January 27, 2006

Stock Market Report - 2005 Review

Market Analysis for Period Ending Friday, December 31, 2005

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 Friday, December 30 at 7753.95. The index increased 7.0 percent during 2005. In December, the NYSE exceeded its bull market peak of 2000 and ended the month 1.2 percent above the peak.

The NYSE index traded above its 200-day moving average during all of 2005 except for a few days in October . Such a prolonged period of time above this trend line usually signals a bull market. The 50-day trend line crossed the NYSE index during the second and fourth quarters, signaling market corrections.

The National Association of Securities Dealers Composite Index (Nasdaq Index) closed Friday, December 30 at 2205.32. During 2005, the Nasdaq Index rose 1.4 percent. Although the Index reached its four-year high in December, the Nasdaq is still 56.3 percent below its March 2000 all-time high (figure 1).

The Nasdaq remained above its 200-day moving average during most of the year. It dipped below the line in mid-March of 2005 and recovered at the end of May. It also fell below the line in October, similarly to the NYSE index. The Nasdaq remained below its 50-day moving average until the end of May and stayed above the line until the end of August. The index crossed its 50-day moving average line several times in September, indicating market corrections.

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

As of December 30, the relative strength index (RSI) for the NYSE Composite had a value of 51.14 percent, in neutral territory (figure 2,

upper panel). The RSI for Nasdaq equaled 41.05 at the end of the year, also in neutral territory (lower panel). The RSI for both indexes remained in neutral territory for the most of 2005.

The number of stocks rising to new 52-week highs in the NYSE had several spikes during the year, the largest of them occurring in the first and third quarter. New lows had two spikes in 2005, one in April and a larger one in October (figure 3 upper panel). The momentum oscillator (middle panel) correctly predicted several rallies when it declined into oversold territory, and the few slumps, when it spiked into the overbought zone. The Market Breadth indicator (figure 3, bottom panel) converged with the Index and followed an increasing trend during the last quarter of 2005, suggesting a widespread rally.

The number of Nasdaq stocks reaching new highs had fewer and smaller spikes than the NYSE. The new lows indicator increased sharply in May and October (figure 4, upper panel). The Nasdaq's momentum indicator (figure 4, middle panel) suggested periods of decline that never occurred but it was more successful at predicting the rallies that occurred in June and November. Growing at a slower pace, the Market Breadth indicator has been diverging from the index since May of 2005, which suggests that the recent rally has been narrow (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 low throughout the year and thus continued the trend from the previous two years.

Put/Call ratios appear in figure 6.

Monthly data are shown from January through December. The CBOE individual equity put/call ratio was moving around the 0.6 value for most of 2005, the border between neutral and bullish territory. The S&P 100 put/call ratio was neutral for most of 2005 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.

Eight of the ten S&P 500 economic sectors report positive returns for the year 2005. Energy, with a gain of 29.1 percent, ranks as the best performing sector for 2005 and over the past five years. Utilities had the second highest return, 12.8 percent. During 2005,

Telecommunications and Consumer Discretionary were the only sectors to record negative growth, -9.0 and -7.4 percent, respectively. Telecommunications also ranked as the worst performer since 2000 while Consumer Discretionary placed third from the top. (figure 7, upper panel).

Japan's Nikkei 225 rose 40.2 percent in 2005. The Wilshire 5000, composed of all U.S. equity issues, gained 4.6 percent . The German DAX increased by 27.1 percent and the British FTSE 100 by 16.7 percent. The FTSE 100 is the only of the four geographical indexes that continues to have negative five-year average annual return (figure 7, middle panel).

All four Russell style indexes in figure 7 (lower panel) had positive returns in 2005 although not as large as in the previous years. The Russell 1000 Value had the highest growth in 2005, 7.1 percent. The Russell 1000 Large-Cap increased 6.3 percent, the Russell Growth gained 5.3 percent and the Russell 2000 Small-Cap earned the least, 4.6 percent. The Russell 1000 Growth index had a negative average annual return in the last five years.

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 to 5.3 percent in the fourth quarter, below the 7.1 percent historical average annual growth rate. During the fourth quarter the price-earnings ratio for the S&P Smallcap 600 decreased to 20.6 from 22.3. (figure 8).

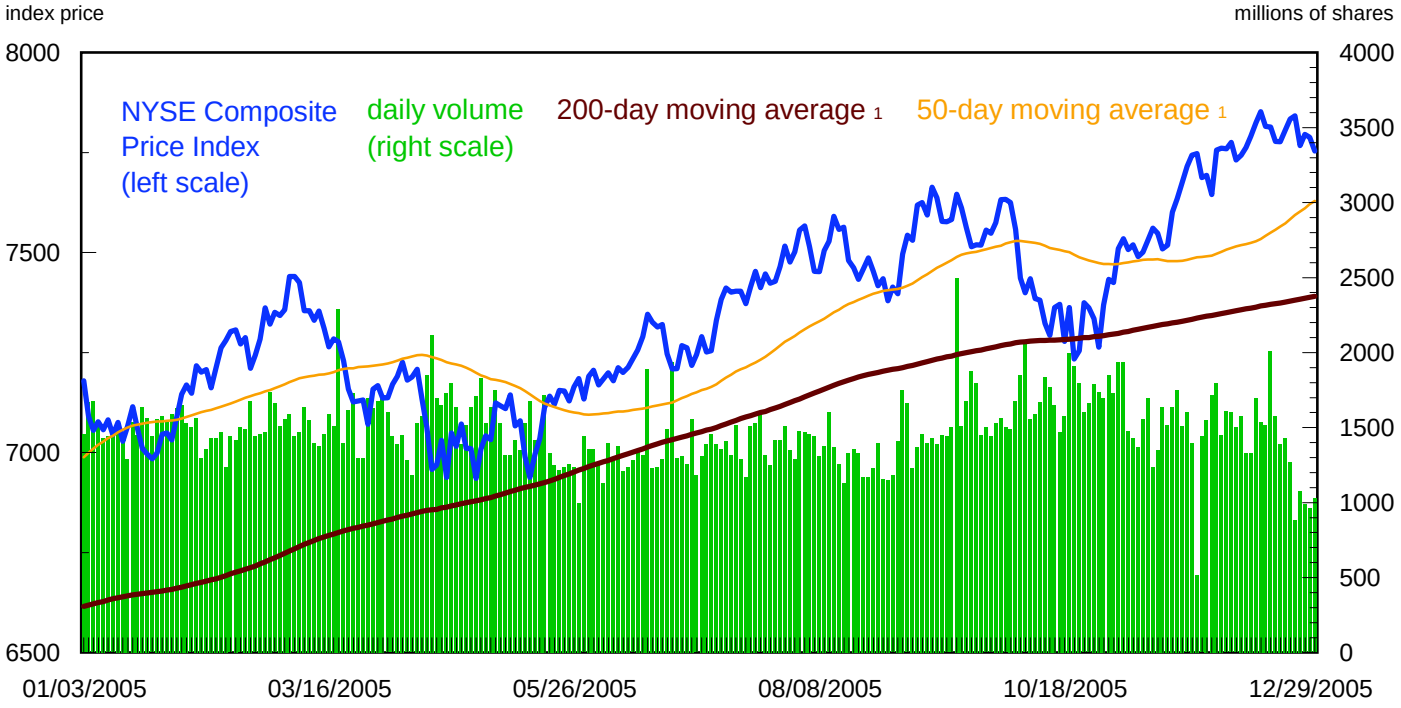
The Stock Market Report is now available to the general public. The current issue, as well as previous editions, can be found at our public website, http://www.bos.frb.org/economic/smr/smr.htm.

