

**EQUITY RISK PREMIA, CORPORATE PROFIT
FORECASTS, AND INVESTOR SENTIMENT
AROUND THE STOCK CRASH OF
OCTOBER 1987**

by

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Abstract

Economists have produced no identifiable event which could justify, on fundamental grounds, the stock market crash of October, 1987. This research confirms that changes in consensus corporate profit forecasts and interest rates were completely unable to explain the decline in stock prices that took place at that time. It is shown that the equity risk premium would have to have increased by about four percentage points between October and November 1987 to explain the stock decline on the basis of these fundamental variables. Several possible explanations for the rise in the risk premium are explored.

Another hypothesis is advanced that suggests that shifts in investor sentiment, perhaps induced by noise traders, was a factor in the stock decline. Analysis of historical data shows that investor sentiment, as well as profit forecasts and interest rates, are significantly associated with stock returns. On the basis of historical data analyzed for periods *excluding* the months around the crash, one can state that changing investor sentiment and profit forecasts can account for between 30 and 45% of the October, 1987 stock market decline. In contrast, changes in profit forecasts and interest rates alone would have, in fact, predicted a *rise* in stock prices. Hence it appears that a significant component of stock returns are driven by yet unexplained changes in investor sentiment unrelated to market fundamentals.

1 Introduction

The stock market crash of October 19, 1987 was one of the most dramatic financial events in recent history. In six and one-half hours of trading, the Dow Jones Industrials fell by 508 points and the S&P 500 Index fell by 20.5%, the greatest single-day decline in history. After the fact, the crash of 1987 is more difficult to explain than that of October, 1929. The 1929 crash was followed by the Great Depression, with plunging corporate profits and massive bankruptcies, while the 1987 crash was followed by continued economic expansion and rising corporate earnings. However, like the 1929 crash, there was no precipitating news event on or immediately before October 19, 1987 that could justify the magnitude of the decline.¹

It is the purpose of this paper to examine whether there was a change in the expectations of future corporate profits or equity risk premia, either immediately preceding or following the crash, that could rationalize the change in the level of stock prices that occurred in October, 1987. By examining a detailed time series of future aggregate profit forecasts by a large number of professional forecasters, the valuation of the overall market is derived under the assumptions of either a constant or a varying equity risk premium.

The data show that the consensus forecasts of the short-term growth in corporate profits did decline immediately after the crash, but long-term expectations were little affected. Furthermore, the decline in the consensus forecasts of the rate of growth of corporate profits was associated with a decline in the long-term rate of interest so that the valuation of corporate equity, based on a constant equity risk premium, changed little over the twelve month period around October 1987.

There are several possible explanations for this result. One is that the equity risk premium rose significantly during the crash. It is determined that this premium would have to have increased by more than four percentage points from the pre- to the post-crash period in order to explain the fall in stock prices based on the consensus forecasts of profit growth at

¹See Brady (1988), Fama (1989), Black (1988), Shiller (1989) to name a few references which find no definitive variable explaining the crash. Cutler, Poterba, and Summers (1989) also find that many large daily movements in returns are not identified with any news events. Mitchell and Netter (1990) find that actions taken by the Congress to restrict takeovers were associated with stock declines earlier in October, but no action was taken on the weekend preceding October 19.

market rates of interest. It is examined whether the dispersion of the individual forecasts of future corporate profits (for a given consensus level) influences the return on stock prices, perhaps through its effect on the risk premium.

An alternative explanation for the stock decline is that the consensus forecasts of future corporate profit do not represent the actual expectations of investors in the market. Recently finance economists have recognized the role that non-informationally based investors, or “noise” traders, play in setting prices in financial markets. De Long, Shleifer, Summers, and Waldman (1990) have developed a model where, because of the finite horizons of investors, noise traders may influence stock prices because of shifts in sentiment unrelated to changing fundamentals. Stock prices may then be influenced by the number and wealth of optimistic and pessimistic traders in the market.

