Revisiting the October 1987 Crash

Barrie A. Wigmore

The crash of 1987 reflected panic selling by the retail public, foreigners, and institutions in response to overvaluation, an effort by the U.S. Congress to restrict merger activity, rising interest rates, and international policy squabbles. Portfolio insurance overwhelmed the specialists, who were unable to handle the large index trades in the Designated Order Turnaround system. The credit crisis on the second day reflected justifiable worries about brokers' credit. With valuation and other indicators back to the record levels of 1987, could the U.S. market suffer a repeat of October 1987?

The S&P 500 Index is almost as overvalued in early 1998 as it was in September 1987, and eerie parallels are visible in the high levels of merger activity and mutual fund inflows. Is another crash imminent? Could we sail through one as smoothly as we did in 1987?

Sound judgments about the prospects of a crash are possible only if one sets aside the conventional image, fostered by the Brady Report, that the 1987 crash resulted from the use of portfolio insurance by a few large pension funds.[1] That view misses the point that retail investors were the largest sellers in the crash and that the specialists, rather than index trading itself, were the weak link. That link is no stronger today than it was then.

Similarly, the credit problems that accompanied the crash have been treated as an institutional failure in cross-margining, whereas they were based on highly justified worries about the credit of the investment banking industry. Its credit has improved substantially, but the securities clearing systems remain dependent on daylight overdrafts that are nothing more than unsecured credits that the commercial banks may, or may not, grant in a crisis.

The Crash

Understanding of the factors behind the 1987 crash will help provide perspective on today. The October 1987 crash was caused by an unusual confluence of factors—overvaluation, an attempt by Congress to restrict mergers, rising interest rates, international policy conflict, and an unbearable burden on the NYSE specialists.

The overvaluation occurred as the S&P 500 rose 26 percent in 1985, 15 percent in 1986, and 39 percent between January and August 1987. The impetus for the gains in 1985 and 1986 was declining interest rates rather than rising earnings estimates, as can be seen in Figure 1, but in 1987, the 1988 I/B/E/S International earnings estimate (an estimate that was subsequently validated) surged 60 percent higher than mid-1987 reported results. Interest rates began going the other way, however, when inflation rose from 1.1 percent in 1986 to 6.3 percent in September 1987 and Alan Greenspan, newly installed chair of the Federal Reserve Board, moved the rate on two-year U.S. Treasury securities from 6.25 percent to 8.40 percent. The result, as shown in Figure 2, was a highly overvalued market. Figure 2 compares the S&P 500 with the results of a two-factor model that indicates what the S&P 500 would have been if it had changed proportionately to changes in earnings forecasts and interest rates since 1978.[2] On this basis, the S&P 500 reached record overvaluation of 27 percent at the end of September 1987.

The principal factors behind this overvaluation were acquisition activity and heavy common stock purchases by mutual funds and foreigners. Announcements of acquisitions and corporate restructurings grew from less than $50 billion annually in 1981 to more than $240 billion in the 12 months preceding the crash (all money amounts are in U.S. dollars). This amount was three times all other demands for stocks. Only one-third of the 1987 volume was public companies, but the premiums paid for acquisitions of S&P 500 companies between 1984 and 1987, grossed up to include the

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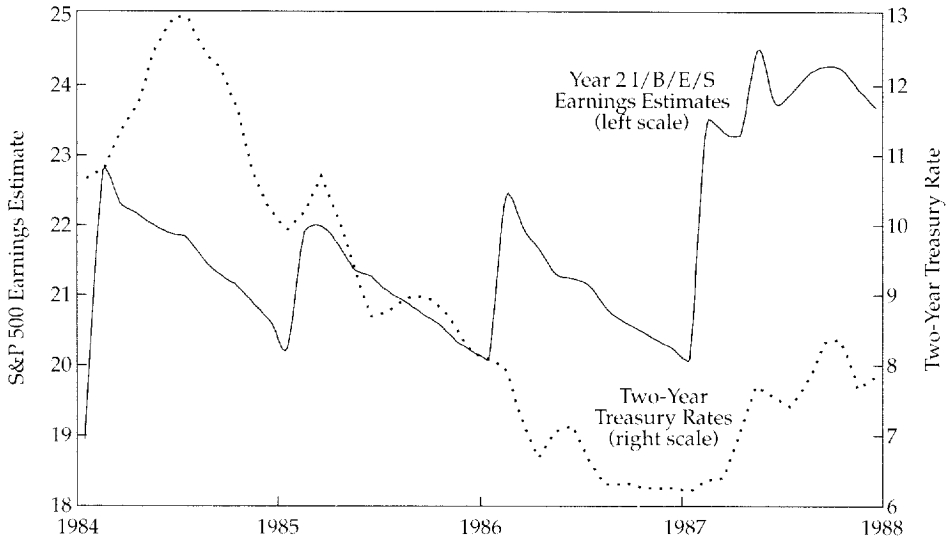
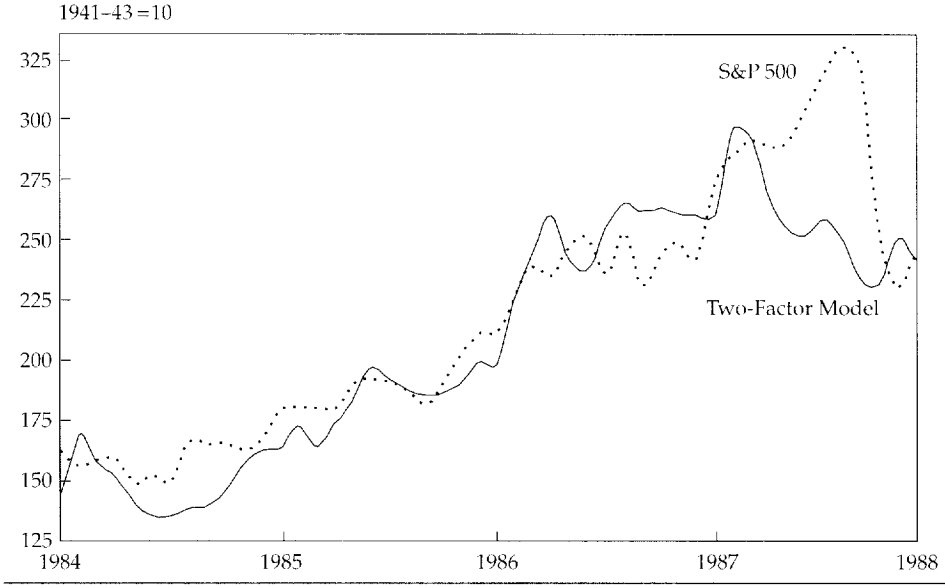
Figure 1. I/B/E/S Year 2 Earnings Estimates and Two-Year Treasury Rates, 1984–88



Sources: Federal Reserve; I/B/E/S.

Figure 2. Actual S&P 500 and S&P 500 Based on a Two-Factor Model, 1984–88



Note: The two factors are I/B/E/S Year 2 earnings estimates and two-year Treasury rates.

