

THE STOCK MARKET CRASH OF 1987:
A MACRO-FINANCE PERSPECTIVE

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Jeremy J. Siegel

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RODNEY L. WHITE CENTER FOR FINANCIAL RESEARCH
The Wharton School
University of Pennsylvania
Philadelphia, PA 19104-6367

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Jeremy J. Siegel

Professor of Finance

The Wharton School
University of Pennsylvania
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ABSTRACT

No economic event on or about October 19, 1987 can explain the record collapse of equity prices that occurred on that day. In the summer of 1987 equity valuations were at a historically high level based on current and projected earnings and the real interest rates available in the bond market.

This paper constructs a theoretical index of stock prices based on the range of actual forecasts of future corporate profits made during 1987. The dispersion of these profit forecasts increased markedly prior to the crash and the actual level of stock prices reached in the summer of 1987 could be justified by only the 10% most optimistic forecasters. Some reasons for the divergence between the actual level of stock prices and the level based on the mean forecasts of corporate profits are analyzed. These include the effects of the unprecedented five year bull market in stocks, changes in the equity risk premium, and investors' misjudgment of the market impact of portfolio insurance.

The divergence between the theoretical and actual stock market levels may have made stocks extremely vulnerable to any negative shocks. The stock market decline appeared to be a belated response of investors to rising real interest rates, which reached their peak on the morning of October 19. Evidence is presented which suggests that the deteriorating U.S. trade deficit was the most important source of the rising dollar interest rates prior to the crash. Increasing inflationary expectations played only a small role in the rate rise and the Federal Reserve assumed a neutral or only moderately tight stance during most of 1987. It is shown that, despite much public opinion to the contrary, there is little evidence to suggest that investors' perceptions of the U.S. budget deficit worsened prior to the crash and were a factor in the fall of equity prices.

I. Introduction

The stock market crash of October 19, 1987 was one of the most dramatic financial events since the Great Depression. In 6½ hours of trading, the Dow Jones Industrial Average fell from 2246 to 1738, or 22.6%, the greatest single day percentage decline in history. From a closing high of 2722 on August 25, the Dow Jones fell over 36% in 7 weeks. As measured by the December 1987 S&P 500 futures contract traded in Chicago, the decline was more severe. From an intra-day high of 342.35 on August 25, the contract fell to an intra-day low of 181 on Tuesday, October 20, a 47.1% decline, before trading was temporarily halted for the only time in the history of trading in stock index futures contracts. Around noon on October 20, the futures contract was selling at an unprecedented 22% discount to the reported spot index. If the futures market accurately reflected the spot prices for stocks on that Tuesday, the Dow-Jones would have fallen to a low around 1400 at mid-day on October 20, before a powerful rally ensued which sent the Dow-Jones to a closing price of 1841.¹

This paper analyzes the fundamental factors leading to the rise and subsequent collapse of stock prices in 1987. The valuation of the stock market based on current dividends, earnings, and real and nominal bond yields is examined on a historical basis from 1953 through 1987. A valuation model is constructed based on forecasts of future corporate profitability. This model shows that the valuation of equities in mid-1987 could be justified by only the most optimistic forecasts of corporate profits.² Shifts of investor sentiment between optimistic and pessimistic fundamental forecasters appear to play an important role in the valuation of equities.

No one economic event can explain the stock collapse of October 19.³ However, sharply rising interest rates are shown to be the fundamental factor depressing equity prices in September and October 1987.⁴ The source of the

rise in interest rates is analyzed in detail, with particular reference to inflation, monetary policy, and the U.S. budget and trade deficits. It is concluded that the deteriorating U.S. trade statistics, and the growing fear of investors of a fall in the dollar were the principal reasons for the rise in dollar rates.

The plan of this paper is as follows. Section II discusses and analyzes the level of the stock market based on the historical relation between real and nominal interest rates, stock earnings, and dividends.

Section III presents a stock market valuation model based on survey data of the time profile of expected future profits of corporations. These are drawn from forecasters of over fifty major industrial, financial, and consulting firms and published monthly in Blue Chip Economic Indicators. The disaggregated nature of this data reveals the dispersion of forecasts and allows for a computation of the range for the valuation of equities.

Section IV analyses the reasons why interest rates rose in 1987 prior to the stock market crash. Four hypotheses are examined: (1) an increase in inflationary expectations, (2) a worsening of the U.S. budget deficit, (3) a deterioration of the U.S. trade deficit and expectations of dollar devaluation, and (4) a tightening of Federal Reserve monetary policy. Section V offers some conclusions based on the evidence analyzed in the preceding sections.

II. Historical Valuation of the Equity Market

The valuation of stocks depends on the expectation of the current and future cash flows from equities, the risks inherent in those flows, and rate at which those flows are discounted. This section examines the valuation of stocks in 1987 based on current dividends, earnings, and alternative nominal and real yields.

Chart 1 displays the earnings-price ratio on stocks, the nominal (or market) yield on bonds, and their difference from 1953 through 1987. These values are plotted annually from 1953 through 1986, and monthly through October, 1987. The earnings-price ratio is calculated as the value of the stocks in the S&P 500 stock index divided by the current yearly earnings of the firms comprising this index. The bond yield is the nominal yield on 10-year constant maturity government bonds. For October, 1987, the yield is taken at its peak level of 10.25% reached on the morning of October 19.

The data show that the earnings-price ratio on stocks in the summer of 1987 was at the lowest point since 1961, reaching 4.75% in July, 1987. The difference between the nominal bond yield and the earnings-price ratio reached a record 4.65% in October, 1987, the greatest difference in the 35 year period studied.

Chart 2 displays the dividend-price ratio on the S&P 500 stocks and the nominal bond yield. The dividend-price ratio hit a record low in August, 1987, of 2.69%, compared to the previous low of 2.84% in 1972. However, because of the extremely high nominal yields in the early 1980's, the difference between the dividend-price ratio and nominal bond yields did not reach a record in October, 1987, but were eclipsed by yearly average data in 1981, 1982, and 1984.

Since stocks primarily represent claims on real assets while bond valuations are based on fixed nominal cash flows, the earnings yield on stocks is also compared with the real interest rate on bonds. The real interest rate expected by investors is approximately equal to the nominal returns minus a (weighted) average of the expected rate of inflation over the life of the bond.⁵

In the absence of direct market based information on inflationary expectations, two methods are used to estimate the real rate: (1) the current (December to December) rate of change in the Consumer Price Index, and (2) survey data on long-term inflation expectations. Survey data on average inflationary expectations over the next ten years taken is based on the "Decision-Makers Poll" of 303 key institutional investors and analysts compiled by Richard B. Hoey, Chief Economist from Drexel Burnham Lambert (DBL). This data has been available since 1978. Chart 3 displays the computation of the real rate based on both procedures. Since year to year inflation is influenced in part by transient factors, it is reasonable that real rates based on ten-year forecasts of inflation are less volatile than those based on current year inflation. The expected real return on bonds based on DBL data was 4.7% in October, 1987, a level exceeded only in 1981, 1982, and 1984.

Since the stock prices reached record levels relative to dividends in 1987, the difference between the real yield on bonds with either the earnings-price ratio or dividend-price ratio on stocks reached a record level in October, 1987. This is depicted in Charts 4 and 5. While the expected real yield on bonds averaged 5.86% below earning-price ratio for stocks from 1953 through 1986, the real yield on bonds steadily climbed throughout 1987 and for the first time nearly matched that on stocks in October. Chart 5 shows that the difference between the real yield on bonds and the dividend-price ratio also reached a record 1½% in October, eclipsing the previous high in 1984.

The evidence presented in Charts 1 through 5 confirm that the valuation of equities in the summer of 1987 was at a historical high level, based on current earnings and dividends relative to the real yields expected on long-term treasury securities. In the absence of any change in the risk premium

used to discount the cash flows from common stocks, these lofty valuations can only be explained by expectations of sharply rising future corporate profits. Section III examines the trend of corporate profit forecasts through 1987.

III. Stock Valuation and Future Profit Forecasts

III.A. Construction of Theoretical Stock Index.

The data used in this study to compute stock valuations based on fundamental economic forecasts is taken from Blue Chip Economic Indicators (BCEI). BCEI compiles monthly forecasts of macroeconomic variables from 52 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. Twice each year, the forecasters are to provide percentage-change forecasts 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.⁶

Table 1 displays the Consensus and the High and Low estimates for corporate profits, from December 1986 through October, 1987. 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 (BEA).⁷ The Consensus forecast is the average of all fifty-two forecasters. The High forecast is the average of the top ten forecasts, and the Low forecast is the average of the bottom ten forecasts. The High and Low forecasts are therefore about the 90th and 10th percentile of ranked forecasts, respectively. Table 1a displays the Consensus and High and Low forecasts for the long-range forecasts surveyed in October, 1986, and in March and October of 1987.

Although the consensus estimate for the growth in 1987 profits increased from 8.3% in December, 1986, to 10.0% in the following October, the estimate for the growth of 1988 profits fell by almost a like amount, from 10.2% in January to 8.3% in October. Table 1a shows that from March to October, 1987, the consensus estimate for corporate profit growth fell considerably in 1989, probably because of the increased expectation of a recession in that year, but rose in years that follow. From October, 1986 through March, 1987 the long-range consensus expectation of corporate profits (yearly average from 1992 to 1997) was unchanged at 7.0% and rose slightly to 7.3% in October. As will be made more specific below, valuation based on the consensus outlook for corporate profits changed little in the months preceding the October crash.

What is so striking about the data is the tremendous increase in the dispersion of estimated future profit growth. This is most vividly illustrated by examining Table 1a. The High or optimistic forecasts for the average annual rate of growth of corporate profits from 1989 through 1992 increased from an average of 7.4% in October, 1986 to 13.7% in October, 1987, while the pessimistic forecasts decreased from a 6.1% growth rate to an average annual decline of 0.6%. The forecast for the outlook after 1992 (far-range outlook) also showed increased dispersion. From October, 1986 to October, 1987, the optimistic forecasters increased their far-range expected annual rate of corporate profit growth from 7.6% to 9.9%, while the pessimists decreased theirs from 6.5% to 4.6%.