It is shown that there is considerable dispersion of the expectations of the growth rates in aggregate corporate profits among even professional forecasters. The valuation of equities based on the mean of the 20% most optimistic professional forecasters of corporate profits was two to three times the valuation based on the pessimistic forecasts. Despite the sharp swings in stock prices during 1987, the movements of the market stayed within the valuation band based on these forecasts. Hence it is possible that shifts of investor sentiment between the optimistic and pessimistic forecasters was a factor determining equity prices. Data representing investor sentiment are then used to determine whether such shifts in sentiment are a significant factor influencing stock returns over longer periods of time.

The plan of this paper is as follows. Section 2 describes the forecast and sentiment data used in this study. Section 3 calculates the theoretical valuation of the S&P 500 Index based on survey data and analyzes the implied changes in the risk premia on stocks during the twelve month period around the stock crash. Section 4 analyzes the impact of interest rates, investor sentiment, and the mean and dispersion corporate profit forecasts on monthly stock returns from 1976 through 1990. Section 5 offers some concluding comments.

2 Sources and Descriptions of Data

2.1 Corporate Profit Forecasts

A time series forecast of corporate profits is taken from the Blue Chip Economic Indicators (BCEI), a monthly publication founded in 1976 by Robert J. Eggert. BCEI compiles forecasts of macroeconomic variables from about 50 major financial, corporate, and forecasting firms. At the beginning of every month, each forecaster is asked to provide an estimate of the percentage change of a particular macroeconomic variable over the next two calendar years.² Twice each year, the forecasters are asked to provide forecasts of the percentage change for several variables for each of the next five years, and then an average annual rate of change for six to ten years ahead. The long-range forecasts are reported twice a year in the March and October bulletins.³

In the survey, corporate profits are defined as nominal pretax profits, including inventory valuation and capital consumption adjustments, as compiled by the Bureau of Economic Analysis. The consensus forecast is the mean of all forecasters. The "High" forecast is the average of the top ten forecasts and the "Low" forecast is the average of the bottom ten forecasts. We shall term the high forecast as representative of the "optimists," and the low forecast as that of the "pessimists." Table 1 displays the consensus, the High and the Low estimates, and the standard deviation of the forecasts of the growth rate of corporate profits from April 1987 through March, 1988. Table 2 displays the long-range forecasts found in the March and October bulletins.

Table 1 shows that there was little change in the consensus forecasts of corporate profits until November 1987, the first survey after the crash. However, in the period leading up to the crash, there was an increasing divergence of long-range forecasts of corporate profit growth between the optimistic and pessimistic forecasters.

²Until 1984, forecasters were asked to forecast over one calendar year, with the switchover occurring in July.

³The bulletins are dated on or about the tenth of each month. BCEI states that the forecast data are collected in the first few days of each month, so that the October, 1987 survey was taken well before the stock crash.

The crash, which first impacts the November data, clearly influenced profit expectations. Since 1987 was nearing an end, the 1987 profit forecasts changed very little, but the impact on 1988 profits was forecast to be significant.⁴ Pessimists lowered their forecasts of 1988 profit growth from -0.3% in October to -10.1% in November, while the consensus forecast fell from 8.3% to 3.0% . The optimists seemed least affected by the crash, lowering their 1988 estimates of profit growth by only three percentage points.⁵

Unfortunately, immediately after the crash there was no survey of the change in the long-range forecasts. The next long-range forecast was conducted in March, 1988. It is apparent from Table 1 however, that the forecasts of profit growth in 1988 remained about as pessimistic in March 1988 as they were in November, 1987, and far below those made before the crash. The longer-range forecasts, however, changed little from just prior to the crash through March 1988. In fact the long-range consensus forecast after 1992 actually increased from October to March, indicating that most forecasters felt the crash, although it might have a short-run effect on corporate profits, would have no effect on long-range profit growth.

2.2 Investor Sentiment

As noted earlier, recent literature has given more weight to investor sentiment as a factor influencing asset prices.⁶ *Investors Intelligence*, a market newsletter, has been rating over 135 independent stock market advisory services since 1964. Its sentiment readings are widely used by other professionals in describing the mood of the market. Polls are taken every Friday after the market closes. The newsletter divides its readings into three classifications:

⁴BCEI indicated that the change in most of the forecast variables in its November survey was the largest in the eleven year history of the survey.

