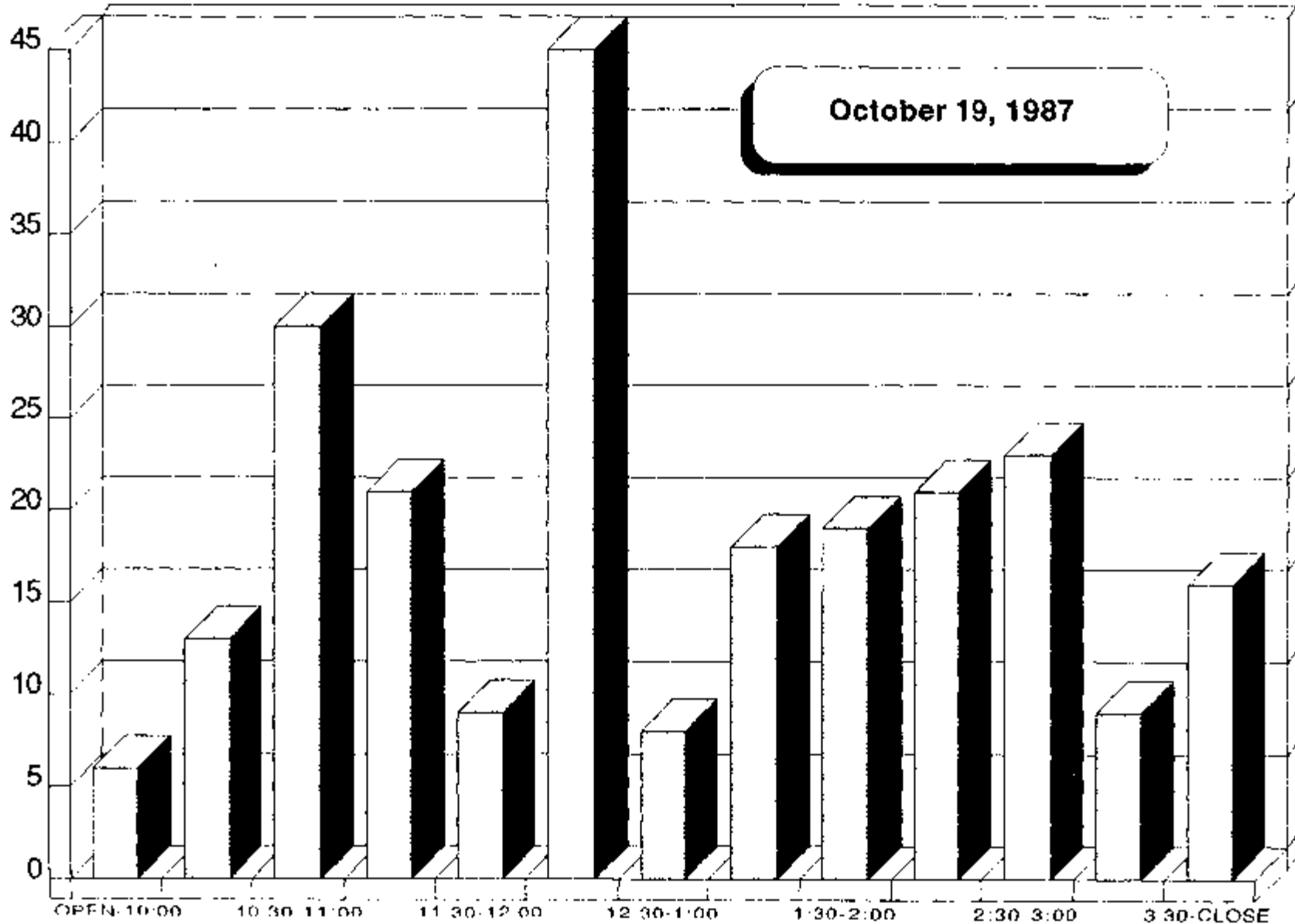


Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)