Sources: Federal Reserve; Standard & Poor's; I/B/E/S; author.

effects of asset sales, accounted for 28 percent of the S&P 500's overvaluation.[3] Anticipated merger activity was even greater. Funds raised for leveraged buyouts rose 1,000 percent from an average of $1.2 billion in 1983 through 1985 to an annual rate of $13 billion by September 1987;[4] new junk-bond issues, more than 80 percent of which were for mergers, rose almost 300 percent—from $11.5 billion in 1985 to an annual rate of $45.2 billion in the third quarter of 1987. Raiders and arbitrageurs were buying furiously. Announced purchases of minority interests of $5 million or more in public companies soared 220 percent—from $3.9 billion in the 12 months ending September 1986 to $12.5 billion in the 12 months ending September 1987. The total effect of all this activity on stock prices is not known, but it probably accounted for 50 percent or more of the S&P 500's overvaluation.

Stock purchases by mutual funds and foreigners were the second largest cause of overvaluation.

As can be seen in Figure 3, mutual funds were buying stocks at a net annual rate of $28 billion through August 1987—1.8 times 1986 and 5.6 times 1984 values. These inflows were stimulated by the high returns on stocks since 1982 (averaging 18.4 percent annually for the S&P 500 through September 1987), by the halving of two-year Treasury rates from 16 percent to 8 percent, and by diversions from tax-shelter investments, which were virtually eliminated by the Tax Reform Act of 1986. The huge (36 percent) return on the S&P 500 through August made the rise in two-year Treasury rates from 6.25 percent to 7.8 percent appear insignificant.

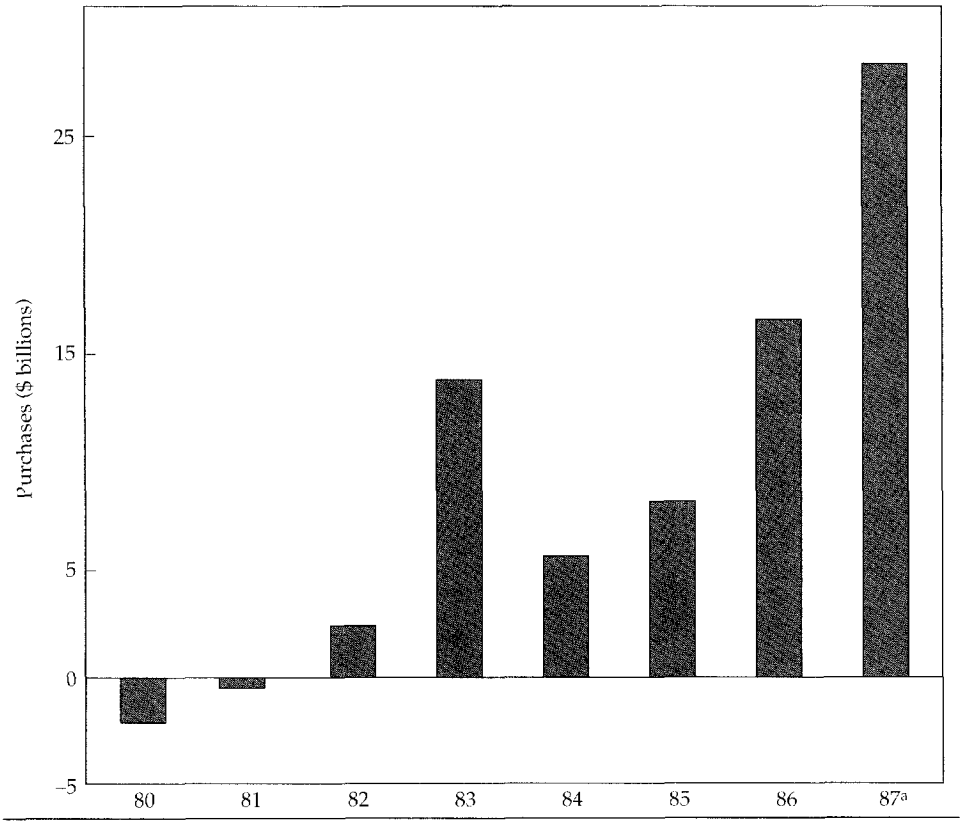
Attracted by the Louvre Accord's promise of stable U.S. exchange rates and the projected sharp increase in 1988 earnings for the S&P 500, foreign equity inflows grew sixfold. Figure 4 shows the flows going from approximately $5 billion throughout the 1982–85 period to a $31 billion annual rate through September 1987.

While these sharp increases from mutual funds and foreigners were occurring, state and local retirement funds were not changing their flows into the market. Indeed, private pension funds took as much as $40 billion to $50 billion *out* of the market.

Various index products might be considered a third factor creating a demand for stocks, but their overall effect was insignificant. Although the value of the S&P 500 futures open interest rose from virtually zero in 1982 to $20.7 billion in September 1987, the major increase—$8.9 billion—was in 1986, not 1987. The increase in open interest in the nine months ending September 1987, net of the increase in the value of the S&P 500, was only $0.1 billion.

In the week before the crash (October 11–18, 1987), the U.S. House Ways and Means Committee approved legislation removing the interest deduction for debt used in hostile takeovers and imposing a 50 percent excise tax on greenmail profits; the August trade deficit came in at a disappointing $15.7 billion; and Treasury Secretary James Baker, in a war of words with the Bundesbank over the lack of German domestic economic stimulation (which he believed was necessary to brunt demands from the U.S. Democratic Party for restrictive trade policies), threatened to let the dollar fall. The stock market appeared about to fall victim to political conflict over merger activity, the dollar, and trade

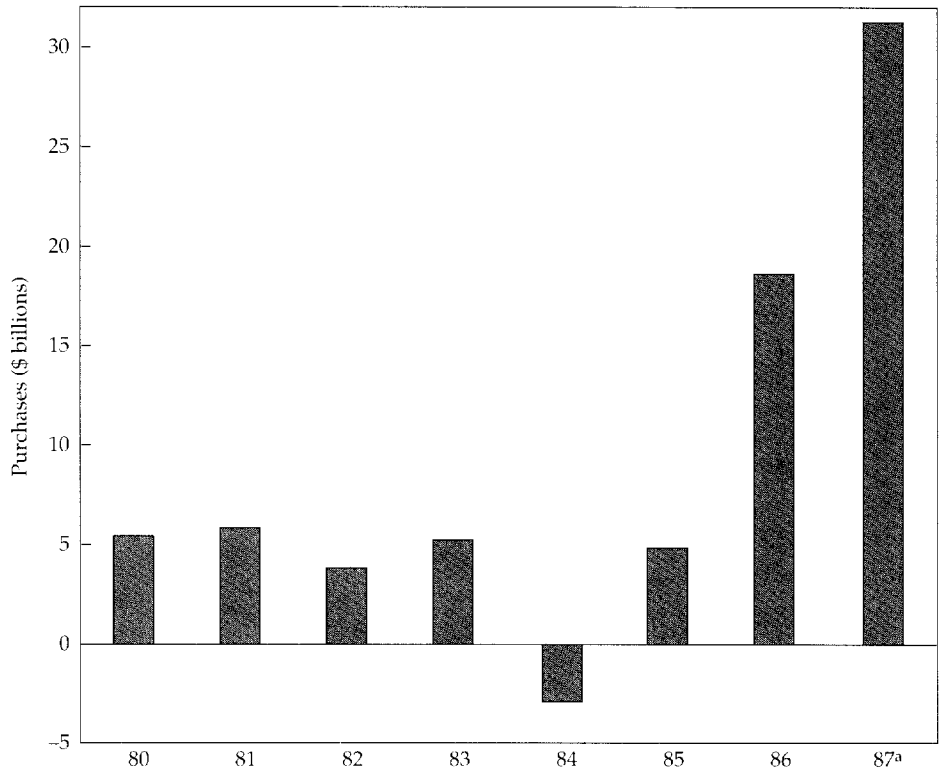
Figure 3. Mutual Fund Net Purchases of Common Stocks



