August 27, 2001

Monthly Stock Market Report

Market Analysis for Period Ending Wednesday, August 1, 2001

This document presents technical and fundamental analysis commonly used by investment professionals to interpret the direction and valuation of equity markets, as well as tools commonly used by economists to determine the health of financial markets and their impact on the domestic United States economy. The purpose of the report is to provide a synopsis of equity markets from as many disciplines as possible, but is in no way an endorsement of any one mode of study or source of advice on which one should base investment decisions.

Definitions of terms and explanations of indicator interpretation follow the charts in the Endnotes section.

Price Trends

Figure 1 presents price trends and daily volumes for the New York Stock Exchange and Nasdaq Composite Indices.

The New York Stock Exchange Composite Index (NYSE Index) closed Wednesday, August 1 at 625.7. This level marked a 5.4 percent decline since the recent high of 661.39 on May 22, and it is 3.1 percent below the opening value on January 1, 2001. The index declined 1.6 percent during the month of July.

The National Association of Securities Dealers Composite Index (Nasdaq Index) closed at 2068.38. Between January 1, 2001 and August 1, the Nasdaq Index fell 9.8 percent.

Market Technicals

Figures 2, 3, and 4 present some technical indicators commonly cited by stock market analysts.

As of August 1, the Relative Strength Index (RSI) for the NYSE Composite had a value of 49.4 percent, showing no recent rapid rise or fall in the index price and putting it in what is commonly viewed as neutral territory (figure 2, upper panel). Figure 3, upper panel, shows that the number of stocks falling to new 52-week lows has been declining. The middle panel shows that momentum (overbought/oversold oscillator) is also essentially neutral, while the Market Breadth indicator (figure 3, bottom panel) shows approximate balance between the numbers of advancing and declining stocks.

For the Nasdaq Index, the relative strength index is also in neutral range (figure 2). The upper panel in Figure 4 shows that both the number of stocks reaching new 52-week lows and the number reaching new highs have been increasing in recent weeks. However, declining stocks still outnumber advancing ones (bottom panel, figure 4). The momentum indicator is slightly in oversold territory,

but has not changed recently (figure 4, middle panel).

Volatility

Put/call ratios appear in figure 5.

Monthly data are shown from January 1997 through July 2001. Both the CBOE individual equity put/call ratio and the S&P 100 put/call ratio are at the high end of the range for the past year. The CBOE ratio for individual equities (figure 5, top panel) reached what some analysts considered "bullish" territory in July.

Indicators of market volatility are shown in figure 6.

The Chicago Board of Options Exchange (CBOE) provides daily measures of volatility for the S&P 500 (VIX) and for the Nasdaq 100 (VXN). Both volatility indicators have fallen in recent weeks and are at relatively low levels compared to the past year's experience.

Valuation

Figure 7 shows three measures of historical and future valuation: historical PE ratios in the top panel, forward and trailing PE ratios using analysts' estimates of operating earnings in the middle panel, and strategists' two-year forecasts of earnings growth in the lower panel. Figure 8 displays historical and current price-earnings ratios and earnings growth for the S&P 500 economic sector groups described above.

As earnings expectations deteriorate, the macro projections from strategists for the growth of earnings of the Standard and Poor's 500 index over the next two years have been revised downward to 5.9 percent in the second quarter, below the 6.7 percent historical average annual growth rate (figure 7, bottom panel). The S&P 500 trailing price-earnings ratio increased to 25.4 in the second quarter from 24.2 in the first quarter (figure 7, top panel). During the same period the price-earnings ratio for the Russell 2000 increased to 79.8 from 54.4. The third quarter forecast for the S&P 500 forward price to operating earnings ratio, using bottom-up forecasts from analysts, declined to 21.4 from 22.8 in the second quarter (figure 7, middle panel).

Among the economic sectors, price-earnings ratios generally have increased since the fourth quarter of 2000. The ratio for consumer cyclicals increased from 17.9 to 33.1 during that period. The technology sector price-earnings ratio increased from 31.2 to 185.5. Despite the year-to-date decline in the price of the S&P 500 Utility Index of 16.9 percent, earnings of utility stocks fell more than prices, causing the price-earnings ratio to increase dramatically in 2001. It was estimated at 34.3 on August 1, up from 25.2 in the fourth quarter of 2000 (figure 8).

Comparative Returns

The earnings-price ratio fell slightly to 3.6 percent in the first quarter from 3.7 percent in the fourth quarter. Typically, the earnings-price ratio falls below the real return on bonds when analysts expect earnings to rise rapidly.

The dividend-price ratio, an indication of the yield investors receive through dividends by holding stocks, increased to 1.3 percent in the first quarter from 1.2 percent in the fourth quarter, but is still substantially below the 5.3 percent real rate of interest on corporate bonds and the 3.39 percent historical average annual dividend yield (figure 10).

Nonfinancial corporate businesses have tried to maintain dividends in the face of sagging profits, resulting in an unusually high dividend to operating profit payout rate of 64.7 percent (figure 11).

Sector Performance

Figure 12 compares the performance of the various economic sectors within the S&P 500 as well as other international and style indices.

Consumer cyclicals returned 12.0 percent between January 1 and August 1, 2001, outperforming all other economic sectors within the S&P 500. Conversely, technology lagged all sectors, losing 18.3 percent in 2001 after returning 34.8 percent annually over the past five years.

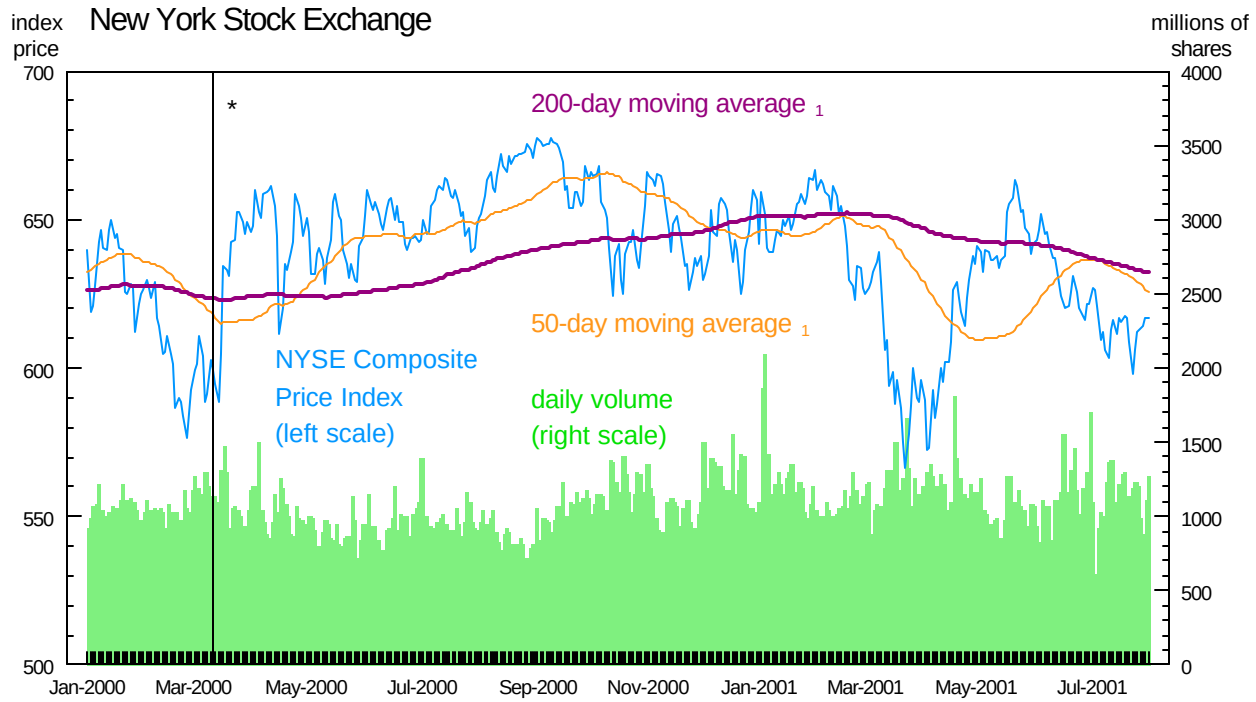
The Wilshire 5000, composed of all U.S. equity issues, fell 7.9 percent year-to-date. Similarly, the German DAX declined 9.3 percent, the British FTSE 100 fell 10.9 percent, and the Japanese Nikkei 225 lost 13.3 percent of its value as of August 1, 2001.

Over the last five years the Russell 1000 Large-Cap Index returned 21.9 percent, while the 2000 Small-Cap Index returned on average 12.8 percent annually. Year-to-date, however, the 1000 Large-Cap Index depreciated 2.5 percent, while the Russell 2000 Small-Cap Index appreciated 1.2 percent.

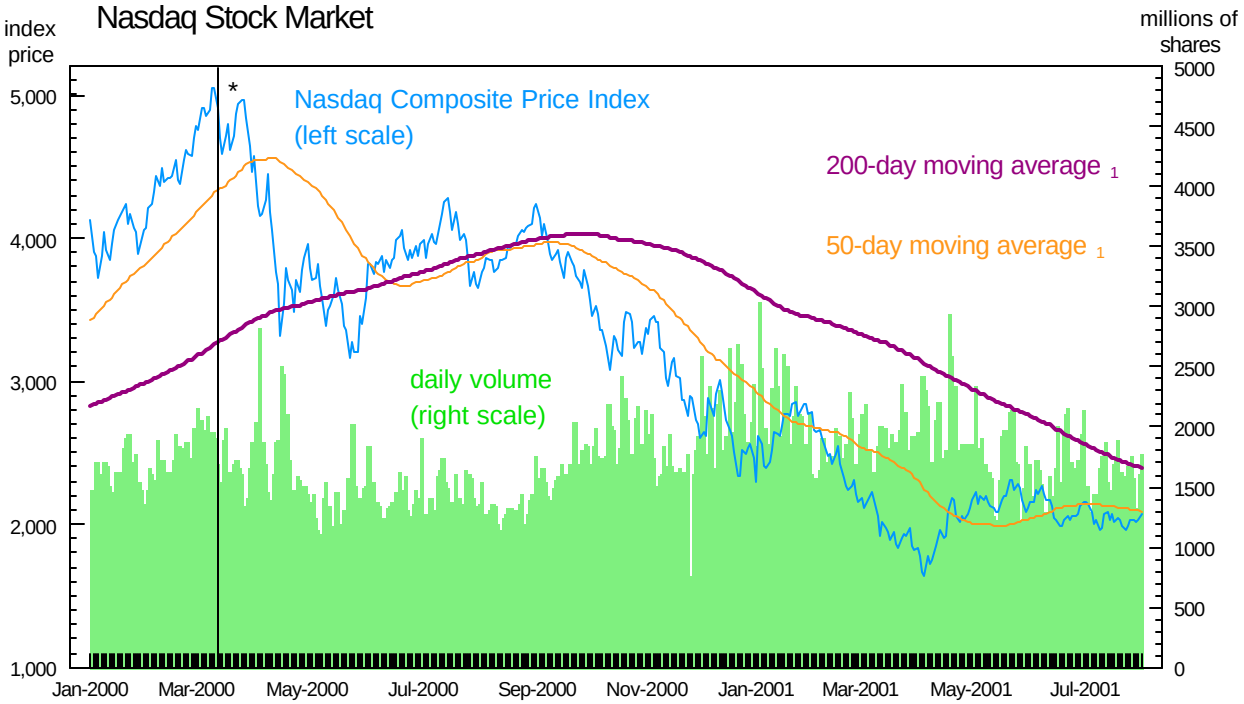
Please contact Richard Brauman for questions and comments (617) 973-3198, Richard.S.Brauman@bos.frb.org.

Figure 1

Daily Trends of Major U.S. Stock Exchanges



* New York Stock Exchange Composite Index closed at 599.34 on March 10, 2000.