These profit forecasts permit the derivation of an index of stock prices based on the future expected profitability and the current discount rate for equity. Specifically, the theoretical index of stock prices, P_t^* , can be written as

$$(1) \quad P_t^* = \sum_{i=0}^{\infty} \frac{CP_{t+i}}{r^{t+i}}$$

where CP_{t+i} is an index of expected corporate profits taken at time t for period $t + i$, and d_t the discount rate on equity. The index CP_{t+i} is taken from the monthly BCEI survey from December, 1986 through October, 1987. The expected growth of corporate profits after 1997 was taken to be the same as the average level expected 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. The discount rate on equity is taken, arbitrarily, at six percentage points above the rate on ten year constant maturity government bonds. This approximates the long-run premium that equity holders have commanded over this rate over the last sixty years. Section IV.A. below examines whether shifts in the equity premium could have been responsible for the movement of equity prices during the first nine months of 1987. Since expectations for future corporate profit growth are reported in nominal terms, a nominal discount rate is appropriate for discounting these cash flows.

Equation (1) indicates that the theoretical valuation of stocks, P_t^* , will change when either corporate profits or the discount rate change. In order to assess the effect of changing expectations of corporate profitability alone, Chart 6 depicts the theoretical price of stocks through 1987 based on the monthly forecasts for corporate profits for a constant discount rate. The theoretical price for the high, low and consensus levels of future expected profits are plotted. The theoretical price based on the consensus forecast, is normalized so that that it equals the actual average level of 248.61 for the S&P 500 index in December of 1986.

Examination of Chart 6 reveals how little the theoretical price of stocks changed during the first nine months of 1987 based on consensus expectations of future corporate profitability. From December, 1986, changing consensus

profit forecasts increased the theoretical price of equities from 249 to 257, a mere 3.6%. However, there is a great difference between the valuation of corporate equity using the optimistic and pessimistic forecasts of future profits. In December, 1986, the high valuation would have placed the theoretical valuation of the S&P 500 index at 336.52, while the pessimistic valuation was 190.68. It is interesting to note that the August 25, 1987, all time high of the S&P index was 336.77, while the intraday low on October 20 was 216.47. Because of the trading halt, the true value of the S&P 500 index was probably closer to the 181 level reached by the futures contract. Therefore, the optimistic and pessimistic valuation of equity made in December, 1986 closely matched the subsequent high and low of actual stock prices.

Of greater significance is that the gap between the optimistic and pessimistic valuations widened significantly as 1987 progressed. In October, 1987 just prior to the crash, the optimistic scenario of future corporate profits, based on the December 1986 discount rate, yielded a theoretical S&P 500 price of 582.36, while the pessimistic scenario justified a price of 142.70. The ratio of the optimistic to pessimistic valuations of stocks widened from 1.76 in December, 1986 to 4.10 in October, 1987.

Chart 7 computes the theoretical price of stocks by discounting by the actual interest rates experienced during 1987. Six percentage points are added to the monthly series of 10-year constant maturity government bond yields to obtain d_t , the rate at which corporate profits are discounted in Eq. (1) above. Because of the general upward movement in interest rates throughout 1987, especially during the late summer and early fall, the theoretical valuation of equity prices based on the consensus forecasts

dropped sharply from 248 in December, 1986, to 186 in the following September, and a low of 171 on October 19.

However, the stock market continued to rise through the spring and summer of 1987, seemingly ignoring the impact of the rise in interest rates on the valuation of corporate equities. Actual stock prices shifted from levels consistent with the consensus valuation of future profits in December 1986 to, and finally in September, above the level based on the most optimistic forecasters. The depressing effect of the rising equity discount rate almost exactly offset the increasingly optimistic profit forecasts of the "High" forecasters so that optimistic valuation of the S&P 500 of 340 in August of 1987, virtually matched the 337 level of the prior December. In September, the rising interest rates brought theoretical valuation based on the optimistic forecasters below the actual value of stock prices for the first time in 1987.

III.B. Causes of Shifts in Investor Sentiment

Throughout 1987 stock prices shifted from a valuation consistent with the consensus estimates of future profits to a level consistent with the most optimistic estimates, and then suddenly, in October, 1987 back to a level nearer the consensus valuation. Three possible reasons for the apparent shift from the consensus valuation are explored: (1) changing risk premia, (2) price history and heterogeneous expectations, and (3) incorrect investor assessment of hedging techniques.

1. Changing Equity Risk Premium.

If the equity risk premium declined during 1987, then the computation of the equity discount rate based on a constant premium over the government bond rate biases the theoretical valuation of stocks downward. Table 2 displays the equity discount rates from December 1986 through September 1987 which

value future consensus level profits to the actual level of the S&P 500 index. The required equity risk premium over the government bond is then calculated.

The data indicate that it is unlikely that the rise in stock values can be explained by varying equity risk premia unless that premium could have fallen to less than 2½% by September, 1987. Since option premiums did not decrease prior to the crash, there is indirect evidence that the average historical equity risk premium could have been reduced by over one-half during the first nine months of 1987.

2. Heterogeneous Expectations and Self Selection.

Expectations about future returns on financial assets are marked by considerable heterogeneity. When a financial market experiences an unusually long move in one direction, as did the stock market in the five year period from August, 1982 through August, 1987, those who had been the most optimistic about the stock returns will have performed very well relative to the pessimists or even the consensus forecasters. Those investors who form their expectations of future profits based on the estimates of other investors may be rationally attracted to the "optimists" during the bull market. In other words, although the consensus forecasts may change little, the forecasters who base their advice on a less optimistic view of future profits lose their following to the most optimistic forecasters who can demonstrate the best performance.

The stock rise from August, 1982 through August 1987 was indeed extraordinary. The maximum decline in the S&P 500 that occurred during that period 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 of the 1920's. where such

a small correction in stock prices occurred. It is not unreasonable under these circumstances that investors attached increasing weight to those forecasters who had justified their bullish position with optimistic forecasts of corporate profits.

The optimism of stock investors is indicated by examining Table 3, which is drawn from DBL "Decision-Makers Poll." Optimistic or "bullish" sentiment rose steadily in 1987 and peaked in August, the month of the stock market reached an all-time high. At that time, the ratio of bullish to bearish sentiment was almost three to one. Bearish sentiment, on the other hand decreased slightly over the same period. It is of note that during the same period, as interest rates rose steadily, bond market sentiment shifted sharply from nearly four to one "bullish" in December of 1986 to over three to one "bearish" by September of 1987.⁸

The high state of optimism in the equity market suggests that an increasing fraction of stock was held by those holding optimistic beliefs about future profitability. Therefore, the "consensus" forecasts of future corporate profits of those holding stock is likely to have shifted to the optimistic scenario, as the data indicated in Section IIIA. Forecasters with lower levels of optimism reduced their own equity holdings and/or lost influence with the less informed investor.

C. Incorrect Market Assessment of Impact of Hedging Techniques.

A third reason why the market may have moved to a level of overvaluation in the summer of 1987 is the proliferation of investor techniques, particularly portfolio insurance, whose consequences may not have been completely understood by the market. The simultaneous purchase of stock and the implementation of portfolio insurance schemes (or the placement of stop loss orders) should have the equivalent effect as the purchase of stock and a

put option on such stock. Demand for puts will normally place immediately downward pressure on the price of a stock while the users of portfolio insurance do not.

It is likely that investors both underestimated the negative potential of such "insurance" schemes and to the extent they employed these techniques may have "over-invested" in the stock market, believing that their portfolio was "insured" on the downside.⁹ Many of these portfolio insurance schemes were implemented once the market fell between 10 and 15%, and the resulting sales reinforced the decline that had already occurred as a result of the rising equity discount rates. In retrospect, investors may not have bid prices to as high levels had the full consequences of such sell plans been recognized before they were implemented.

IV. Sources of Rise in Interest Rates

The previous section documented that the rise in interest rates, and not the fall in the consensus expectations of future corporate profitability, was a fundamental factor influencing the valuation of stocks in 1987. This section explores the reason for the rise in interest rates. Four sources are considered: (1) a rise in inflationary expectations, (2) a worsening of the federal budget deficit outlook, (3) unexpectedly tighter monetary policy, and (4) increased expectations of a fall in the international value of the dollar generated by disappointing U.S. trade balance statistics.

A. Inflationary Expectations

Changes in the level of inflationary expectations are examined by using survey and market-generated data. The survey data are gathered from three sources: The Blue Chip Economic Indicators, the Drexel Burnham Lambert

"Decision-Maker Poll" on inflationary expectations, and NBER Survey data.

These data are reported in Tables 4 through 6.

Table 4 displays the inflation expectation data (CPI based) drawn from the Blue Chip Economic Indicators. The "high" and "low" expectations represent, as before, the mean forecast of the top 20% and the bottom 20% of the forecasters; the consensus forecast is the average of all forecasters.

The consensus forecast of inflation for 1987 increased from 3.2% in December, 1986, to 3.8% in October, 1987. Over the same period, the consensus forecast for inflation in 1988 increased from 4.1% to 4.6%. Table 4a reports that inflationary expectations for 1989 through 1992 increased on average 0.4 percentage points, and expectations after 1992 increased 0.3 percentage points. This survey indicates that near-term inflationary expectations increased about one-half percentage point, and long-term inflation, about one-third percentage point. Over the same interval, the ten year constant maturity bond yield increased from 7.13% to over 10%. Therefore, consensus expectations of inflation accounted for less than one-fifth the rise in long-term nominal rates.¹⁰

In contrast to the data on expected profits, the survey data on inflation forecasts do not indicate any increase in the dispersion of inflationary expectations. From January through October, 1987, the difference between the high and low expectations of inflation for 1988 actually fell. From October, 1986 to October, 1987, the gap between the high and low inflation forecasts for the five-year expectations of inflation widened slightly from 1.1 to 1.2 percentage points, and remained at 1.1 percentage points for the five year period from 1992-1997.

It is possible that investors shifted from the "consensus" to the "High" levels of inflationary expectations during 1987. However, unlike the

motivation of a shift from the consensus to the "High" corporate profitability forecasts, which could be rationalized by the surging stock market, inflation in 1987 was moderate and only slightly above earlier expectations. Even if there were a shift of investor-based expectations of inflation from the consensus level in December, 1986, to the High level in October, 1987, this could only explain a small part of the rise in long-term rates. Early in 1987 the consensus expectation of inflation for the years after 1989 was slightly over 4%, while the "High" forecast in October, 1987 was about 5½%, a difference of less than one and one-half percent. During that same period the nominal rate of interest on long-term government bonds increased by over three percentage points.