[a]Annual rate through August 1987.

Source: Investment Company Institute, *Mutual Fund Fact Book 1991*, Washington, DC: Investment Company Institute (1991).

Figure 4. Foreign Net Purchases of U.S. Equities



[a]Through September 1987 (annualized).

Source: Treasury bulletins.

policies just as the Federal Reserve was seeking higher interest rates to damp down inflation. The stock market decline for the week—10 percent—was the worst since 1940.

The weekend brought heavy mutual fund redemptions, large foreign sell orders, and an accumulation of unexecuted portfolio insurance sales from Friday. Negative sentiment was exacerbated Monday morning, October 19, by a retributive U.S. attack on Iranian oil platforms, which suggested that oil prices might rise again. The resulting Monday crash is well known: By the close on October 19, the S&P 500 was down 30 percent from September 30, and on October 20, the noon futures market indicated a decline of 45 percent.

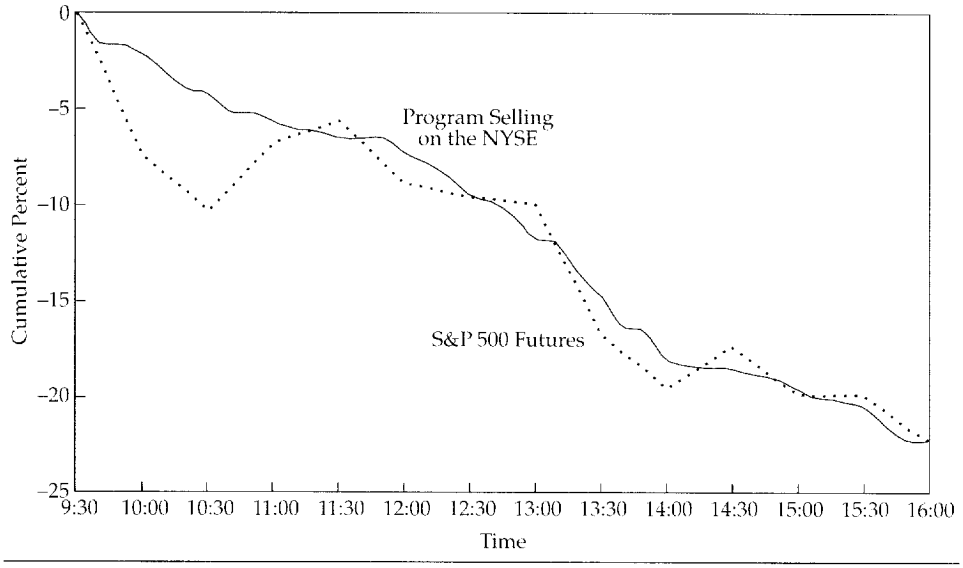
The Culprits on October 19

The popular culprit in the search for causes of the crash was portfolio insurance. The U.S. SEC report gave the mistaken impression that assets subject to portfolio insurance grew from $8.5 billion in 1986 to $60 billion by September 1987.[5] In fact, the low 1986 number was in error because the source, *Pension & Investment Age*, had omitted Leland, O'Brien and Rubinstein (the largest manager of such assets) in earlier reports.[6] The funds subject to portfolio insurance actually declined $1.9 billion between March and September 1987 when adjusted for the 10 percent increase in the S&P 500 in that period.

Index selling, however, was a serious problem in the crash, and its role highlights the institutional problem that still exists with the specialist system. Portfolio insurance sales were $4.0 billion on the Chicago Mercantile Exchange (CME) on Monday and $1.7 billion on the NYSE. Index arbitrageurs added another $1.7 billion of selling on the NYSE. Combined, these sales accounted for 43 percent of CME public volume and 24 percent of NYSE nonspecialist volume. The close relationship between index selling and the decline in the S&P 500 futures on October 19 is illustrated in Figure 5, which depicts the cumulative percentage of program selling on the NYSE and the percentage decline in the S&P 500 in the futures market in 10-minute intervals on that day. The surge in portfolio insurance selling was unique; while other sectors were both smaller and declining, the insurance selling rose from 5.6 percent of CME public volume on October 14 to 30 percent on October 19.

The problem with this massive selling was not its size but that it bypassed the block-trading firms and relied instead on the NYSE's Designated Order

Figure 5. Indexed Percentages for the Change in the S&P 500 Futures and Program Selling's Share of the S&P 500 Trading Volume, October 19, 1987



Source: SEC, *The October 1987 Market Break*, pp. 2–44, D–50.

Turnaround (DOT) system and, in turn, on the specialists, who had modest capital and totally lacked distribution power. Direct NYSE program sales in place of futures selling had the same weakness. Widespread awareness of the system's inability to handle this flood of program sales helped foster a panic and undercut the block-trading function that handled the normal large orders.

Few people appreciate the importance of the DOT system to NYSE functioning. It was begun in 1976 to automate small orders, but the system was also very attractive to those placing large orders because market orders are executed by the specialists within three minutes. Thus, the allowable size rose continually until by the time of the crash any order less than 2,100 shares was eligible and larger orders were eligible at the opening or on limit orders. When orders for a large number of stocks were combined, as in the case of index arbitrage or program trading, the order size could be massive. Combining the maximum number of shares for each company in the S&P 500, for example, added up to approximately $40 million.

DOT was swamped on October 19. Some $500 million in sell orders were in DOT at the opening, and an additional $500 million came in within minutes. The specialist system immediately collapsed; it did not open 95 of the S&P 500 stocks, equal to 38 percent of the index's value. Sales in the first two hours were almost $2.7 billion, compared with $1.4 billion on the 15th and 16th. DOT processed 471,513 orders for 324 million shares on the 19th—an increase of 239 percent over September—but it failed to execute 28 percent of the orders received because either their time limits had expired or they were limit orders. It handled only 27 percent of total transaction volume (compared with 36.5 percent in September). There were delays in the system of 45–75 minutes by noon, generally caused by the printers. At the worst point, limit orders were backed up more than an hour. Computers as well as printers gave out, software malfunctioned, and computer memory capacity was exceeded. Execution reports were often delayed for hours, and some were even lost.