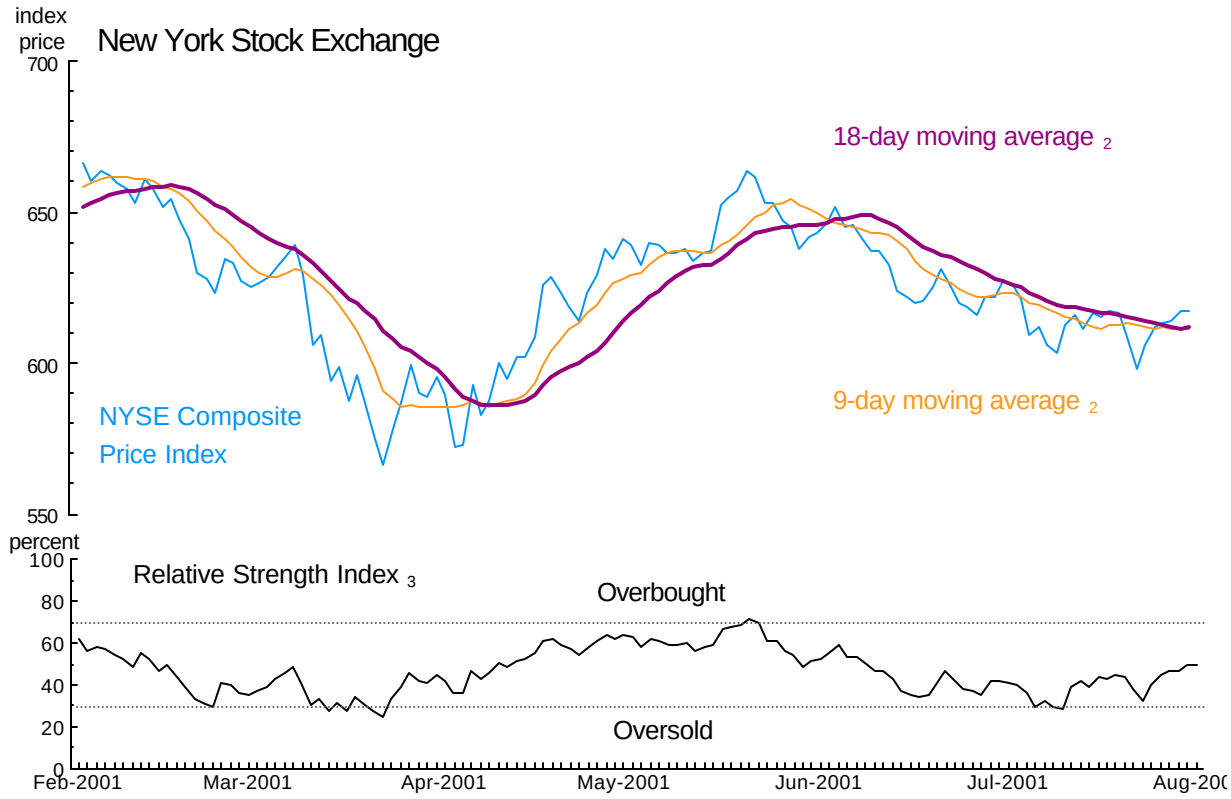


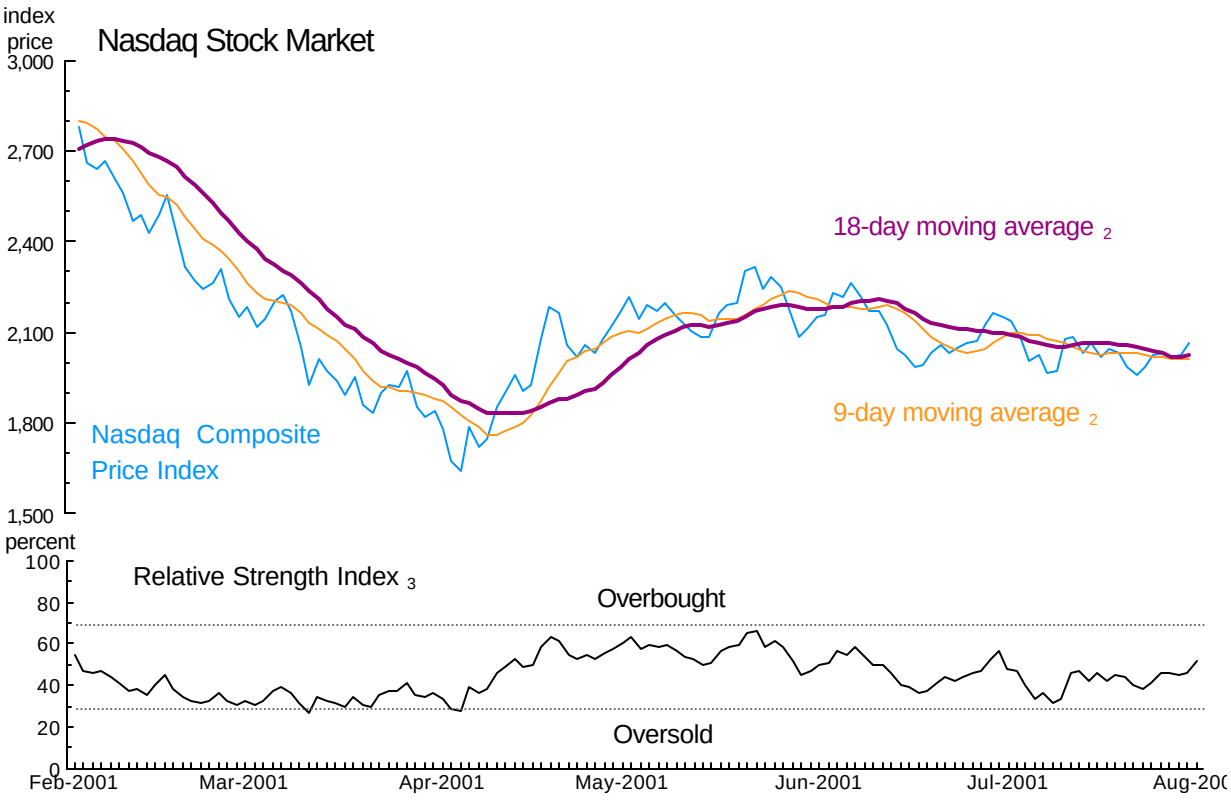
* Nasdaq Composite Index peaked at 5048.62 on March 10, 2000.

Source: Bloomberg, L.P.

Figure 2

Moving Averages and Relative Strength

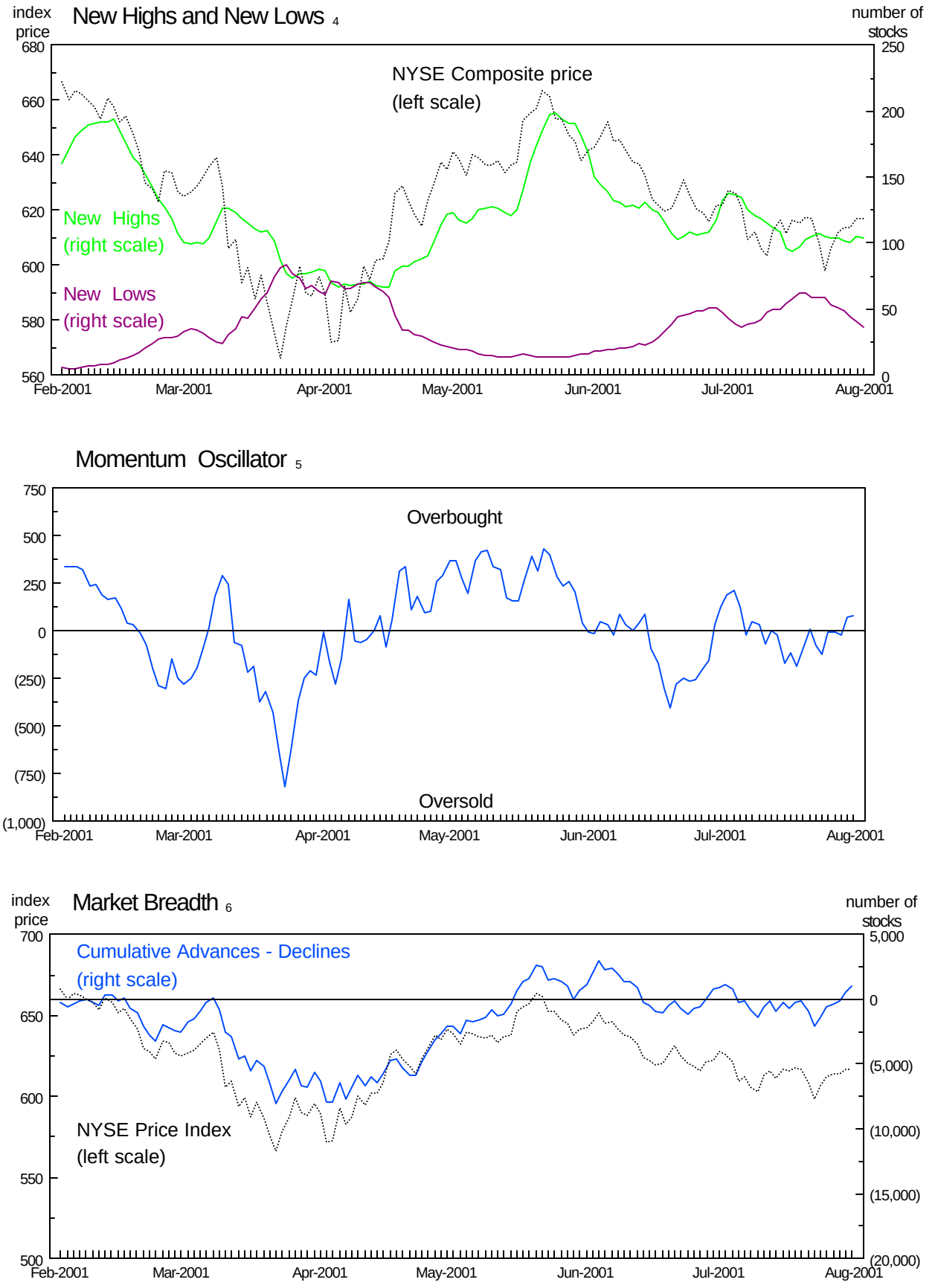




Source: Bloomberg, L.P.

Figure 3

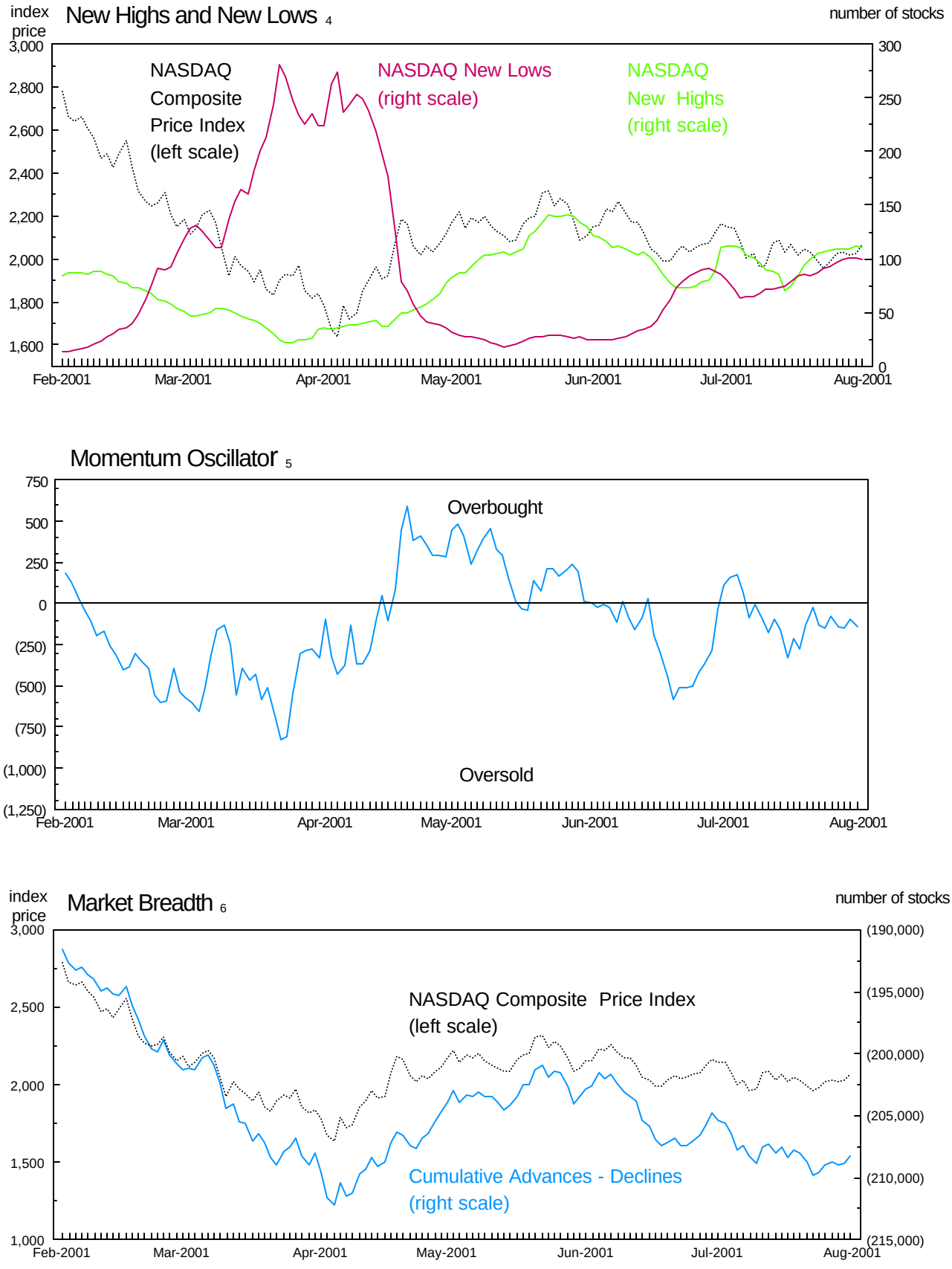
Index Breadth and Momentum Indicators - New York Stock Exchange



Source: Bloomberg, L.P.