A second source of survey data on inflationary expectations comes from the "Decision-Makers Poll" conducted by Richard B. Hoey of Drexel Burnham Lambert. This data has already been utilized in the computation of real yields described in Section II. Table 5 shows the 10-year inflation expectations taken from the Hoey poll from December 1986 through November, 1987. The rise confirms the data from the Blue Chip Economic Indicators, namely a rise of about one half percentage point in long-range inflationary expectations during the period. It should be noted that the long-range inflation expectation in September, 1987, was approximately equal to that in May, although interest rates continued to rise during this period. A large part of the rise in inflation expectations in 1987 occurred in the Spring as a result of a jump in commodity prices that occurred at that time and will be studied below.

A third survey source for inflationary expectations comes from the National Bureau of Economic Research and American Statistical Association (NBER-ASA) survey of 22 business, academic, and government economists. These

economists are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical Association. The results of that survey is given in Table 6. From the fourth quarter of 1986 to the third quarter of 1987, the median year ahead forecast of inflation increased .8 percentage points from 3.3% to 4.1%. As in the DBL data, most of the increase occurred early in 1987. From the second to the third quarter of 1987 there was only a one-tenth percentage point increase in the median estimate of inflation and the fraction of economists who expected the rate of inflation to be 6% or higher was virtually unchanged from the first quarter through the third quarter of 1987.

Direct market generated data on inflationary expectations is difficult to obtain since there is no active market for price level indexed dollar debt and the inflation futures market established in 1985 by the Coffee, Sugar, and Cocoa Exchange did not prove successful. However, in 1986 the New York Futures Exchange began trading a futures contract based on the Commodity Research Bureau or CRB Index. The CRB Index is a price index composed of 21 commodities which have active futures markets.¹¹ This index is computed continuously and is closely regarded by investors in both the treasury bond cash and futures markets as a sensitive early indicator of inflation.

Chart 8 plots the CRB cash index and a ten-day centered moving average of the "spread" or difference between the second deferred contract (the contract after the "front" or next immediate contract to expire) and the index. The average period of time represented by this spread is about four months. The larger the spread, the higher traders believe the CRB index will be approximately four months from now compared to the current level.¹²

From February to June, 1987, the CRB index increased almost 15% from 205 to 235. This surge did increase inflationary expectations, as the data from BCEI and the NBER-ASA survey showed. The spread between the spot and the futures contract also widened at this time. However, in June the rise in the CRB stalled, and the index stayed within a relatively narrow range until October when, prior to the stock crash, it began to increase again. Both the spring and October increases were associated with drops in the international value of the dollar. As described in Section E. below, the increase in the CRB index in the first half of October was often cited in news accounts justifying the bearish sentiment among bond traders during this period. Despite the rise in the index in October, the spread between the futures and spot index actually decreased and turned negative on October 12. This evidence suggests that inflationary pressures from commodity prices in October were not expected to persist. The rise in commodity prices at that time should therefore have had only a small effect on long-range inflationary expectations.

Both the survey and market-generated data indicate the increase in inflation expectations prior to the crash was significantly smaller than the rise in long term bond yields. The data support the conclusion that most of the rise in long-term nominal rates during 1987 was a rise in real rates.

B. Federal Budget Deficit

After the crash, the large U.S. budget deficit was frequently cited as a major, if not the major, cause of the stock decline.^{13,14} The Budget deficit allegedly caused higher interest rates and increased investor pessimism about the U.S. economy.¹⁵

The U.S. budget deficit has been large since the bull market in stocks began in 1982. In order for the deficit to be a factor influencing the market

in 1987, current and prospective budget deficits must have been perceived as worsening throughout the year, since the existence of the deficit had been long known to investors.

Survey data is available about investor forecasts of and sentiments about the U.S. budget deficit. Table 7 lists the expectations of the forecasters participating in the Blue Chip Economic Indicators. The budget deficits for the first three quarters of 1987, were far lower than the expectations reported in the December 1986 survey. One reason for the lower budget deficit figures was the unexpectedly high tax receipts from the change in the capital gains tax. Nonetheless, the actual data being reported by the Treasury was much better than had been expected.

Table 8 reports data taken from the DBL survey of the long-range expectations of the budget deficit. This series indicates that as the year progressed, there was significant improvement in the expectations of the budget deficit in the fiscal years ending September 1987 through 1989 and slight improvement for 1990 and 1991. From December, 1986 through September, 1987, those polled reduced their expectations of the budget deficit by \$28 billion to \$166 billion, or 14%, for the 1987 fiscal year. For the fiscal years ending in 1988 through 1991 the forecaster reduced their budget deficit projections by 17, 9, 6 and 4 billion dollars, respectively. None of this data indicates any worsening of expectations of future deficits.¹⁶

Since the revised Gramm-Rudman Deficit Reduction Act, designed to reduce the deficit to zero by 1993, was passed and signed by President Reagan just days before the crash, there are no independent data on whether enactment of that legislation reduced expectations of long-term deficits. The November, 1987 DBL survey showed a sharp drop in the long-run expected deficit from the September level. But there is not enough information to determine whether

this drop is due to the Gramm-Rudman Law, or the statements by many political leaders and economic analysts that the budget deficit was a major cause of the crash and a way must be found to bring it under control to prevent economic disaster. In any case, the shift in deficit expectations did indicate the belief that some strong policy action would be taken, since the increased recessionary fears induced by the stock crash would, by themselves, cause an increase in the budget deficit.

Finally, a budget sentiment indicator is reported in Table 9, taken from the DBL "Decision-Makers Poll," which asked the question of the forecasters: "Do you believe that the current Federal Budget Process is 'Out of Control'?" The vast majority responded "yes." But the percent who did so in August and September, 1987, although it did represent a slight worsening from the levels of late Spring, was actually below that of December, 1986. These data, including that from other surveys, indicate that the U.S. budget deficit was regarded as a continuing problem, but a problem that was not perceived to be getting worse and therefore unlikely to be a cause of increased investor pessimism.

C. Monetary Policy

Whether monetary policy is regarded as "tight" or "loose" depends on which variables under Federal Reserve control are considered important direct or indirect influences on the economy. This paper will not take a stance on this controversial question, but rather examine whether the Federal Reserve regarded itself as initiating and supporting higher interest rates until the October crash.

Table 10 summarizes the record of the policy actions of the Federal Open Market Committee (FOMC). In four of the six meetings in 1987 prior to the crash, the directive to the New York Federal Reserve Bank was to exert "no

change" in pressure on the reserve positions of the banks, while "some increased pressure," and "slightly firmer," was indicated in the other two. The minutes of the meetings convey the impression that the Committee did not instigate higher interest rates, but rather passively, and very cautiously, ratified the higher rates that were initiated by other market forces.

In its contingent directive, the Committee lists a number of factors that may impinge on its basic directive as conditions unfold. The order of those factors often corresponds to their importance. The behavior of monetary aggregates, which was listed first in the February meeting, dropped to last in the August and September meetings.¹⁷ In August and September, the list of contingent factors was headed by "Progress against inflation," followed by the "Strength of the business expansion." The performance of the dollar on international markets was always cited as a factor and was given top priority in the meeting on March 31. In no case did the Committee indicate that an "extreme" or even "substantial" tightening was justified by events in the economy. The Committee's desired range of the Federal Funds rate was kept unchanged at 4% to 8% until the September meeting when it was raised to 5 to 9 percent in response to rising open market rates. In fact, the average Fed funds rate increased from 6.91% in December, 1986 to only 7.29% in September, 1987, an increase of 38 basis points. Over the same time period, 10-year government bond yields increased from 7.11% to 9.42%, or 231 basis points, and the yield on these bonds rose to over 10% on October 19. This steeping of the yield curve does not usually connote Federal Reserve tightening, but indicates the presence of other long-term factors influencing the rate of interest.

In summary, the Federal Reserve viewed itself as maintaining a neutral or moderately tight stance during the period leading up to the October crash. Neither Chairman Greenspan nor any Fed official called for a drastic increase

in interest rates in response to economic events, as Volcker did in October, 1979 in response to double digit inflation. In fact, short-term interest rates rose far less than long rates during the pre-crash period. The central bank, sharing the same dollar and inflation fears of investors, pursued a policy which yielded to and did not counteract the higher market interest rates.

D. U.S. Trade Deficit

Unlike the U.S. budget deficit and inflation, the U.S. merchandise trade deficit was deteriorating both absolutely and relative to expectations throughout 1987. There are several direct channels through which a deteriorating current account and falling dollar can lead to higher dollar nominal interest rates.¹⁸ But perhaps the most important was the expectation of further dollar depreciation generated by the worsening trade deficit.¹⁹ In February 1987, the Group of Seven nations, in response to the 40% decline in the value of the dollar over the past two years, met in Paris and fashioned an agreement on exchange rate management, later known as the "Louvre Accord." This accord was based on the hope that the dollar had already declined sufficiently and that lower U.S. trade deficits would emerge later in 1987. To prevent the dollar from dropping too low, the major industrial nations pledged to support the dollar, although the precise points of intervention were not made public.

Table 11 lists the consensus expectations and the actual data for U.S. net exports from the Blue Chip Economic Indicators quarterly survey. As 1987 progressed, private forecasters predicted, as did the government, that the U.S. trade balance in 1987 would be improving, albeit at a slow pace. Instead, the actual trade balance steadily worsened. In December, 1986 the consensus forecast was for the fourth quarter 1987 trade deficit to be under

\$98 billion; in September of 1987, the expectation was revised upward to \$111.7 billion.²⁰

The impact of the worsening trade picture in 1987 is also evident by examining the expectational data taken from financial market surveys immediately before the publication of the monthly trade data. MMS International (formerly, Money Market Services) surveys economists, financial analysts, and other forecasters in the days immediately prior to the release of economic data. These data form the "market expectation" which are widely disseminated to the press. Table 12 reports the expected trade deficit and the actual reported figure for the months of January through October, 1987.

It can be seen that for six of the seven months, from April through October, the actual figure reported by the Commerce Department was worse than expected by the financial markets. The deviation of reported figures from market expectations worsened significantly in July and August. The release on October 14, 1987, of a \$15.68 billion deficit was \$1.2 billion worse than expected. Although this was not a record deviation, the cumulation of negative surprises reinforced investors' perceptions that the deterioration of the U.S. trade balance was representative of an underlying imbalance and not due to transient events. The announcement was associated with a surge in interest rates and a 95 point drop in the Dow Jones Industrial Average. The following two days the Dow dropped another 166 points to bring its three day loss to 10.5% and its loss for the week to a 47-year record.