DOT and the specialist system were not designed or intended to cope with the huge transactions coming at them on October 19. Specialists acted as principal on one side or the other in 23.2 percent of 1986 trades but only briefly and for small net commitments of capital. On October 19, they bought $486 million (net), which for them was a lot, and participated in 17.5 percent of total transaction volume, which was 50 percent more than the first nine months of 1987, but their effort was a drop in the bucket considering what was needed. Two specialist firms failed; by the close on the 19th, at least eight were undermargined and perhaps five more were in the same boat but their records were too chaotic to be sure. Sixteen were under surveillance by the NYSE. Of the 55 specialist firms, 13 had completely lost their buying power because of capital inadequacy and 23 had buying power of less than $5 million. The 55 firms lost slightly less than

$200 million on an equity base of only $808 million.[7]

The upstairs block-trading firms were the ones expected to execute the big orders. Blocks normally accounted for 50–55 percent of all NYSE volume. The 15 largest firms had an $18.4 billion equity base that was 23 times that of the specialists, plus they had distribution power through their large sales staffs. No wonder the specialists collapsed.

The result was the breakdown of the S&P 500 futures market on the 19th. In this sense, the media and the Brady Report were correct in emphasizing the role of index futures in the crash. The S&P 500 futures contract sold at a 7–8 percent discount to the stock market on an adjusted basis (calculated as if closed stocks declined as much as open stocks); on an unadjusted basis, the discounts were 20 percent. Volume dropped to 95 percent of the NYSE (compared with 160 percent through September). Yet, the various algorithms for portfolio insurance called for huge additional selling. The Brady Report estimated that portfolio insurance algorithms called for selling $20 billion to $30 billion, but only $5.5 billion of futures and $2.3 billion (October 19 only) of direct NYSE sales had been made by the 19th, which meant that $12 billion to $22 billion was unrealized. At least $12 billion more was called for by the 20 percent decline implicit in the futures market at noon on the 20th, when most NYSE stocks were closed.[8] Fortunately, many of the largest pension funds quit the practice of portfolio insurance in the face of such failure.

Index arbitrage, which should have provided both better prices and higher volumes for the futures market, was incapacitated by delays in the DOT system, the risk that the specialists would close trading in the S&P 500 stocks, the lack of upticks to allow short sales, and the circumstance that those funds that could do index arbitrage without complying with the short-sale rule had used up their capacity by committing too early.[9]

Portfolio insurance selling was an important factor in the crash, but in actuality, the retail public accounted for larger sales. As can be seen in Table 1, small investors' direct sales of stocks and their redemptions of equity mutual funds were 28 percent of NYSE sales compared with program trading's 23.8 percent.

The first indication of public panic was equity mutual fund redemptions of $1.8 billion on Friday, October 16. Figure 6 shows the stark contrast between that amount and the equity mutual fund inflows of $250 million to $500 million daily throughout 1986 and precrash 1987. During the weekend, redemptions were heavy, particularly at Fidelity Investments, which took more than 200,000 calls on Sunday (versus a normal level of 115,000).[10] On Monday, redemptions developed into a tidal wave, $2.7 billion. An official at Kemper Funds described the demands as a "genuine panic." Both Fidelity Investments and T. Rowe Price invoked a little-used provision in their sales contracts allowing them seven days to pay off redemptions.

Table 1. Breakdown of Selling on the NYSE on Monday, October 19, 1987

	Amount (billions)	Percent of Total
Index arbitrage	$1.7	10%
Other programs	2.3	14
Total programs	$4.0	24%
Mutual fund redemptions	2.7	16
DOT < 1,000 shares	2.0	12
Total public sales	$4.7	28%
Other	6.1	36

Note: Excludes specialists.

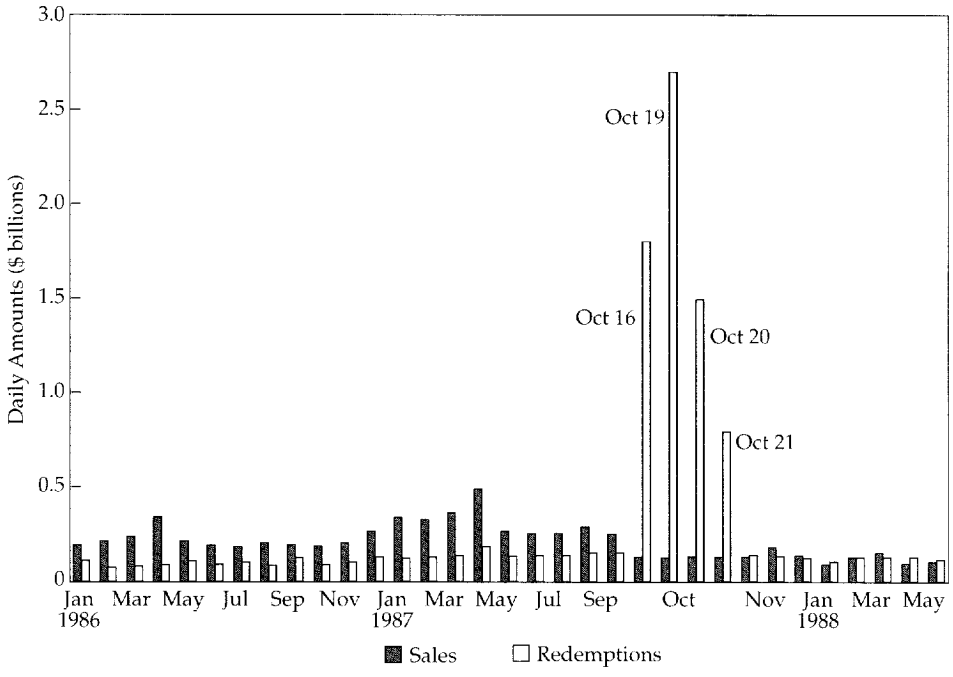
Sources: Brady Report; Investment Company Institute.