Figure 4

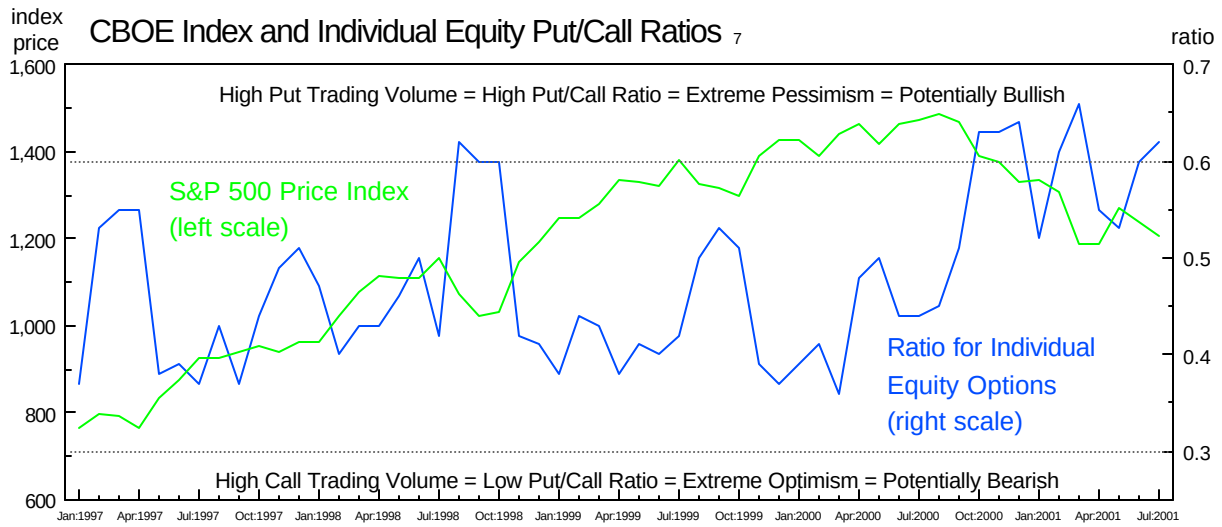
Index Breadth and Momentum Indicators - Nasdaq Stock Market

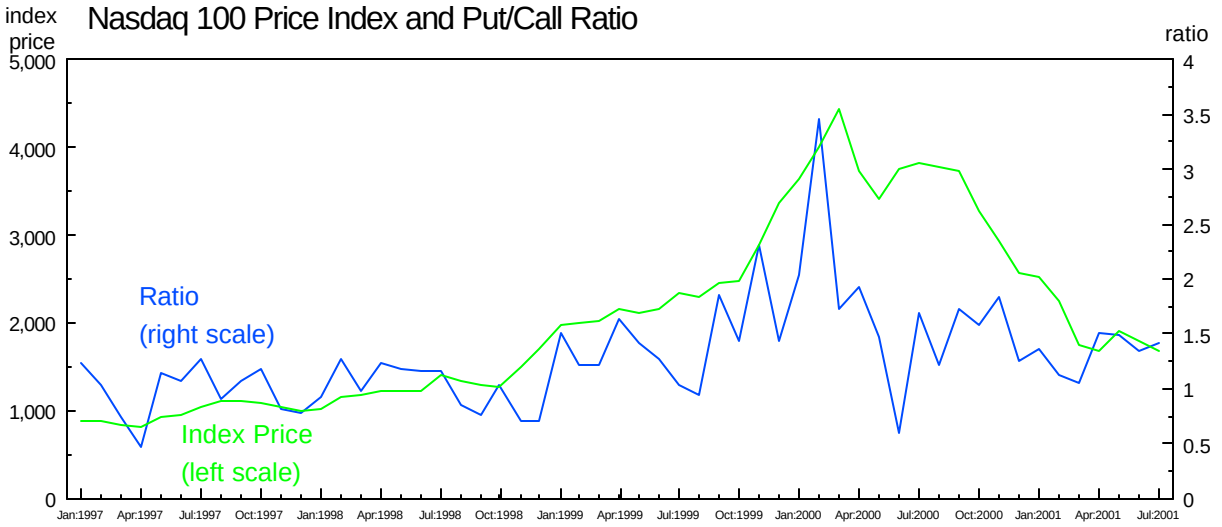


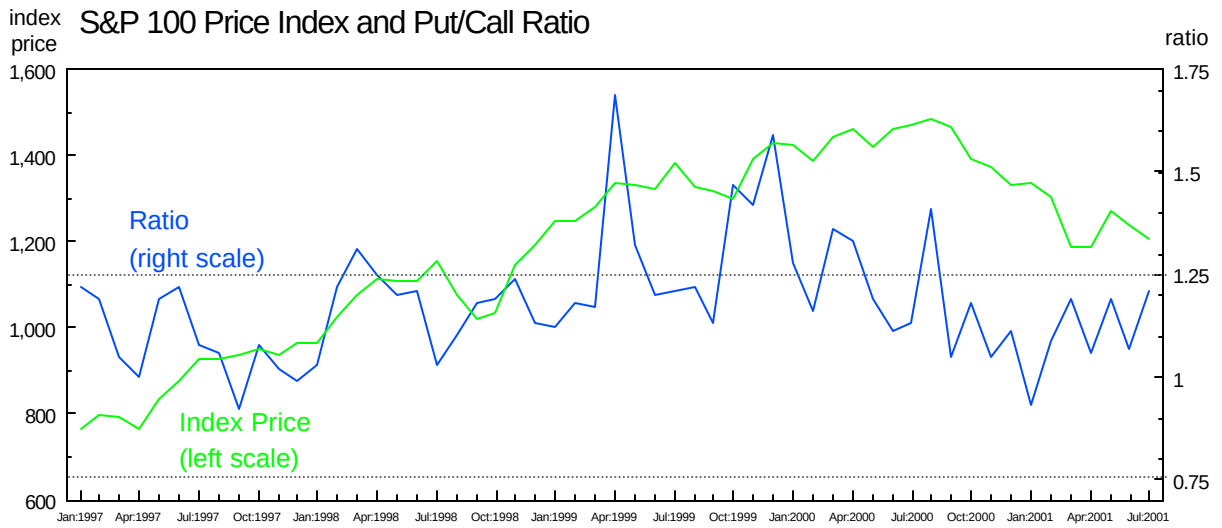
Source: Bloomberg, L.P.

Figure 5

Put / Call Ratio



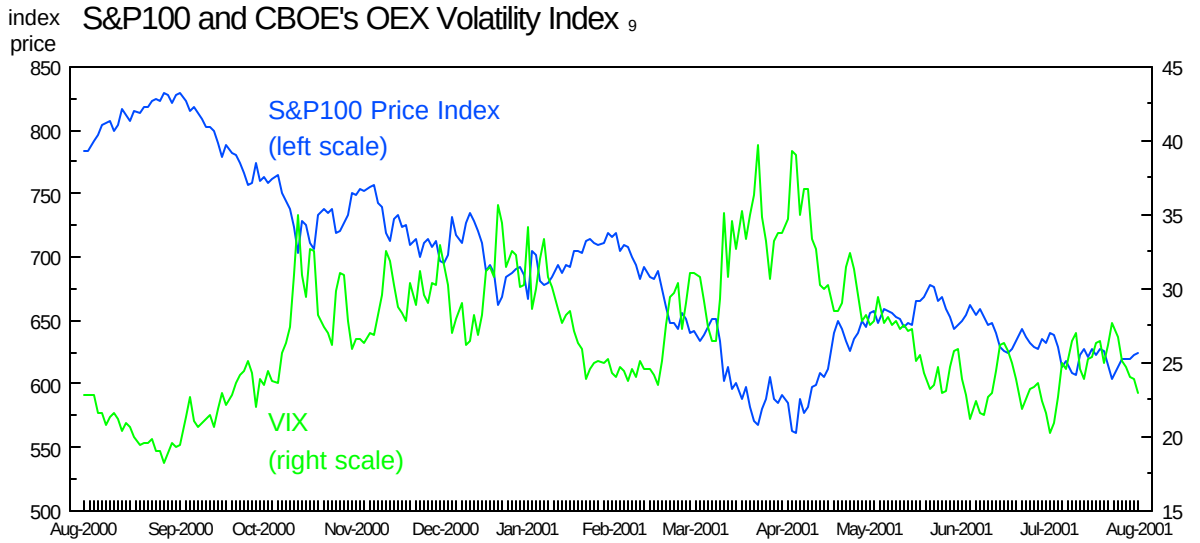


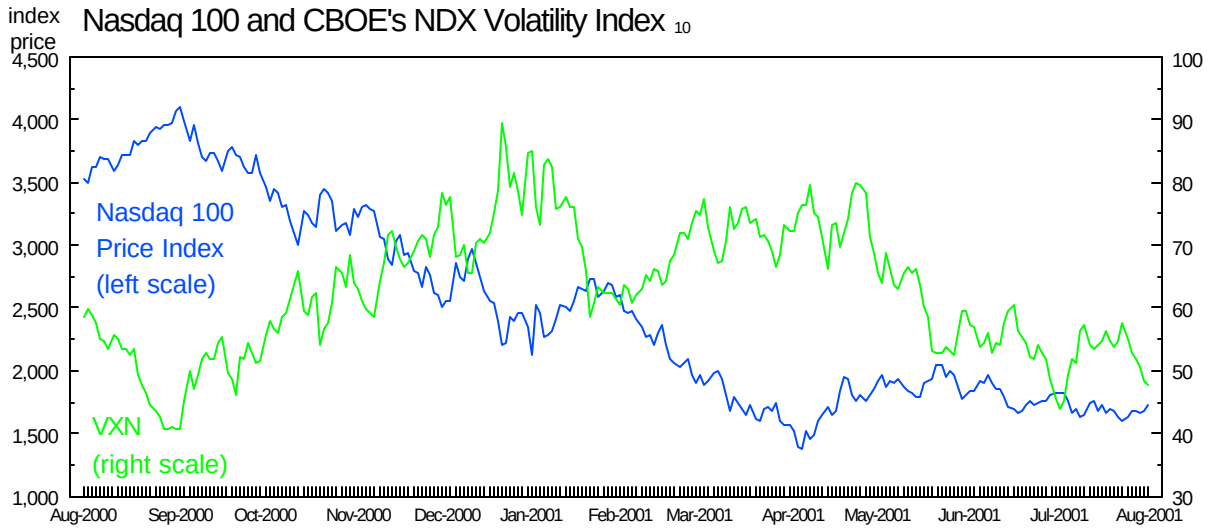


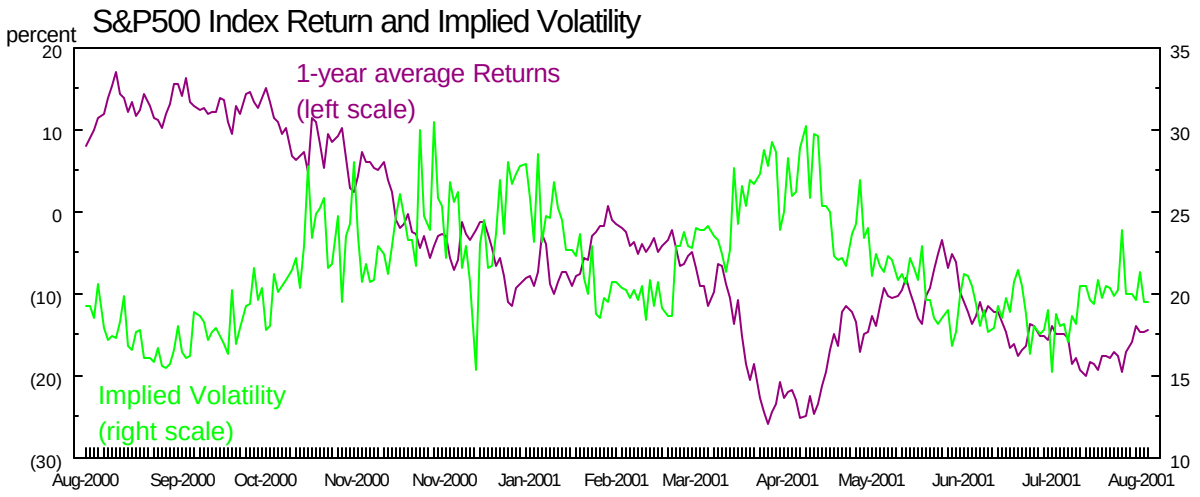
Source: Chicago Board of Options Exchange, Wall Street Journal / Haver Analytics

Figure 6

Volatility [8]



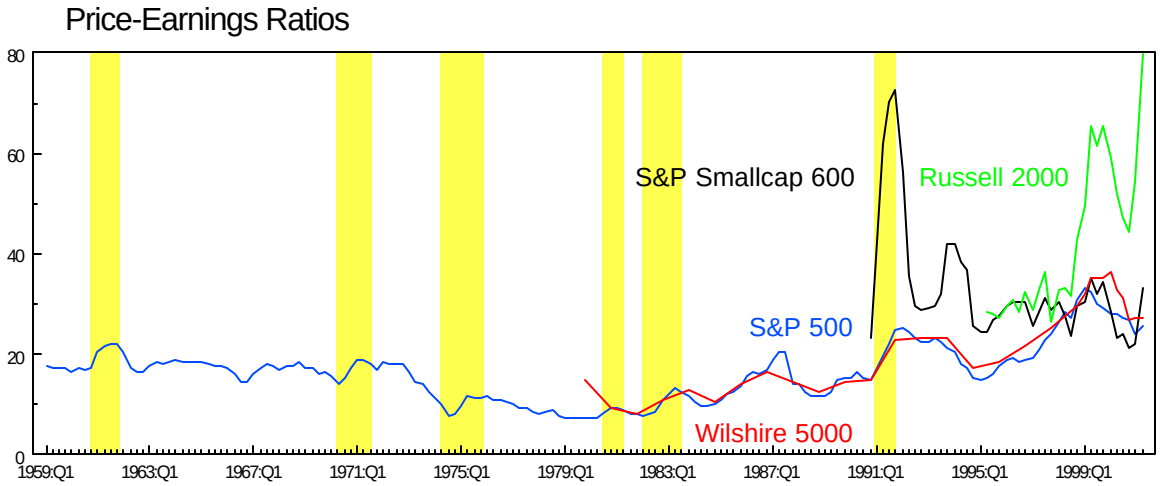


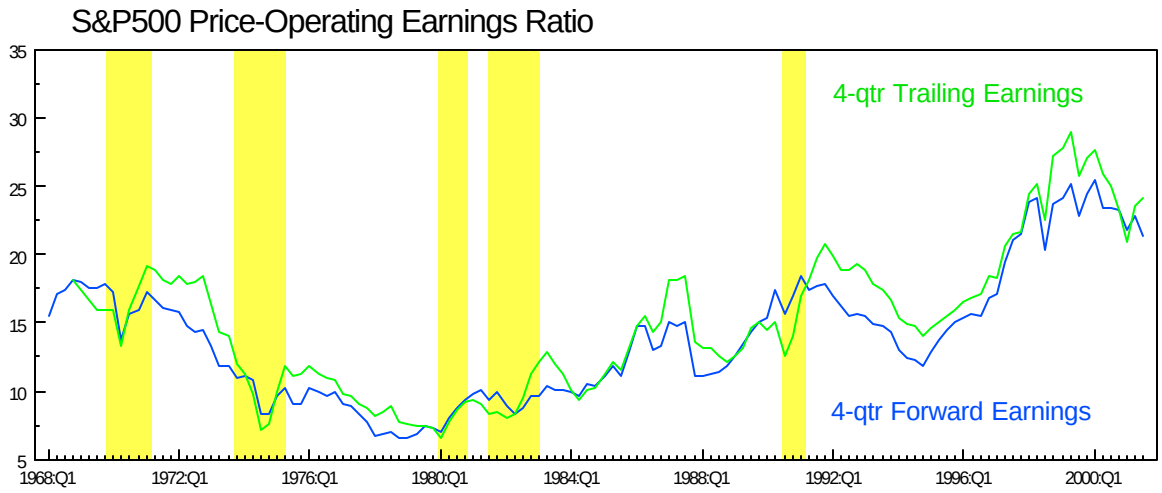


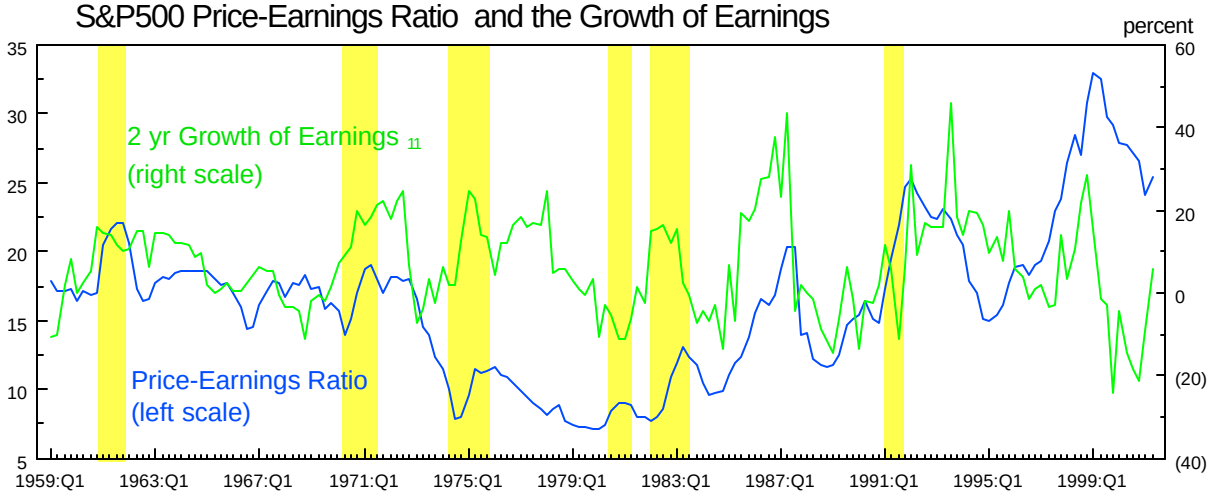
Source: Bloomberg, L.P.