Please contact Maria Giduskova for questions and comments at Maria.Giduskova@bos.frb.org, or by phone at (617) 973-3198.

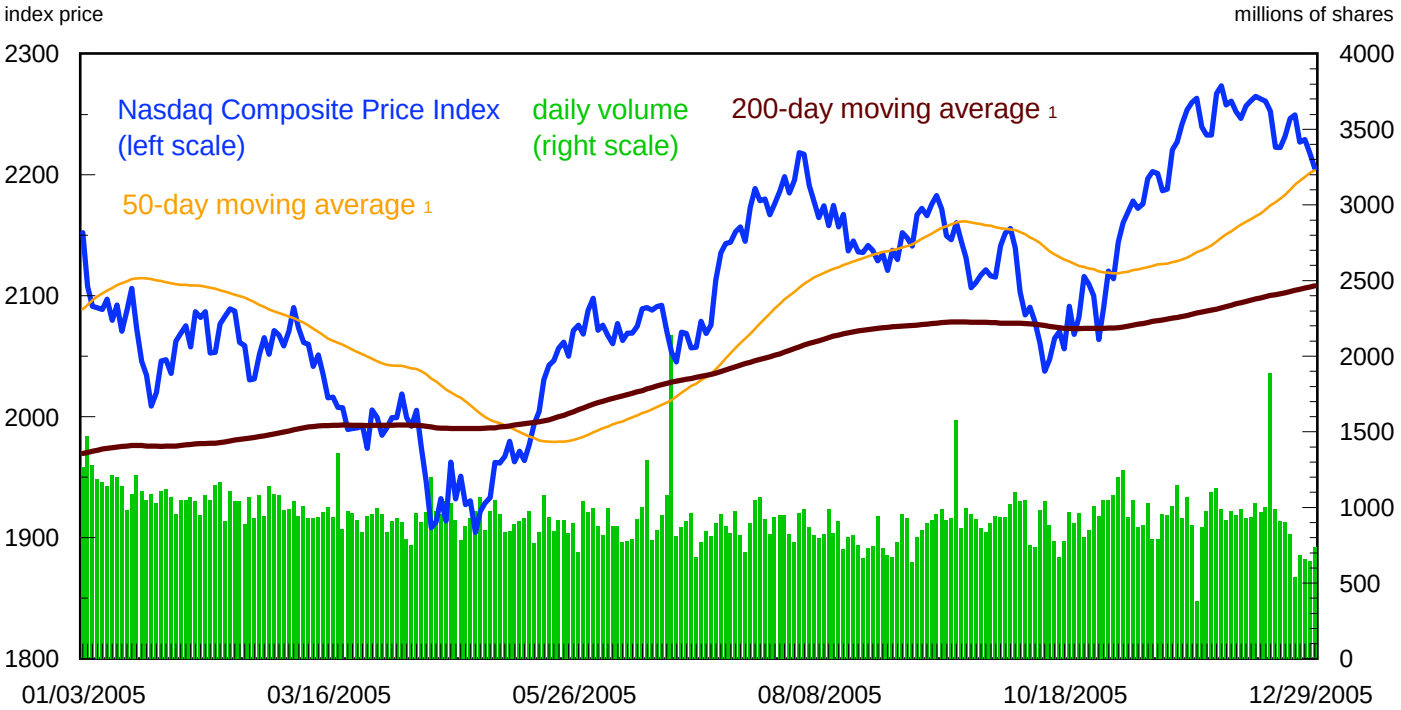
Figure 1

Daily Trends of Major U.S. Stock Exchanges