⁵The record shows that corporate profits increased 10.0% in 1988 over 1987. This was slightly above the consensus forecast through most of the pre-crash period (the January 1987 consensus was exactly on target), but vastly above the consensus forecast after the crash. *Ex post*, the fact that the crash had negligible short-run effect on the economy surprised most forecasters.

⁶The valuation of risky assets with differential expectations was first analytically derived by Lintner (1967), and later extended by Grossman (1976) and Huang and Litzenberger (1988). These models are not "rational expectations" equilibria where the price of securities "homogenizes" the individual expectations of all investors.

investor services which are clearly bullish, clearly bearish, and those which have a mixed forecast, e.g., differ in the short- and long-run projections. Because of the ambiguity of this third group, most technical analysts make use of a sentiment indicator which is defined as the percentage bulls over the sum of those who are bullish and bearish, omitting the third classification. The sentiment index is reported for the first Friday of every month in Table 1.

Table 1 shows that the sentiment index plunged between October and November, 1987. The number of investment advisers who were bullish compared to those who were bearish flipped from nearly a two-to-one ratio just prior to the crash to a one-to-two ratio after the crash. This is the largest monthly change in the sentiment ratio recorded in the 27 years that Investors Intelligence has been keeping these records.

3 Valuation of Corporate Profit Forecasts from April 1987 through March 1988

3.1 Valuation Technique

Aggregate profit forecasts can be used, in conjunction with appropriate discount rates, to derive an index of stock prices. Specifically, a theoretical index of stock prices, P_t^* , is defined as

$$P_t^* = \sum_{\tau=1}^{\infty} \frac{k_{t+\tau} CP_{t+\tau}^e | I_t}{(1 + d_t)^\tau} \quad (1)$$

where $CP_{t+\tau}^e$ is an index of expected corporate profits taken at time t for period $t+\tau$, based on the information set, I_t ; $k_{t+\tau}$ is the fraction of corporate profits remitted to the shareholders at time $t + \tau$, and d_t is the discount rate on equity. The index $CP_{t+\tau}^e$ is taken from the BCEI surveys taken from April 1987 through March 1988.⁷

⁷The expected growth of corporate profits after 1997 is taken to be the same as the average long-range growth rate from 1992 through 1997. Since the long-range forecasts are taken only twice per year, expected growth rates in intermediate months are calculated by straight line interpolation, with one exception. If the March, 1988 forecast is below that of the previous October, then the lower-figure is used in the intermediate months. The rationale for this is that the stock crash immediately lowered profit estimates, and it was unlikely that the March 1988 figure would be below that of the previous November.

The discount rate on equity, d_t , can be expressed as

$$d_t = i_t + ep_t, \quad (2)$$

where i_t is the nominal interest rate and ep_t is the equity risk premium.⁸

Equation (1) indicates that for a constant k_t , the theoretical valuation of stocks, P_t^* , changes when either (1) expectations of corporate profits change or (2) the discount rate changes. In turn the discount rate changes when either interest rates or the equity risk premium changes.

Theoretical price indices for the S&P 500 Index are computed for three series of expected future profits: the consensus level, representing the mean expectations, and the optimistic and pessimistic level, representing the mean of the ten highest and ten lowest forecasts.⁹ The theoretical price index is normalized so that the mean of the consensus level equals the actual mean of the S&P 500 Index over the twelve month period.

Table 3 computes the monthly theoretical valuations of stocks, P^* , based on expected future profits under two assumptions: (1) a constant discount rate, and (2) a variable discount rate set at six percentage points over the nominal long-term treasury rate, a premium which approximates the long-run excess return of stocks over bonds. Section 3.2 below analyzes the case of a variable risk premium.

Table 3 demonstrates how little the theoretical price of stocks changed during the twelve month period based on the consensus expectations of corporate profit growth, assuming either a constant or variable discount rate. Under the assumptions of a constant discount rate, the valuation based on the consensus estimate dropped by about 7% from October to November, and both the optimistic and pessimistic valuation fell by about 11%. In contrast the S&P 500 Index fell nearly 25% during that month.

The valuation of corporate profit forecasts changed even less during the crash if one assumes a constant equity risk premium rather than a constant discount rate. This is due

⁸Since expectations for future corporate profit growth are reported in nominal terms, a nominal discount rate is appropriate for discounting these cash flows.