The worsening trade situation indicated to the foreign exchange market that the trading range for the dollar selected by the central banks was increasingly untenable. Traders' expectations increased that the range would have to be lowered, if not abandoned. To compensate holders of dollar denominated assets for the increased risk of depreciation in the value of

their assets, dollar interest rates rose markedly. Motivated by increased selling by internationally oriented investors, bond prices plunged and interest rates reached a peak during the morning of October 19. Combined with downward pressure in the stock futures markets generated by portfolio insurance, the stage was set for the record collapse of equity prices.²¹

E. Daily Commentary on Credit Markets

Daily commentary from the "Credit Market" column in Wall Street Journal was examined from October 1 through October 16, 1987 to ascertain the opinions of traders as to the cause of the rise in interest rates. The factors noted in the column as influencing the market on that day were enumerated. The falling value of the dollar and U.S. trade deficit was mentioned seven times and usually most prominently,²² while the fear of rising inflation was noted five times. Concerns that foreign authorities might raise interest rates to forestall inflationary pressures was mentioned twice, and rising U.S. short-term rates once. The U.S. budget deficit was not mentioned once by traders or commentators on the market as a factor influencing interest rates during this period.²³ The daily commentary in the credit markets supports the contention that factors related to the U.S. trade deficit were paramount to traders in the weeks preceding the stock market crash.

V. Conclusions

This paper evaluates the macroeconomic events prior to the crash to determine what factors caused or were associated with the sudden downward valuation of equity prices. The following are the conclusions reached:

(1) No one economic event on October 19 or the week before can explain the sudden collapse of equity prices. However, the cumulative effect of rising real interest rates appeared to quickly shift sentiment of investors

from an extremely optimistic scenario of future corporate profits to one closer to the consensus view. Heterogeneous forecasts appear to play an important role in the changing valuation of equities as investor sentiment seems to be volatile within the range dictated by these forecasts.

(2) Relative to current and consensus forecasts of earnings, and real interest rates, stocks reached historically high levels in 1987. Although the consensus expectations of future corporate profitability changed little from December, 1986 through October, 1987, the dispersion of future profitability increased markedly during the year. Given the rising level of interest rates, the high level of equity valuation reached in August could only be supported by the most optimistic forecasters of future corporate profits. The migration of investors to the optimists was fed by the unprecedented nature of the 1982-87 bull market and the large commitments of equity under "portfolio insurance."

(3) The proximate cause of the stock market decline was the rise in market long-term interest rates which reached their peak on the morning of October 19. Increases in inflationary expectations played only a small part in this rise. The unexpected worsening of the U.S. trade deficit was the major reason for the rise in real interest rates in the late summer and early fall of 1987. The deteriorating trade picture caused currency traders and international investors to expect that central banks would abandon the dollar ranges that had been established in February by the Louvre Accord. Sharply higher dollar interest rates were therefore required to induce investors to hold U.S. assets in an overvalued currency. Neither Federal Reserve policy nor the U.S. budget deficit played a significant role in raising interest rates or precipitating the stock market crash.

FOOTNOTES

¹See the Brady Report [1988] for a detailed description of the events on and about the week of October 19, 1987.

²Fama [1988] claimed that the overvaluation of stocks in the summer of 1987, not the crash itself, was the most puzzling aspect of market behavior in 1987.

³This is the conclusion of the vast majority of market researchers. See, in particular, Cutler, Poterba, and Summers (1988) and Shiller (1987).

⁴The strong correlation of market moves to the interest rates in the week preceding the crash is noted by Meltzer (1988). Brady (1988) also emphasizes the effect of rising rates.

⁵If nominal returns and inflation expectations are expressed in annual rates, the appropriate real rate is equal to $(i - \pi)/(1 + \pi)$ where i is the nominal rate, and π is the annual expected rate of inflation. For a standard nominal coupon bond, π should be a declining weighted average of future expected rates of inflation. Such detailed expectational data are rarely, if ever, available for future inflation.

⁶The Bulletins are dated on or about the tenth of each month. BCEI states that the survey is taken in the first few days of each month, so that the October 1987 survey was taken well before the stock crash.

⁷Since the analysis in this section is based on the expected percentage change in future profits, there will be a difference in equity valuation based on before- and after-tax profits only if tax rates are expected to change.

⁸By November 1987, a month after the crash, sentiment in both markets shifted radically to more than two to one bearish in the stock market and two to one bullish in the bond market. This was the sharpest shift in sentiment ever recorded in the DBL poll. Movements in stock prices caused by heterogeneous beliefs is examined by De Long et al. (1987).

⁹The phenomenon has been noted by Grossman [1987]. Shiller [1988] and Rubinstein [1988] also speak to this issue.

¹⁰If tax effects are included, a rise in inflationary expectations increases interest rates by $\pi/(1-t)$, where t is the marginal tax rate. Most empirical work has failed to find much evidence of this effect. Even if it were fully operative with $t = .5$, inflationary expectations would explain less than one-half the rise in interest rates.

¹¹The CRB Price Index represents the unweighted geometric average of the futures prices of 21 commodities, with 1967 set at 100. The futures price of each commodity is the arithmetic average of all futures contracts expiring by the end of the ninth calendar month from the current date. The 21 contracts include corn, oats, soybeans, soybean meal, soybean oil, wheat, coffee, cocoa, sugar, orange juice, cattle, hogs, pork bellies, cotton, lumber, crude oil, heating oil, copper, silver, platinum, and gold. The futures contract on the

CRB Price Index are cash settled on the third Friday of March, May, September, and December.

¹²The second deferred future was chosen to avoid the problem that the immediate future must equal the spot at expiration. A moving average representation smooths some of the daily volatility of the spread.

¹³Such opinion appeared in news stories and editorials following the crash. The Wall Street Journal reported on October 21, in an article entitled "Reagan Now Willing to Look at Tax Boost in Effort to Trim Deficit, Calm Markets," that "Congressional leaders from both parties pressed the president for reversing field and agreeing to budget negotiations." The New York Times editorial on the same day held the budget deficit (and foreign trade bill) responsible for the crash. In a Fortune article dated November 23, Margaret Thatcher is quoted as saying that cutting the budget is "the most important single thing" in restoring confidence in the world economy.

¹⁴Economists were more of a mixed opinion on the importance of the deficit. Lawrence Summers in a New York Times article on October 21 stated that the Administration's unwillingness to confront the budget deficit was partly responsible for the crash. Robert Solow of M.I.T., who had been awarded the Nobel Prize during the week of the crash, blamed the decline on the budget deficits of the Reagan Administration. In contrast, Prof. Robert Eisner, in an article in the Times on October 29, said the deficit was not the cause for the crash. This position was supported in a Times article on December 22 by Prof. John K. Galbraith, who had written extensively about the 1929 crash.

¹⁵Budget deficits can put upward pressure on interest rates in two ways: (1) enhancing the net supply of government securities on the market, a supply which is not offset by an increased demand by savers to hedge against future taxes, and (2) an increased fear of inflation, resulting from the potential monetization of future deficits.

¹⁶Since the gross government debt in 1987 was about \$2.2 trillion, such a long-term deficit represented a 7 to 8 percent growth rate in government debt. This implies that national income must grow at that rate to prevent the debt-to-income ratio from rising. Assuming three percent real growth, a constant debt-income ratio would imply a 4 to 5% rate of inflation, a level not far from what had been experienced in 1987. However, if the debt-to-GNP ratio is expected to decline during peace-time prosperity, so as to prevent the ratio from ratcheting upwards during recessions or wars, then a \$170 billion deficit is not compatible with moderate to low inflation rates in the long-run.

¹⁷Monetary aggregates broader than the monetary base did decline substantially in 1987. The Fed, in its annual report to Congress in February, 1988 claimed that special factors cause the aggregates to decline and that the decline did not signify a tightening of Fed policy. The higher interest rates induced by the trade deficit caused a shift from M1 and M2 deposits to the money market, reducing these aggregates in 1987.

¹⁸A drop in the dollar exchange rates generates (1) a rise in inflationary expectations as the price of imported goods is expected to

increase, (2) a more restrictive posture by the Federal Reserve, to the extent that the central bank wishes to offset or cushion the decline in the exchange rate, and (3) increased economic activity and loan demand due to the additional exports which a lower dollar is expected to stimulate. All these factors lead to a rise in nominal and/or real interest rates.

¹⁹Lawrence Summers (1987) noted the Louvre Accord's attempt to maintain a "wildly overvalued dollar," as an important contributor to the crash.

²⁰Even though expectations worsened substantially in March, forecasters always felt the trend would improve throughout 1987. Instead the actual trade deficit worsened in each quarter.

²¹Market expectations of a fall in the value of the dollar were realized in the weeks following the crash. From October 16 through December, 31, 1987 the dollar fell 14% on a trade-weighted basis. The ill-starred Louvre Accord of February was abandoned as policymakers refused, in light of the pessimism which followed the crash, to support the higher interest rates needed to keep investors in an overvalued dollar. The decision was made (with surprising consensus) to accept the risks of higher inflation and a temporarily undervalued dollar in order to avoid a recession induced by higher interest rates and falling equity prices.

²²The importance of the trade deficit and the dollar to the stock crash is supported by Table 2 in the Shiller (1987) survey. That survey indicates the single most important factor influencing the decisions of institutional investors on October 19 was the fact that long-term interest rates reached 10½%. Excluding the effect of the stock decline itself, the next most important factors were the trade figures announced on October 14 and the suggestion by Secretary of the Treasury Baker that the dollar should decline further.

²³J. Dewey Daane, Prof. of Banking at Vanderbilt and Peter G. Peterson, Chairman of the Blackstone Group and a long time proponent of fiscal responsibility and budget balance, were quoted as concerned about the budget deficits overall economic impact.