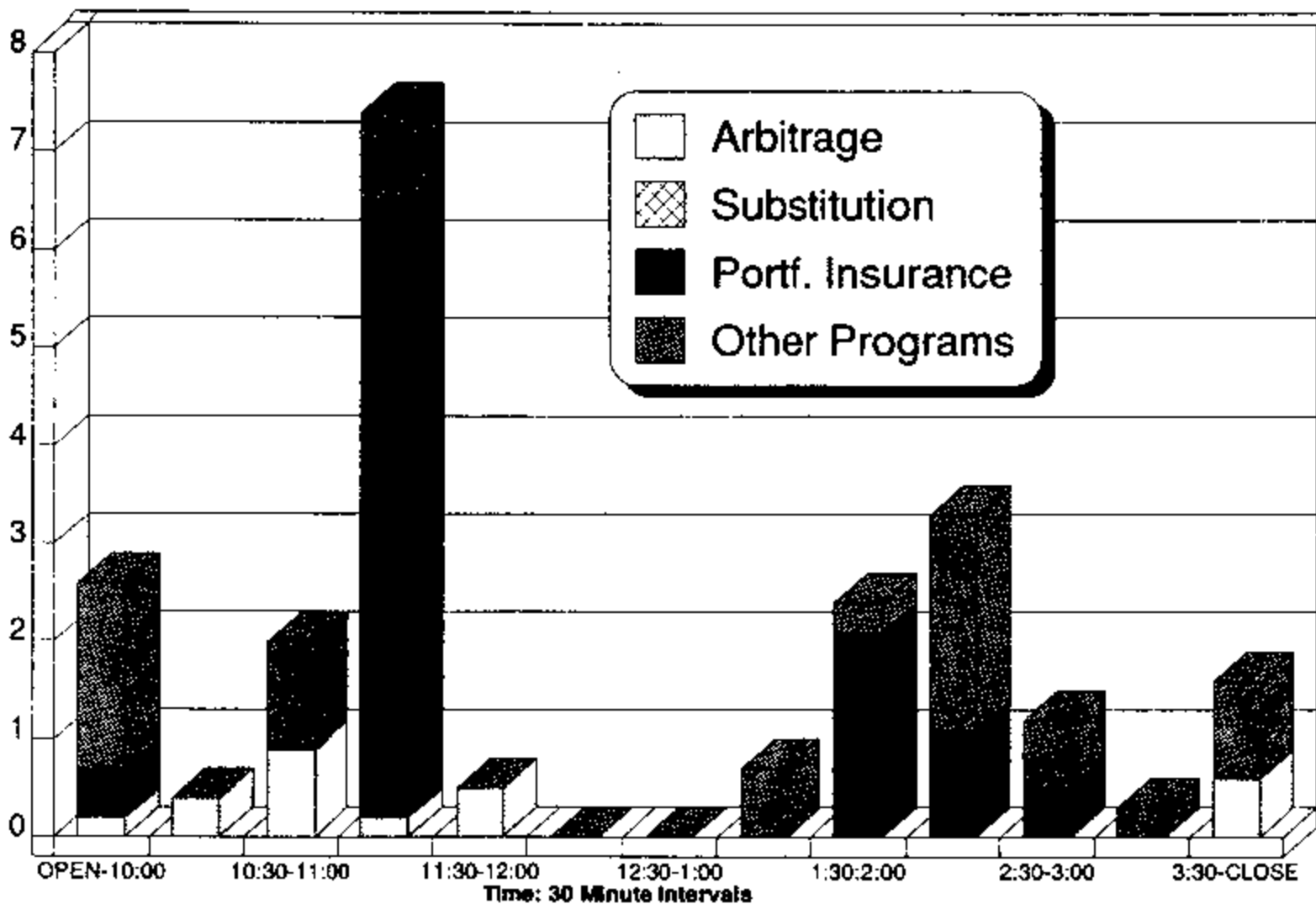
Portfolio Insurance Futures Selling Percentage of CME Volume