⁹It is possible that forecasters who were optimistic (or pessimistic) in the short-run were not so for the long-range estimates. In that case, the high and low valuations represent hypothetical valuations based on taking the optimistic forecast for each period, and may not represent a specific forecaster in the survey.

to the fact that the long rate dropped significantly between October and November and actually more than offset the decline in the consensus estimates of corporate profit growth on the theoretical valuation.¹⁰

3.2 Changes in Equity Risk Premium

Table 3 also calculates the level of the equity risk premium, ep_t , which, given the interest rate on long-term governments, i_t , discounts the consensus forecast of future profits to the actual level of the S&P 500 Index. The equity premium falls from about 6% in April, 1987, to less than 3% in October, just prior to the crash. It then rises sharply to over 8% in December and February before decreasing to about 7% in March, 1988.

It is an open question what could have caused such a drastic change in the risk premium on equity during October. Some researchers, like Black (1988) claim that the equity risk premium is indeed volatile and investors' risk tolerance and estimates of mean reversion in equity returns can change quickly. Certainly the crash itself increased expected volatility, at least in the short-run, which should increase the risk premium. But that does not explain why the premium declined in the months prior to the crash.

It is conceivable that the nature of the 1982–87 bull market may have contributed to the decline of the risk premium prior to the crash. From August, 1982 through August 1987 the maximum decline in the S&P 500 Index was 13.2% (between October 1983 and June 1984). Data available on broad based stock indices from 1885 show that there is no other comparable five-year period, even during the great bull market from 1924–29, where such a small correction in stock prices occurred. The lack of a correction, combined with the increasing popularity of “portfolio insurance” during this period, may have given some investors the illusion of being protected against a stock decline. This may have contributed to the decline in the equity risk premium preceding the crash.¹¹

¹⁰A real business cycle model might suggest that the drop in interest rates was caused by the drop in the expected profitability of capital used by firms.

¹¹See Grossman (1988) and Leland and Rubinstein (1988) for a discussion of the role of portfolio insurance and the stock crash.

It is clear from these calculations that changes in the consensus (or optimistic or pessimistic) forecasts cannot explain the fall in stock prices in October, 1987, whether one uses either a constant discount rate or constant equity risk premium.¹² Explanations of the crash must be grounded in either changes in the equity risk premium or deviations of investor expectations from consensus forecasters.

4 Longer-Term Empirical Analysis

4.1 Regression Equations

This section determines which expectational and fundamental variables are significant in explaining monthly stock returns, with special attention to the period around the October, 1987 stock crash. The monthly return, denoted RET, is the CRSP valued-weighted return on NYSE stocks recorded between the close of trading of the first Friday of each month. These dates are chosen since they closely correspond to the time when the *Blue Chip Economic Indicators* conducts its monthly survey.

Four independent variables are used in the regression: one relating to investor sentiment, two relating to expectational variables, and one to an observable fundamental variable. Δ SENT refers to the change in the sentiment index, derived using the *Investors Intelligence* surveys and discussed in Section 2.2. Δ PROF measures the change in the mean (consensus) rate of growth of corporate profit forecasts, taken from the BCEI surveys, in the calendar year following the survey.¹³ Δ RISK is the change in the standard deviation of the individual monthly BCEI corporate profit forecasts. This variable is included to determine whether the dispersion of forecasts influence stock returns, such as Malkiel and Cragg (1980) and Miller (1977) have conjectured. Finally, Δ INT measures the change in the thirty-year constant maturity government bond interest rate.

¹²Another way of seeing that corporate profit forecasts cannot explain the crash is by cumulating the percentage changes that are implied by the forecasts in Table 1. The difference between the October and November forecast of the long-run level of corporate profits is less than 10%. I owe this observation to the referee.

¹³Current calendar year forecasts are not used since most unexpected macroeconomic events and changes in business cycle forecasts have small impact on near-term profit forecasts.

