January 7, 2003

Stock Market Report – 2002 Review

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Market Analysis for Period Ending Tuesday, December 31, 2002

This document presents technical and fundamental analysis commonly used by investment professionals to interpret 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 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.

Technical 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 Tuesday, December 31 at 472.87. The index lost 19.8 percent of its value during 2002, the largest annual decline since 1974. The NYSE index has risen 12.3 percent since its low point on October 9, but it has resumed a downward trend since the beginning of December.

The NYSE index has traded far below its 200-day moving average line since the spring. Typically, a prolonged period of time beneath the 200-day trend line signals a bear market, and most analysts would agree that 2002 fit that description. Except for a prolonged slump in the summer and the October dip, the NYSE has closely followed its 50-day moving average, reflecting the lack of substantial rallies or corrections for most of the year.

The National Association of Securities Dealers Composite Index (Nasdaq Index) closed at 1335.51. During 2002, the Nasdaq Index fell 31.5 percent, the third straight annual decline. Since its March 2000 peak, the Nasdaq has lost 73.5 percent of its value. However, the Nasdaq has recovered 19.9 percent since October 9, its six-year low (figure 1).

Except for two days in March, the Nasdaq index has not exceeded its 200-day moving average since January. After annual declines averaging more than 30 percent, it would not be

a stretch to consider this a bear market for the Nasdaq. The Nasdaq has deviated from its 50-day average more than the NYSE, including the spring and summer doldrums and the November rally.

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

As of December 31, the relative strength index (RSI) for the NYSE Composite had a value of 44.6 percent, remaining in what is commonly viewed as neutral territory (figure 2, upper panel). For the Nasdaq Index, the relative strength also remains in the neutral range (lower panel). The only time the RSI for the NYSE escaped neutral territory was after the July slump, predicting the August rally. But, in general, the RSI did a poor job of predicting the sharp declines of 2002. In fact, the Nasdaq RSI reached oversold territory *before* the 500-point drop in June and July.

The number of stocks falling to new 52-week lows in the NYSE had two large peaks in July and October, but for the most part remained flat. New highs were almost nonexistent after June, despite the slight rally from the October lows (figure 3 upper panel). The momentum oscillator (middle panel) foresaw the August rally when it fell sharply into oversold territory, but never really provided a hint of the declines in June and July. The Market Breadth indicator (figure 3, bottom panel) has been fairly flat since July, even during the August and November rallies and October decline, suggesting that the trends were not widespread.

The number of Nasdaq stocks reaching new lows has been more volatile than NYSE stocks, staying high throughout June and July while spiking again in October, while the new highs indicator has been close to zero (figure 4, upper panel). The momentum indicator (figure 4, middle panel) also failed to predict the two major declines, but did a better job before the rallies. The Market Breadth indicator has followed the index closely, probably signifying that trends were widespread (lowest panel, figure 4).

Volatility

Indicators of market volatility are shown in figure 5.

The Chicago Board of Options Exchange (CBOE) provides daily measures of volatility for the S&P 100 (VIX) and for the Nasdaq 100 (VXN). Both the VIX and VXN remained at historically high levels from June through October, but have declined slightly since then.

Put/Call ratios appear in figure 6.

Monthly data are shown from January through December. The CBOE individual equity put/call ratio was in territory normally interpreted as bullish for almost all of 2002, even before the June-July and September-October declines. The S&P 100 put/call ratio was neutral for most of 2002 (figure 6, top panel).

Sector Performance

Figure 7 compares the performance of the various economic sectors within the S&P 500 as well as other international and style indices.

After a third straight down year, only half of the S&P 500 economic sectors has seen a positive average performance in the past five years. However, all ten sectors had negative returns in 2002. Information technology, the top performing sector since 1997, lost the most this year, 37.6 percent. Utilities and telecommunications, the weakest sectors over the last five years, continued to struggle. Only the materials and consumer staples sectors finished the year with single-digit negative returns (figure 7, upper panel).

The Wilshire 5000, composed of all U.S. equity issues, fell 22.1 percent in 2002. The German DAX (43.9 percent) and British FTSE 100 (24.5 percent) fared even worse, while Japan's Nikkei 225 also experienced a large loss. Over the past five years, all four geographical indexes have negative average annual returns (figure 7, middle panel).

All four Russell style indexes in figure 7 (lower panel) also had large negative returns in 2002. This year's poor returns have reduced their average annual return over the past five years to less than two percent for even the best performer, the Russell 1000 Value index (1.78 percent). The Russell 2000 Small-Cap index has a negative average return since 1997. The Russell 1000 Growth index had the largest negative return in 2002, 28.6 percent. Large-cap stocks also lost value this year, according to the Russell 1000 index.

Valuation

Figure 8 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 9 graphs the current and previous earnings forecasts for several calendar years in the top panel, and lists the current and previous growth of earnings forecasts for each S&P 500 sector in the two tables.

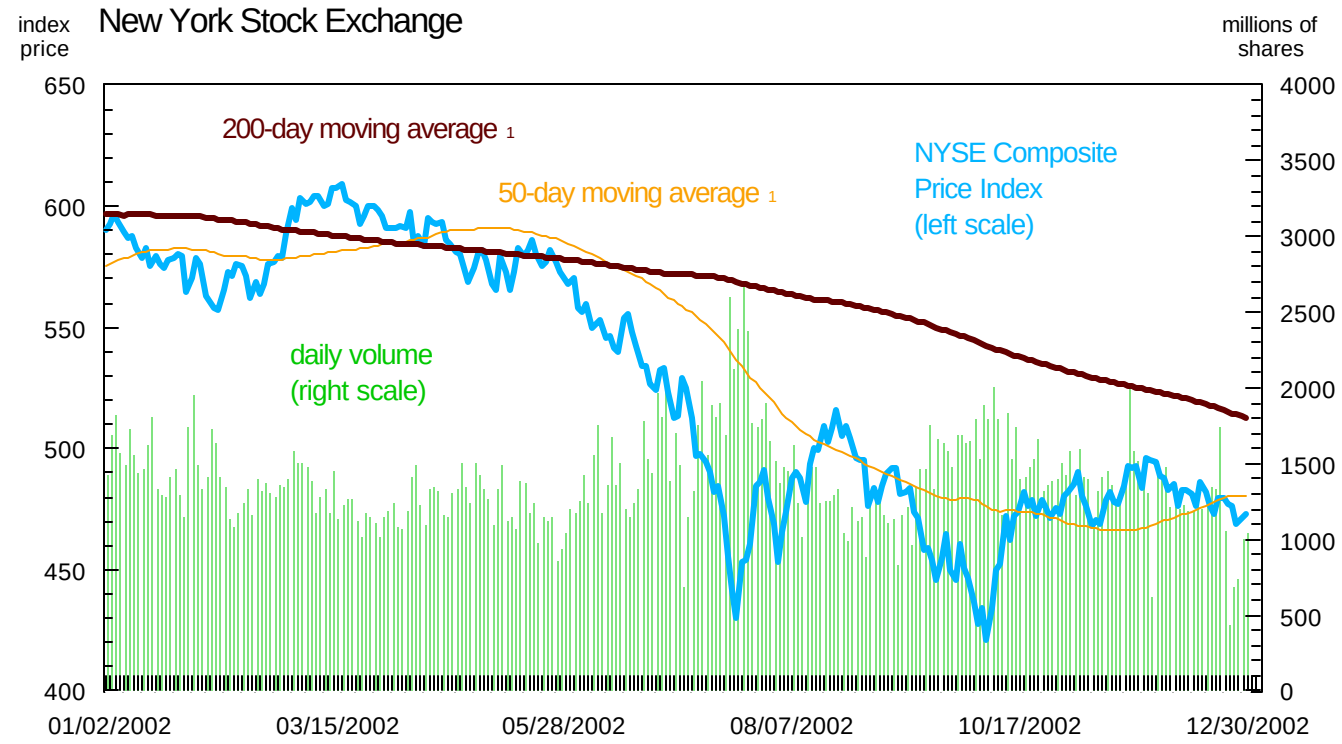
The macro projections from strategists for the growth of earnings for the Standard and Poor's 500 index over the next two years have been revised upward to 23.2 percent in the fourth quarter, above the 6.2 percent historical average annual growth rate. The **S&P 500 trailing price-earnings ratio** increased to 27.8 in the fourth quarter from 26.9 in the third quarter. During the same period the price-earnings ratio for the S&P Smallcap 600 decreased to 26.8 from 30.5. The first quarter forecast for the **S&P 500 forward price to operating earnings ratio**, using bottom-up forecasts from analysts, increased to 17.2 from 16.6 in the fourth quarter (figure 8).