New York Stock Exchange



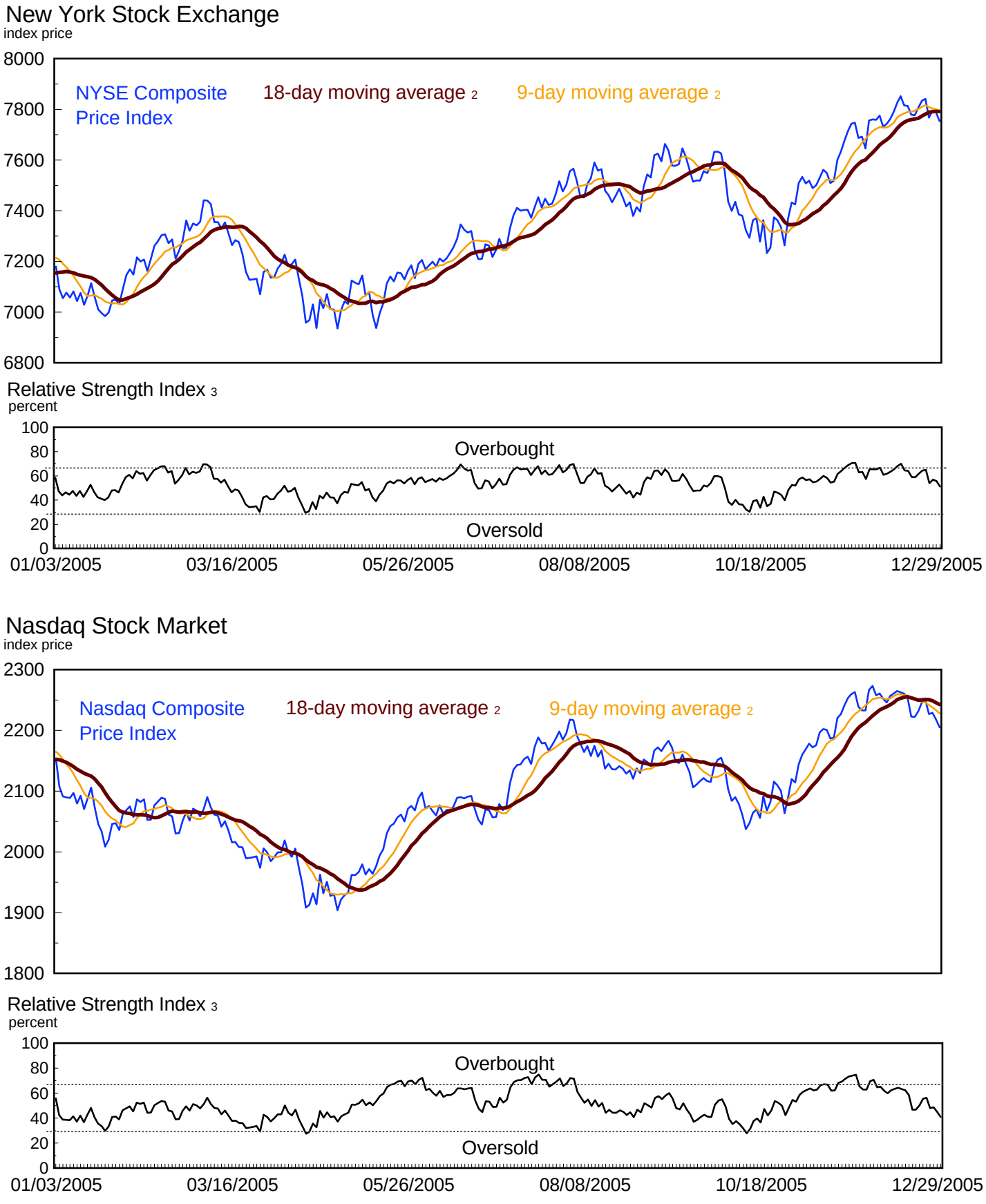
Nasdaq Stock Market



Source: Bloomberg, L.P.

Figure 2

Moving Averages and Relative Strength

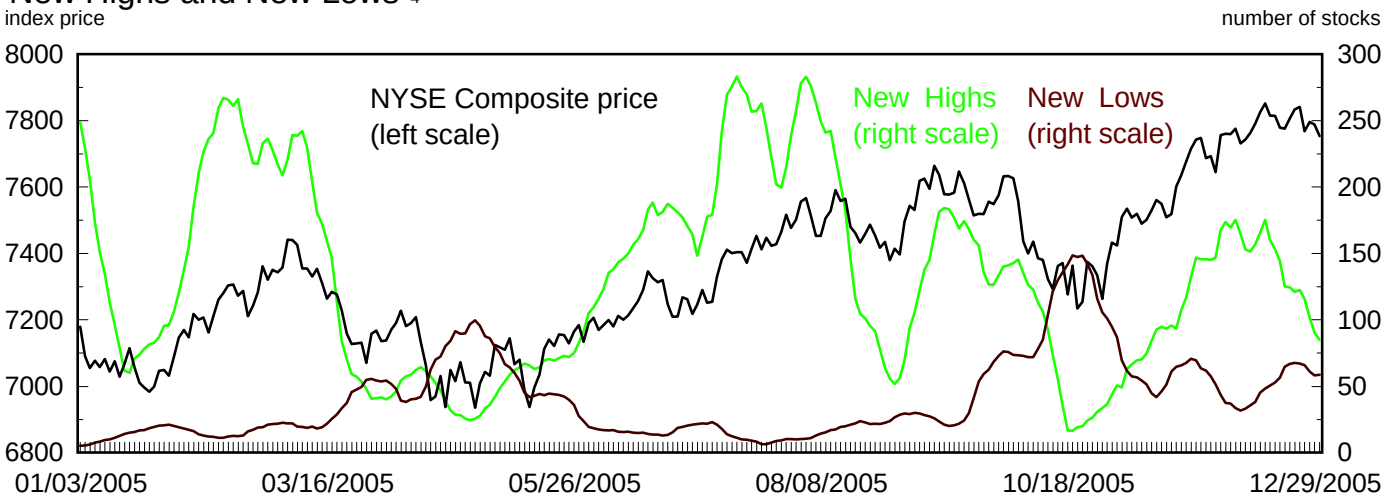


Source: Bloomberg, L.P.