Regressions were run over several time periods. The sentiment indicator has been collected since 1963, but the BCEI forecasts of corporate profits are available only back to 1976. In some of the earlier BCEI surveys (from August 1976 through August 1984), data on profit expectations for the following calendar year are absent and hence those data points are eliminated. Since 1984, the BCEI surveys consistently disclosed forecasts for both the current and following calendar year. Therefore, estimation periods cover both the fourteen year period since 1976 and the six year period since 1984, when BCEI improved its survey. Regressions were also run for both periods since 1976 excluding the crash (April 1987 through March, 1988) and for this 12-month period around the crash.

The results are reported in Table 4. The sentiment index has strong significance in all the regressions over all the time periods. Changes in the sentiment index explain between one-fifth and one-fourth of the monthly returns on the CRSP value-weighted index.¹⁴ Except for the period of the stock crash itself, changes in expected corporate profits and changes in the interest rate are significant in explaining changes in stock return, and have the expected economic signs. Changes in the dispersion of corporate profit forecasts, $\Delta RISK$, have the right sign, but the effect is not statistically significant.

The regression coefficients during the twelve month period around the crash have the expected sign except for the rate of interest. This is because interest rates dropped sharply in October, 1987, as investors shifted to government bonds and the Fed eased credit. In contrast, outside the crash period, changes in interest rates are significantly, and negatively correlated with stock returns. In October, 1987 expected corporate profits fell and the dispersion of profit forecasts jumped and each variable independently is significant during the stock crash period. However, $\Delta PROF$ and $\Delta RISK$ are almost completely swamped by the impact of changes in investor sentiment, so they are insignificant in the multiple regression.

¹⁴It should be noted that these regressions involve *contemporaneous* values of stock returns and sentiment. Neither the level nor changes in the level of the sentiment index is significant in explaining *future* short-run stock returns.

4.2 Ability of Regressions to Explain the October, 1987 Stock Return

The CRSP value weighted index fell 22.3% from the first Friday of October through the first Friday of November. Table 5 indicates the explanatory power of the regressions estimated for explaining the October, 1987 stock decline. On the basis of the regression from the period from 1976 through 1990, *excluding* the twelve-month period around the crash, all four explanatory variables can explain a 3.4 percentage points, or 15.3% of the October decline. Using the data from 1984 onward (but still excluding the crash period), when BCEI expanded and improved its survey, 6.6 percentage points, or about 30% of the monthly decline is explained.

The change in the sentiment indicator (ΔSENT) alone explains about 14% to 23% of the decline (depending on whether the post 1976 or post 1984 data are utilized), while the sentiment changes and profit forecasts (ΔPROF) explain over 30% to nearly 45% of the October decline. However, when changes in the interest rate (ΔINT) are added to the regression, the ability of the regression equations to explain the fall in October, 1987 is significantly reduced because, as noted above, interest rates and stock returns both fell in October, contrary to their normal pattern. In fact, if only changes in consensus expected corporate profits and interest rates are considered, the stock market, based on historical regressions, should have increased. This result was also obtained from Table 3, when an explicit set of future corporate profits were discounted with a constant equity premium and showed a negligible change in the valuation of the stock market. Hence the data confirm the need to include a sentiment indicator if any of the decline in October, 1987 is to be explained.

5 Conclusions

This study explores the factors influencing stock returns, with special emphasis on the period surrounding the October, 1987 stock crash. It is found that changes in the consensus estimates of future corporate profits cannot explain the stock crash under the assumptions of either a constant discount rate or a constant equity risk premium. The equity risk premium

would have had to have increased about four percentage points during October in order to explain the decline in stock returns under consensus corporate profit forecasts.

It is also shown that changes in investor sentiment are significantly associated with changing stock returns over periods extending back to 1963. Changes in investor sentiment may influence stock returns in models which contain “noise traders” who trade on factors unrelated to the fundamentals valuing stock prices. Expected corporate profits, changes in interest rates, and, especially investor, sentiment are significantly associated with stock returns in data analyzed since 1976. Sentiment and profit forecasts variables alone can account for from 30 to 45% of the October, 1987 stock decline, while profit forecast and interest rate variables alone incorrectly predicted a rise in stock prices between October and November, 1987.