Percentage of
Total Volume

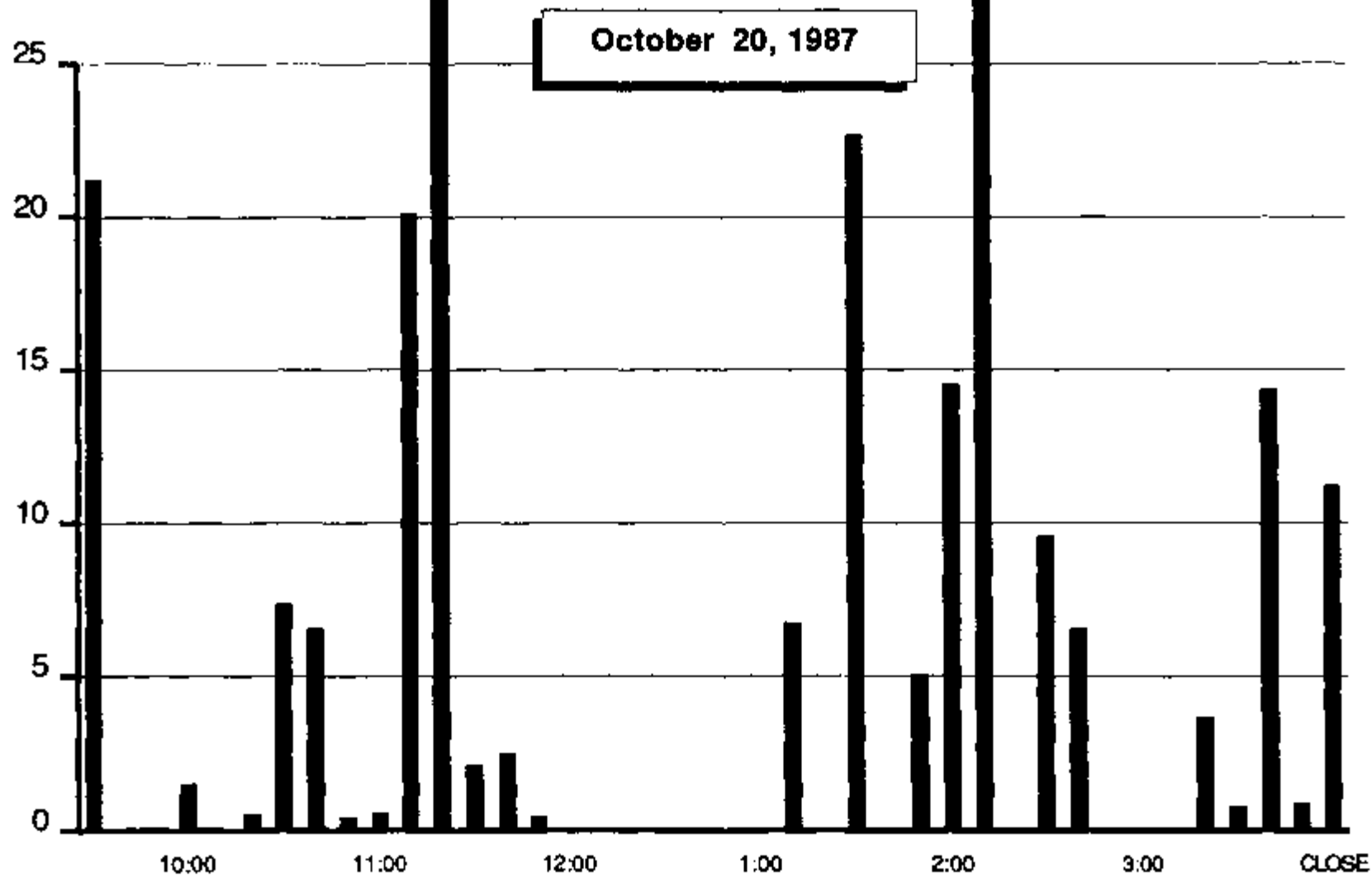


Thirty Minute Breakdown of Index-Related Selling on NYSE (October 20, 1987)

Millions of Shares



Total Program Selling on NYSE as % of Volume in S&P Stocks (10 Minute Intervals)