Figure 7

PE Ratios and the Growth of Earnings



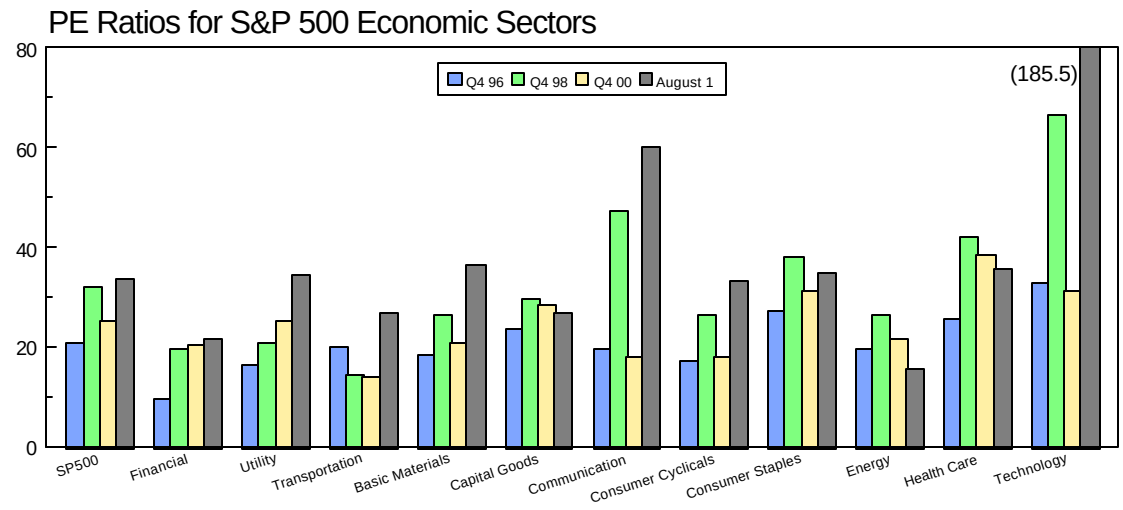


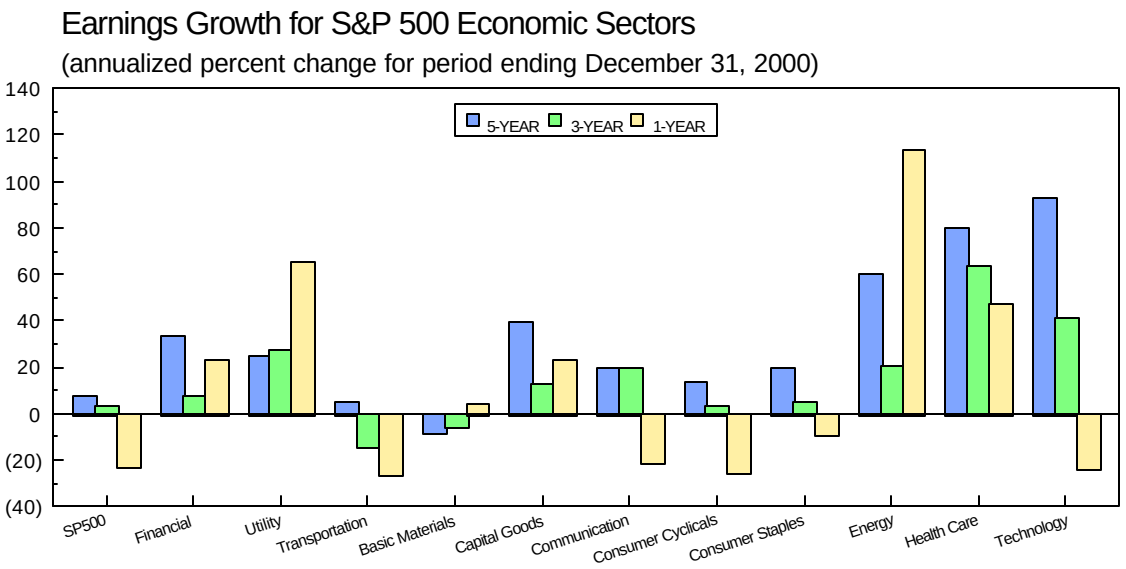


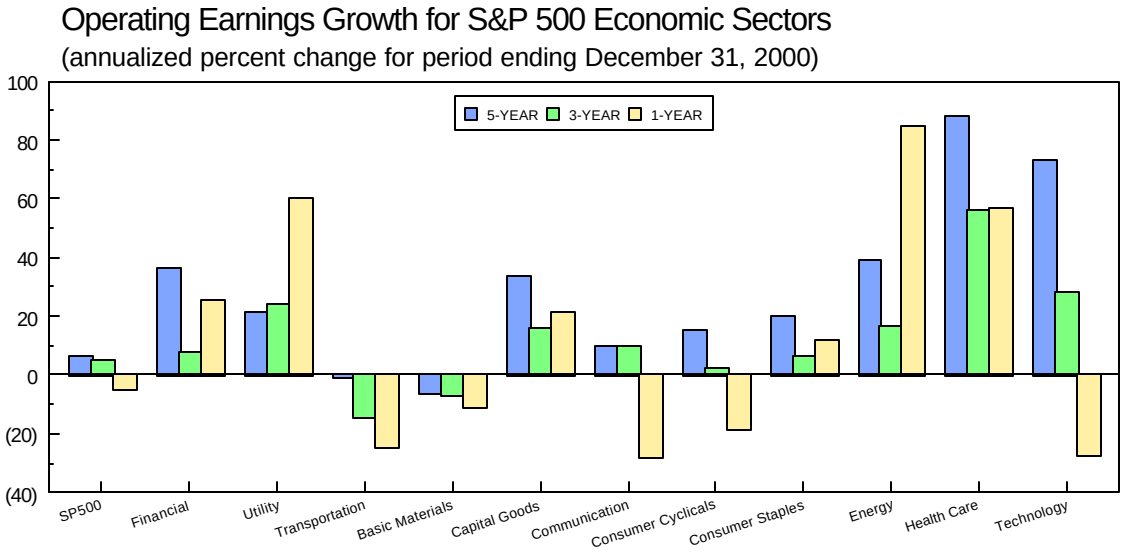
Source: Bloomberg L.P.; Standard & Poor's / Haver Analytics; First Call; DRI

Figure 8

S&P 500 Economic Sectors - Earnings Growth





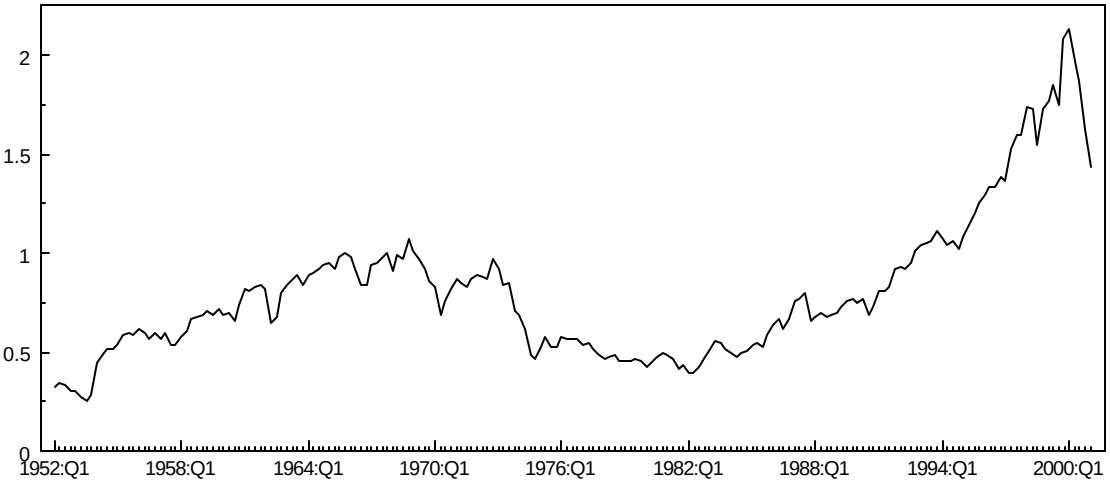


Source: Standard & Poor's Compustat Special Projects; Bloomberg, L.P.

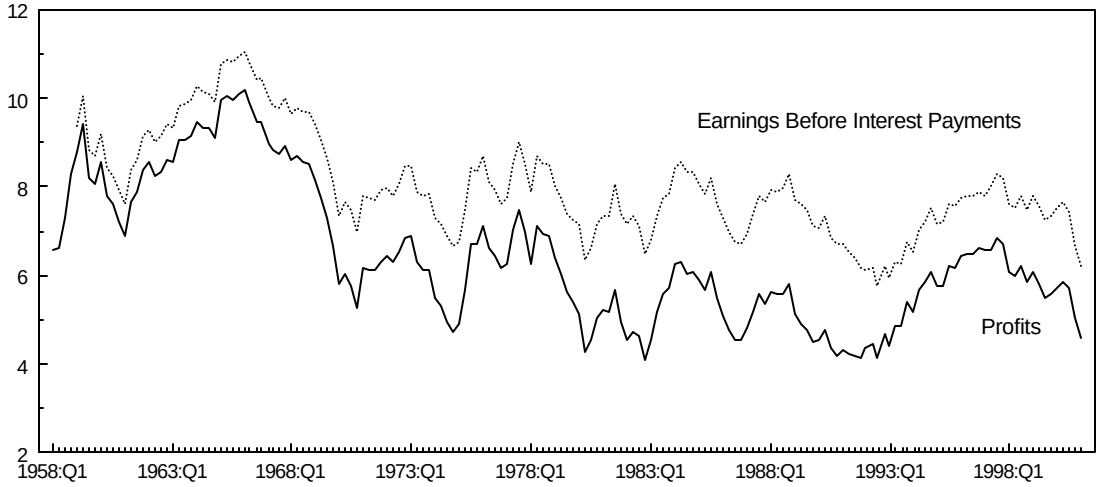
Figure 9
Economic Measures of Equity Valuation

Real Rate of Return on Nonfinancial Corporate Equity [12]
percent (from National Income and Flow of Funds Accounts)

Tobin's q [13]



Profits of Nonfinancial Corporations
(percent of GDP)

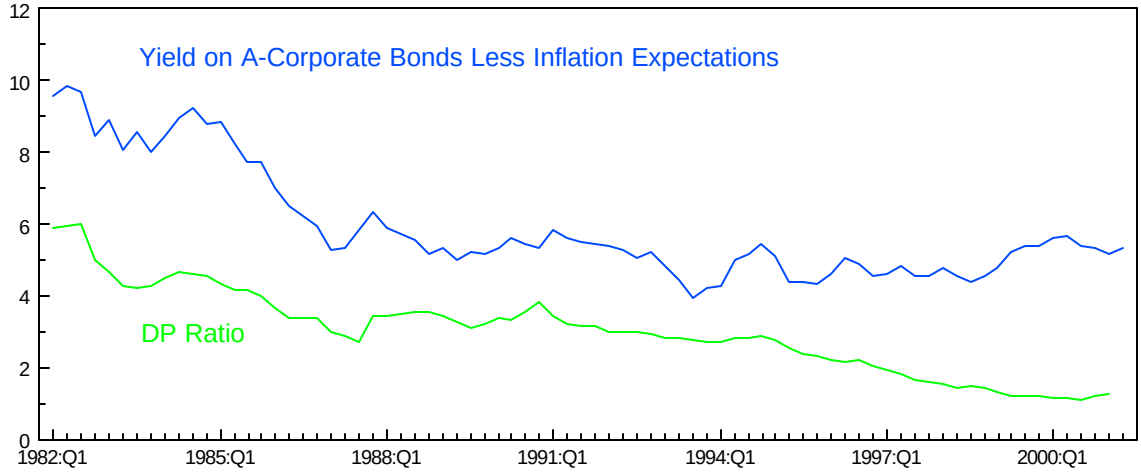


Source: National Income and Product Accounts, Flow of Funds Accounts of the United States (Federal Reserve Board), Bureau of Economic Analysis / Haver Analytics; NYSE Fact Book