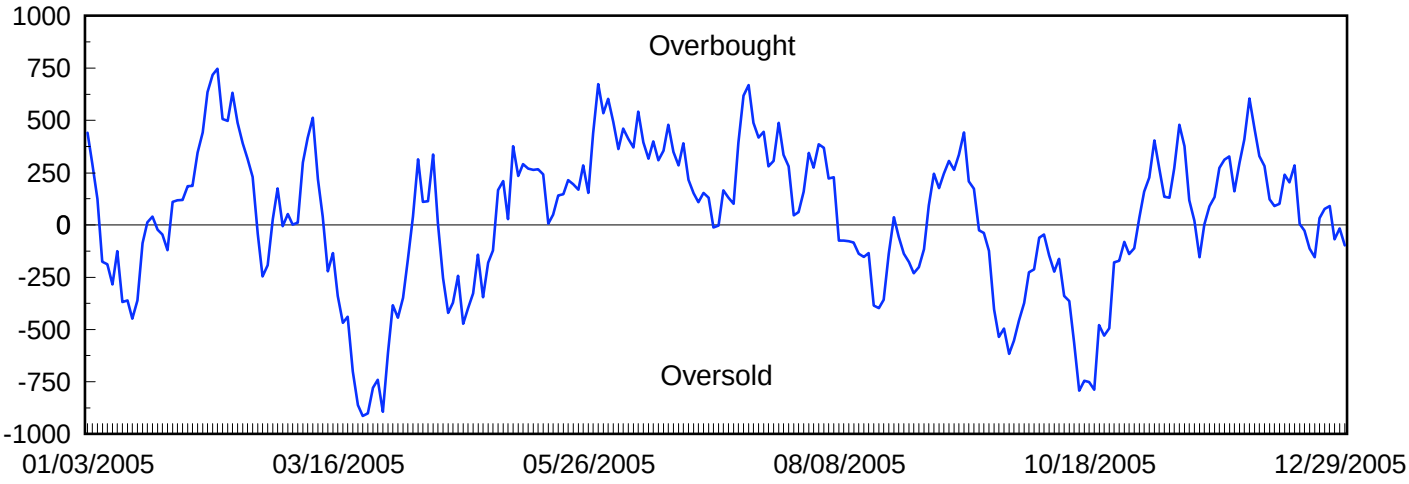
Figure 3

Index Breadth and Momentum Indicators - New York Stock Exchange

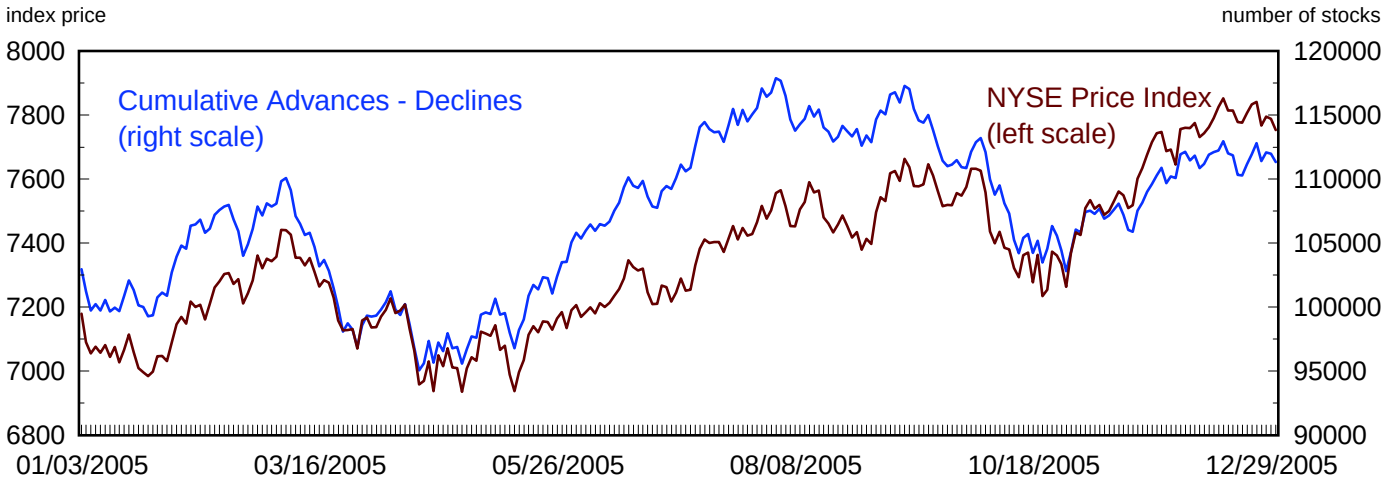
New Highs and New Lows [4]



Momentum Oscillator [5]



Market Breadth [6]

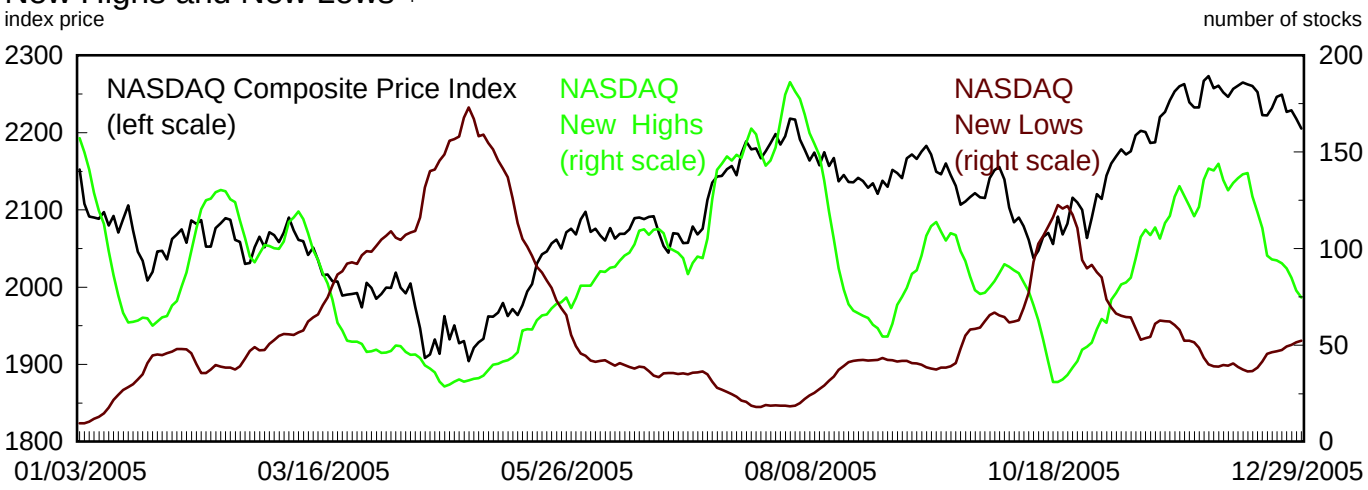


Source: Bloomberg, L.P.