Portfolio Insurance Futures Selling Percentage of CME Volume

Percentage of
Total Volume

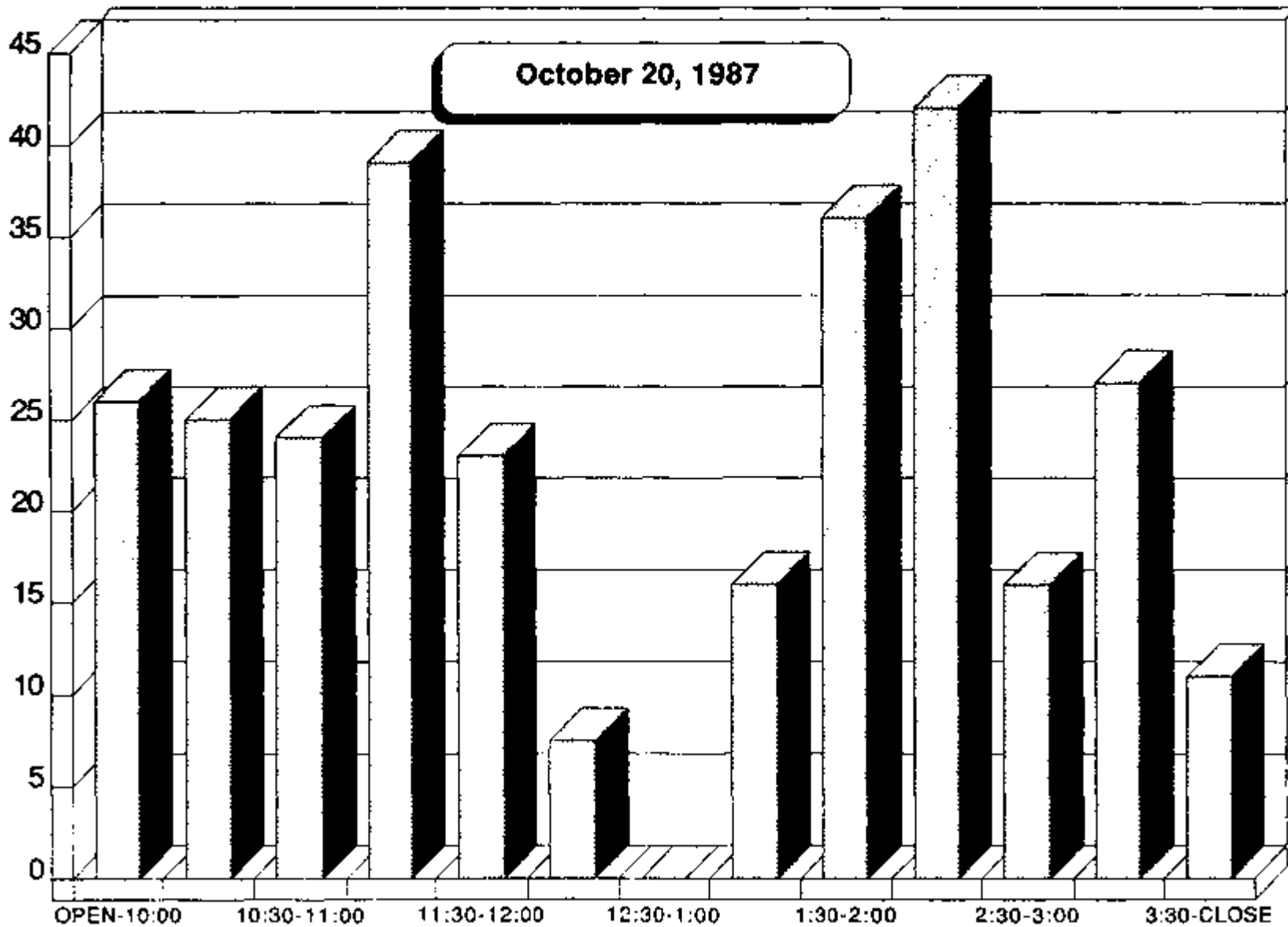


CHART 2-1
 S&P500 ADJUSTED TO COMPENSATE FOR
 NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 19, 1987

TIME	NUMBER OF NYSE STOCKS HALTED		MARKET VALUE OF NYSE S&P500 STOCKS HALTED (\$Millions)	PERCENT OF S&P500 MARKET VALUE	REPORTED S&P 500	ADJUSTED S&P 500 -- AS IF PRICE OF HALTED STOCKS :		
	TOTAL	S&P 500				MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT	S&P 500 FUTURES PRICE
10:00	154	95	731198.97663	38.01780	273.17	267.6360	259.8816	261.5
10:30	121	73	636923.50225	34.03813	265.77	262.1060	254.2109	253
11:00	69	37	231681.27125	12.73551	258.38	257.3357	254.4144	263
11:30	30	12	32901.9975	1.771126	263.85	263.7931	263.3308	265.5
12:00	18	6	21017.3615	1.125273	265.28	265.1422	264.9265	257
12:30	11	2	9532.9015	0.520978	259.89	259.7131	259.7144	254.5
1:00	5	2	9532.9015	0.526488	257.17	257.0050	256.9944	254
1:30	0	0	0	0	255.7	255.7	255.7	235
2:00	1	0	0	0	247	247	247	227
2:30	1	0	0	0	245	245	245	233
3:00	0	0	0	0	243.93	243.93	243.93	226
3:30	1	1	4520.885	0.272333	235.78	235.7384	235.7675	226
4:00	2	2	20029.1525	1.262042	225.41	225.2457	225.4521	219
TOTAL NUMBER OF STOCKS HALTED DURING THE DAY S&P500			167 107	SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS				