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Table 1

Expected Yearly Percentage Increase in Corporate Profits¹

	Month of Survey											
	Dec 86	Jan 87	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	
1987 over 1986	18.5	18.2	18.1	17.1	19.1	18.8	18.8	18.1	17.5	16.7	17.7	
High	-0.5	-1.1	-0.6	-0.7	0.8	1.8	1.8	3.9	3.8	3.7	4.2	
Low	8.3	8.1	8.4	7.7	9.3	10.5	10.5	11.6	10.4	9.6	10.0	
1988 over 1987	--	16.8	18.3	19.0	18.3	17.3	17.3	15.7	15.6	15.7	16.0	
High	--	3.7	4.1	3.5	2.5	0.8	0.8	-0.8	0.1	1.1	-0.3	
Low	--	10.2	10.9	10.7	10.0	8.9	8.9	7.2	8.2	8.5	8.3	

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

Table 1a

Long-Term Expected Increase in Corporate Profits

	October 1986	March 1987	October 1987
1989 over 1988			
High	7.3	9.7	11.1
Low	5.8	2.6	-6.0
Cons	6.7	6.4	3.5
1990 over 1989			
High	7.4	9.3	13.5
Low	5.9	-1.3	-3.7
Cons	6.7	5.1	5.3
1991 over 1990			
High	7.5	8.7	17.6
Low	6.4	1.4	3.1
Cons	7.0	5.7	10.2
1992 over 1991			
High	7.6	10.8	12.7
Low	6.5	5.4	4.3
Cons	7.0	7.7	8.3
Annual 1992 through 1997			
High	7.6	8.0	9.9
Low	6.5	5.9	4.6
Cons	7.0	7.0	7.3

Table 2

Discount Rate and Equity Risk Premium

Month	Discount Rate ¹	Bond Rate ²	Equity Risk Premium ³
December 86	13.11	7.11	6.00
January 87	12.69	7.08	5.61
February 87	12.37	7.25	5.12
March 87	12.08	7.25	4.83
April 87	12.22	8.02	4.20
May 87	12.27	8.61	3.66
June 87	12.11	8.40	3.71
July 87	11.97	8.45	3.52
August 87	11.72	8.76	2.96
September 87	11.89	9.42	2.47
October 87 (Average)	12.63	9.52	3.11
October 19, 1987	12.63	10.25	2.38

¹Discount Rate required to value Consensus Level expected future profits to the actual level of the S&P 500.

²Ten-year, constant maturity bond rate

³Discount Rate minus Bond Rate

Table 3

Institutional Sentiment Indicators

DBL Decision-Makers Poll
Drexel Burnham Lambert

Date of Poll	Stock Market Sentiment		Bond Market Sentiment	
	Bullish	Bearish	Bullish	Bearish
December 1986	43.6	21.6	43.4	11.5
January 1987	49.6	25.2	29.3	30.1
May 1987	40.2	27.1	22.8	43.4
June 1987	49.5	19.9	23.3	38.0
August 1987	57.2	19.6	19.3	42.8
September 1987	47.9	24.5	15.6	48.8
November 1987	19.9	42.4	41.6	19.0
January 1988	12.4	48.2	35.0	25.5

Table 4

Inflation Expectations¹

	Month of Survey											
	Dec 86	Jan 87	Feb 87	Mar 87	Apr 87	May 87	Jun 87	Jul 87	Aug 87	Sep 87	Oct 87	
1986	3.8	3.8	3.8	3.8	3.9	4.0	4.0	4.2	4.2	4.1	4.2	
sus	2.4	2.5	2.7	2.5	2.9	3.2	3.2	3.3	3.5	3.5	3.6	
sus	3.2	3.2	3.3	3.2	3.4	3.6	3.6	3.8	3.8	3.8	3.8	
1987	--	5.2	5.2	6.2	5.3	5.3	5.3	5.5	5.5	5.3	5.4	
sus	--	3.0	3.2	2.2	3.2	3.4	3.4	3.6	3.8	3.8	3.9	
sus	--	4.1	4.2	4.1	4.3	4.4	4.4	4.5	4.6	4.6	4.6	

1. Data taken from Blue Chip Economic Indicators.

Table 4a

Long-Term Expected Inflation Rates¹

	Date of Survey		
	October 86	March 87	October 87
1989 over 1988			
High	5.4	5.8	6.3
Low	3.0	3.2	3.6
Consensus	4.2	4.5	4.9
1990 over 1989			
High	5.2	5.6	5.8
Low	3.0	3.1	2.8
Consensus	4.1	4.3	4.5
1991 over 1990			
High	5.1	5.2	5.4
Low	2.9	2.9	2.8
Consensus	4.0	4.1	4.3
1992 over 1991			
High	5.2	5.0	5.5
Low	3.1	3.2	3.2
Consensus	4.1	4.1	4.4
Yearly 1992-1997			
High	5.2	5.0	5.5
Low	3.1	3.4	3.3
Consensus	4.1	4.2	4.4

¹Taken from Blue Chip Economic Indicators.

Table 5

10-Year Inflation Expectations

Decision Makers Poll
Drexel Burnham Lambert
Richard B. Hoey, Chief Economist

Date of Survey	10 Year Inflation Expectations
December 86	4.93
January 87	5.11
March 87	5.46
May 87	5.34
June 87	5.25
August 87	5.53
September 87	5.43
November 87	5.14

Table 6

NBER-ASSA Survey of Inflationary Expectations¹

	Date of Survey			
	IV-1986	I-1987	II-1987	III-1987
1987 over 1986	3.0	2.7	3.1	3.2
1988 over 1987	--	3.7	4.0	4.1
Twelve Month Forecast				
Median:	3.3	3.7%	3.9%	4.1%
Distribution:				
> 8%			3%	3%
6-8%	5%	12%	8%	9%
4-6%	19%	25%	45%	55%
2-4%	62%	45%	38%	31%
< 2%	14%	18%	6%	2%

¹Inflation measured from changes in GNP Implicit Price Deflator.

Table 7

Expectations of Budget Deficit (Billions of Nominal Dollars)¹

Forecast Quarter	Month of Survey				Actual
	Dec. 86	March 87	June 87	Sep. 87	
1987 I	-182.6	-177.1	-174.4	-170.5	-170.5
1987 II	-172.9	-164.8	-143.7	-141.9	-139.2
1987 III	-167.6	-160.3	-156.7	-167.9	-135.8
1987 IV	-161.5	-156.0	-155.8	-167.5	-161.4

¹Blue Chip Economic Indicators

Table 8

Expected Budget Deficits (Billions of Nominal Dollars)¹

Date of Survey	Fiscal Year Ending				
	9/30/87	9/30/88	9/30/89	9/30/90	9/30/91
Dec. 86	194	183	181	178	174
Jan. 87	180	176	174	167	166
March 87	182	167	165	165	164
May 87	183	170	167	164	161
June 87	176	169	171	169	170
August 87	170	169	173	171	169
Sept. 87	166	166	172	172	170
Nov. 87	---	156	153	152	144

¹Data from DBL's "Decision-Maker's Survey."

Table 9

Budget Skepticism Index¹

Percentage of Decision-Makers Who Believe
Federal Budget Is "Out-of-Control"

	Agree
December 86	85.7
January 87	81.2
March 87	76.7
May 87	79.3
June 87	80.3
August 87	82.2
September 87	82.0
November 87	82.2%

¹Reported in DBL's "Decision-Makers Poll."

Table 10

Record of Policy Actions of
Federal Open Market Committee

Date of Meeting (1987)	Directive on Degree of Pressure on Reserve Position	Contingent Directive	Range of Fed Funds Rates
Feb. 10-11	No change	Somewhat greater reserve restraint may be acceptable depending on (1), (2), (3), (4), and (5)	4-8%
March 31	No change	Limited adjustments towards firming depending on (3), primarily, then (1), (2), (4), (5)	4-8%
May 19	Some increase in Reserve pressure	Then ease or tighten depending on (4) and (3), then (1) and (2)	4-8%
July 7	No change	Firm or ease depending on esp. (4) and (3), then (1) and (2)	4-8%
August 13	No change	Firm or ease depending on (4), (2), (3), (1)	4-8%
September 27	Slightly firmer	Firm or ease depending on (4), (2), (3), (1)	5-9%

- (1) Behavior of monetary aggregates
- (2) Strength of business expansion
- (3) Performance of dollar
- (4) Progress against inflation
- (5) Conditions in domestic and international credit markets

Table 11

Consensus Forecasts of U.S. Trade Deficit (Net Exports)¹

Forecast Period	Month of Survey				Actual
	Dec 86	Mar 87	Jun 87	Sep 87	
1987 I	-110.0	-119.8	-111.9	-112.2	-112.2
1987 II	-106.0	-123.1	-114.9	-118.6	-118.4
1987 III	-101.1	-120.8	-113.9	-114.6	-123.7
1987 IV	-97.9	-118.2	-111.9	-111.7	-124.7
All 1988		-116.5	-105.3	-106.0	