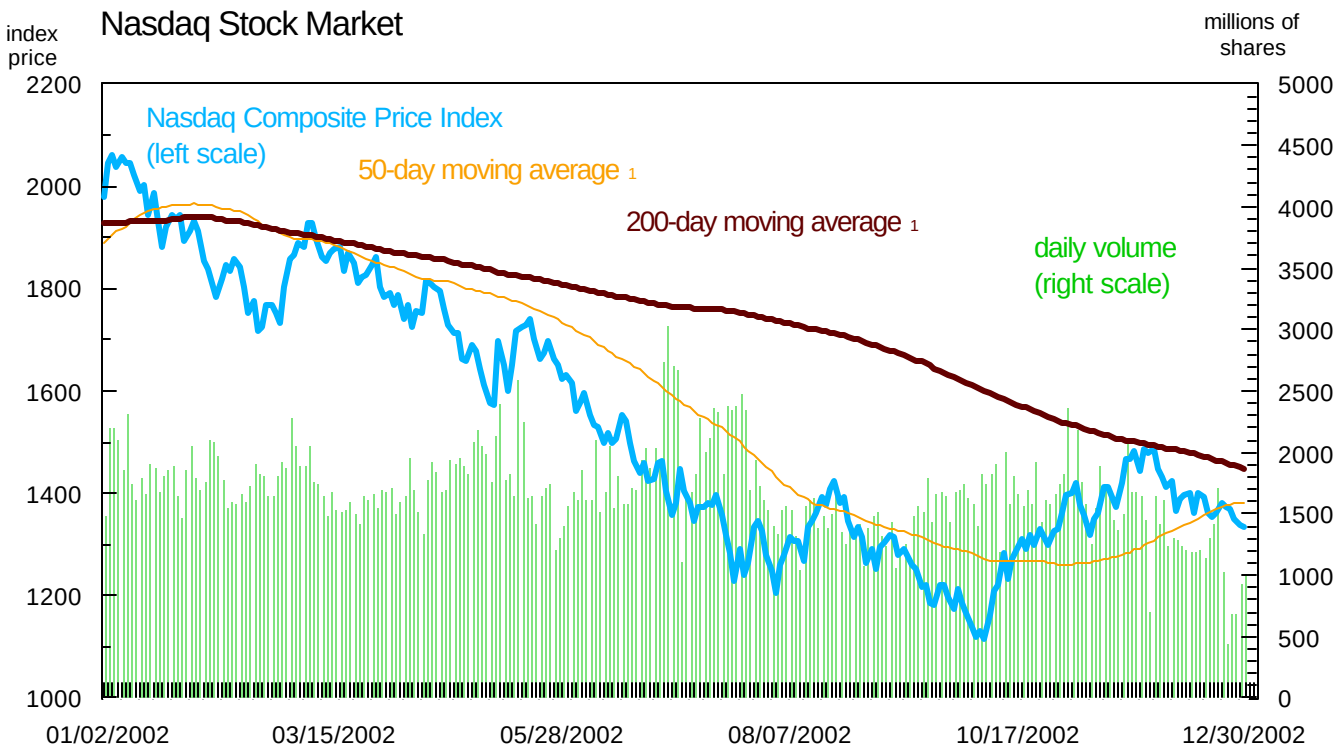
The analysts surveyed by Thomson Financial/First Call report a 12.9 percent increase in earnings for the S&P 500 in the fourth quarter of 2002, and a 1.5 percent increase for calendar year 2002. Analysts have cut earnings expectations for the fourth quarter for nine of the eleven sectors, often sharply, since the quarter began. In the fourth quarter, the materials and transportation sectors are expected to experience the biggest increase in earnings, but those sectors had especially poor earnings in the fourth quarter of 2001. Earnings for the utilities sector are expected to continue to suffer after a poor third quarter. Analysts expect a 14.1 percent increase in profits for calendar year 2003, including an 11.5 percent increase in the first quarter (figure 9).

Please contact Matthew S. Rutledge for questions and comments (617) 973-3198.