Some mutual funds met the resulting cash demands from already existing cash balances or bank borrowing, but this stopgap simply portended future selling—an abrupt reversal in mutual funds' stock market participation. That is, if mutual funds had sold stocks equal to their net redemptions, they would have shifted from purchases of $3 billion to $4 billion in most months prior to the crash to sales of $8.3 billion between Friday, October 16, and Friday, October 23.[11] Fidelity alone, however, sold $1 billion on the 19th. Mutual funds continued to be net sellers (of $16.2 billion) in 1988 and were insignificant buyers in 1989.[12]

Substantial anecdotal evidence suggests a retail market panic. Automatic Data Processing Corporation, which handled order executions for many small firms, was overwhelmed by volume three to five times normal at discount brokers and regional firms. The order system of one large discount broker failed several times as a result of the heavy volume. Brokers widely reported that their branches had more business than they could handle.[13]

Foreigners had the same incentives to sell as domestic investors. In addition, because Secretary Baker's arguments with the German government and the Bundesbank threatened the stability of exchange rates, foreigners had worries about the U.S. dollar. The evidence of foreign panic selling in the crash is only anecdotal, but the *Wall Street Journal* reported that Japanese and European sell orders

Figure 6. Daily Sales and Redemptions of Equity Mutual Funds, January 1986–June 1988



Note: Some data are approximate.

Source: ICI, *After the October 1987 Market Break*, pp. 4–5.

Sunday night were huge. Although the SEC downplayed foreign selling as a factor in the crash, the data indicate that before the crash, foreigners were consistent net buyers of $2 billion to $4 billion of U.S. stocks monthly but were net sellers of $6.7 billion in November and of $3 billion in December. This shift surely took place during the crash but is masked in the October data by the strong foreign buying just prior to the crash. Foreign buyers remained net sellers for most of the rest of the decade. They and mutual funds were the only sectors that switched their participations so dramatically.

The Credit Breakdown on October 20

The credit crisis on Tuesday, the second day of the crash, when all of the markets came within a hair's breadth of closing, has passed into history as a technical problem in cross-margining among markets. In fact, the crisis reflected a realistic assessment of Wall Street's possible losses on its inventories of stocks, junk bonds, and bridge loans, as well as the Street's inadequate equity to accommodate the clearing process. Without the aggressive leadership of the White House and the Federal Reserve, and ultimately the willingness of the New York banks to lend on blind faith, many of the firms and traders who enjoy prominence today might instead have been wiped out. The aftermath of the crash would also have been different.

Investment bankers in 1986 and 1987 adopted strategies involving dramatically higher risks than in the early 1980s. They held $10 billion in equities at the time of the crash, with losses at noon on the 20th approaching $1.7 billion, based on the futures market. They also held junk-bond inventories of $2 billion to $3 billion, which dropped at least 20 percent in value as yields on BB rated bonds rose from 14 percent to 16 percent. Such bonds were notoriously difficult to price, and some could have been almost valueless because of the deterioration in credit ratios and stock market values. Even more of a problem was the $8.5 billion in bridge loans that investment bankers had advanced to facilitate mergers in the 10 months before the crash. As much as $6 billion of these loans may not have been refinanced; at the time of the crash, the 162 "hung" merger transactions or recapitalizations had a combined value of $69.6 billion. Bridge loans were the bottom of the credit barrel—unsecured, repayable only by suddenly uncertain junk-bond financing, and dependent on the last 10 percent of company value at a time when companies' values had just dropped 20–50 percent.

All of these high-risk asset categories amounted to 192 percent of equity and 421 percent of liquid

equity for the 15 largest investment banking firms, as can be seen in Table 2.[14] Without the rescue that occurred, investment bankers would not have lost 100 percent of these assets, but values could have approached zero in the junk-bond and bridge-loan categories.

The crucial issue on the 20th was whether the banks would lend to Wall Street without demanding the extra margin that the near-term volatility justified and without critically evaluating the market value of the bridge loans, junk bonds, and other illiquid assets in brokers' inventories. When many banks demanded increased margin protection on the 20th, all of the firms, knowing that they could otherwise be opening the door to a spiral in requirements everywhere, adamantly resisted. Borrowers and lenders were in a standoff.

What saved the day was official action. The Federal Reserve flooded the system with money, cajoled the major banks, bent legal lending limits, and immediately placed lookouts at many firms. When Gerald Corrigan, the president of the New York Federal Reserve, called John Reed at Citibank in the midst of the crisis on Tuesday to press him to make loans to Wall Street, Reed told him, "We can't take a $100 million write-off to save some broker. The stockholders would lynch me—with good reason." Reed was articulating a perfectly prudent credit position, but it was a position that promised a debacle. Corrigan must have been persuasive: Citibank's loans to 20 brokers went from $200 million to $1.4 billion, and in the spirit of leniency, it did not even take possession of the collateral. Other New York banks followed suit, and broker loans at the 10 largest New York banks doubled to $12 billion.

At the same time, the White House called many major corporations to entreat them to repurchase their stock to provide market support. By noon on October 20, 650 corporations had announced stock-repurchase programs, with a total worth more than $6 billion. Some 158 of these companies were in the S&P 500, and 129 of them made actual purchases during the week. The purchases amounted to 90.4 million shares and 18.7 percent of the volume in the companies' stocks. Purchases on October 19 and 20 were only $1.1 billion—3 percent of trading volume—but the $6 billion in announcements was equivalent to 15 percent of the two days' combined trading volume.

Based on the news of the announced buybacks, the Major Market Index on the Chicago Board of Trade—the only futures exchange still open—jumped 17 percent in 20 minutes on very small volume.[15] Stocks in general began to recover, which eased margin requests and anxious fears, but the call had been close. The SEC provided a useful reminder of just how close things came in its later report:

> . . . banks made many of their crucial lending decisions during and after the market rebound on Tuesday, October 20th. . . . Thus, it is not certain that credit would have remained so readily available had the market continued to fall sharply on Tuesday.

The credit breakdown in the futures and options markets was even more ominous. The CME struggled to get the necessary bank credit to clear settlements. The crash on Monday entailed three intraday "variation" margin calls for $1.6 billion, an additional variation requirement of $1.1 billion on the 20th, plus $1.0 billion related to new positions. The variation margin requirement was 10 times average and 3 times the prior record.

The New York banks were slow to make the payments to the clearing corporation's Chicago banks that would have completed these settlements. A myriad of details held them up, and the daylight overdrafts exceeded both normal intraday lending practices and the banks' legal lending

Table 2. Risk Exposure of the 15 Largest Investment Bankers, September 30, 1987

	Amount (billions)	Percent of Liquid Equity	Percent of Equity
Balance sheet			
Stockholders' equity	$ 9.8	na	na
Illiquid assets	5.3	na	na
Liquid equity	4.5	na	na
High-risk inventories			
Equities	10.0	224%	102%
Recent bridge loans	5.8	130	59
Estimated junk bonds	3.0	67	31
Total high-risk assets	$18.8	421%	192%

na = not applicable.

Source: SEC, *The October 1987 Market Break*.

limits. The Federal Reserve gave the banks *ad hoc* absolution of violations of legal lending limits, but even its own daylight overdraft rules were violated, which slowed the federal funds wire that was the backbone of the money transfer system. Federal Reserve absolution or no, the banks still had no way of knowing whether the securities firms' customers were good for the funds that were expected to balance out the transfers at the end of the day. Fourteen clearing members were out of compliance with capital regulations because of the magnitude of the transfers. Six had margin calls to customers greater than their capital.[16] Rumors were flying that Michael Steinhardt, the prominent hedge fund trader, had bought S&P futures all the way down on the 19th and owed large amounts to Goldman, Sachs & Company. Even if the banks had had Steinhardt's portfolio to evaluate—which they did not (although Goldman Sachs did)—they would nevertheless have been in a quandary about the market values of the portfolio's futures contracts, what collateral value to assign them under such volatile circumstances, and their credit rights if Goldman Sachs defaulted. If the clearing system was to hold up, the banks had to proceed on blind faith in a moment of calamity.