¹Blue Chip Economic Indicators

Table 12

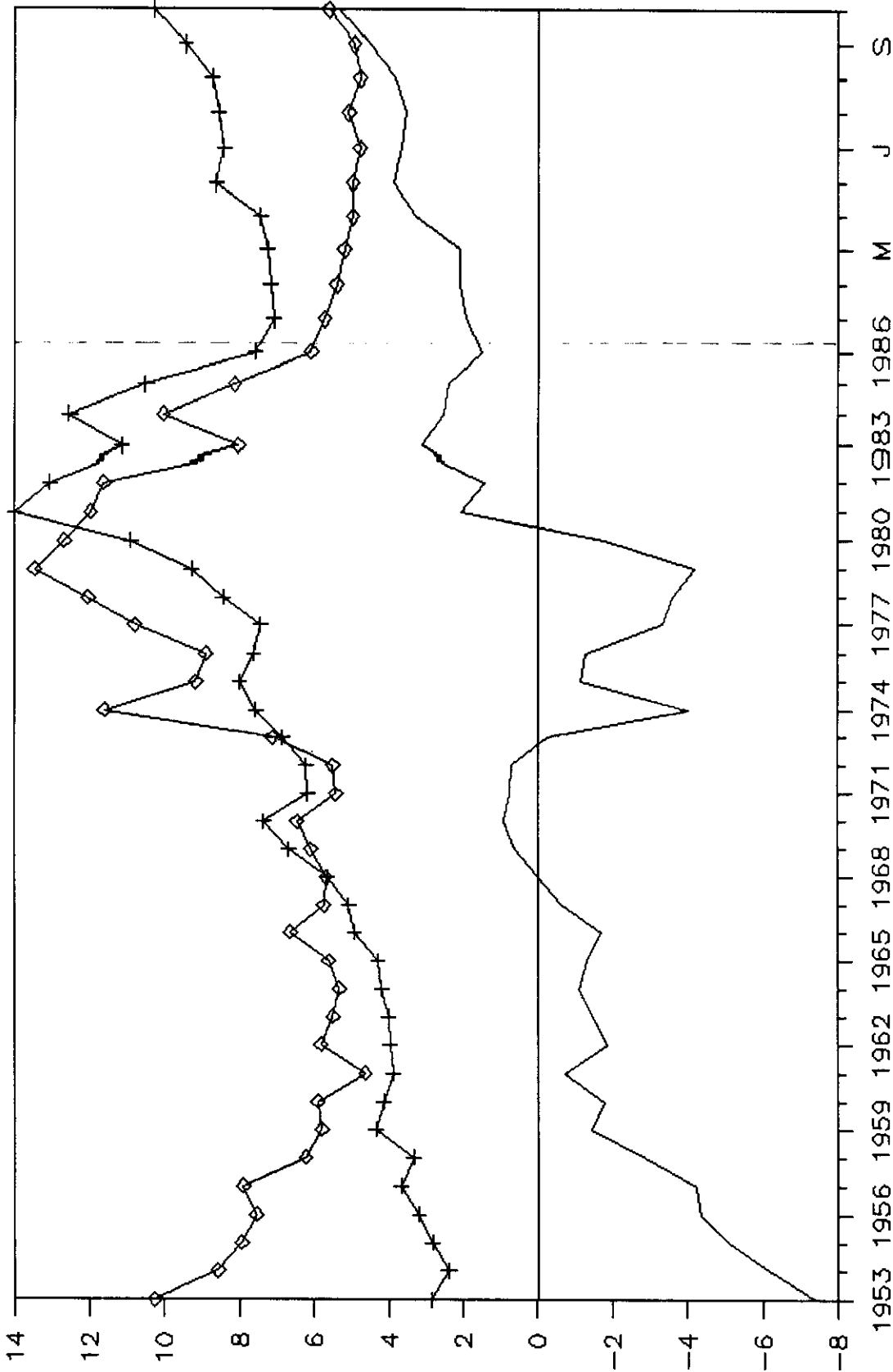
Market Expectations of Merchandise Trade Deficit¹

Month	Date of Survey	Date Reported	Expected Deficit	Reported Figure
January 87	March 2	March 17	14.0	12.44
February 87	April 10	April 14	13.0	15.06
March 87	May 8	May 14	13.5	13.63
April 87	June 5	June 15	13.7	13.32
May 87	July 10	July 15	13.0	14.4
June 87	Aug 7	Aug 14	13.0	15.71
July 87	Sep 4	Sep 11	16.0	16.47
August 87	Oct 9	Oct 14	14.5	15.68

¹Taken from MMS International Survey.