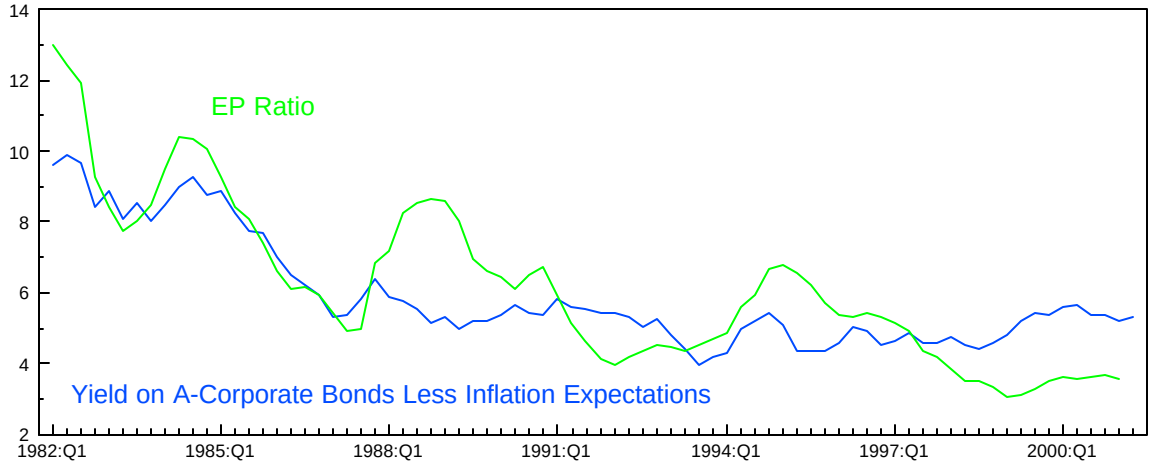
Figure 10

Comparative Returns

Dividend-Price Ratio [14] for the S&P 500 and the Real Corporate Bond Rate [15]

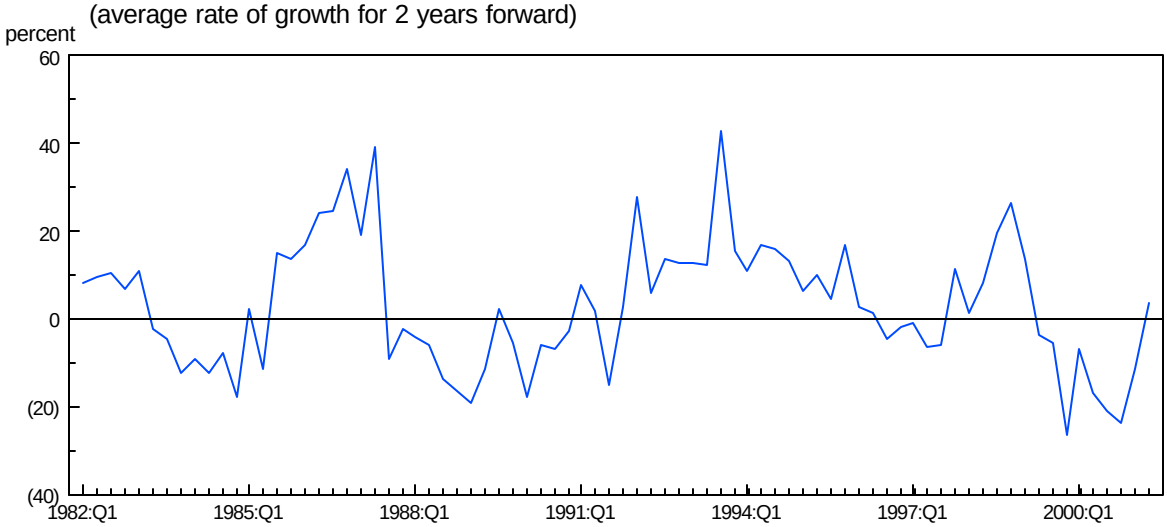


Earnings-Price Ratio [14] for the S&P 500 and the Real Corporate Bond Rate [15]



Growth of Real Earnings for S&P 500

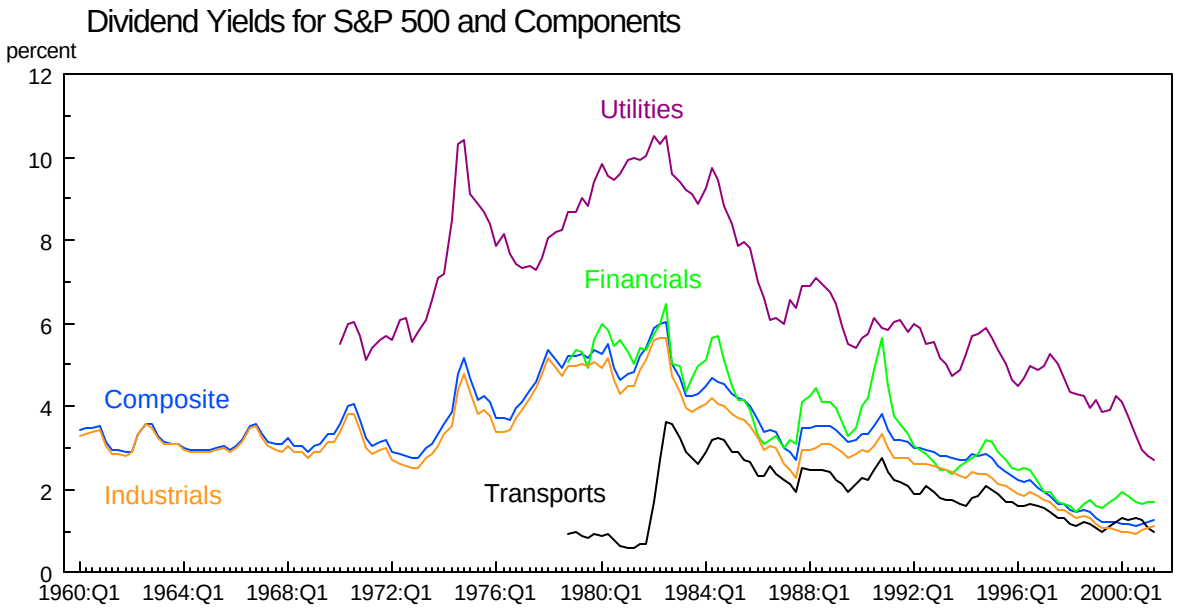
(average rate of growth for 2 years forward)

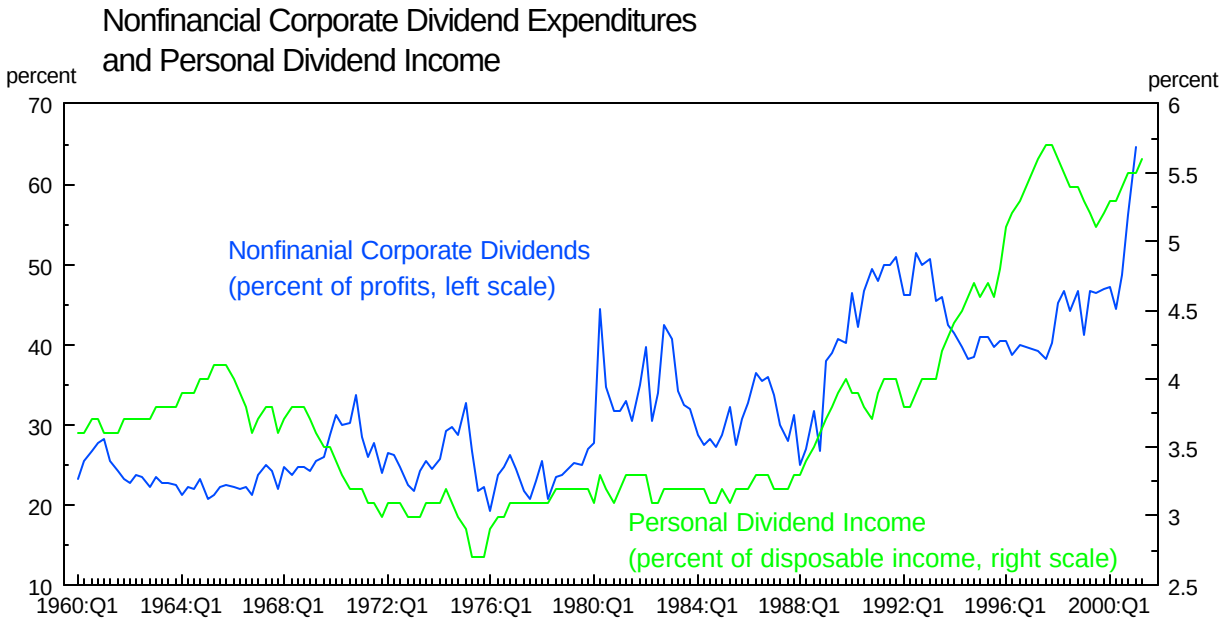


Source: Federal Reserve Board, Standard & Poor's / Haver Analytics; Federal Reserve Bank of Philadelphia / FAME; DRI

Figure 11

Dividend Yields

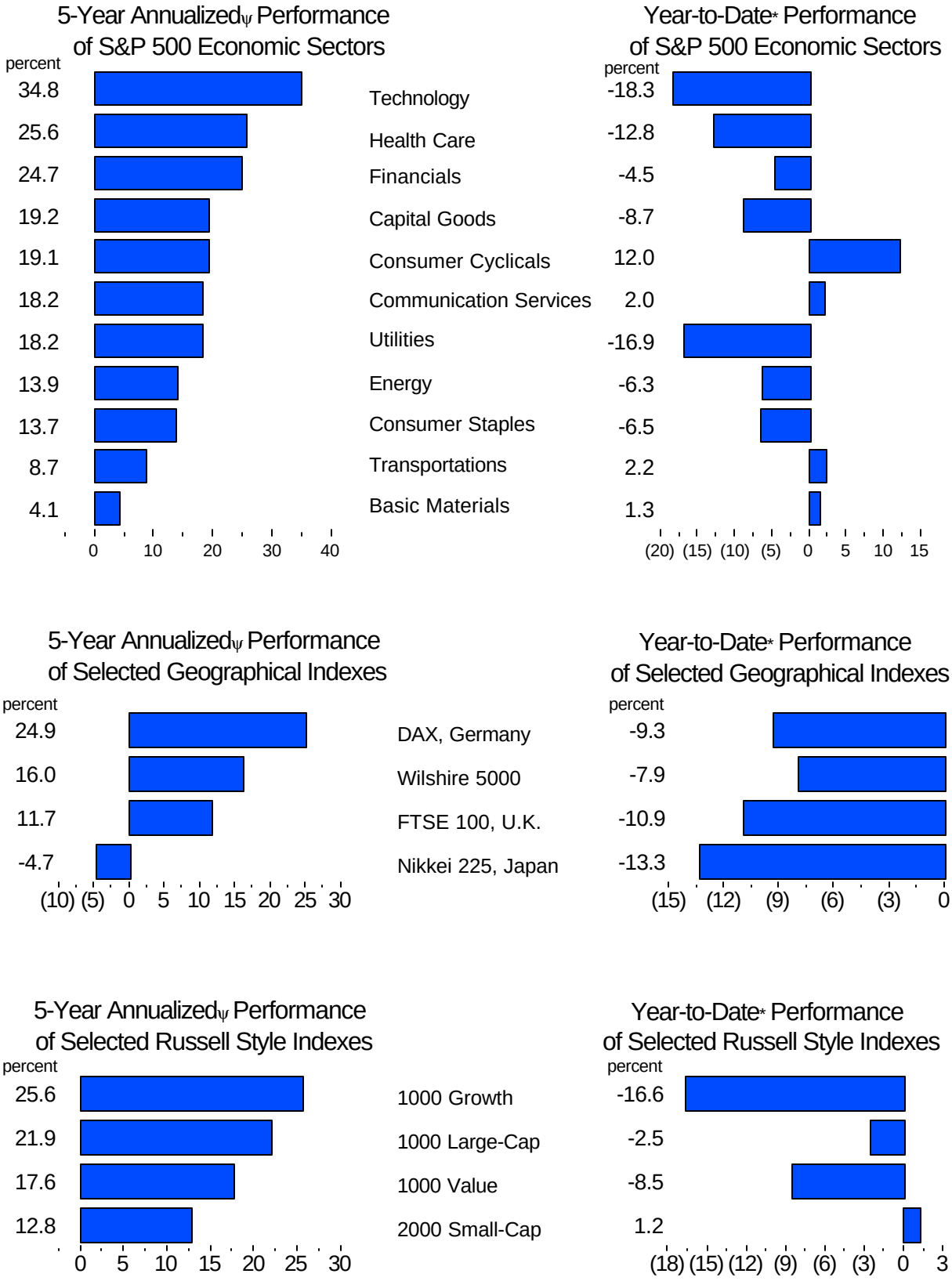




Source: Standard & Poor's, Bureau of Economic Analysis / Haver Analytics

Figure 12

S&P 500 Economic Sectors - Index Returns



ψ Five-year annualized performance for period ending December 31, 2000.

* Year-to-Date performance covers period between December 31, 2000 and August 1, 2001.

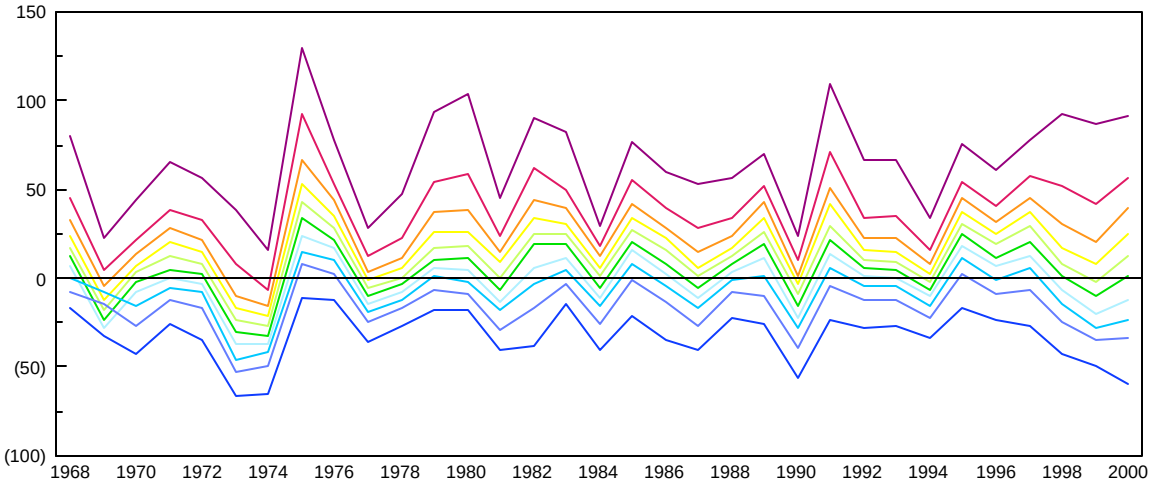
Source: Bloomberg, L.P.