Figure 1

Daily Trends of Major U.S. Stock Exchanges

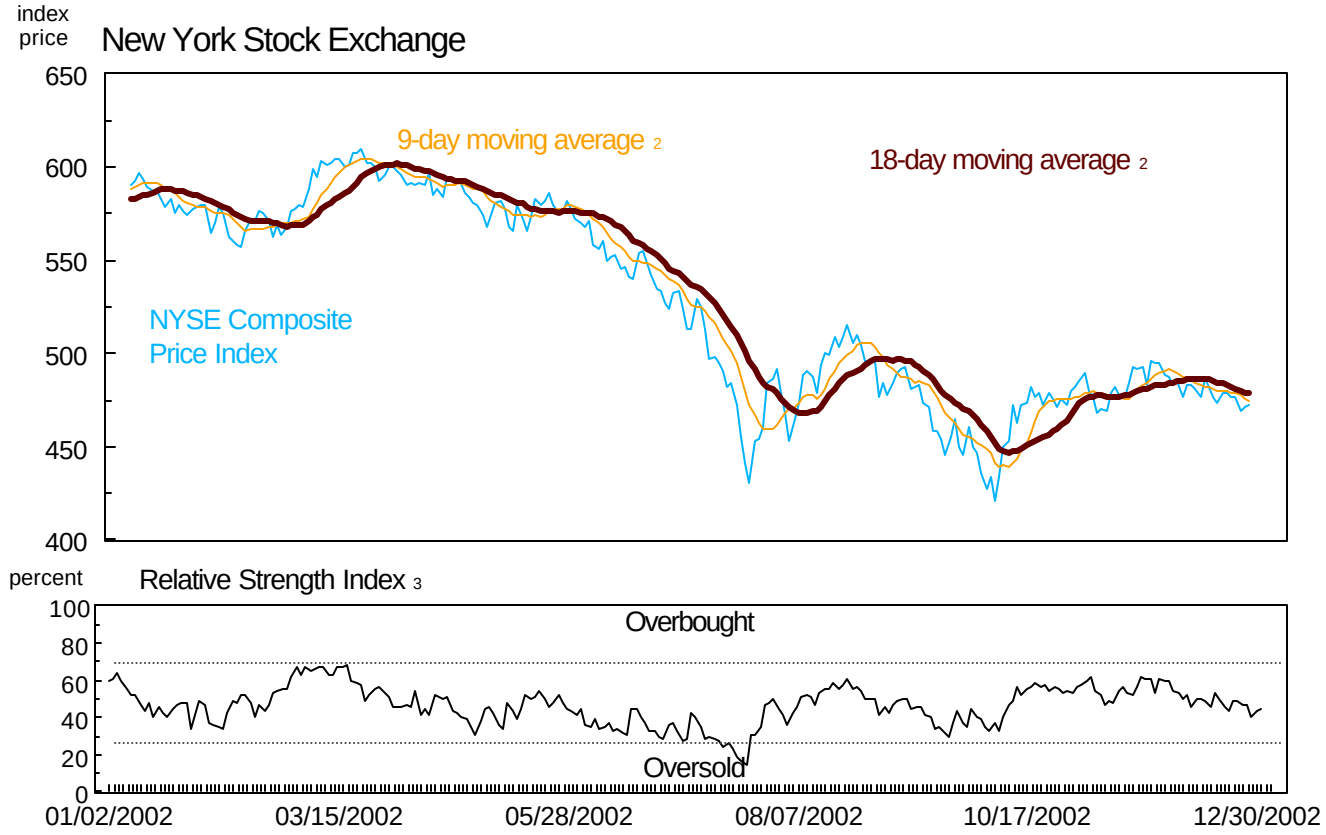


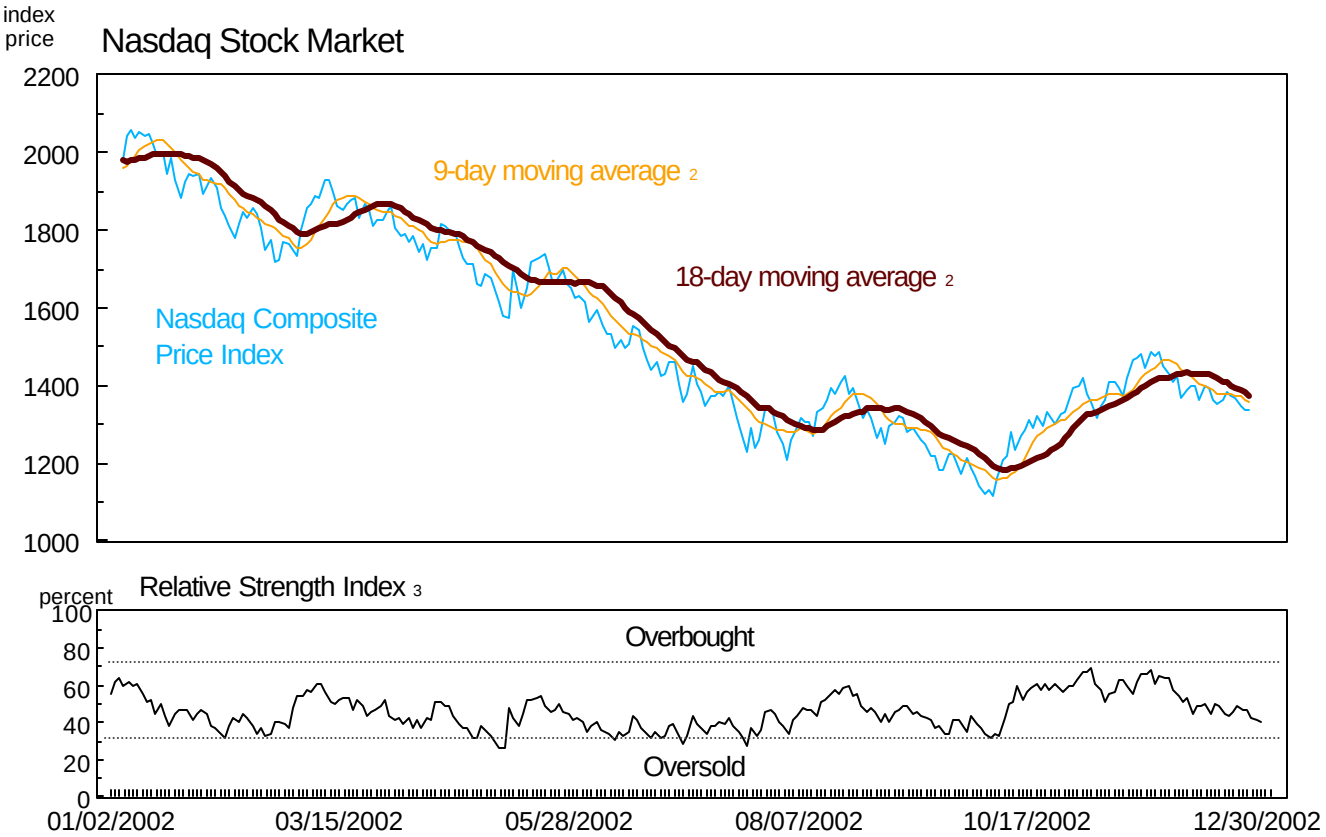


Source: Bloomberg, L.P.

Figure 2

Moving Averages and Relative Strength

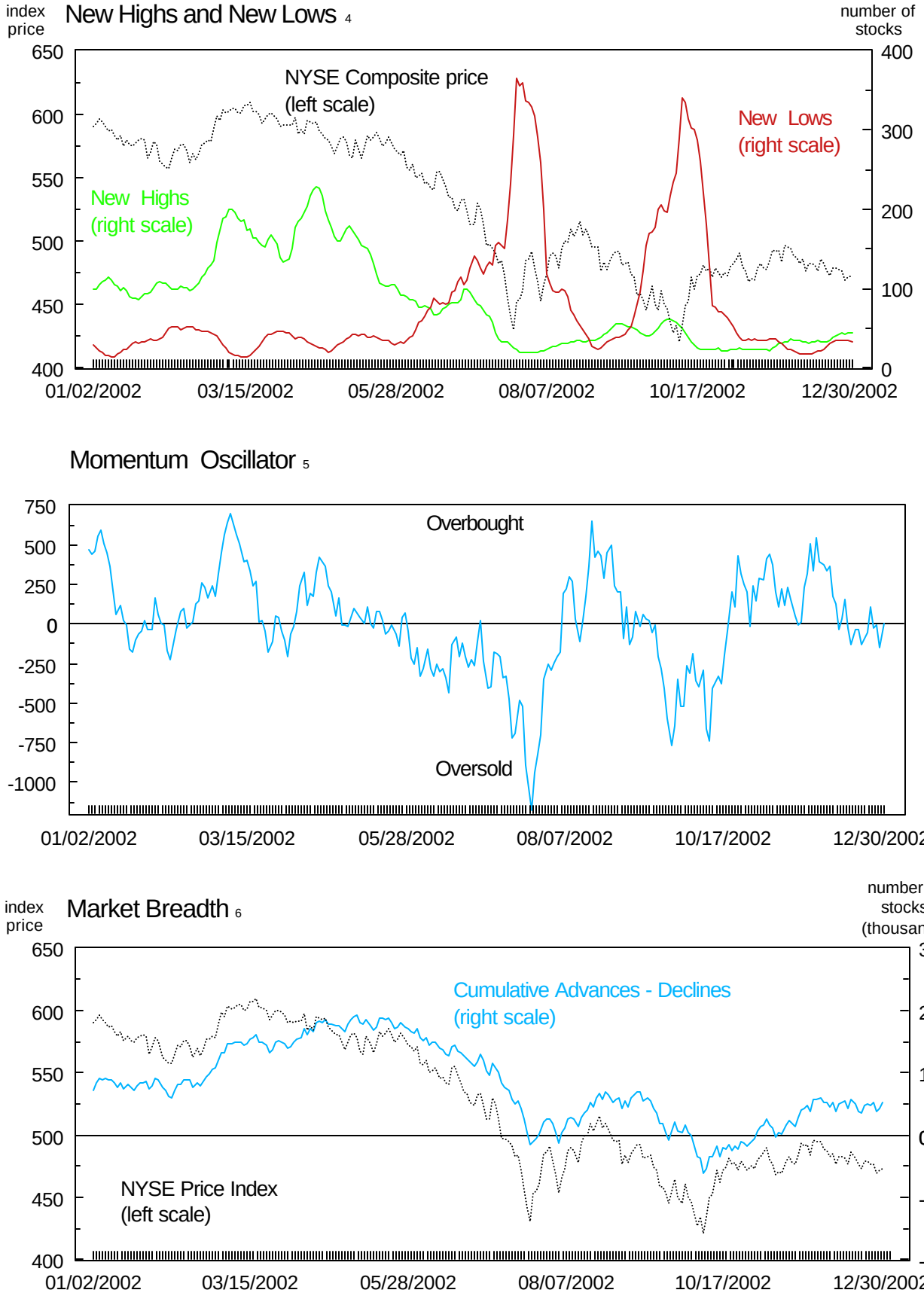




Source: Bloomberg, L.P.