The data presented here support the role of “investor sentiment” as a significant factor influencing stock returns. It should be noted that neither investor sentiment, nor changes in expected corporate profits, should necessarily be construed as “causal” in explaining stock returns. Non-informed shifts between pessimistic and optimistic profit outlooks may be caused by changes in the stock returns themselves. Nevertheless, based on this analysis, the change in investor sentiment is strongly correlated with stock returns and capable of “explaining” up to one half of the record October 1987 stock market break.

Bibliography

- Barro, Robert J., "The Stock Market and the Macroeconomy: Implications of the October 1987 Crash," in *Black Monday and the Future of Financial Markets*, eds. R. Kamphuis, et al., 1989, Irwin, Homewood, IL, pp. 4-81.
- Black, Fischer, "An Equilibrium Model of the Crash," N.B.E.R. *Macroeconomics Annual*, 1988, (Cambridge, Mass. M.I.T. Press), Stan Fischer, editor, pp. 269-275. Goldman Sachs mimeo, March, 1988.
- Blue Chip Economic Indicators*, ed., Robert J. Eggert, Capital Publications, Inc., Alexandria, VA, all issues, 1976-1990.
- Brady, Nicholas F., et al., *Report of the Presidential Task Force on Market Mechanism*, Washington, DC, U.S. Government Printing Office, 1988.
- Cutler, David, James Poterba, and Lawrence Summers, "What Moves Stock Prices?" *Journal of Portfolio Management*, 15, Spring, 1989, pp. 4-12.
- De Long, J. B., A. Shleifer, L. H. Summers, R. J. Waldmann, 1990, "Noise Trader Risk in Financial Markets," *Journal of Political Economy*, vol. 98, 703-38.
- Fama, Eugene F., "Perspectives on October 1987: Or, What Did We Learn from the Crash?" in *Black Monday and the Future of Financial Markets*, ed., Robert W. Kamphuis, Jr. et al., Dow Jones-Irwin Inc., Homewood, IL, 1989, pp. 71-82.
- Grossman, Sanford J., "An Analysis of the Implications for Stock and Futures Price Volatility of Program Trading and Dynamic Hedging Strategies," *Journal of Business*, 1988, v. 61, pp. 275-98.
- Grossman, Sanford J., "On the Efficiency of Competitive Stock Markets When Agents Have Diverse Information," *Journal of Finance*, 31, pp. 573-85, 1986.
- Huang, Chi-fu, and Litzenberger, Robert H., in *Foundations for Financial Economics*, North Holland, NY, 1988.
- Leland, Hayne, and Mark Rubinstein, "Comments on the Market Crash: Six Months After," *Journal of Economic Perspectives*, 2:3, Summer, 1988, 45-50.
- Lintner, John, "The Aggregation of Investor's Diverse Judgements and Preferences in Purely Competitive Security Markets," *Journal of Financial and Quantitative Analysis*, December 1969, pp. 347-400.
- Malkiel, Burton G., and Cragg, John C., "Expectations and the Valuation of Shares," April, 1980, N.B.E.R. Working Paper.

- Meltzer, Allan H., "Overview," in *Black Monday and the Future of Financial Markets*, ed. Robert W. Kamphuis. Jr. et al., Dow Jones-Irwin Inc., Homewood, IL, 1989, pp. 15-34.
- Miller, Edward M., "Risk, Uncertainty, and Divergence of Opinion," *The Journal of Finance*, Sep. 1977, Vol. 32, No. 4, pp. 1151-1168.
- Mitchell, Mark L., and Netter, Jeffry M., "Triggering the 1987 Stock Market Crash," *Journal of Financial Economics* 24, 37-68.
- Siegel, Jeremy J., "The Stock Market Crash of 1987: A Macro-Finance Perspective," *Causes, Consequences, and Implications of the "Crash of 1987"*, Rodney L. White Working Paper, 1988.
- Swidler, Steve, "An Empirical Investigation of Heterogeneous Expectations, Analysts' Earnings Forecasts, and the Capital Asset Pricing Model," *Quarterly Journal of Business and Economics*, Winter, 1988, pp. 20-37.
- Verrecchia, R. E., "A Proof of the Existence of 'Consensus Beliefs'," *Journal of Finance*, September 1979, 34 (4), pp. 957-63.
- Zarnowitz, V., and Lambros, L., "Consensus and Uncertainty in Economic Prediction," *Journal of Political Economy*, 1987, Vol. 95, No. 3, pp. 591-621.