Figure 13

Breadth of the S&P 500

One-Year Price Changes for Companies

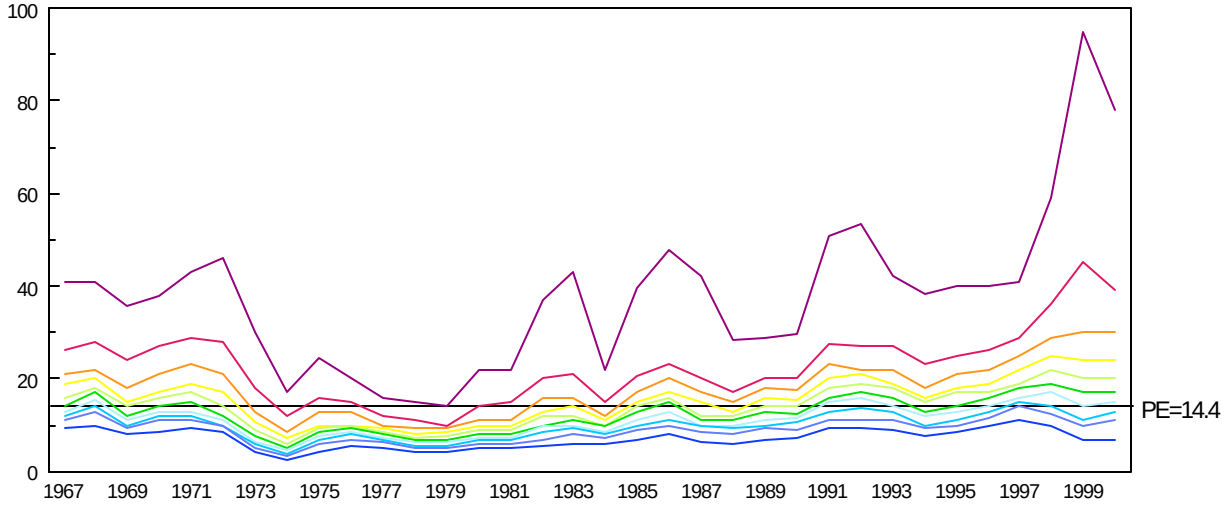
(median percentage change for each decile, ranked by performance)



Proportion of the S&P 500 Stocks Whose Price Increased Over One Year

PE Ratios for Companies

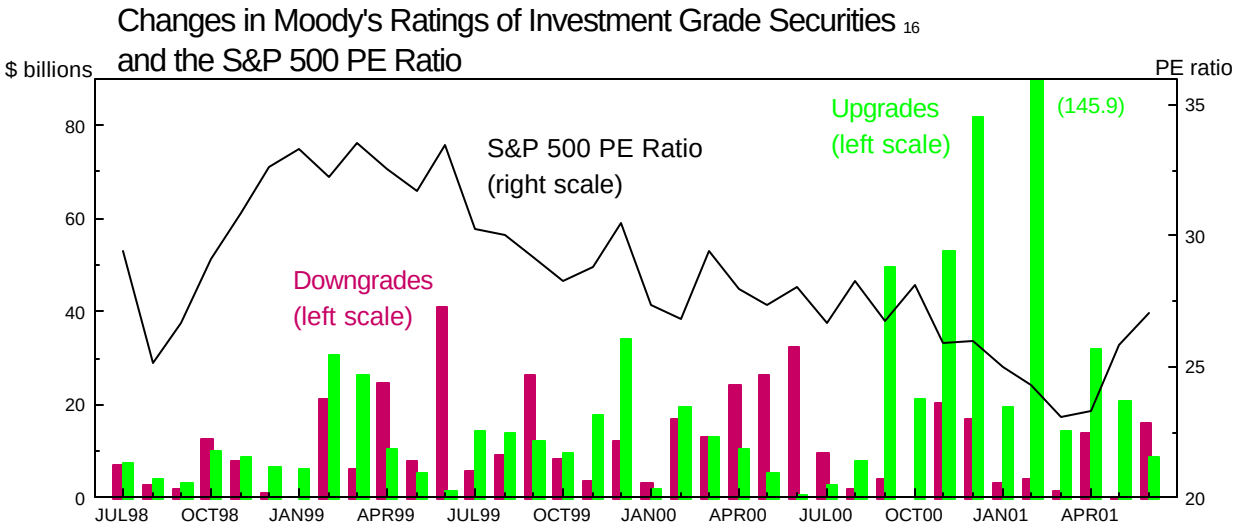
(median ratio for each decile, ranked by PE ratio)

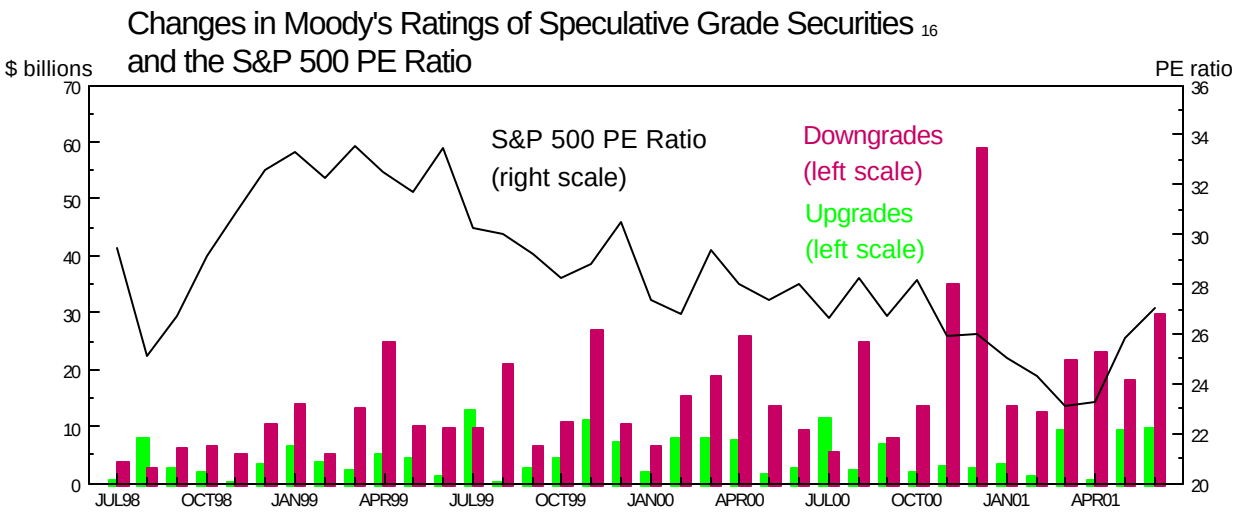


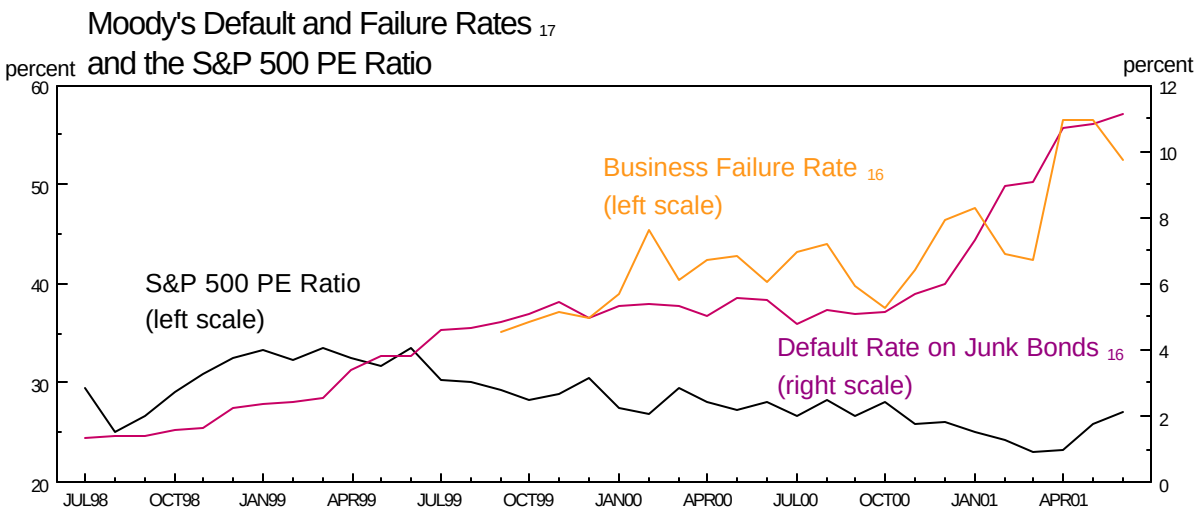
Source: Standard & Poor's Compustat Special Projects

Figure 14

Ratings and Default Rates



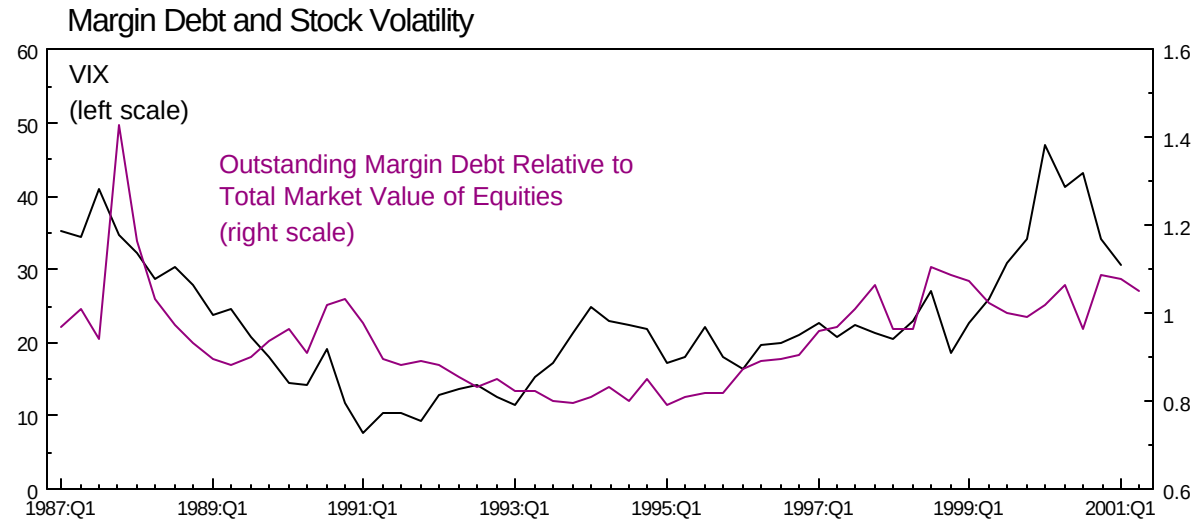


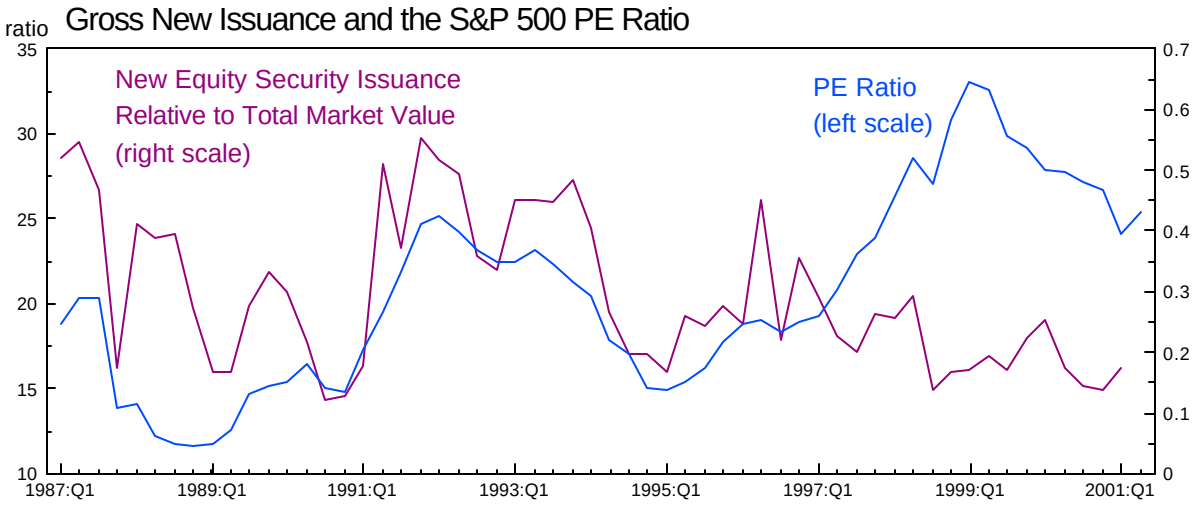


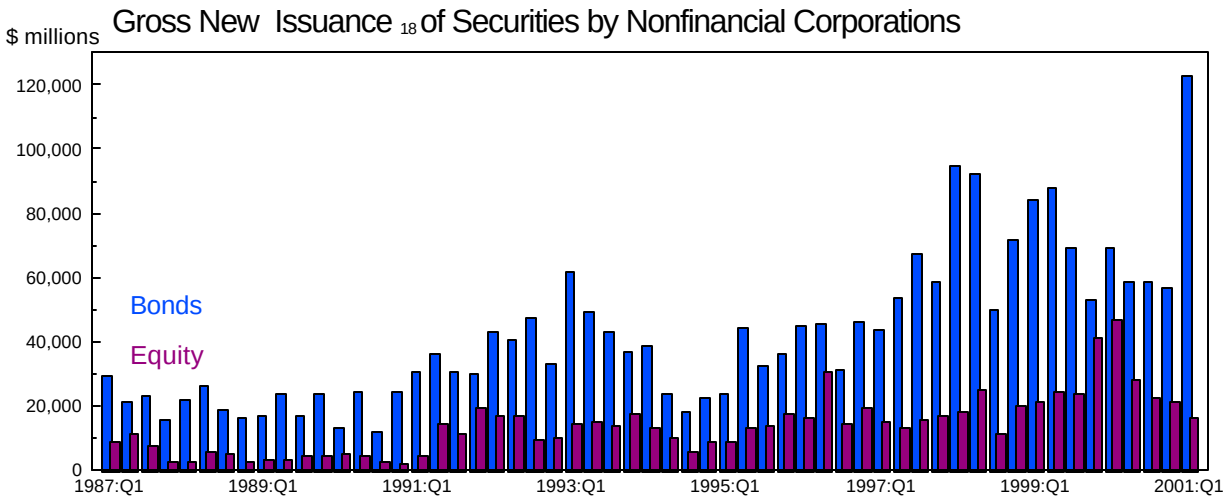
Source: Board of Governors of the Federal Reserve System / FAME