Figure 3

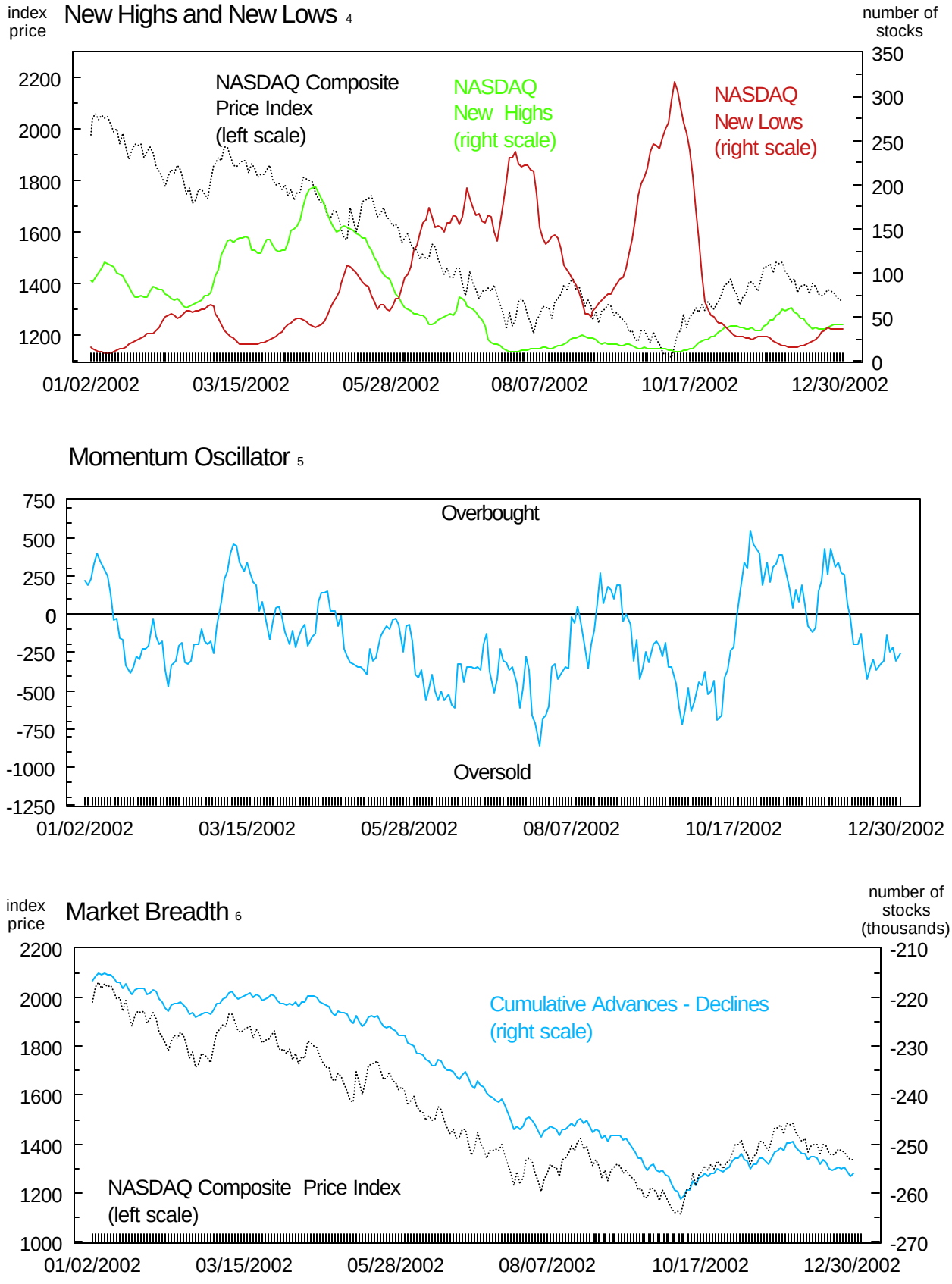
Index Breadth and Momentum Indicators - New York Stock Exchange



Source: Bloomberg, L.P.

Figure 4

Index Breadth and Momentum Indicators - Nasdaq Stock Market

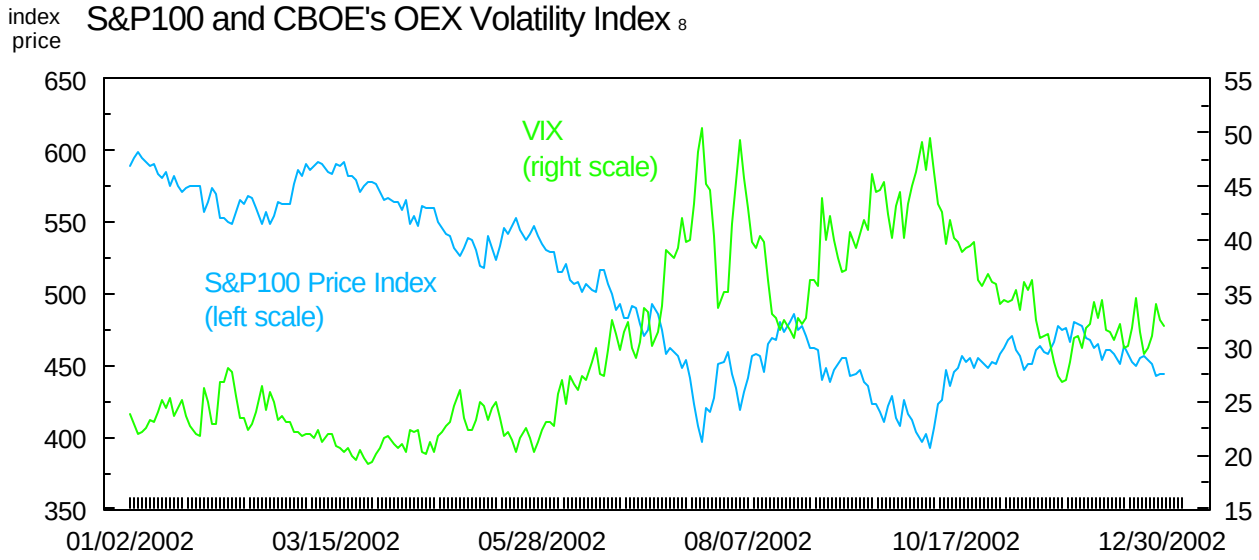


Source: Bloomberg, L.P.

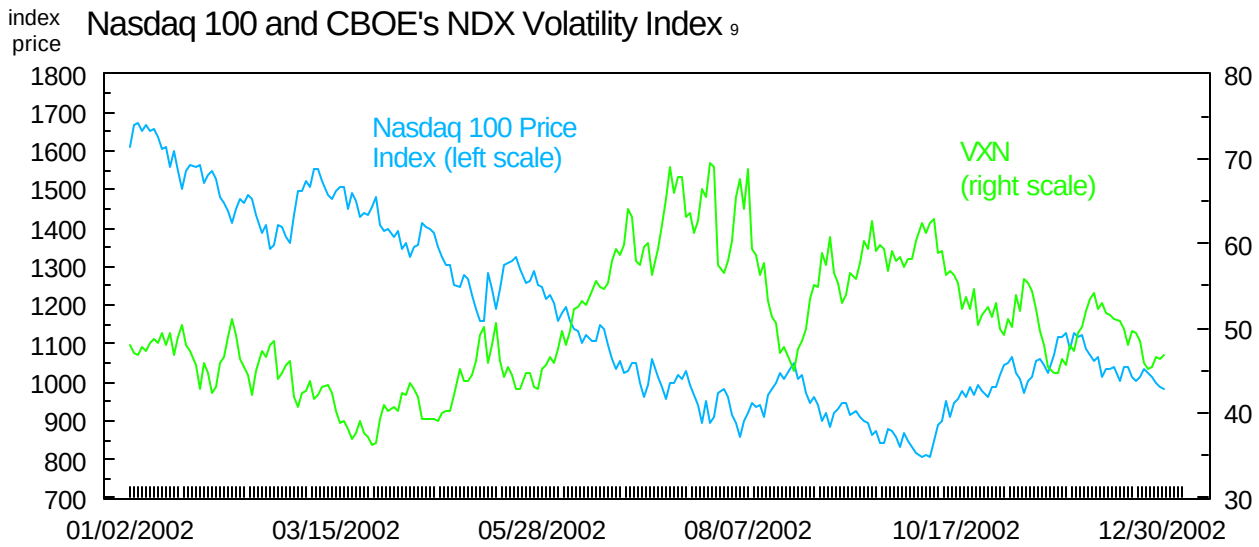
Figure 5

Volatility [7]