Table 1

Expected Yearly Percentage Increase in Corporate Profits¹ and Investor Sentiment²
(Surveys Taken in First Week of Month)

	Pre-Crash							Post-Crash				
	Apr 87	May 87	Jun 87	July 87	Aug 87	Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88
<u>1987 over 1986</u>												
High	19.1	18.8	18.5	18.1	17.5	16.5	17.7	16.5	16.4	-	-	-
Low	0.8	1.8	3.8	3.9	3.8	3.7	4.2	3.8	4.1	-	-	-
Consensus	9.3	10.5	11.0	11.6	10.4	9.6	10.0	9.2	9.7	-	-	-
High minus Low	18.3	17.0	14.7	14.2	13.7	13.0	13.5	12.7	12.3	-	-	-
Std. Dev.	6.6	6.2	5.4	5.1	5.1	5.0	5.2	4.9	4.6	-	-	-
<u>1988 over 1987</u>												
High	18.3	17.3	16.5	15.7	15.6	15.7	16.0	13.0	12.7	13.5	12.0	12.3
Low	2.5	0.8	0.0	-0.8	0.1	1.1	-0.3	-10.1	-9.0	-10.9	-9.4	-9.0
Consensus	10.0	8.9	8.1	7.2	8.2	8.5	8.3	3.0	3.4	2.9	2.9	2.9
High minus Low	15.8	16.5	16.5	16.5	15.5	14.6	16.3	23.1	21.7	24.4	21.4	21.3
Std. Dev.	5.8	6.1	6.0	6.0	5.6	5.3	5.5	7.0	6.9	7.1	6.7	6.7
<u>1989 over 1988</u>												
High	-	-	-	-	-	-	-	-	-	16.1	18.1	16.9
Low	-	-	-	-	-	-	-	-	-	-3.0	-1.3	-2.5
Consensus	-	-	-	-	-	-	-	-	-	5.6	6.4	5.9
High minus Low	-	-	-	-	-	-	-	-	-	19.1	19.4	19.4
Std. Dev.	-	-	-	-	-	-	-	-	-	7.4	7.3	6.8
<u>Investor Sentiment</u>												
Bulls	54.8	44.0	38.1	44.3	46.0	55.4	47.2	28.0	28.0	40.0	36.5	40.3
Bears	14.5	22.4	29.4	23.4	23.0	20.7	25.2	44.9	45.8	38.0	39.5	38.8
Index ³	79.1	66.3	56.4	65.4	66.7	72.8	65.2	38.4	37.9	51.3	48.0	50.9

¹ Current Dollar, Pretax Corporate Profits with Inventory Valuation Adjustment and Capital Consumption Allowance. Source: *Blue Chip Economic Indicators*.

² Source: *Investors Intelligence*, New Rochelle, N.Y.

³ Index = Bulls/(Bulls + Bears)

Table 2
Long-Range Expected Percentage Change in Corporate Profits

	Pre-Crash		Post-Crash
	March 1987	October 1987	March 1988
<u>1989 over 1988</u>			
High	9.7	11.1	16.9
Low	2.6	-6.0	-2.5
Consensus	6.4	3.5	5.9
High minus Low	7.1	17.1	19.4
<u>1990 over 1989</u>			
High	9.3	13.5	11.9
Low	-1.3	-3.7	-7.9
Consensus	5.1	5.3	3.4
High minus Low	10.6	17.2	19.8
<u>1991 over 1990</u>			
High	8.7	17.6	13.8
Low	1.4	3.1	0.8
Consensus	5.7	10.2	7.8
High minus Low	7.3	14.5	13.0
<u>1992 over 1991</u>			
High	10.8	12.7	14.7
Low	5.4	4.3	3.0
Consensus	7.7	8.3	9.0
High minus Low	5.4	8.4	11.7
<u>Annual 1992-97</u>			
High	8.0	9.9	9.7
Low	5.9	4.6	5.9
Consensus	7.0	7.3	7.5
High minus Low	3.1	5.3	3.8