Relevance of the Crash Today

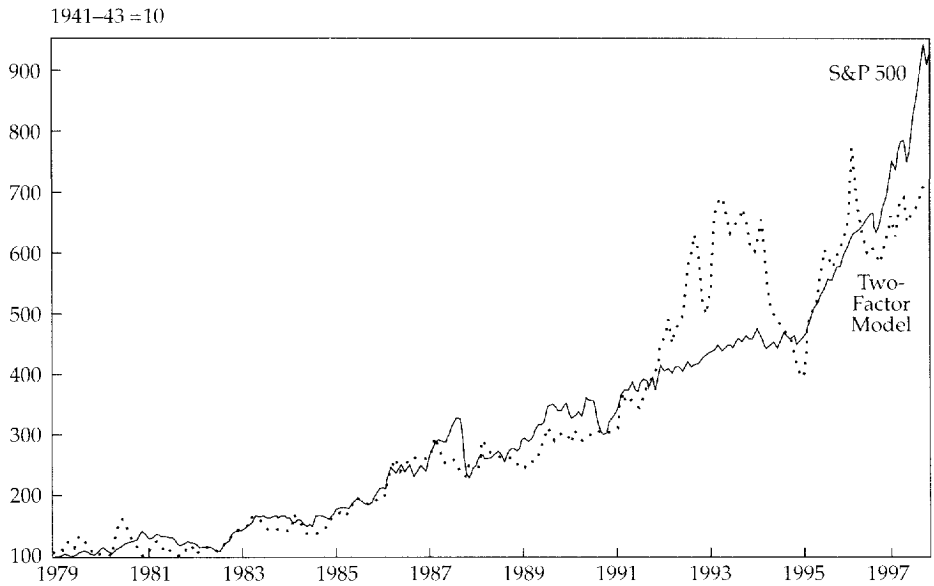
S&P 500 overvaluation is again approaching the high levels that characterized the market before October 1987. In Figure 7, my two-factor model indicates that, at 950 in September 1997, the S&P 500 was 25 percent overvalued.

The driving factor is rising earnings estimates, as can be seen in Figure 8. I/B/E/S estimates for Year 2 S&P 500 earnings rose from $32 in the 1991–93 period to $52 in September 1997, while two-year Treasury rates have been between 5.5 and 6.5 percent for most of the past two and a half years. This time, the question is whether earnings growth can be sustained. Estimated earnings for the S&P Industrials in 1998, assuming 3 percent sales growth, reflect a record 7.2 percent return on sales. This return is far above the 5.6 percent return on sales in the prior earnings peak of 1988.

Moreover, merger announcements have risen to a post-1989 peak—more than 8 percent of GDP (shown in Figure 9), although these mergers do not have the high speculative component that was present in 1987. Recent junk-bond issues are equal to only 5 percent of announced mergers (compared with 14 percent in 1987). The myriad raiders and arbitrageurs who stimulated mergers in the 1980s are much less in evidence; minority stakes of $5 million or more have declined from more than 5 percent of announced mergers and acquisitions in 1987 to less than 1 percent in 1997.

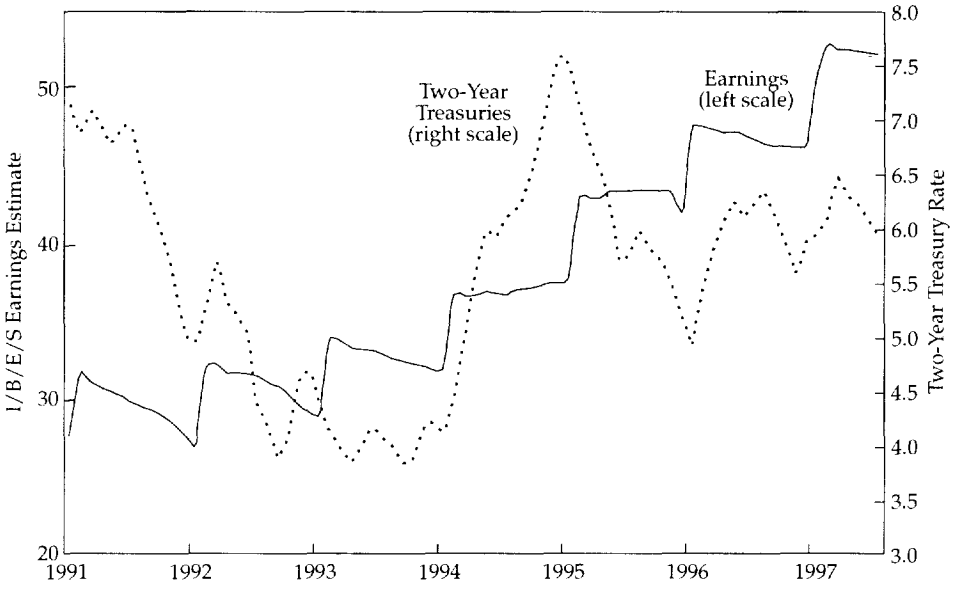
Mutual funds' stock purchases are again a large distorting factor. Purchases rose abruptly

Figure 7. Actual S&P 500 and S&P 500 Based on a Two-Factor Model, January 1979–September 1997



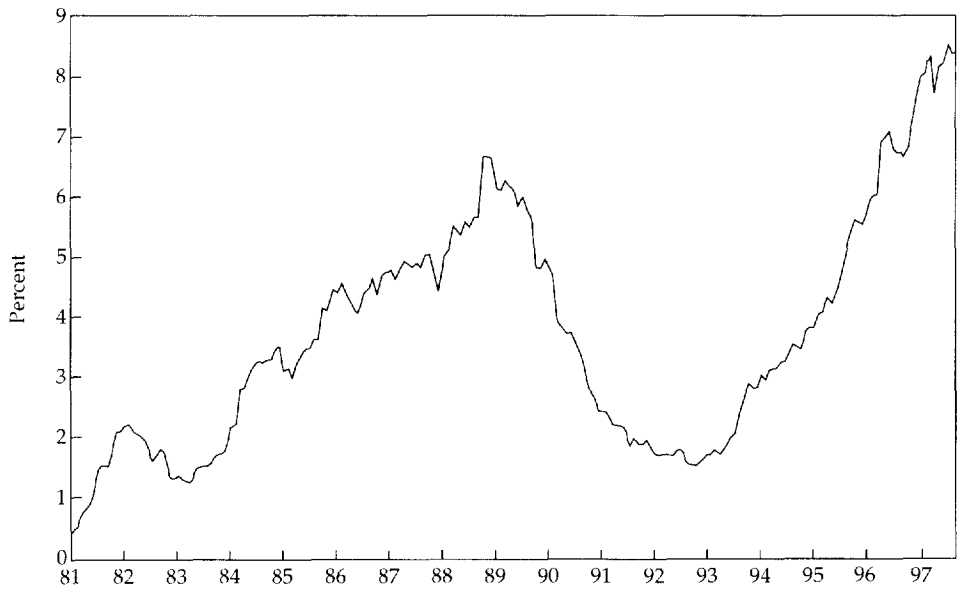
Note: The two factors are I/B/E/S Year 2 earnings estimates and two-year Treasury rates.
Sources: Standard & Poor's; Federal Reserve; I/B/E/S.