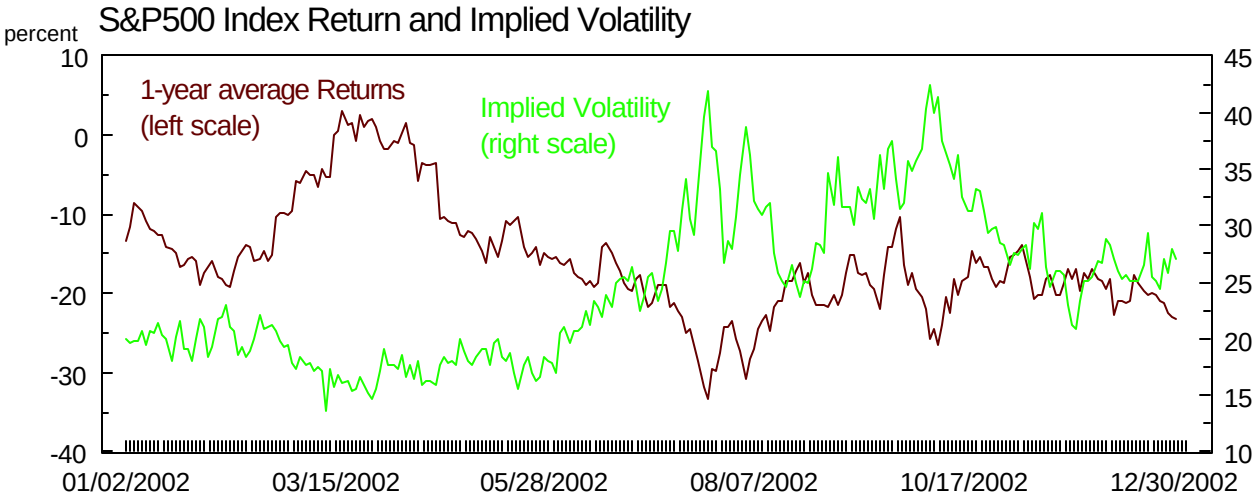
S&P100 and CBOE's OEX Volatility Index [8]



Nasdaq 100 and CBOE's NDX Volatility Index [9]



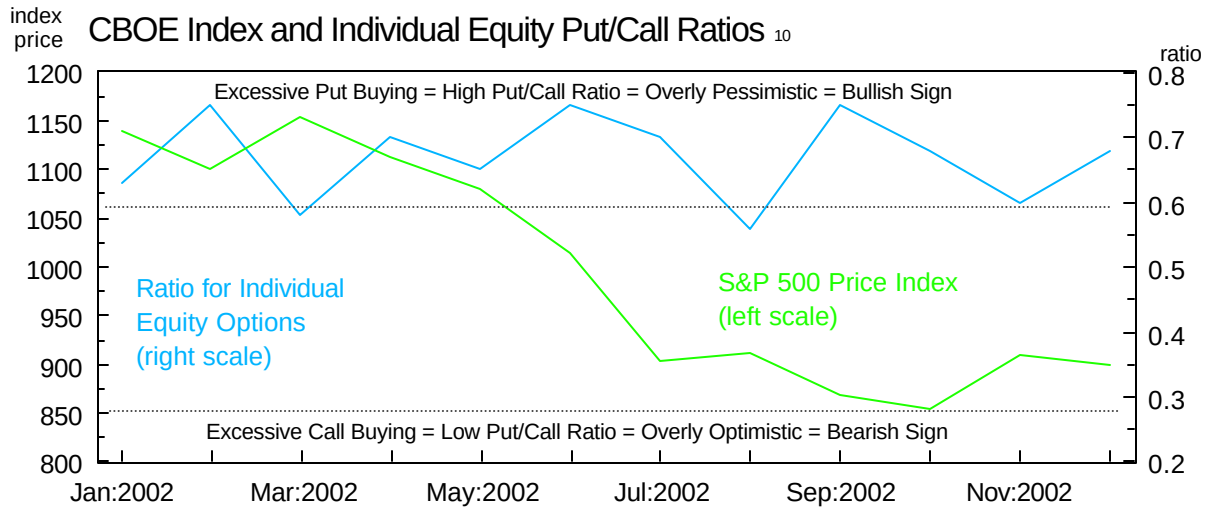
S&P500 Index Return and Implied Volatility