Table 3

Valuation of S&P 500 Based on Corporate Profit Forecasts

Data	Pre-Crash						Post-Crash					
	Apr 87	May 87	Jun 87	July 87	Aug 87	Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88
(1) S&P 500	300.41	288.03	293.45	305.63	323.00	316.70	328.07	250.41	223.87	243.42	250.96	267.31
(2) Interest Rate ¹	7.89%	8.59%	8.66%	8.43%	8.93%	9.47%	9.70%	8.85%	9.12%	9.12%	8.36%	8.52%
<i>Valuations Based On</i>												
Constant Discount Rate:												
(3) Consensus	281.9	284.5	286.6	287.3	289.0	289.8	292.6	271.3	276.9	272.1	275.9	275.8
(4) Optimist	444.9	470.1	503.8	531.8	571.6	617.4	682.7	609.1	617.4	598.7	602.6	613.8
(5) Pessimist	182.3	176.0	171.0	167.2	163.7	160.6	155.1	136.8	142.7	141.2	149.5	146.8
Constant (6%) Equity Premium:												
(6) Consensus	310.6	288.6	298.7	297.1	286.0	263.2	261.9	264.2	264.6	270.6	292.6	285.5
(7) Optimist	473.3	446.4	488.9	503.2	500.0	466.1	489.1	507.0	500.8	518.2	575.3	564.9
(8) Pessimist	206.3	187.2	186.7	182.2	173.6	160.7	154.7	144.8	148.5	149.8	165.9	159.7
(9) Equity Risk Premium Required to Discount (6) to (1)	6.47%	6.03%	6.26%	5.60%	4.29%	3.39%	2.84%	6.82%	8.76%	7.69%	8.38%	6.99%

¹30-year constant maturity government bonds.

Table 4

Regression Equations

$$RET_t = \alpha + \beta_1 \Delta SENT_t + \beta_2 \Delta INT_t + \beta_3 \Delta PROF_t + \beta_4 \Delta RISK_t + \epsilon_t$$

Time Period	Independent Variables (t-statistics)				N	\bar{R}^2	SEE	DW
	$\Delta SENT$	ΔINT	$\Delta PROF$	$\Delta RISK$				
1976.08-1990.11	.191** (5.45)	-.020** (2.32)	.0096** (3.06)	-.0057 (1.10)	124	.3422	.0375	2.40
	.199** (5.81)	-.0182** (2.17)	.0108** (3.64)		125	.3412	.0375	2.41
	.221** (6.64)		.0102** (3.41)		125	.3212	.0380	2.38
	.201** (6.74)				171	.2092	.0403	2.21
1984.08-1990.11	.299** (5.86)	-.0021 (0.17)	.0134** (3.23)	-0.0 (.02)	75	.4515	.0359	2.35
	.299** (6.21)	-.0021 (0.18)	.0134** (3.48)		75	.4592	.0357	2.35
	.301** (3.66)		.0135** (3.50)		75	.4665	.0354	2.35
	.339** (6.87)				75	.3841	.0381	2.10
1984.08-1990.11 Excl. 1987.04-1988.03	.2287** (3.91)	-.0160 (1.29)	.0090** (2.70)	.0047 (0.79)	63	.3725	.0290	2.11
1976.08-1990.11 Excl. 1987.04-1988.03	.143** (4.42)	-.029** (3.55)	.0065** (2.20)	-0.00 (.01)	112	.3164	.0327	2.28
1987.04-1988.03	.564* (2.02)	.008 (.16)	.0693 (.53)	.003 (1.43)	12	.441	.065	2.43
1963.02-1990.11	.065** (3.85)				355	.0267	.044	2.11

** = significant at 5% level

* = significant at 10% level

Table 5

Percent of October, 1987 Return of $-.2225$
 Explained by Regression Equations Estimated
Excluding Crash Period: April 1987–March 1988

Variables	Time Period Estimated	
	1976.08–1987.03 1988.04–1990.10	1984.08–1987.03 1988.04–1990.10
Δ SENT, Δ PROF Δ INT, Δ RISK	15.3%	29.8%
Δ SENT, Δ PROF, Δ INT	15.2%	33.8%
Δ SENT, Δ PROF	30.7%	44.9%
Δ SENT	14.1%	22.8%
Δ PROF, Δ INT	-6.7%	-1.2%