Figure 8. I/B/E/S Year 2 Earnings Estimates and Two-Year U.S. Treasury Rates, January 1991–September 1997



Sources: Standard & Poor's; Federal Reserve.

Figure 9. Announced Mergers and Acquisitions as a Percentage of GDP, January 1981–September 1997



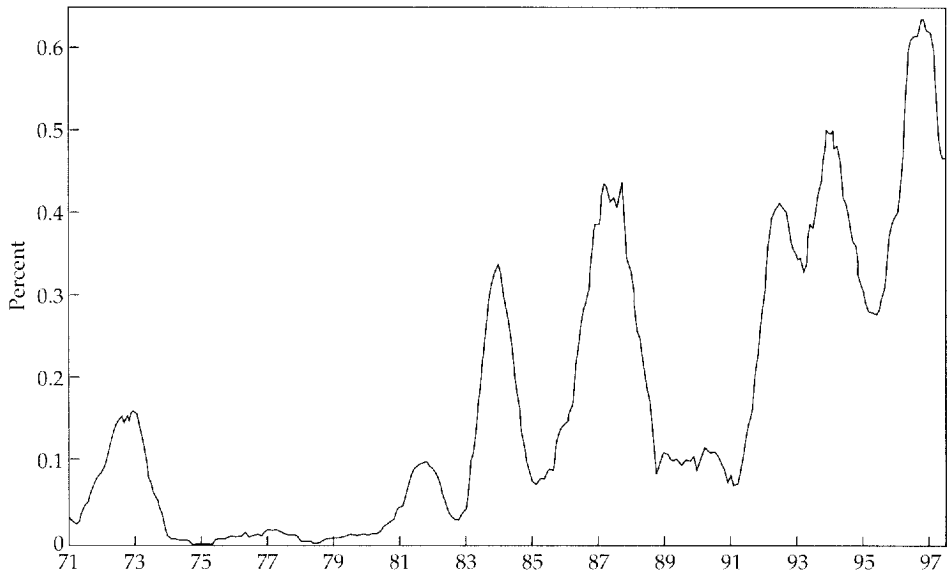
Note: Rolling 12 months.

Sources: Securities Data Co.; U.S. Department of Commerce.

from $104 billion in 1995 to $225 billion in 1996 but have abated somewhat in 1997.

The list of speculative indicators is much longer than in 1987. The Nasdaq 100 Index rose from 75 percent of the S&P 500 in 1990 to 135 percent in September 1997. Initial public offerings were recently at a record 0.6 percent of GDP (as shown in Figure 10) and, although they fell in mid-1997, show signs of reaccelerating. Figure 11 indicates that combined NYSE and Nasdaq monthly trading volume was a record 12 percent of GDP in the fall of 1997. The trend has been toward increased trading, but the September trading level was 85 percent above trend. The University of Michigan's Consumer Confidence Index reached a record 107 in late 1997, and no professional pollster

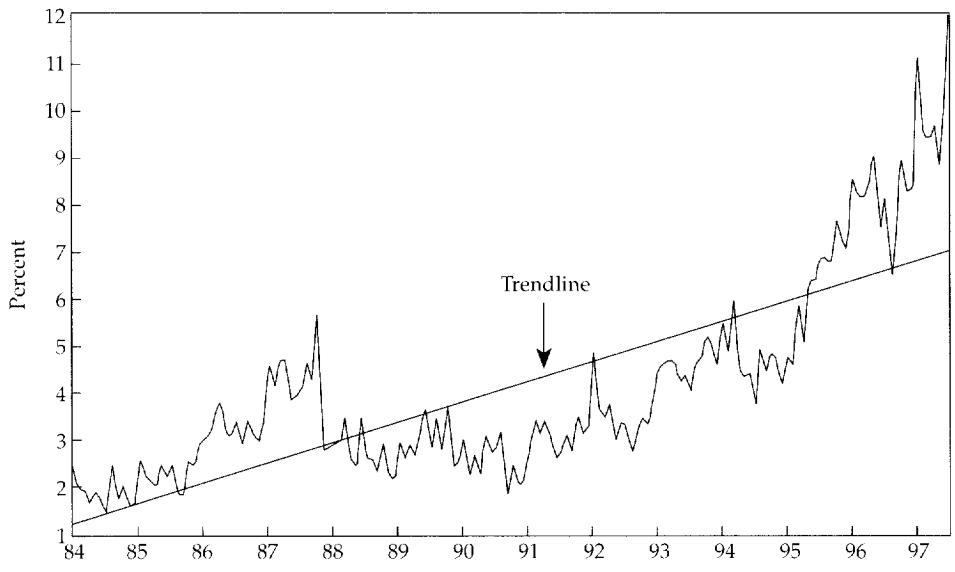
Figure 10. Initial Public Offerings as Percentage of GDP, January 1971–July 1997



Note: Rolling 12 months.

Sources: Securities Data Co.; U.S. Department of Commerce.

Figure 11. NYSE and Nasdaq Monthly Trading Volume as a Percentage of GDP, January 1984–July 1997



Note: Rolling 12 months.

Sources: NYSE; National Association of Securities Dealers; U.S. Department of Commerce.

is needed to confirm that cab drivers and waiters are caught up in the stock market.

The technical problem associated with portfolio insurance has disappeared—only to be replaced by a growth in index-managed funds. Indexed mutual funds have grown from $37 billion at the end of 1995 to $97 billion in July 1997 ($121 billion annualized). Managed indexed equity funds for pensions exceed $600 billion. Concentrated index selling from these funds could dislocate the market much as portfolio insurance did in 1987. Their sales are not subject to the uptick rule on NYSE program trades when the DJIA declines 50 points, and the sales would be directed straight at the specialists, who constitute the same flaw in the system as in 1987 because of their limited capital and lack of distribution power.

Fortunately, there has been no apparent growth in hedging with the S&P 500 futures to exacerbate this threat. Although the value of the S&P 500 open interest has risen from $30 billion to $90 billion since 1992, its relative magnitude has declined—from 26 percent of NYSE trading volume in early 1995 to only 19 percent in September 1997.