Figure 15

Margin Debt and Expected Returns



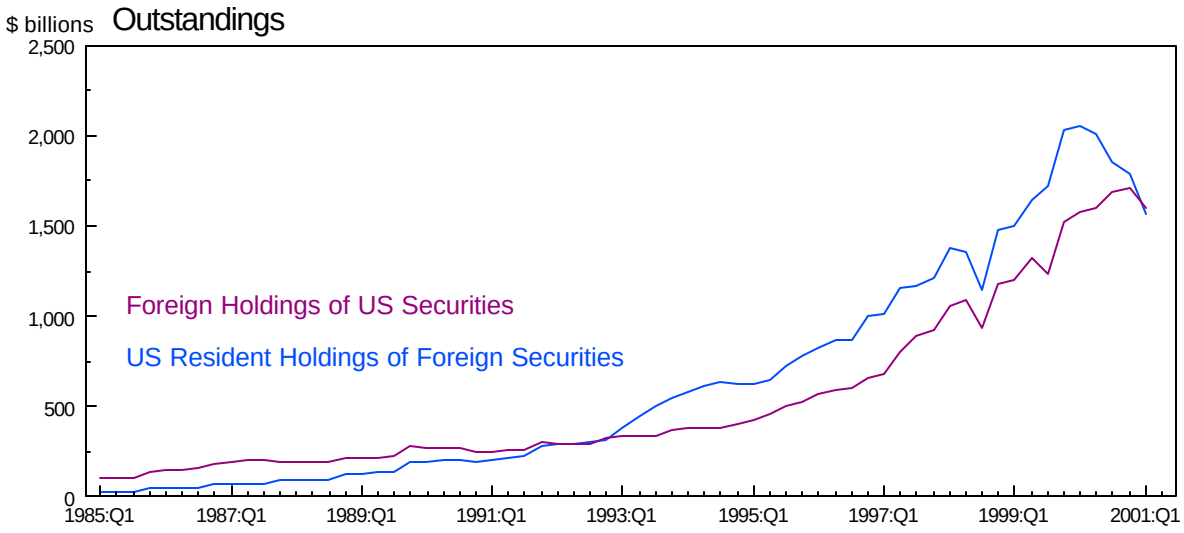


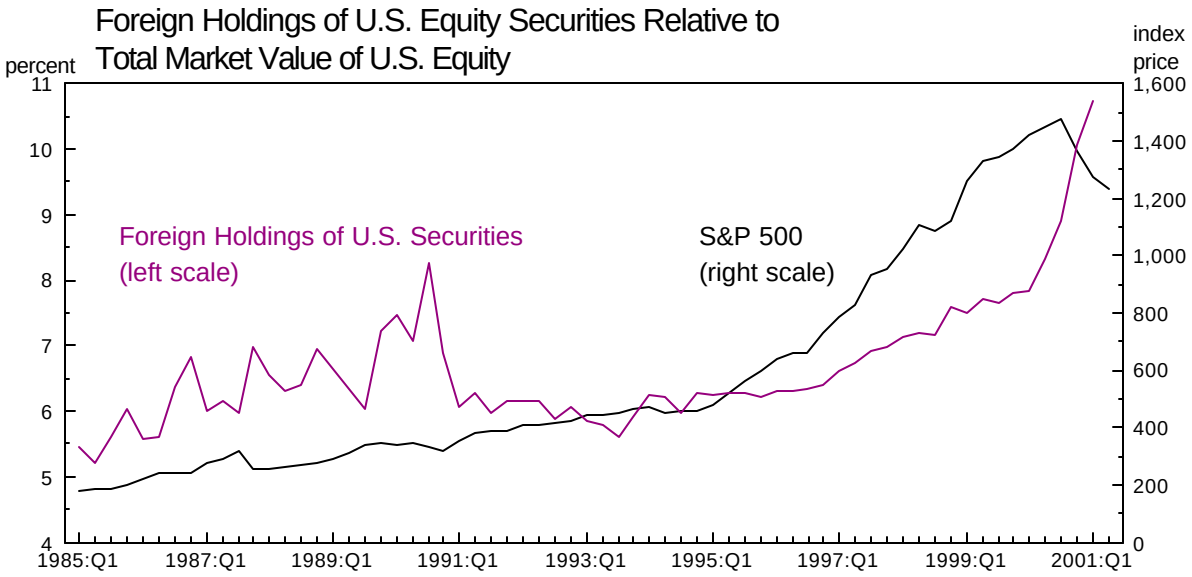


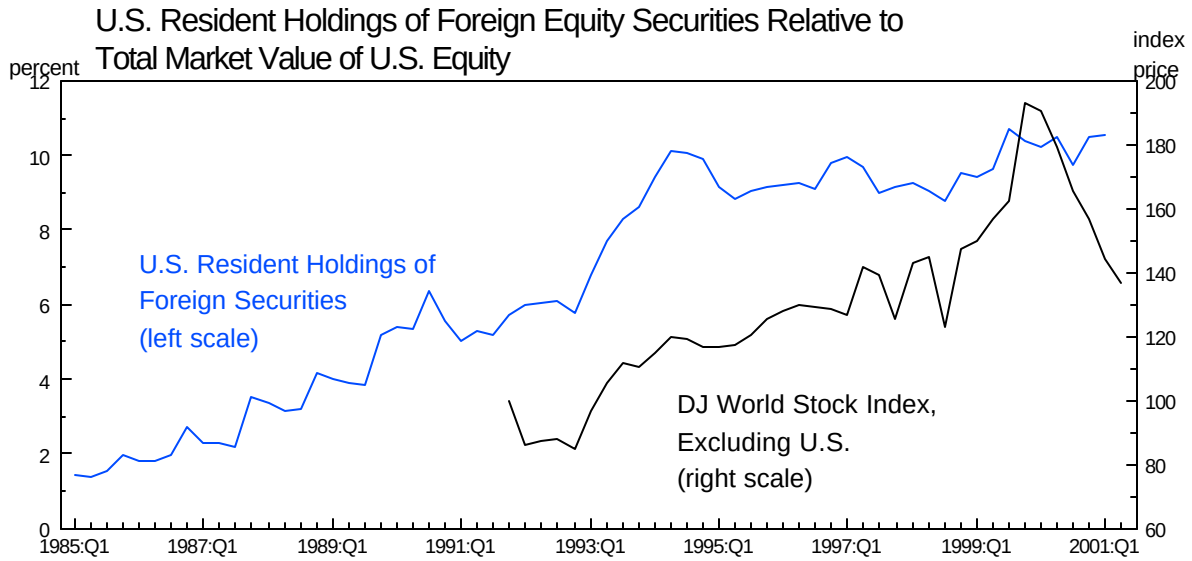
Source: Nasdaq, NYSE, CBOE, Standard & Poor's / Haver Analytics;
Board of Governors of the Federal Reserve System / FAME

Figure 16

Foreign and Domestic Holdings

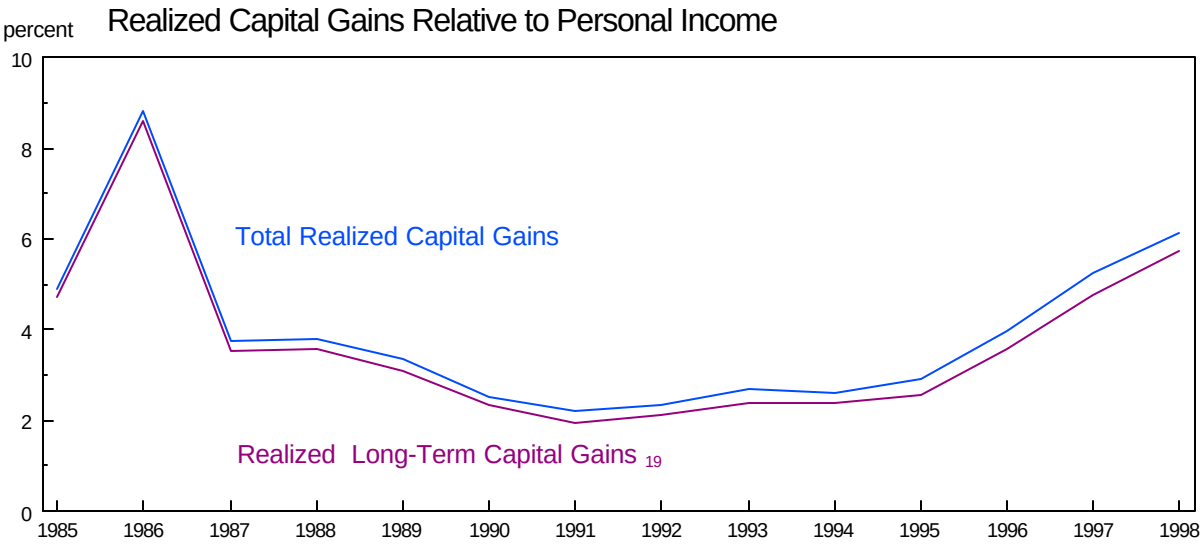


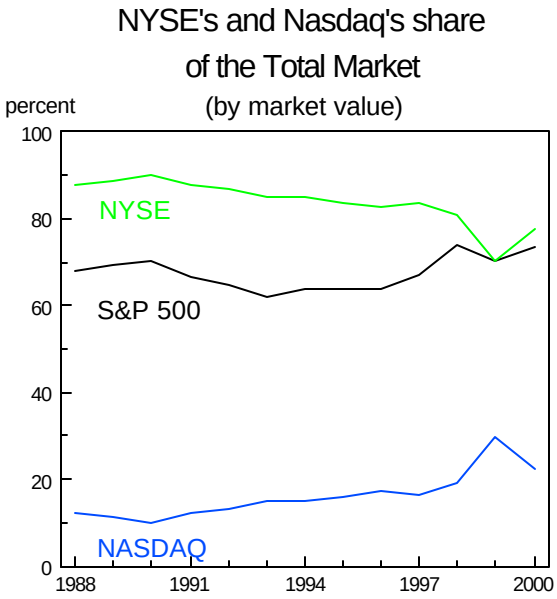


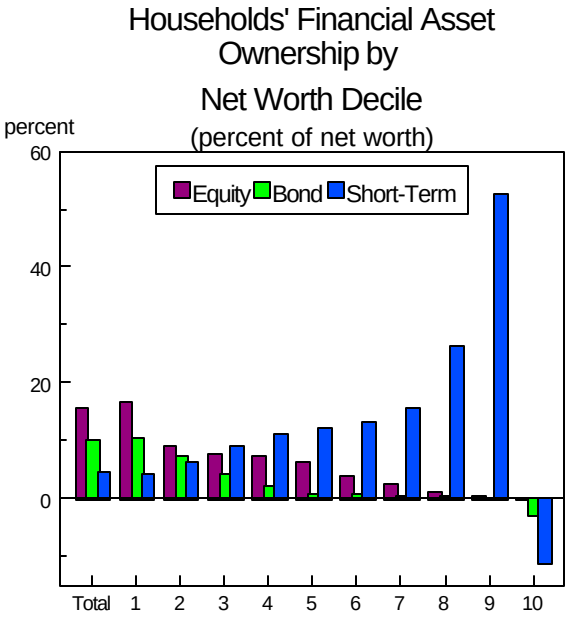


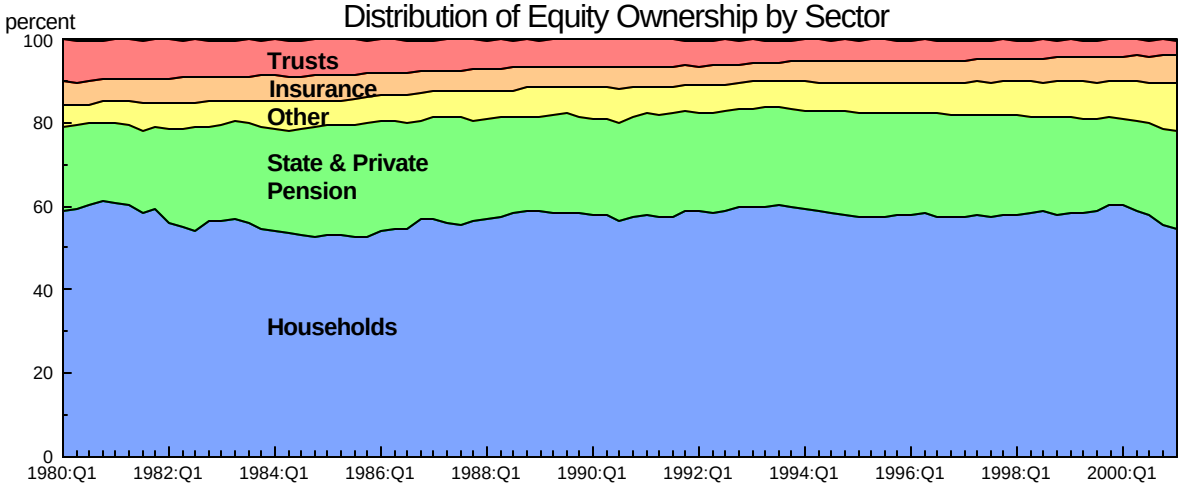
Source: Flow of Funds Accounts of the United States (Federal Reserve Board) /
Haver Analytics; Wall Street Journal

Figure 17
Demographics









Source: U.S. Treasury (Internal Revenue Service), NYSE, Nasdaq, Flow of Funds Accounts of the United States (Federal Reserve Board) / Haver Analytics; Survey of Consumer Finances

Endnotes

Relationships described in these notes represent the thinking of those analysts who commonly cite these indicators. While many analysts consider these to be commonly used indicators, they are not necessarily endorsed as the prevailing tools used by the analyst community and have not been validated by anyone at the Federal Reserve Bank of Boston.