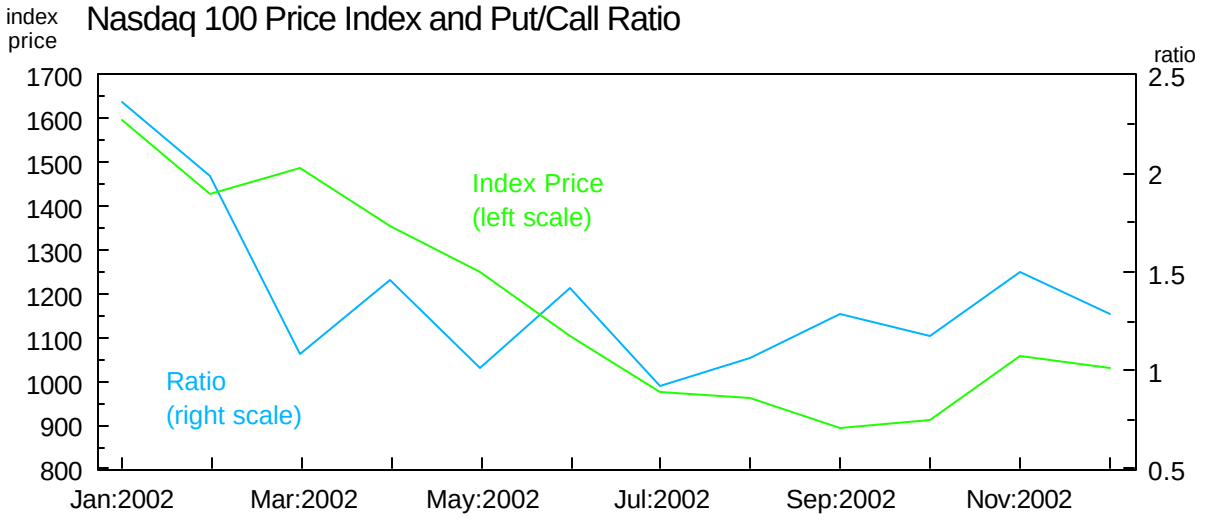


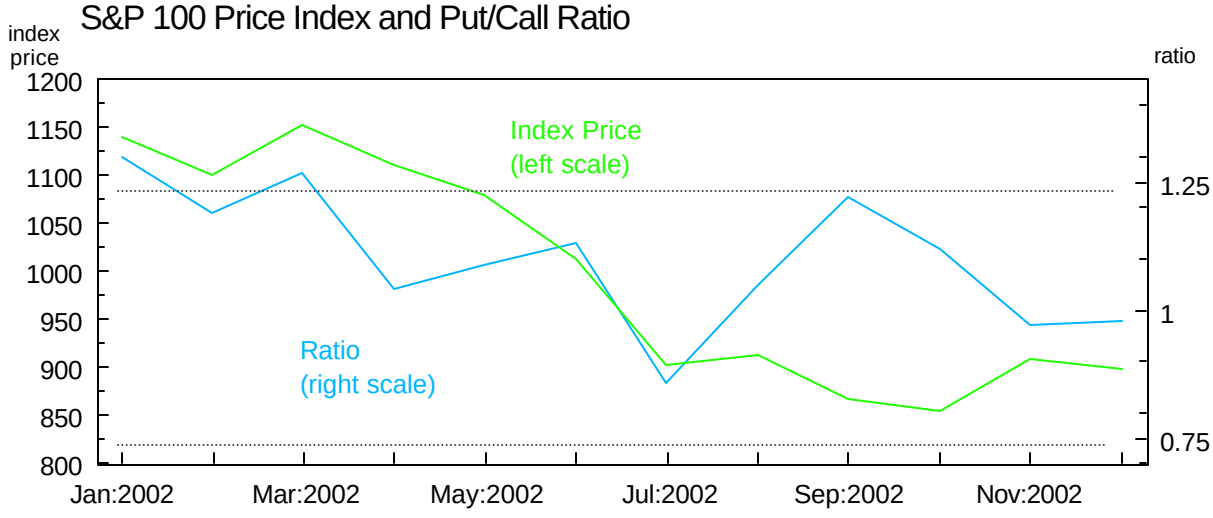
Source: Bloomberg, L.P.