CHART 2-2
 S&P500 ADJUSTED TO COMPENSATE FOR
 NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 20, 1987

TIME	NUMBER OF NYSE STOCKS HALTED		MARKET VALUE OF NYSE S&P500 STOCKS HALTED (\$Millions)	PERCENT OF S&P500 MARKET VALUE	REPORTED S&P 500	ADJUSTED S&P 500 -- AS IF PRICE OF HALTED STOCKS :		
	TOTAL	S&P 500				MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT	S&P 500 FUTURE'S PRICE
10:00	79	52	524157.105	31.24602	238.26	244.3353	247.0138	238
10:30	39	19	200625.79325	11.62309	245.16	245.7104	245.3477	228
11:00	31	15	93224.8915	5.560117	238.14	237.4480	237.3335	209
11:30	57	38	179889.60663	11.41745	223.78	222.7536	222.2108	192
12:00	112	63	328024.79723	21.04423	221.39	221.0694	219.8405	183 (Closed)
12:30	145	77	374906.34823	24.57924	216.64	216.5250	215.0907	183 (Closed)
1:00	123	57	264392.95335	16.44209	228.39	231.0580	227.6398	183 (Closed)
1:30	81	33	110345.4855	6.938737	225.87	225.9709	225.8754	207
2:00	61	23	83773.5235	5.283044	225.22	225.4354	225.1800	214
2:30	46	17	55111.936	3.433922	227.95	228.3235	227.8864	219.5
3:00	35	10	13932.48875	0.838034	236.13	236.2758	236.0634	221
3:30	15	3	1351.21325	0.079897	240.2	240.2076	240.1779	225.5
4:00	10	1	565.3535	0.033775	237.74	237.7404	237.7395	218.5
TOTAL NUMBER OF STOCKS HALTED DURING THE DAY			215	SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS				
S&P500			127					

2-45

CHART 2-3
 S&P100 ADJUSTED TO COMPENSATE FOR
 NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 19, 1987

TIME	NUMBER OF NYSE STOCKS HALTED		MARKET VALUE OF NYSE S&P100 STOCKS HALTED (\$Millions)	PERCENT OF S&P100 MARKET VALUE	REPORTED S&P 100	ADJUSTED S&P 100 -- AS IF PRICE OF HALTED STOCKS :	
	TOTAL	S&P 100				MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT
10:00	154	29	435555.26075	49.42343	265.64	257.8366	250.0552
10:30	121	25	415982.09275	48.03421	261.04	256.9274	245.8949
11:00	69	8	103091.8635	12.30536	252.53	251.3800	249.6893
11:30	30	2	8776.10025	1.021216	259.04	259.4429	259.0027
12:00	18	1	7488.204	0.870445	259.31	259.6376	259.31
12:30	11	1	7488.204	0.890219	253.55	253.8171	253.55
1:00	5	1	7488.204	0.897940	251.37	251.6726	251.37
1:30	0	0	0	0	249.85	249.85	249.85
2:00	1	0	0	0	240.53	240.53	240.53
2:30	1	0	0	0	239.12	239.12	239.12
3:00	0	0	0	0	237.95	237.95	237.95
3:30	1	1	4375.05	0.576658	228.69	228.6808	228.7075
4:00	2	2	19755.15	2.744124	217	216.7678	217.1721

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TOTAL NUMBER OF STOCKS HALTED DURING THE DAY 167
 S&P100 37

SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS

CHART 2-4
 S&P100 ADJUSTED TO COMPENSATE FOR
 NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 20, 1987