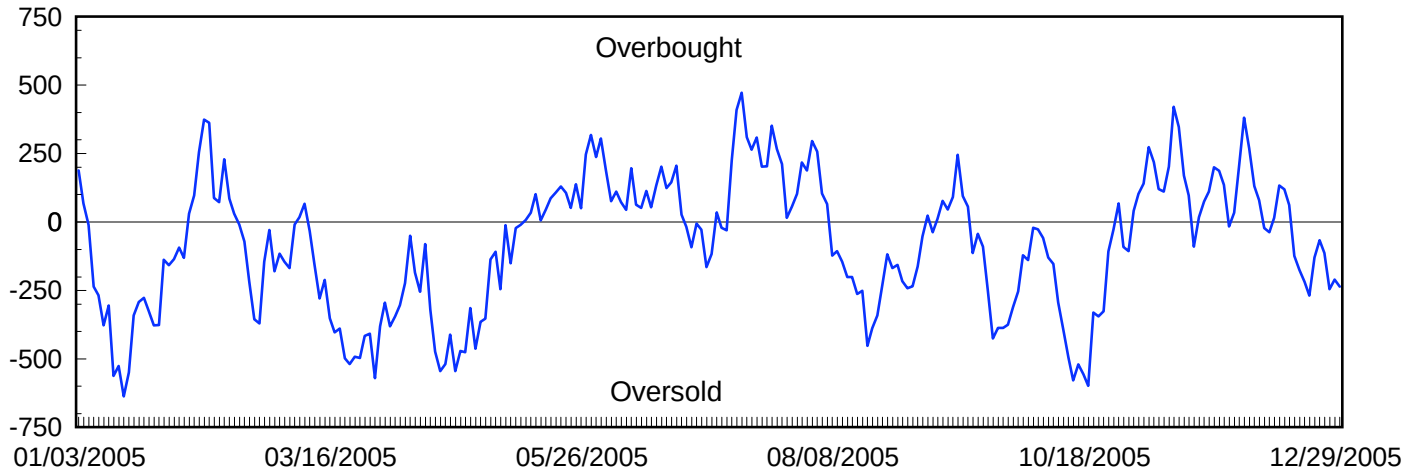
Figure 4

Index Breadth and Momentum Indicators - Nasdaq Stock Market

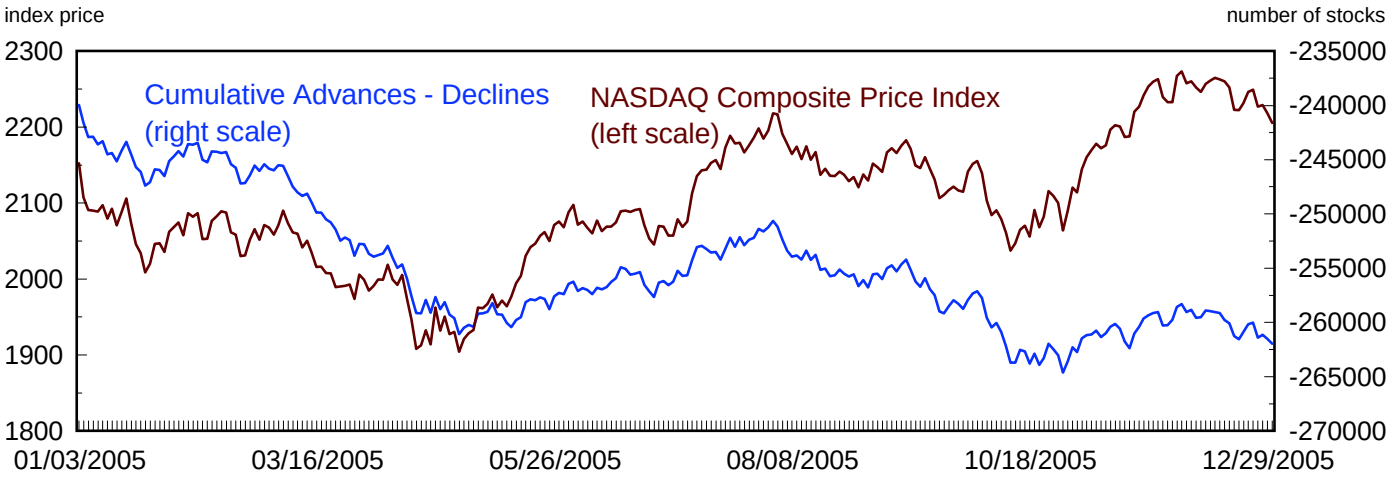
New Highs and New Lows [4]



Momentum Oscillator [5]



Market Breadth [6]

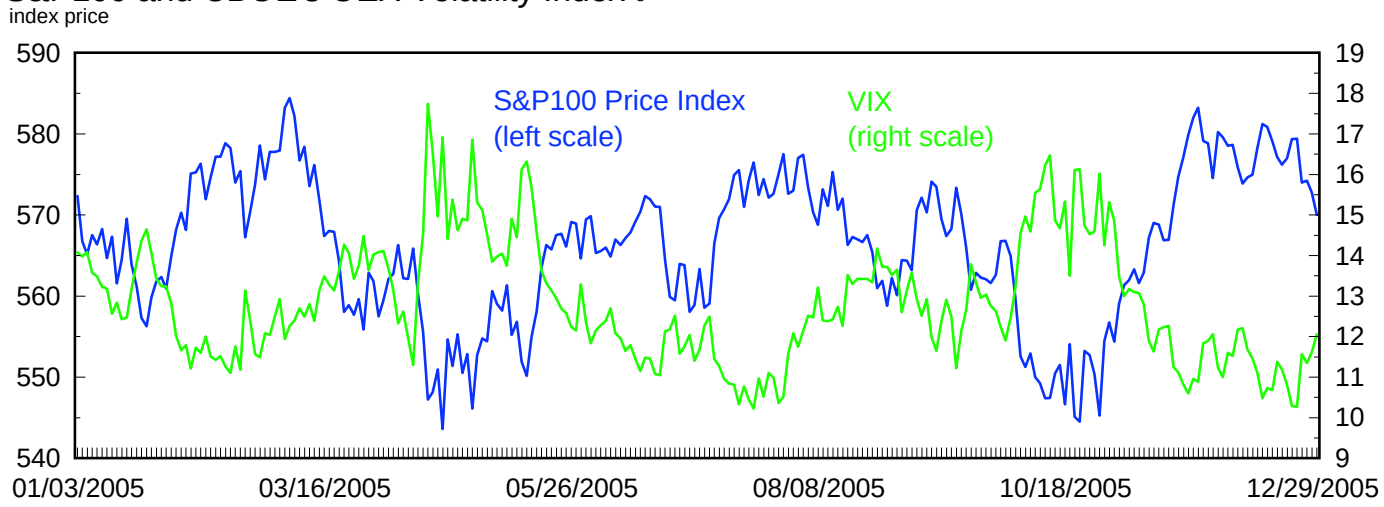


Source: Bloomberg, L.P.

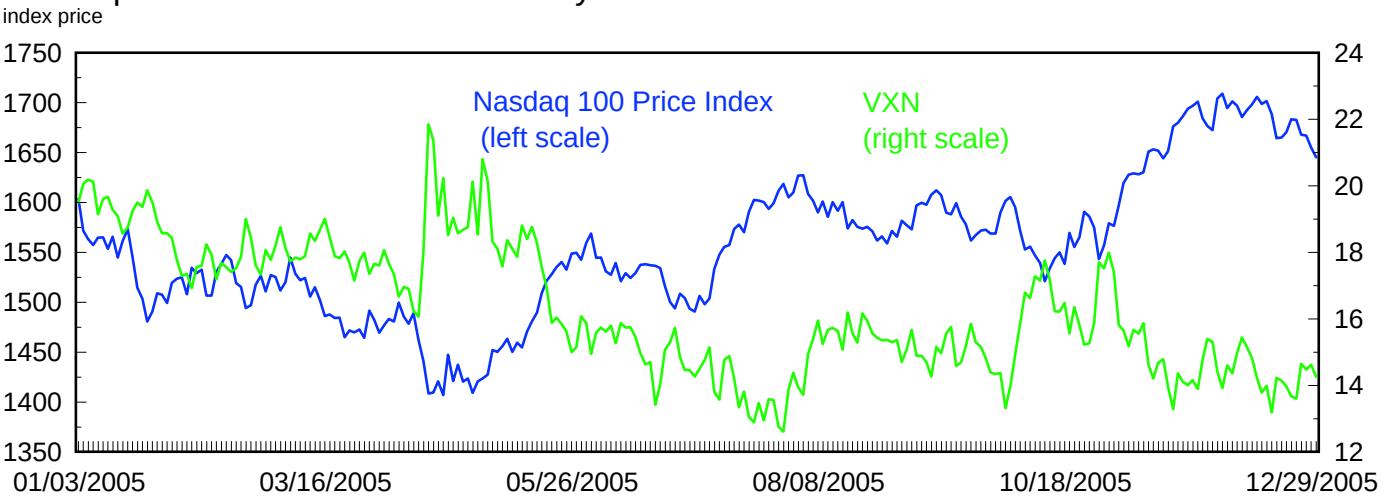
Figure 5

Volatility [7]