Technical Analysis (figures 2 through 5): Research into the demand and supply for securities and commodities based on trading volume and price studies. Technical analysts use charts or computer programs to identify and project price trends in a market, security, or commodity future. Some commonly used measures a technical analyst might study include velocity and momentum indicators like relative strength, market breadth indicators like the cumulative advance-decline line, contrary sentiment indicators like put-call ratios, and surveys of investor sentiment. Most analysis is done for the short or intermediate term, but some technicians also predict long-term cycles based on charts and other data. Unlike fundamental analysis, technical analysis is not concerned with the financial position of a company (Source: Barron's Dictionary of Finance and Investment Terms).

Fundamental Analysis (figures 9-11, 13-16):

Investment: analysis of the balance sheet and income statements of companies in order to forecast their future stock price movements. Fundamental analysts consider past records of assets, earnings, sales, products, management, and markets in predicting future trends in these indicators of a company's success or failure. By appraising a firm's prospects, these analysts assess whether a particular stock or group of stocks is undervalued or overvalued at the current market price (Source: Barron's Dictionary of Finance and Investment Terms). The analyses of individual company statistics can be combined to create an aggregate value for an index. This is known as a bottom-up approach, as seen in the First Call forward and trailing price to operating earnings ratios in figure 7. Conversely, macro strategists perform analysis and make predictions based on the index as a whole. This is known as a top-down approach and can be seen in the 2-year earnings growth forecasts found in the bottom panel of figure 7.

Economics: research on such factors as interest rates, gross national product, inflation, unemployment, and inventories, as tools to predict the direction of the economy. The data for computations such as Tobin's q and the real return on equity in figure 9, or ratios involving foreign and domestic holdings of U.S. securities in figure 16 come from national balance sheets found in the Flow of Funds Accounts of the United States, provided by the Board of Governor's of the Federal Reserve System. While analysis occurs in this case at the national level, many of the indicators are the same or similar (Wilshire 5000 PE ratio, Return on Equity from National Accounts) to those generated for individual companies.

1. 50-Day, 200-Day Moving Averages: Moving averages represent the average price investors pay for securities over a historical period and present a smoothed picture of the price trends, eliminating the volatile daily movements. Because these lines

offer a historical consensus entry point, chartists look to moving average trend lines of index prices to define levels of support or resistance in the market. When a chart trend is predominantly sideways (figure 1, top chart), moving averages and the underlying series frequently cross, but during a time of prolonged increase or decrease (figure 1, bottom chart), the daily prices of a security typically are above or below the trailing average.

2. 9-Day, 18-Day Moving Averages: The 9-day and 18-day moving averages are often used together by traders using technical analysis to provide buy and sell signals. Buy signals are indicated by the 9-day average crossing above the 18-day when both are in an uptrend. The reverse, the 9-day crossing below the 18-day while both moving averages are declining, is a sign to sell. However, this simple tool can often be misleading because of its dependence on trending markets and its inability to capture quick market turns.

3. Relative Strength Index (RSI): This momentum oscillator measures the velocity of directional price movements. When prices move rapidly upward it may indicate an overbought condition, generally assumed to occur above 70 percent. Oversold conditions arise when prices drop quickly, producing RSI readings below 30 percent. Traders will often use values close to 80 percent and 20 percent as sell and buy signals. The general formula is as follows:
RSI = 100 - [100 / (1 + (AvgUp / AvgDn))], where
AvgDn = Sum of all changes for advancing periods divided by the total number of RSI periods, and
AvgUp = Sum of all changes for declining periods divided by the total number of RSI periods.

4. New Highs, New Lows: A straightforward market breadth indicator, this is the 10-day moving average of the number of stocks on a given index or exchange making new 52-week highs or lows each day. This indicator also demonstrates divergence. If an index makes a new low, but the number of stocks in the index making new lows declines, there is positive divergence. Technical analysts refer to this as a lack of downside conviction, a situation where stocks generally fell on a given day but not by a significant margin that would indicate intense selling pressure and further declines. Conversely, in rising markets, if an index makes a new high but the number of individual stocks in that index making new highs does not increase, analysts believe the rally may not be sustained.

5. Momentum Oscillator: Also known as the overbought/oversold oscillator, this indicator is calculated by taking the 10-day moving average of the difference between the numbers of advancing and declining issues for a given index. The goal of the indicator is to show whether an index is gaining or losing momentum, so the size of the moves is more important than the level of the current reading. The level of the reading is affected by how the oscillator changes each day, dropping a value ten days ago and adding today's value. If the advance-decline line read minus 300 ten days ago, and reads minus 100 today, even though the

market is down again, the oscillator will rise by 200 because of the net difference between the exchanged days' values. This scenario suggests a trough. On the other hand, if today's reading was minus 500, it would demonstrate an acceleration of across-the-board selling.

The magnitude in moves is also useful when it is compared with the divergence from the index price. If the Dow peaks at the same time the oscillator peaks in overbought territory, it suggests a top. If the index then makes a new high but the oscillator fails to make a higher high, divergence is negative and momentum is declining. If the index at this point declines and the oscillator moves into oversold territory, it may again be time to buy. If the index rises but does not make new highs, but the oscillator continues to rise above a previous overbought level, upside momentum exists to continue the rally.

6. Cumulative Advance - Decline Line: Referred to as market breadth, the indicator is the cumulative total of advancing minus declining issues each day. When the line makes new highs, a rally is considered widespread, but when the line is lagging, a rally is seen as narrow.

7. Put / Call Ratios: These ratios are used by analysts as contrary sentiment indicators. Unusually high ratio values, indicating much more put buying than call buying, occur when investors are extremely pessimistic and believe the market will continue to fall dramatically, at times from already low levels, and they are often considered by analysts to indicate overly pessimistic sentiment. Because so many investors believe prices will continue to fall, assets can become undervalued by contemporary valuations, and prices can move quickly back up quickly. This phenomenon in capital markets is exacerbated by the volatility and leverage associated with derivative securities like options.

The CBOE index ratios track put and call option trade volume for exchange-traded index options like the S&P 500 and Nasdaq 100. These ratios reflect sentiment of professional and institutional strategies because they are typically used as hedging tools by professional money managers. For example, a trader may purchase Nasdaq 100 puts as protection against loss if she also chooses to simultaneously buy the Nasdaq 100 tracking stock (AMEX: QQQ). Her belief is that the Nasdaq 100 will rise, hence the outright purchase of shares, but she has hedged her bet by purchasing puts option contracts, which cost a fraction of the value of the underlying asset. Because of the institutional presence, there is more put buying of index options than of individual equity options, and the index put-call ratios are typically above 1. Index readings above 1.25 indicate much put buying and often occur when institutional investors are very pessimistic, and such readings can lead to a short-term rally in response to the extreme negativity. Conversely, index ratios below 0.75 show very optimistic sentiment.

The CBOE equity ratio, however, is composed of trade volume for individual equity options. While both retail and institutional investors purchase individual equity options, this ratio is considered by technical analysts to be an indicator of retail investor sentiment. Because there is less of the large-volume put buying associated with institutional hedging, many analysts believe this is a more sensitive indicator of sentiment, especially among individual investors who may

be purchasing puts when they actually believe the price of a particular stock will fall rather than as a hedge to a long position in that stock. Readings above 0.6 suggest a rally may occur because too many investors are pessimistic. Traders believe readings below 0.3 show complacent investor psychology and that prices may decline in the future.

8. Volatility: With regard to stock price and stock index levels, volatility is a measure of changes in price expressed in percentage terms without regard to direction. This means that a rise from 200 to 202 in one index is equal in volatility terms to a rise from 100 to 101 in another index, because both changes are 1 percent. Also, a 1 percent price rise is equal in volatility terms to a 1 percent price decline. While volatility simply means movement, there are four ways to describe this movement:

    1. *Historical volatility* is a measure of actual price changes during a specific time period in the past. Mathematically, historical volatility is the annualized standard deviation of daily returns during a specific period. CBOE provides 30-day historical volatility data for obtainable stocks in the Trader's Tools section of CBOE's Web site.
    2. *Future volatility* means the annualized standard deviation of daily returns during some future period, typically between now and an option expiration. And it is future volatility that option pricing formulas need as an input in order to calculate the theoretical value of an option. Unfortunately, future volatility is only known when it has become historical volatility. Consequently, the volatility numbers used in option pricing formulas are only estimates of future volatility. Theoretical values are only estimates, and as with any estimate, they must be interpreted carefully.
    3. *Expected volatility* is a trader's forecast of volatility used in an option pricing formula to estimate the theoretical value of an option. Many option traders study market conditions and historical price action to forecast volatility. Since forecasts vary, there is no specific number that everyone can agree on for expected volatility.
    4. *Implied volatility* is the volatility percentage that explains the current market price of an option; it is the common denominator of option prices. Just as p/e ratios allow comparisons of stock prices over a range of variables such as total earnings and number of shares outstanding, implied volatility enables comparison of options on different underlying instruments and comparison of the same option at different times. The theoretical value of an option is a statistical concept, and traders should focus on relative value, not absolute value. The terms "overvalued" and "undervalued" describe a relationship between implied volatility and expected volatility. Two traders could differ in their opinion of the relative value of the same option if they have different market forecasts and trading styles (volatility explanation courtesy of CBOE).

9. CBOE Volatility Index (VIX): The VIX, introduced by CBOE in 1993, measures the volatility of the U.S. equity market. It provides investors with up-to-the-minute market estimates of expected volatility by using real-time S&P 100 (OEX) index option bid/ask quotes. This index is calculated by taking a weighted average of the implied volatilities of eight OEX calls and puts. The chosen options have an average time to maturity of 30 calendar days. Consequently, the VIX is intended to indicate the implied volatility of 30-day index options. Some traders use it as a general indication of index option implied volatility (Source: CBOE).

10. CBOE Nasdaq 100 Volatility Index (VXN): Like the VIX, the VXN measures implied volatility, but in this case for Nasdaq 100 (NDX, AMEX: QQQ) index options, thereby representing an intraday implied volatility of a hypothetical at-the-money NDX option with 30 calendar days to expiration. Both the VXN and the VIX are used by market observers as sentiment indicators for the Nasdaq 100 and for the broader market, respectively. Higher readings and spikes generally occur during times of investor panic and at times coincide with market bottoms. Low readings suggest complacency and often occur around tops in index prices.

11. 2-Year Growth of Earnings: Growth of earnings over subsequent 8 quarters. Current observations use forecast of earnings from DRI macro projections.

12. Real Return on Equity: Is the defined as follows:
[nonfinancial corporate profits with inventory valuation and capital consumption adjustments + (Liabilities of nonfarm nonfinancial corporations - Assets of nonfarm nonfinancial corporations) * consumer price index annual percent change] /
[current cost of tangible assets of nofarm nonfinancial business - (Liabilities of nonfarm nonfinancial corporations - Assets of nonfarm nonfinancial corporations)]

13. Tobin's q: The ratio of the market value of equity plus net interest-bearing debt to the current value of land, inventories, equipment, and structures.

14. Earnings and Dividend Price Ratios: These ratios represent an investor's yield from earnings and dividend payments. Historically, the EP ratio often has exceeded the real return on bonds, reflecting the greater risk to shareholders of choosing equity investments. In recent quarters, the EP ratio has fallen below the return on bonds. Traditionally, the EP ratio has fallen below this real bond rate when earnings are expected to rise dramatically.

15. Real Bond Rate: Moody's composite yield of A-rated corporate bonds less the expected rate of inflation over the next 10 years, as measured by the consumer price index from the Survey of Professional Forecasters, published by the Federal Reserve Bank of Philadelphia.

16. Moody's Ratings: For each time period, Moody's upgrades and downgrades securities

for companies issuing investment grade (above ba1) or speculative grade (below ba1) debt. These series show the total dollar amount in billions of all the outstanding securities in a rating class that are upgraded or downgraded. The data are collected by company and by each group of rated securities that the company issued, then aggregated to form the data presented in the charts.

17. Default and Failure Rates: The default rate shows the frequency of failure of corporate junk bond issuers to meet their covenant with the respective bond holders. Breach of covenant can occur from missed interest payments or if the corporation files Chapter 11 or 13. In this case, junk bonds are defined as those rated below ba1 by Moody's, and the rate is calculated by summing the amount of defaulted debt in dollars and dividing it by the total outstanding junk-rated debt. The business failure rate refers to companies filing for one of the four bankruptcy laws, Chapters 7, 11, 12, and 13. The failure rate series is calculated by dividing all of the balance sheet assets of those corporations that file for bankruptcy by the outstanding assets of all corporations. The series is not limited to issuers of any particular grade of debt securities.

18. Gross Proceeds from Security Issuance: The Federal Reserve Board collects security issuance data for bonds and stocks. In this case, 'bonds' refers to the gross proceeds from the issuance of all U.S. corporate bonds, issued domestically and in foreign markets, including private placements. The 'Stocks' series is all primary corporate offerings in domestic markets of common and preferred stock.

19. Realized Long-Term Capital Gains: Data include returns with positive long-term gains in excess of any short-term losses. Data for each year include some prior year tax returns.