Figure 6

Put / Call Ratio



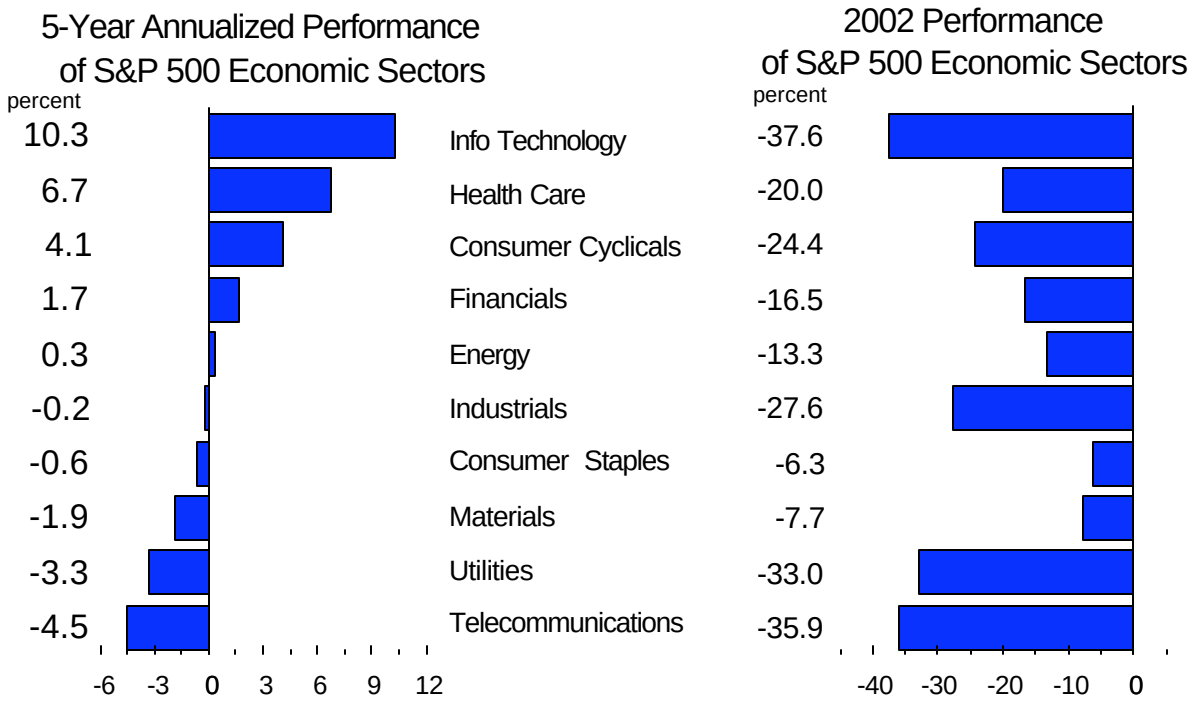


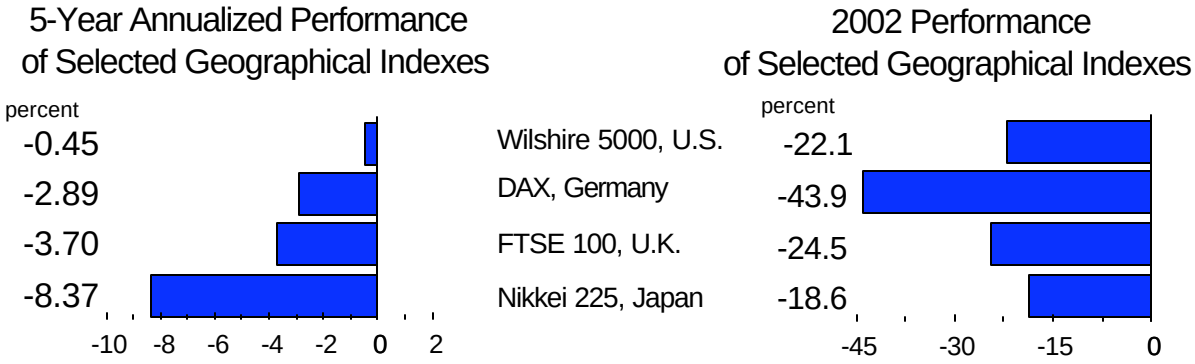


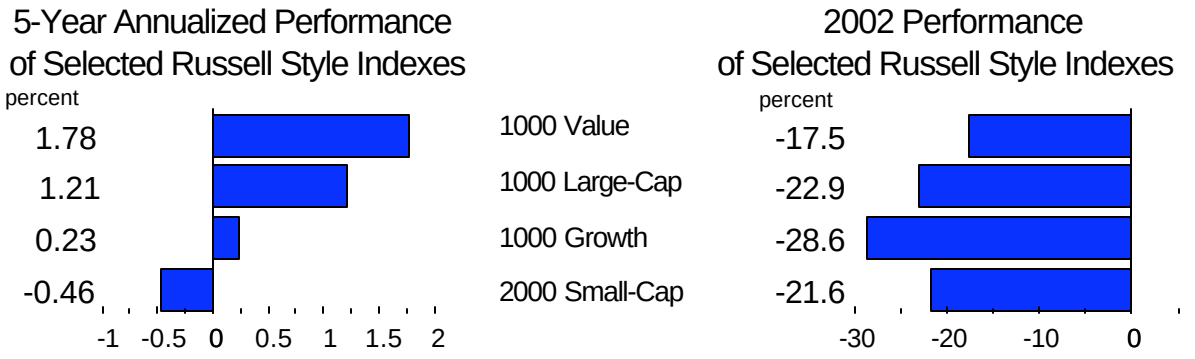
Source: Haver Analytics

Figure 7

S&P 500 Economic Sectors - Index Returns



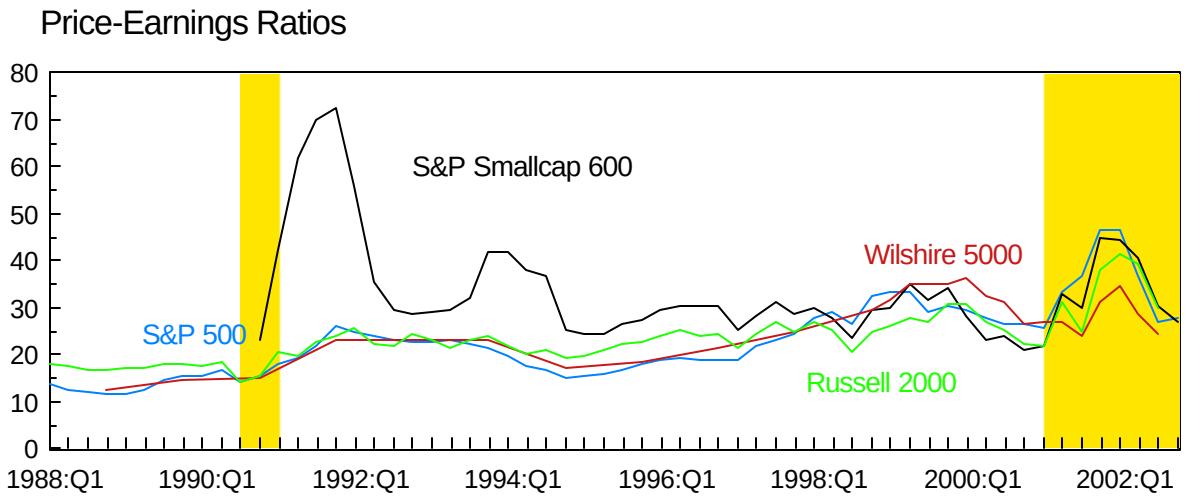


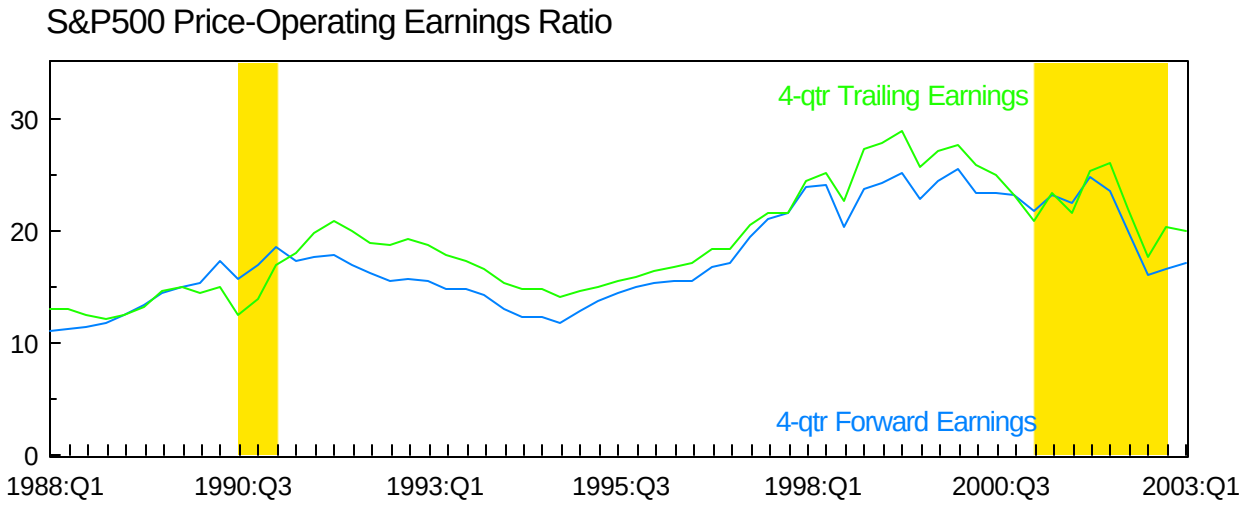


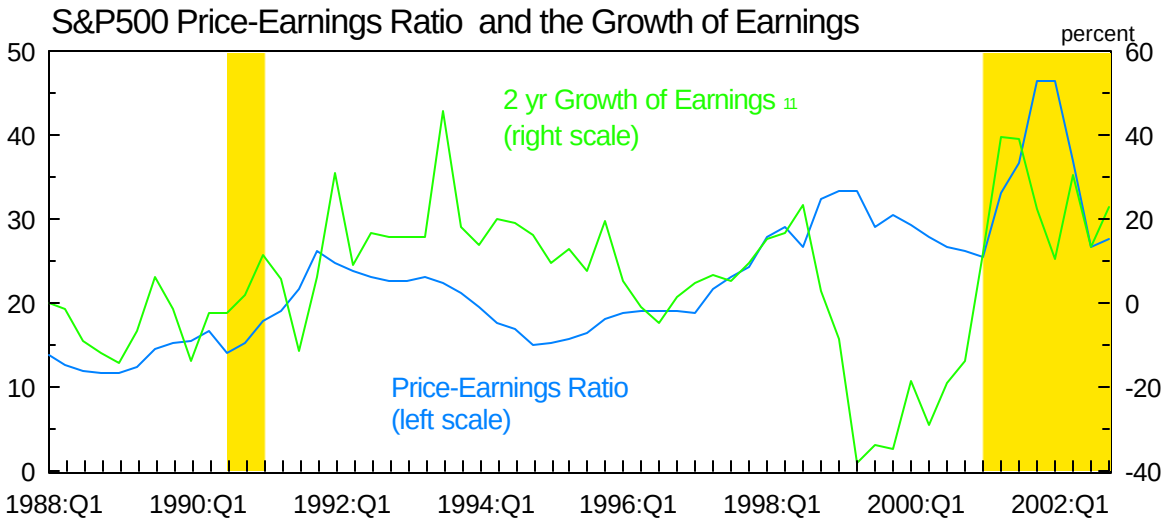
Source: Bloomberg, L.P.

Figure 8

PE Ratios and the Growth of Earnings



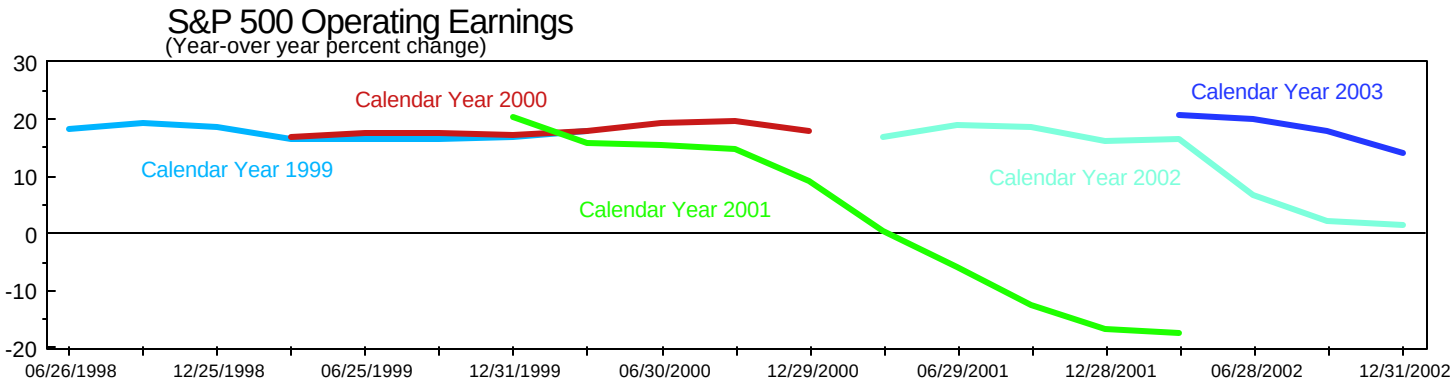




Source: Thomson Financial/First Call, Global Exchange (formerly DRI), Bloomberg L.P., Frank Russell Company

Figure 9

S&P 500 Economic Sectors - Earnings Forecast



Growth of Earnings - Quarterly Pattern

(4-quarter percent change)