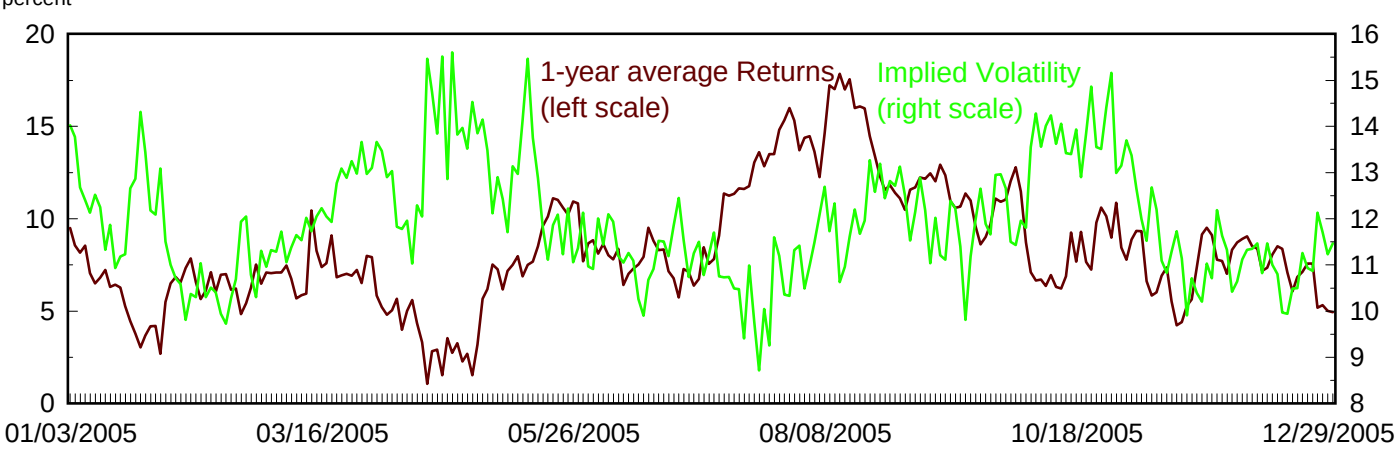
S&P100 and CBOE's OEX Volatility Index [8]



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



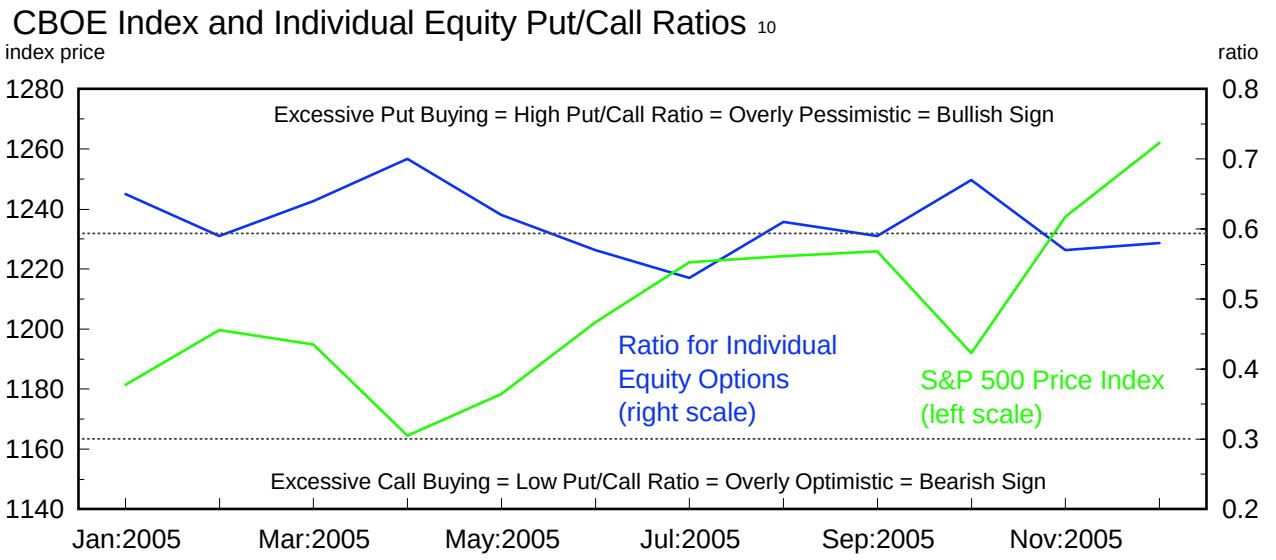
S&P500 Index Return and Implied Volatility