The only counterweight to these concentrations of indexed assets is the NYSE's "circuit breakers" requiring trading pauses. Whether they will seriously reduce the momentum of a crash is unknown. The October 1997 market decline was not of a sufficient magnitude to test the breakers.

If a crash occurs, the odds that a credit crisis comparable to that in 1987 would occur are much lower now, despite the widespread perception that investment bankers are taking much greater risks today. Table 3 outlines the high-risk assets relative to book and liquid equity for eight of the largest investment banking firms (Bear, Stearns & Company, Donaldson, Lufkin & Jenrette, Goldman, Sachs & Company, Lehman Brothers, Merrill Lynch & Company, Morgan Stanley–Dean Witter, PaineWebber, and Salomon Brothers) at the end of their 1996 fiscal years. Emerging market debt is included as high risk, but it was virtually nonexistent in 1987. High-risk assets are down from 421 percent of liquid equity in 1987 (see Table 2) to 293 percent today. More important are the data showing that these investment banks had virtually no unsecured long-term debt on their balance sheets in 1987 but now have $94 billion. The last column of Table 3 shows that high-risk assets are only 69 percent of liquid equity plus long-term debt. Thus, investment bankers are in a position to collateralize their short-term borrowings under almost any circumstances. Investment bankers' commercial paper borrowings of more than $50 billion may be vulnerable in a crash, but the alternative would simply be higher-cost collateralized bank borrowings.

The area that would continue to be vulnerable in a crash is the continued reliance of various clearing systems on daylight overdrafts. Little has changed in this respect, except that greater competition between commercial and investment banks may inhibit cooperation in a crisis.

Conclusions

An unusual confluence of events triggered the crash of October 19, 1987—extreme overvaluation, a congressional threat to merger activity, rising interest rates, and strident international debate over monetary policy and currency values. The resulting panic engulfed sophisticated institutions and retail investors, both U.S. and foreign. Index selling, particularly portfolio insurance, was the weak point in the system primarily because it was routed through the specialists with their modest capital and total lack of distribution power.

The credit crisis that erupted on October 20, 1987, could have produced a more serious collapse with greater effects on the real economy if the Federal Reserve and the White House had not combined to restore order. Whether the banks would have responded to the Fed's pressure if the massive stock repurchases induced by the White House had not caused the stock market to rally remains an unanswered question.

Table 3. Risk Exposure of Eight Large Investment Bankers, Fiscal Year End 1996

	$ Billions	Percent of Liquid Equity	Percent of Equity	Percent of Liquid Equity + Long-Term Debt
Balance sheet				
Stockholders' equity	$34	na	na	na
Illiquid assets	5	na	na	na
Liquid equity	29	na	na	na
Long-term debt	94	na	na	na
High-risk inventories				
Equities	60	207%	176%	49%
Junk bonds[a]	4	14	12	3
Emerging market debt[a]	7	24	21	6
Other	14	48	41	11
Total high-risk assets	$85	293%	250%	69%

na = not applicable.

[a]Estimated.

Sources: Annual reports; estimates.

A crash is a freak occurrence, and whether investors should be worried or reassured by the comparisons of October 1987 with today is not clear. Overvaluation, the prominent role of the retail public, high speculative levels, and reliance on the specialists to execute index orders are the weak links today. Other features of 1987 that might combine to produce a crash are not apparent. There are no efforts to restrict merger activity or problems with rising interest rates. International problems are limited to a moderately strong dollar and turmoil in developing countries. There is no threat of a recession, although earnings growth may still be difficult to sustain.

Finally, if a crash were to occur, the related credit problems would probably be concentrated not in the liquidity of the investment banking community but in the clearing systems' need for daylight overdrafts.

Notes

1. Published in January 1988, the official report of the Presidential Task Force on Market Mechanisms is referred to here as the Brady Report.
2. The formula for the model is as follows:

$$S\&P500 = S\&P500_{12/79} \times \frac{IBES_n}{IBES_{12/79}} \times \frac{I_{12/79}}{I_n},$$

where

$IBES_{12/79}$ = the I/B/E/S Year 2 bottom-up earnings estimate for the S&P 500 in December 1979

$IBES_n$ = the I/B/E/S Year 2 bottom-up earnings estimate for the S&P 500 in month n

$I_{12/79}$ = the Federal Reserve's constant maturity index for two-year U.S. Treasuries in December 1979

I_n = the Federal Reserve's constant maturity index for two-year U.S. Treasuries in month n

3. Assuming the ratio of asset or subsidiary sales to public takeovers was the same for the S&P 500 as for the total market.
4. Data courtesy of Asset Alternatives, Inc., *The Private Equity Analyst* (Wellesley, MA).
5. SEC, *The October 1987 Market Break* (February 1988).
6. *Pension & Investment Age*, (November 2, 1987):50 and (April 20, 1987):3.
7. Brady Report, Study VI, p. VI–5; SEC, *The October 1987 Market Break*, pp. 4–12, 4–55, 4–58, 4–63, 4–64.
8. Sales volumes were calculated from SEC, *The October 1987 Market Break*, pp. C–3 to C–42. Algorithms varied according to an institution's objectives. A 10 percent decline in the S&P 500 called for sales varying from 10 percent to 50 percent of an institution's portfolio. The implicit further decline in the futures market at noon on the 20th would have required between $12 billion and $60 billion of further "insurance" sales (Brady Report, p. V–17).
9. Wells Fargo Investment Advisors, "Anatomy of a Decline," San Francisco: Wells Fargo Investment Advisors, 1987, p. 20.
10. The *New York Times*, 10/17/87, p. 1; 10/20/87, p. D33.
11. Monthly stock sales are from the Investment Company Institute (ICI), and for October 16–23, they were calculated as redemptions minus November's daily sales rate from the ICI. *After the October 1987 Market Break*, Washington, D.C.: Investment Company Institute, October 1988, p. 5.
12. The Brady Report attributed only $0.8 billion of net selling to mutual funds on October 19 and $3.1 billion between October 16 and 23, compared with the $8.3 billion cited in the text, but net redemptions provide a more accurate image of the true selling pressure. Brady Report, Study IV, p. IV–4.
13. Brady Report, Study III, p. III–21; SEC, *The October 1987 Market Break*, pp. A–16, A–39 to A–40.
14. I estimate junk-bond inventories were as follows (in billions): Drexel Burnham Lambert, $0.8; Salomon Brothers, $0.4; Merrill Lynch & Company, $0.4; Morgan Stanley, $0.2; Goldman, Sachs & Company, $0.2; Donaldson, Lufkin & Jenrette, $0.2; Shearson-Lehman Brothers, $0.2; CS First Boston, $0.2; Kidder Peabody & Co., $0.1; others, $0.3.
15. I am indebted to Jeff Miller, senior partner of Miller, Tabak, Hirsch + Company, for this explanation of the market recovery. His firm was a major participant in futures buying at this point.
16. Brady Report, p. VI–73.