Sector	Current Dec02Q	Oct-02 Dec02Q	Jul-02 Dec02Q	Apr-02 Dec02Q		Current Mar03Q	Oct-02 Mar03Q	Jul-02 Mar03Q		Current Jun03Q	Oct-02 Jun03Q		Current Sep03Q		Current Dec03Q
Basic Materials	47.1%	95.5%	109.0%	108.0%		58.2%	104.9%	120.5%		26.2%	54.5%		50.3%		78.1%
Capital Goods	-13.6%	2.1%	7.0%	15.4%		-0.6%	12.2%	10.7%		-2.5%	6.7%		11.2%		26.5%
Telecom	39.4%	17.9%	18.2%	-10.0%		9.7%	11.2%	35.6%		2.5%	1.6%		70.0%		-0.4%
Consumer Cyclicals	26.4%	31.8%	35.3%	33.4%		14.0%	21.4%	29.0%		4.0%	13.3%		9.2%		13.6%
Consumer Staples	7.4%	5.2%	10.7%	15.8%		4.9%	11.8%	13.8%		6.2%	12.3%		8.4%		14.5%
Energy	45.0%	45.4%	53.0%	49.0%		90.0%	91.0%	91.4%		14.8%	20.0%		8.8%		2.2%
Financials	17.5%	27.3%	34.6%	36.6%		6.8%	9.7%	13.6%		14.3%	17.1%		18.0%		19.8%
Health Care	9.3%	9.9%	11.0%	15.0%		8.4%	10.6%	11.5%		11.6%	13.8%		15.9%		13.8%
Technology	15.6%	32.4%	54.0%	61.0%		15.9%	28.1%	59.9%		27.5%	37.5%		49.9%		44.1%
Transports	70.9%	140.4%	255.0%	nm		98.5%	19.4%	33.3%		57.5%	14.0%		78.6%		96.1%
Utilities	-27.3%	-12.8%	6.0%	16.0%		-16.6%	-8.2%	9.5%		-6.4%	6.4%		9.9%		28.0%
Total	12.9%	19.9%	27.7%	31.5%		11.5%	17.4%	25.3%		10.7%	16.4%		16.7%		20.0%
Total ex. Tech	12.7%	18.6%	25.3%	28.4%		11.1%	16.4%	22.0%		9.3%	14.5%		13.9%		17.5%
Total ex. Energy	11.2%	18.5%	27.0%	31.1%		8.1%	14.2%	21.1%		10.4%	16.2%		17.2%		21.3%

Growth of Earnings - Calendar Year

(4-quarter percent change)

Sector	Current 02CY	Oct-02 02CY	Jul-02 02CY	Apr-02 02CY	Jan-02 02CY	Oct-01 02CY		Current 03CY	Oct-02 03CY	Jul-02 03CY	Apr-02 03CY
Basic Materials	7.6%	15.8%	22.1%	23.6%	22.2%	70.9%		43.3%	57.0%	64.7%	68.6%
Capital Goods	-10.2%	-7.0%	-2.8%	3.5%	2.9%	14.0%		7.7%	12.3%	15.5%	13.4%
Communications	3.8%	-8.1%	-10.8%	-9.3%	-8.5%	22.4%		-3.0%	7.8%	9.8%	11.7%
Consumer Cyclicals	24.3%	25.1%	23.7%	15.4%	10.8%	21.3%		11.3%	16.2%	19.7%	23.1%
Consumer Staples	9.2%	3.6%	5.5%	8.8%	0.4%	14.8%		10.6%	12.7%	14.5%	15.5%
Energy	-36.4%	-36.6%	-29.4%	-33.5%	-26.1%	-16.4%		20.5%	23.3%	19.8%	24.8%
Financials	13.8%	15.7%	21.2%	22.6%	20.8%	20.5%		14.9%	15.9%	14.7%	14.2%
Health Care	6.2%	4.2%	6.3%	10.5%	9.8%	15.9%		12.1%	14.2%	15.1%	14.6%
Technology	2.4%	5.6%	30.4%	41.3%	46.4%	59.8%		36.6%	40.2%	52.5%	58.0%
Transports	-16.2%	-5.7%	57.7%	nm	nm	166.0%		74.2%	89.6%	156.8%	152.2%
Utilities	-24.1%	-18.4%	-7.3%	-1.3%	4.8%	13.4%		-2.4%	3.7%	8.1%	9.1%
Total	1.5%	2.1%	6.8%	9.3%	8.8%	18.6%		14.1%	17.8%	20.0%	20.7%
Total ex. Tech	1.4%	1.8%	5.0%	6.9%	6.2%	15.1%		12.2%	15.8%	16.9%	17.6%
Total ex. Energy	5.4%	5.9%	11.1%	14.0%	13.2%	23.3%		13.7%	17.5%	20.0%	20.4%

Source: Thomson Financial/First Call

Endnotes

1. 50-Day, 200-Day Moving Average: Moving averages represent the average price investors paid for securities over a historical period, and present a smoothed picture of the price trends, eliminating the volatile daily movement. 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 (bottom chart) the daily prices of a security typically are above or below the trailing average. Moving above or below the 50-day moving average is sometimes associated with rallies or corrections. Similarly, prolonged movements, such as bull and bear markets can be represented by securities remaining above or below their 200-day moving average for prolonged periods of time.

2. 9-Day, 18-Day Moving Averages: The 9-day and 18-day moving averages are often used together 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 can often be misleading because of its dependence on trending markets and inability to capture quick market turns.

3. Relative Strength Index: This (RSI) momentum oscillator measures the velocity of directional price movements. When prices move rapidly upward they 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.

4. New Highs, New Lows: A straightforward 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, and in this case a lack of downside conviction. 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 this suggests a false rally.

5. Overbought / Oversold Oscillator: This momentum indicator is calculated by taking the 10-day moving average of the difference between the number 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 are more important than the level of the current reading. This is first affected by how the oscillator changes each day, by dropping a value ten days ago, and adding one today. If the advance decline line read minus 300 ten days ago, and minus 100 today, even though the market is down again, the oscillator will rise by 200 because of the net difference of the exchanged days' values. This suggests a

trough, however, if today's reading was minus 500 it would demonstrate a gain in downside momentum.

The magnitude in moves is useful when compared with divergence to 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 lagging a rally is seen as narrow.

7. Volatility: With regard to stock prices 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. *Historic volatility* is a measure of actual price changes during a specific time period in the past. Mathematically, historic 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 this 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 historic volatility. Consequently, the volatility numbers used in option pricing formulas are only estimates of future volatility. This might be a shock to those who place their faith in theoretical values, because it raises a question about those values. 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. 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.

8. 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 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 days. Consequently, the VIX is intended to indicate the implied volatility of 30-day index options. It is used by some traders as a general indication of index option implied volatility. (Source: CBOE)

9. CBOE NASDAQ Volatility Index (VXN): Like the VIX, the VXN measures implied volatility, but in this case for NASDAQ 100 (NDX) index options, thereby representing an intraday implied volatility of a hypothetical at-the-money NDX option with thirty calendar days to expiration. Both the VXN and the VIX are used 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.

10. Put / Call Ratio: These ratios are used as contrary sentiment indicators. Higher ratio values, indicating more put trading, is considered more bullish. The CBOE index ratio tracks trade volume of all exchange traded index options, reflecting sentiment of professional and institutional strategies. The CBOE equity ratio is composed of trade volume for individual equity options and a better indicator of retail investor sentiment. Equity ratio readings 60/100 and 30/100 denote levels of bullishness and bearishness. Similarly, bullish and bearish boundaries for the S&P 100 are 125/100 and 75/100.

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

12. 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 for choosing equity investments. Recently, the EP ratio has fallen below the return on bonds as investors demand uncharacteristically large capital gains to compensate for the low earnings yield. Historically, the EP ratio has fallen below the real bond rate only when earnings are expected to rise dramatically.

13. 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.

14. Moody's Ratings: Denotes the change in dollar amount of investment grade (above BA1) or speculative grade (BA1 or below) securities outstanding for a particular company if that company is up/downgraded during a given month. For example, if company XYZ was upgraded, and they had bonds rated AA2 for $10, AA1 for $2, and A3 for $15, this company's contribution to the chart value is $27.

15. Investor Expectations: Internally generated composite of the Conference Board's 12-month forward investor expectations for no change, increase, and decrease in the stock market. Composite values of 50 indicate neutral expectations. Values below 50 demonstrate bearish sentiment, though the chart demonstrates that the outlook of investors is typically bullish.

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