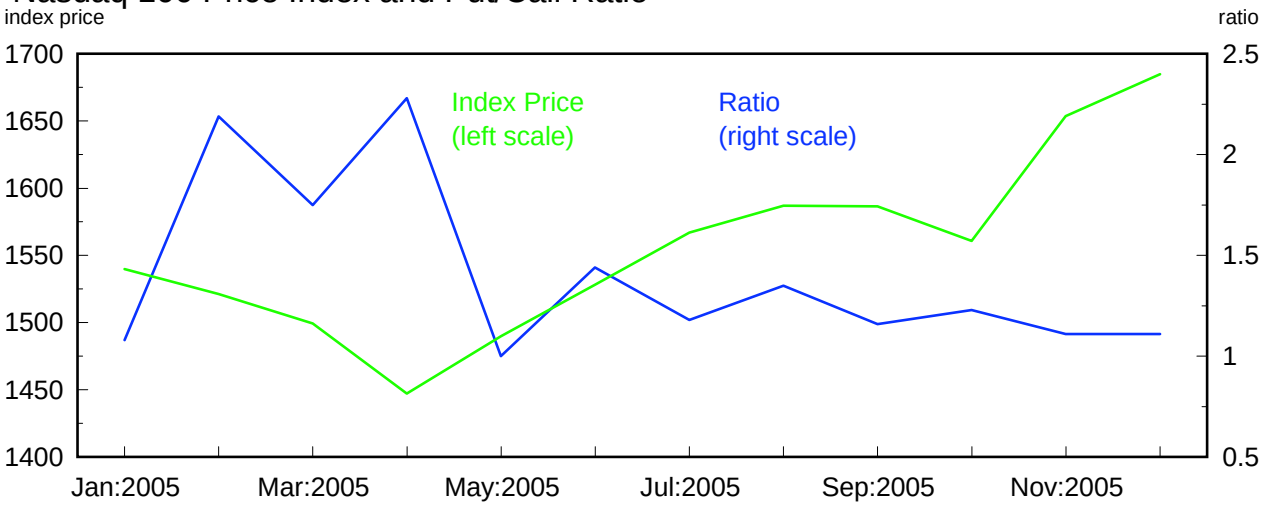


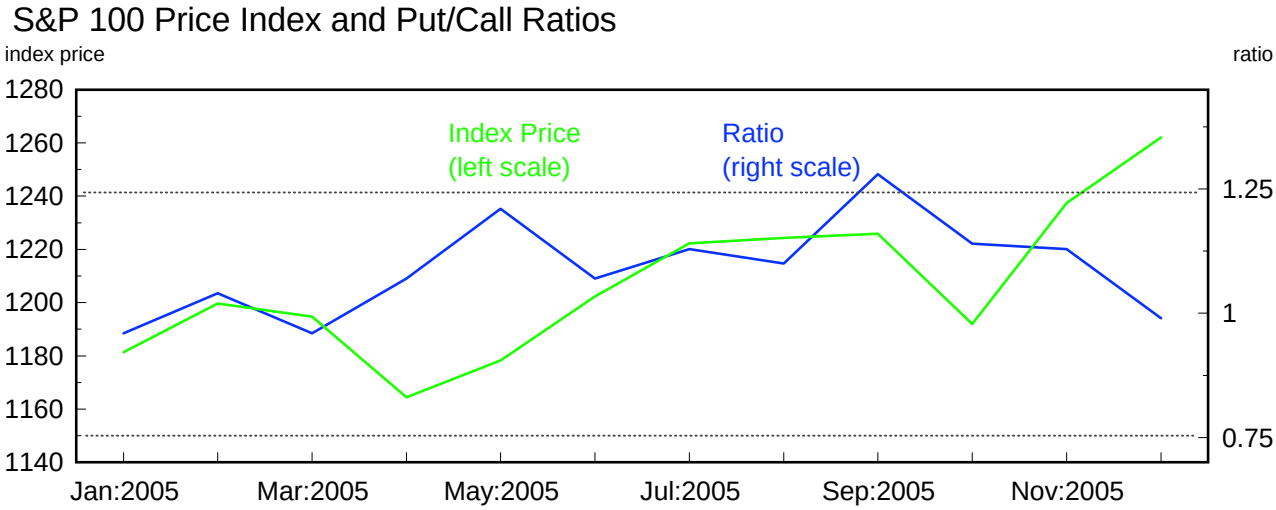
Source: Bloomberg, L.P.

Figure 6

Put / Call Ratio



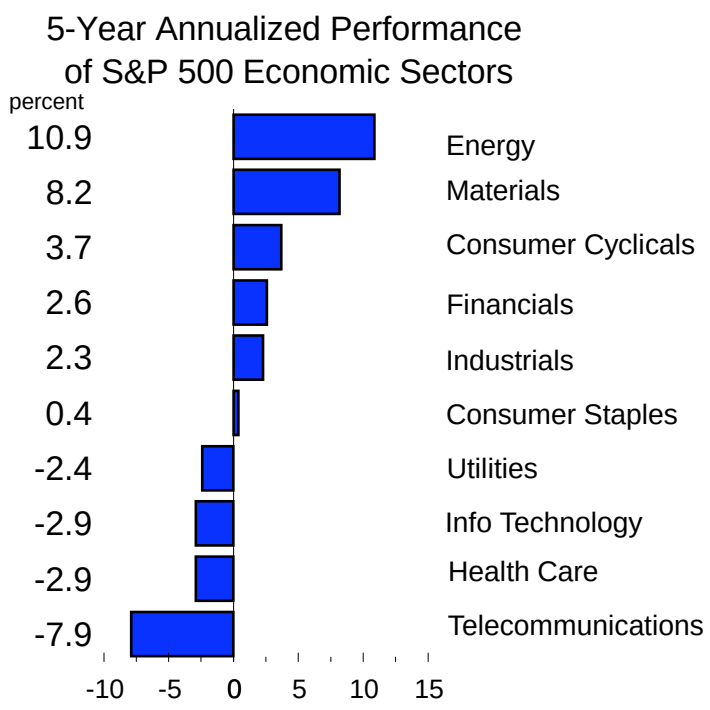


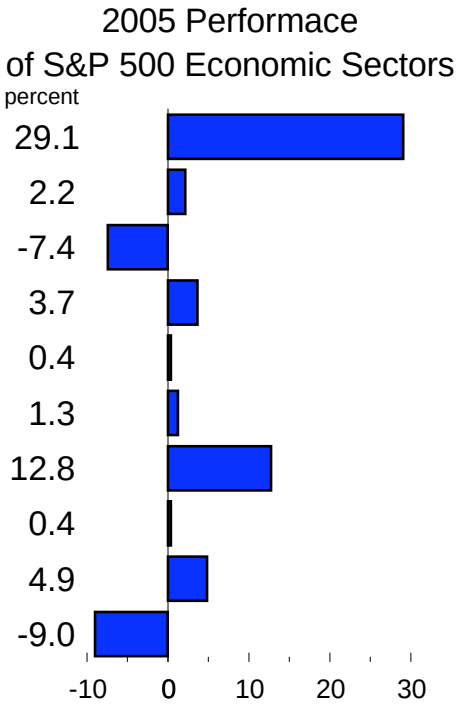


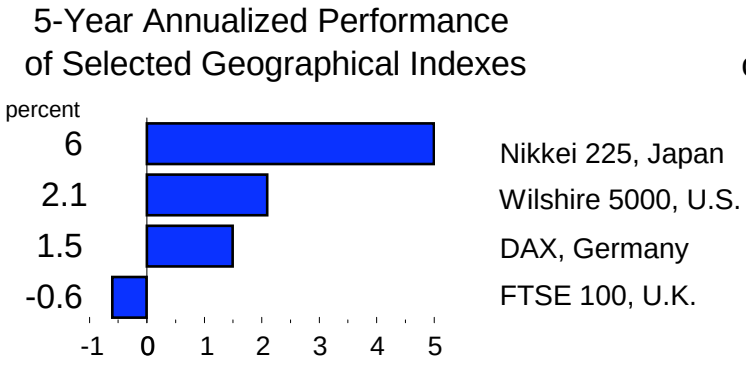
Source: Haver Analytics

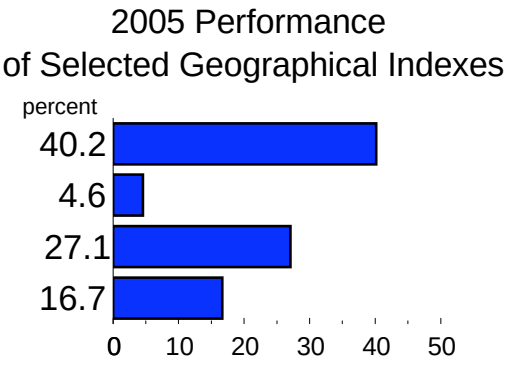
Figure 7

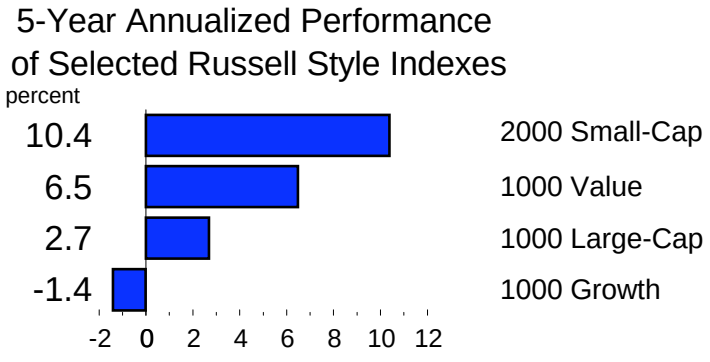
S&P 500 Economic Sectors - Index Returns