TIME	NUMBER OF NYSE STOCKS HALTED		MARKET VALUE OF NYSE S&P100 STOCKS HALTED (Millions)			ADJUSTED S&P 100 -- AS IF PRICE OF HALTED STOCKS :	
	TOTAL	S&P 100	S&P100 STOCKS HALTED	PERCENT OF S&P100 MARKET VALUE	REPORTED S&P 100	MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT
10:00	79	24	371678.66138	48.59011	230.57	244.3822	241.9915
10:30	39	9	144513.43288	18.26659	238.47	239.3600	237.8325
11:00	31	7	78381.282	10.19605	231.72	230.2775	230.1131
11:30	57	13	123514.032	16.79018	221.74	220.5145	219.5137
12:00	112	19	220668.0065	30.79276	216.01	214.8010	214.1306
12:30	145	23	228372.291	32.41558	212.36	211.9126	210.1712
1:00	123	15	163548.0125	21.79490	226.19	229.7689	225.4320
1:30	81	6	46629.6575	6.353616	221.22	221.0709	221.7172
2:00	61	5	32654.3015	4.439342	221.72	221.9300	221.7815
2:30	46	3	14575.918	1.948029	225.54	225.7928	225.6132
3:00	35	1	5257.71	0.672559	235.64	235.7176	235.6282
3:30	15	0	0	0	238.89	238.89	238.89
4:00	10	0	0	0	233.71	233.71	233.71

2-47

TOTAL NUMBER OF STOCKS HALTED DURING THE DAY 215
 S&P100 42

SOURCE: SEE DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS

CHART 2-5
 XMI ADJUSTED TO COMPENSATE FOR
 NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 19, 1987

TIME	NUMBER OF NYSE STOCKS HALTED		TOTAL PRICE OF XMI STOCKS HALTED	PERCENT OF XMI VALUE	REPORTED XMI	ADJUSTED XMI -- AS IF PRICE OF HALTED STOCKS :		
	TOTAL	XMI				MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT	FUTURES PRICE
10:00	154	8	744.375	53.01698	428.81	415.1093	403.2697	415
10:30	121	8	744.375	53.63107	423.9	418.3594	398.3597	404
11:00	69	1	43.5	3.269079	408.9	408.4146	407.8310	412
11:30	30	0	0	0	422.21	422.21	422.21	424
12:00	18	0	0	0	419.43	419.43	419.43	413
12:30	11	0	0	0	408.59	408.59	408.59	407
1:00	5	0	0	0	408.16	408.16	408.16	410.5
1:30	0	0	0	0	405.6	405.6	405.6	395
2:00	1	0	0	0	390.45	390.45	390.45	375
2:30	1	0	0	0	388.05	388.05	388.05	383
3:00	0	0	0	0	384.52	384.52	384.52	373.7
3:30	1	0	0	0	367.98	367.98	367.98	363
4:00	2	0	0	0	344.7	344.7	344.7	333
TOTAL NUMBER OF STOCKS HALTED DURING THE DAY			367	SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS				
XMI			11					

2-4-88

CHART 2-6
 XMI ADJUSTED TO COMPENSATE FOR
 NYSE DELAYED OPENINGS AND TRADING HALTS DUE TO ORDER IMBALANCES ON OCTOBER 20, 1987

TIME	NUMBER OF NYSE STOCKS HALTED		TOTAL PRICE OF XMI STOCKS HALTED	PERCENT OF XMI VALUE	REPORTED XMI	ADJUSTED XMI -- AS IF PRICE OF HALTED STOCKS :		
	TOTAL	XMI				MOVED SAME PERCENT AS NON-HALTED	EQUAL TO FIRST PRICE AFTER HALT	FUTURES PRICE
10:00	79	13	811.125	69.10363	368.74	413.8567	384.8007	387
10:30	39	5	375.125	30.78166	382.84	380.8785	374.3972	370
11:00	31	2	249	21.15327	349.79	359.7606	361.6221	333
11:30	57	4	327	29.14961	352.41	341.8046	343.2997	312
12:00	112	8	627	56.88017	346.29	334.3120	339.7714	306
12:30	145	7	582	53.06141	344.57	337.2979	336.8733	300
1:00	123	4	369.875	31.56192	368.15	370.8999	362.6916	360
1:30	81	2	88.875	7.890973	353.82	352.6033	354.9587	352
2:00	61	1	23.375	2.065595	355.5	355.0125	355.6963	348
2:30	46	0	0	0	364.51	364.51	364.51	360
3:00	35	0	0	0	383.85	383.85	383.85	379
3:30	15	0	0	0	388.97	388.97	388.97	387
4:00	10	0	0	0	372.08	372.08	372.08	357

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TOTAL NUMBER OF STOCKS HALTED DURING THE DAY 215
 XMI 17

SOURCE: SEC DIRECTORATE OF ECONOMIC AND POLICY ANALYSIS