EARNINGS-PRICE RATIO AND NOMINAL RATES

1953 - 1986 AND MONTHLY 87

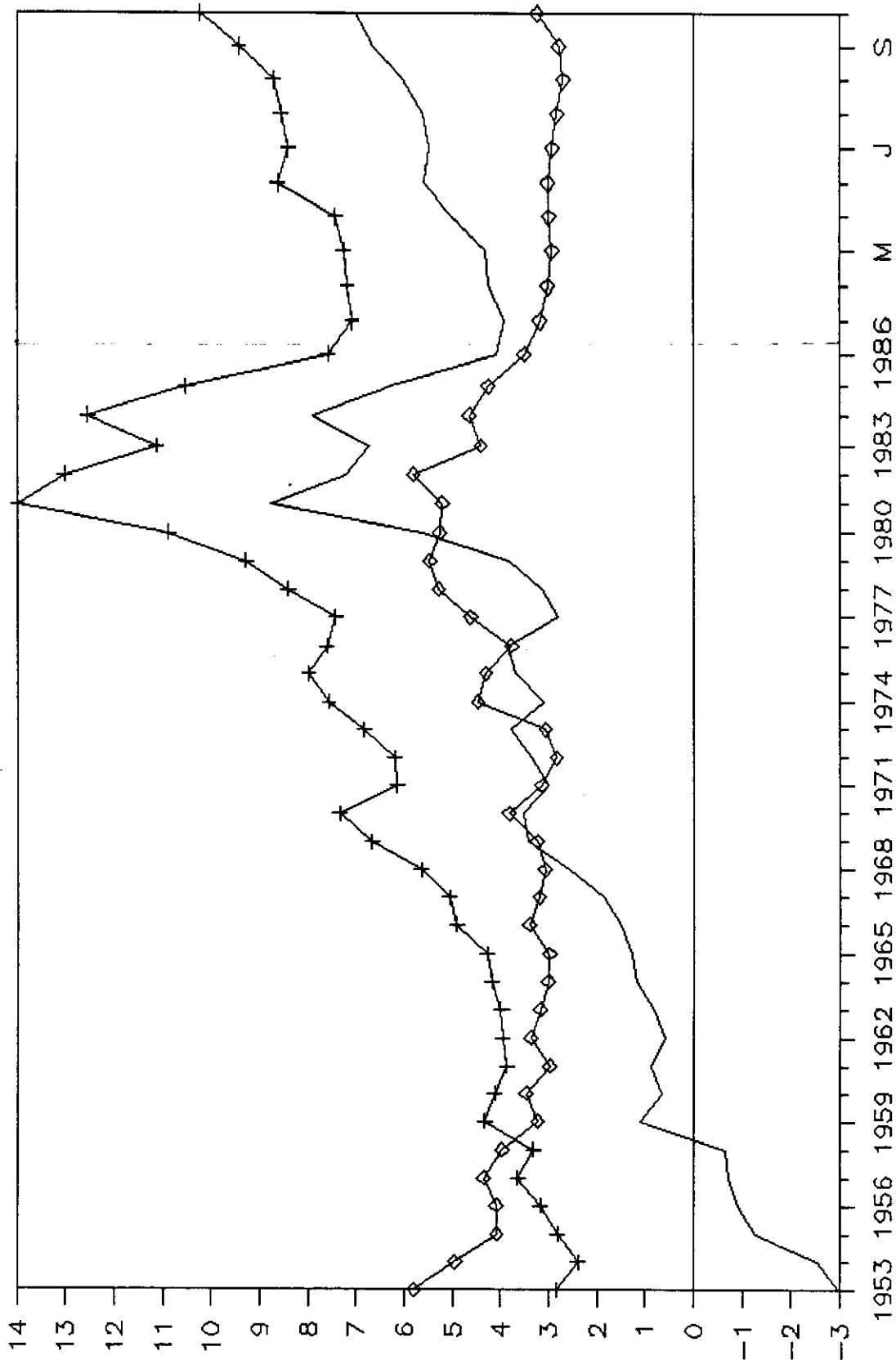


YEAR AND MONTH
 EARNING-PRICE RATIO
 DIFFERENCE

CHART 1

DIVIDEND-PRICE RATIO AND NOMINAL RATES

1953 - 1986 AND MONTHLY 87



OMINAL RATES ◊ YEAR AND MONTH — DIFFERENCE

CHART 2

NOMINAL AND REAL INTEREST RATES

1953 - 1986 AND MONTHLY 87

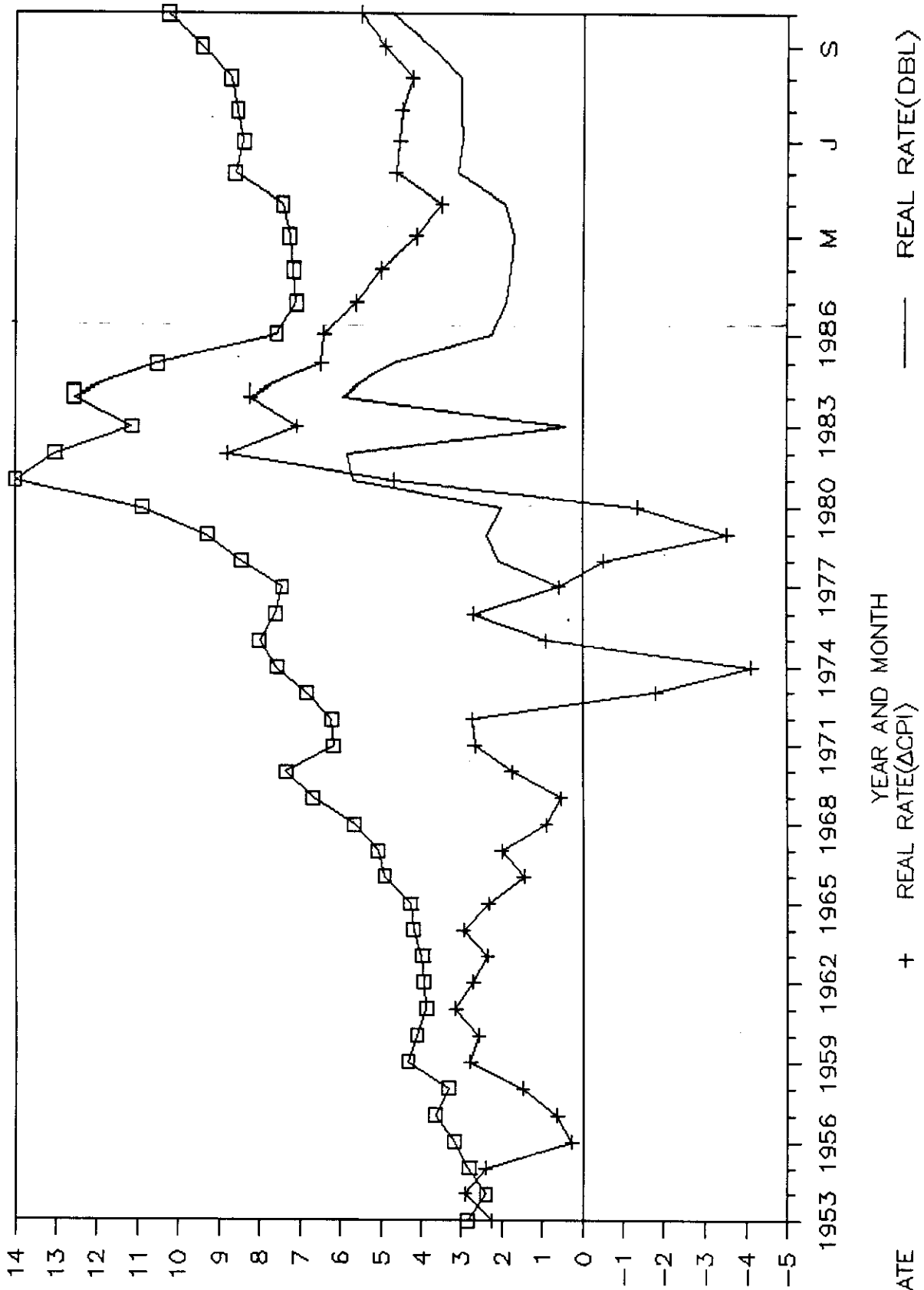


CHART 3

EARNINGS-PRICE RATIO AND REAL INT RATE

1953 - 1986 AND MONTHLY 87

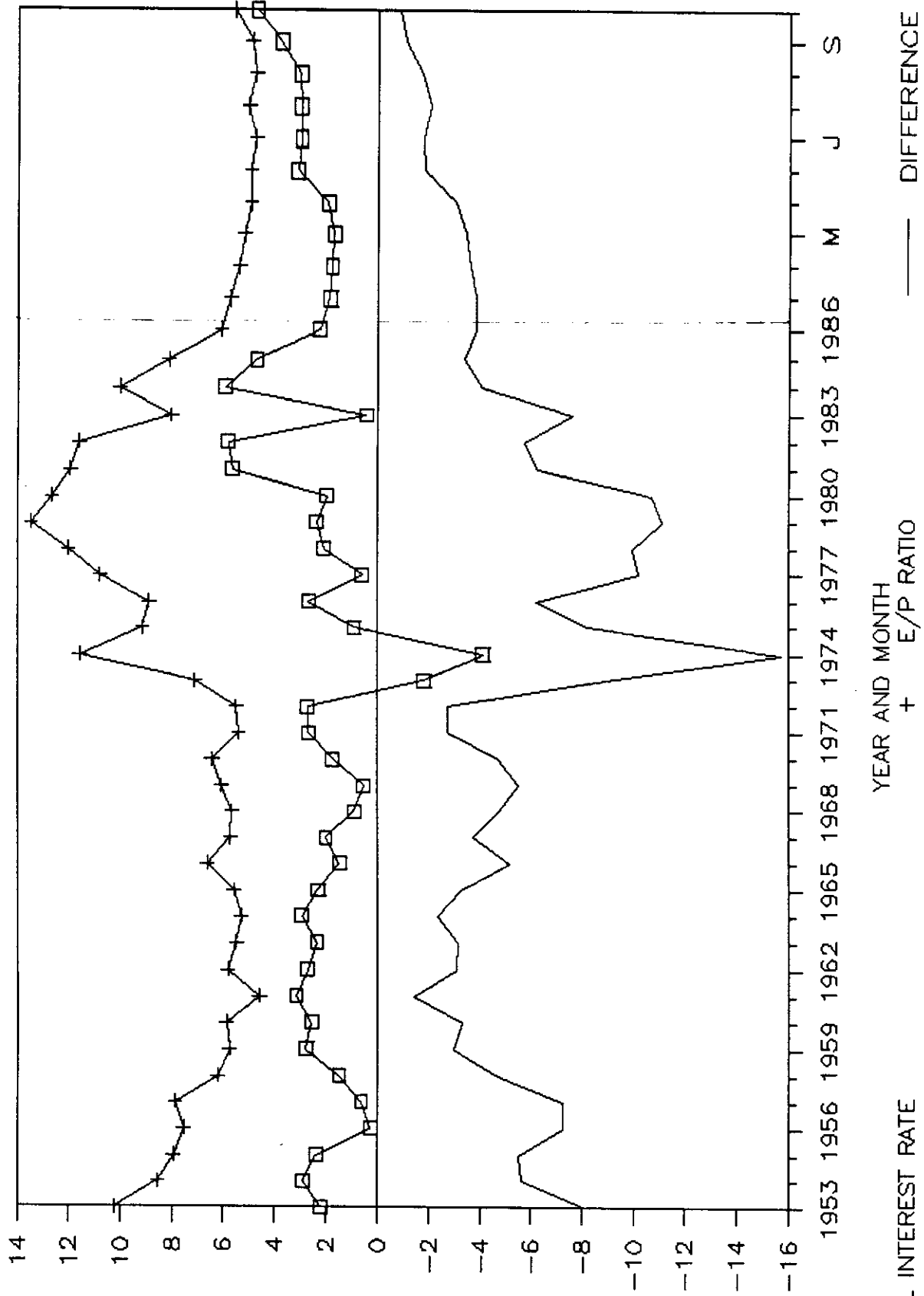
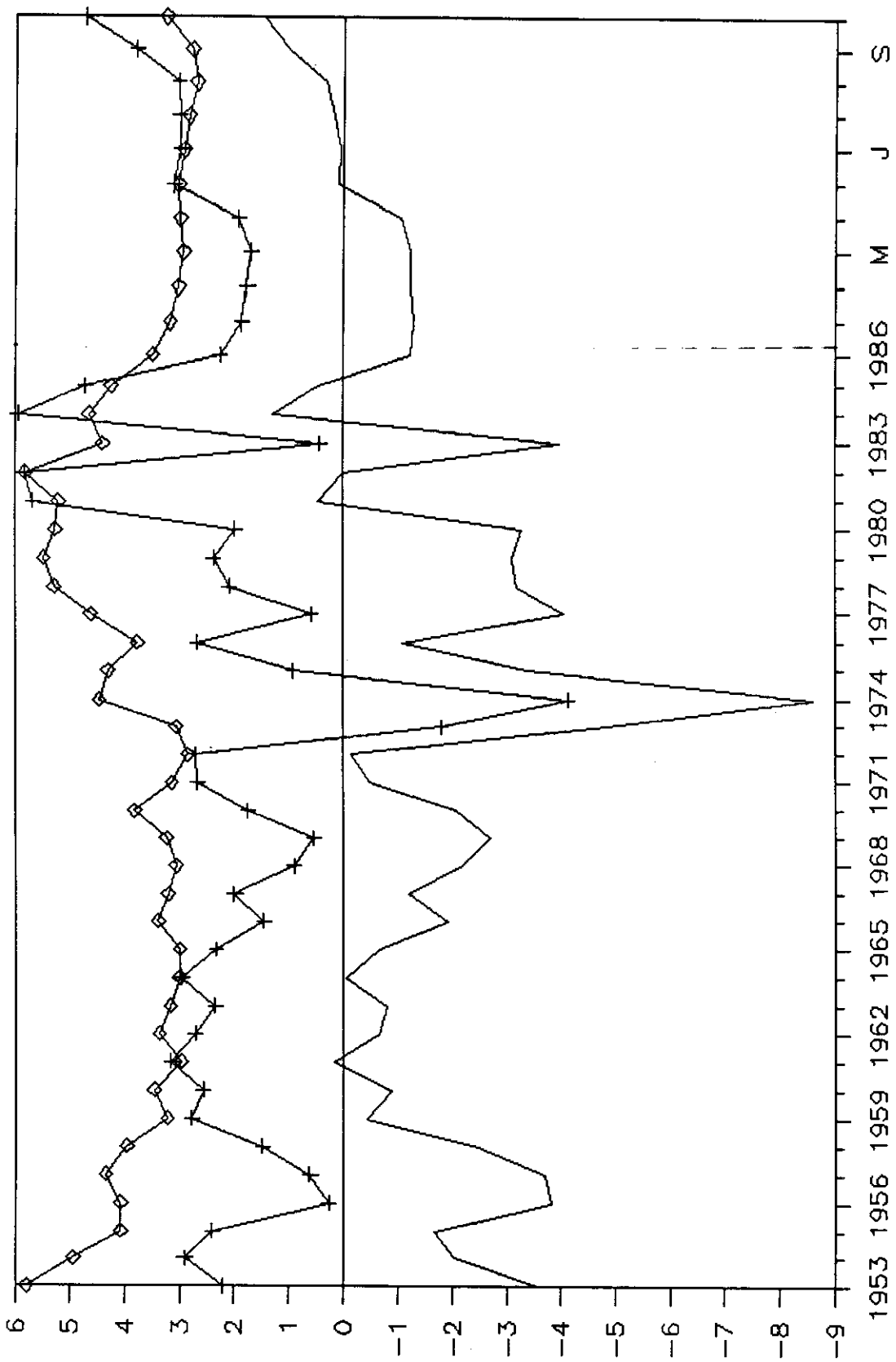