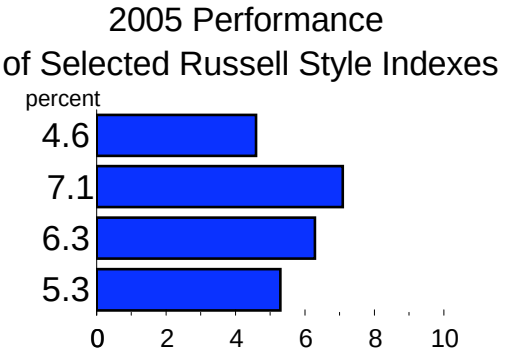








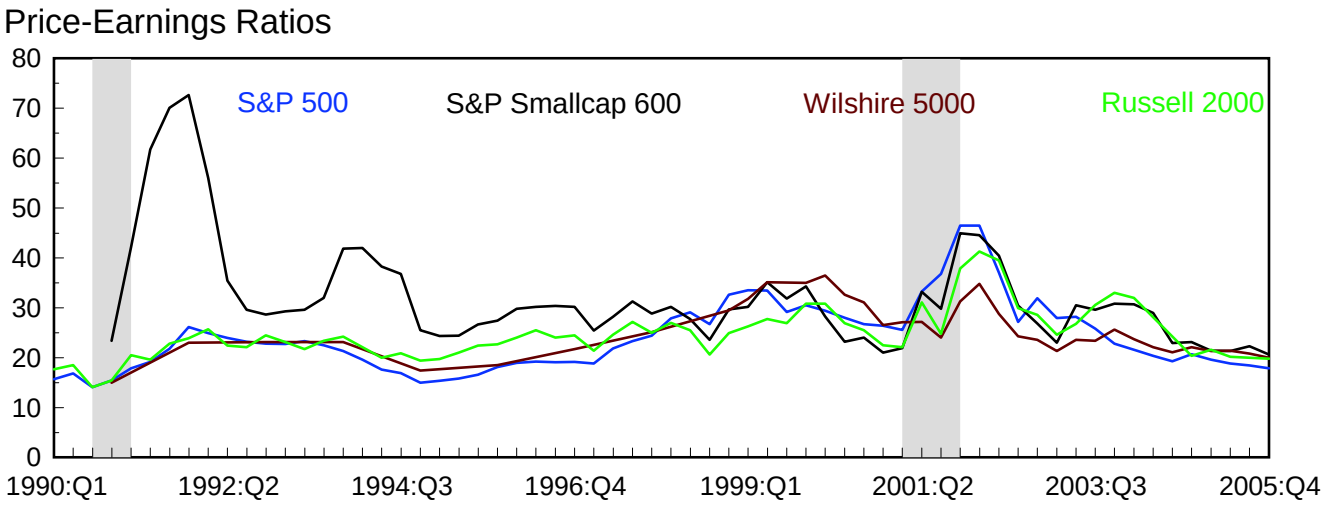


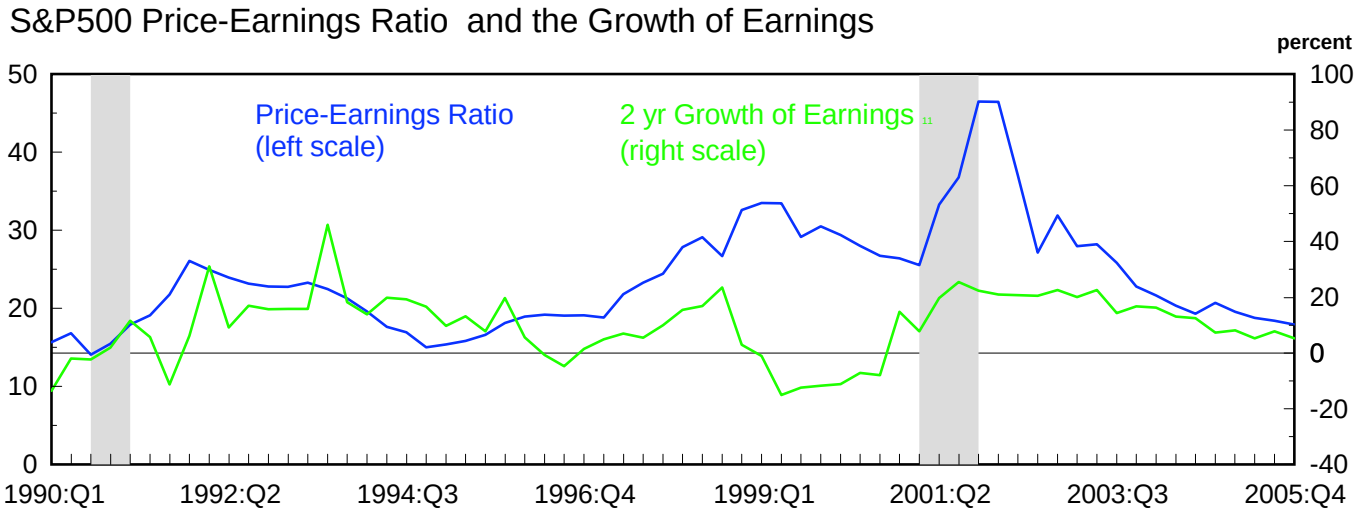


Source: Bloomberg, L.P.

Figure 8

PE Ratios and the Growth of Earnings





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

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.

1. 50-Day, 200-Day Moving Average: 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 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 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.

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. Technical analysts refer to this as a lack of downside conviction, or 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 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 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 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 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 price and stock index level, 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 S&P 100 (AMEX: 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. Some traders use it as a general indication of index option implied volatility. (Source: CBOE)

9. CBOE Nasdaq 100 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 Ratios: These ratios are used 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 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. 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 chose 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 has hedged her bet by purchasing puts option contracts, which cost a fraction of the underlying asset. Because of this institutional presence there is more put buying of index options compared with 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 can lead to a short-term rally in response to this 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.

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