CHART 4

DIVIDEND-PRICE RATIO AND REAL INT RATE

1953 - 1986 AND MONTHLY 87



INTEREST RATE
 YEAR AND MONTH
 ◇ DIV-PRICE RATIO
 — DIFFERENCE

CHART 5

S&P 500 VALUATION

CONSTANT DISCOUNT RATE

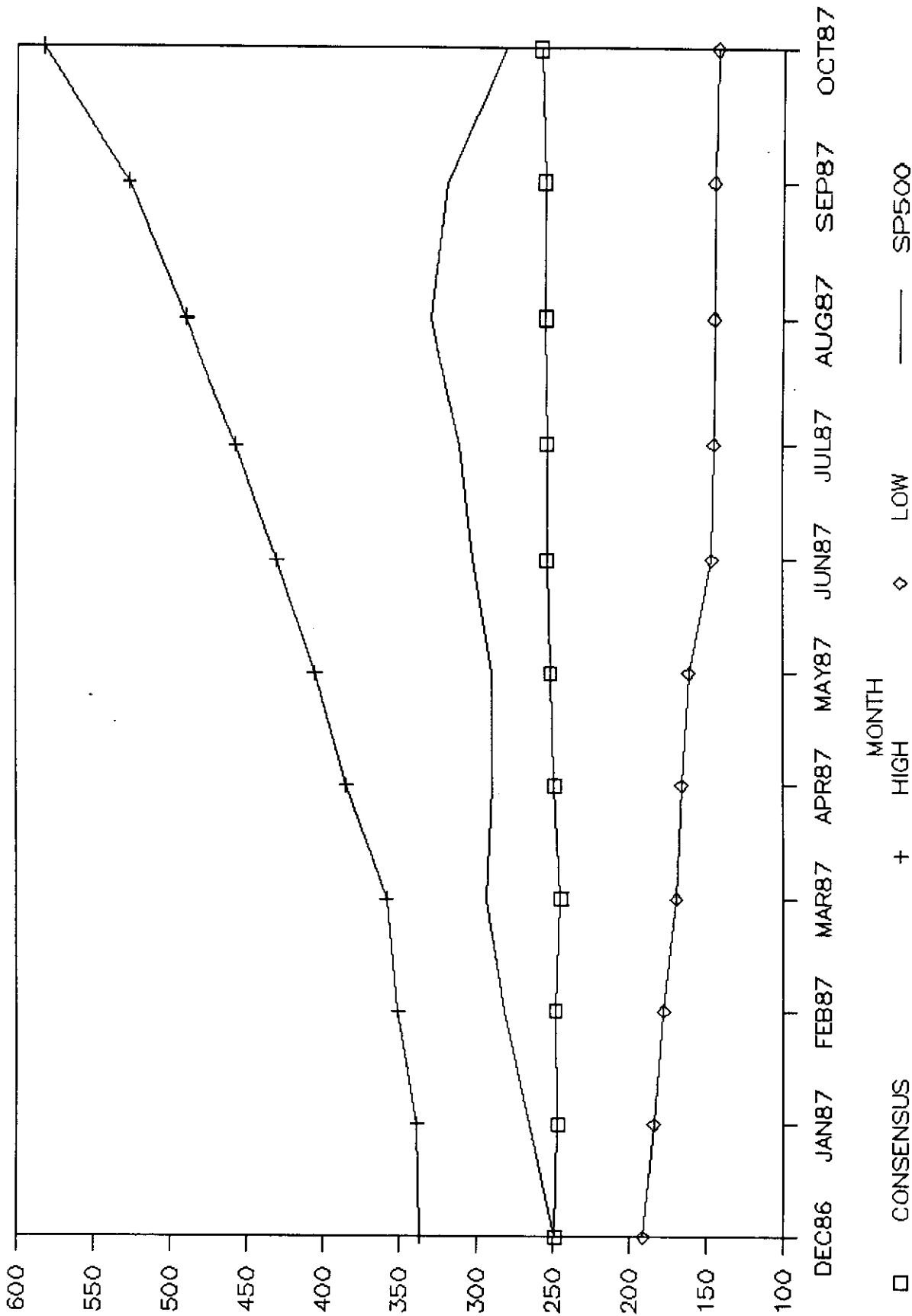


CHART 6

S&P 500 VALUATION

MARKET DISCOUNT RATE

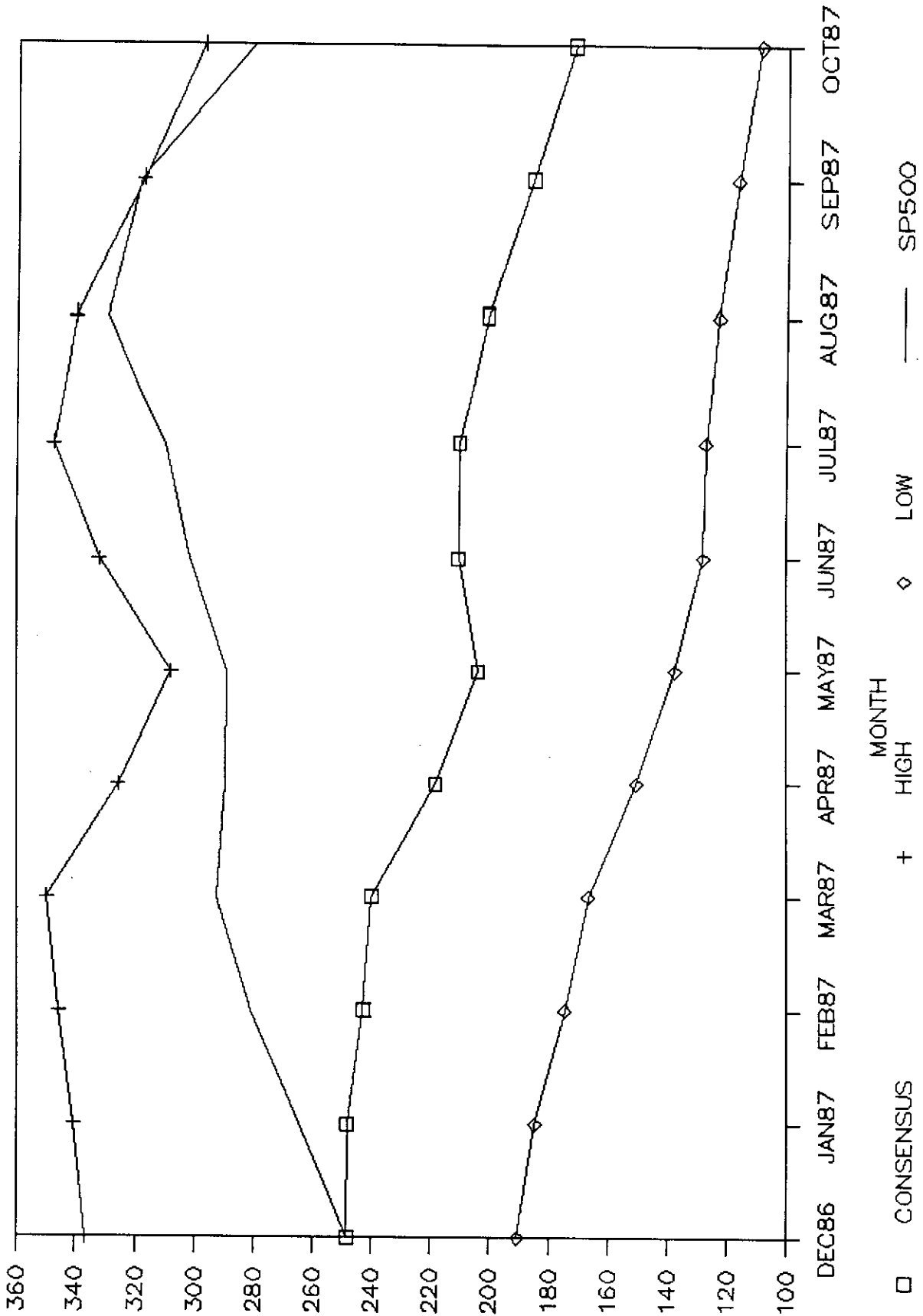
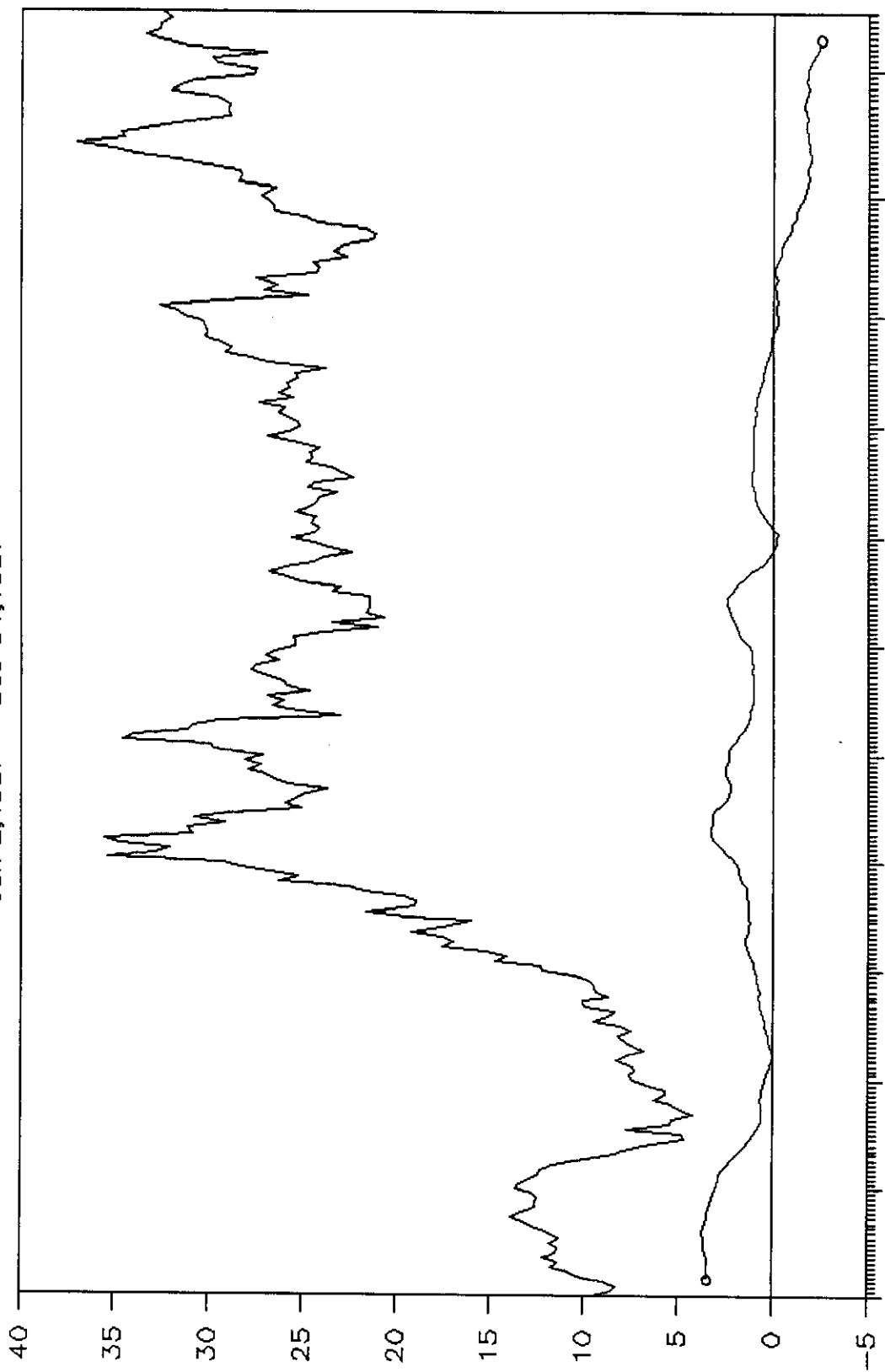


CHART 7

CRB INDEX AND FUTURES-SPOT SPREAD

Jan 2, 1987 - Dec 31, 1987



— CRB INDEX ○—○ FUTURES-SPOT SPREAD

CHART 8