



# U.S. Equities: Overvalued or Undervalued?

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*“Be fearful when others are greedy, and greedy when others are fearful.” -Warren Buffett*

*“... valuing the market has nothing to do with where it's going to go next week or next month or next year, a line of thought we never get into. The fact is that markets behave in ways, sometimes for a very long stretch, that are not linked to value. Sooner or later, though, value counts.” Warren Buffett*

*“The less prudence with which others conduct their affairs, the greater the prudence with which we should conduct our own affairs.” -Warren Buffett*

*“All intelligent investing is value investing - acquiring more than you are paying for. You must value the business in order to value the stock.” - Charlie Munger*

As the U.S. equity markets continue to defy gravity, the chasm between those who suggest that U.S. equities are overvalued and those who believe they are undervalued is widening. The debate on market's valuations is linked to the debate on U.S. corporate profit margins, a topic we discussed in one of our earlier articles.

Those who believe U.S. equities are undervalued put forward two key reasons: low interest rates and consequently low discount rates are in an environment characterized as the new normal; and that U.S. equities aren't all that expensive on price-to-earnings basis. As we showed in our corporate profit margins paper, U.S. corporate profit margins are in the “wonderland” region and corporate earnings are susceptible to the mean reversion of profit margins.

As such, arguments in favor of U.S. equities being undervalued rest to a large extent on the assumption that corporate profit margins will stay elevated and on the continued omnipotence of central bankers.

Calculating fair value based on earnings that are far away from their sustainable level and assigning multiples to such earnings based on interest rates that have nothing to do with natural rates of interest is an exercise in futility; a folly similar to that of assigning value to shares of a company without any effort to value the business (refer to the addendum for a discussion of natural rates of interest and

their significance for valuation).

## Top-down valuation tools

An analyst has a variety of valuation tools at his/her disposal. In selecting one, an analyst needs to understand its applicability and limitations. All valuation models can be classified in two ways: asset-based valuation (ABV) tools and cash-flow-based valuation (CFV) tools.

In case of ABV tools, the analyst tries to assess the cost of reproducing the business. The underlying premise of such a valuation process is that the value of a business is related to the cost of reproducing the assets underlying the business. This relationship is driven by entrepreneurial actions such that where market valuations are well in excess of their reproduction costs, due to temporarily higher returns in excess of the cost of equity, entrepreneurs will establish businesses and attract capital. Once set in motion, this increased inflow (outflow) of capital drives market valuations back down (up) towards reproduction costs. ABV tools are particularly appropriate for use in businesses that have low barriers to entry.

In case of CFV processes, the analyst is trying to estimate the future cash flows that will be generated by the business. Here, a business' value from the equity owner's point of view is equal to the discounted value of future cash flows belonging to the equity owner. Key issues with such valuation models include sustainability of cash flows, the choice of discount rates and the derivation of appropriate growth rates. Given these issues, market participants have resorted to shortcuts, which are used as proxies for CFV processes. Price-to-earnings and price-to-sales ratios are examples of such shortcuts. CFV tools are particularly appropriate in cases where there are high barriers to entry.

Over the years, market participants have devised extensions to these tools to value overall equity markets/indices. Chief among these tools are Cyclically Adjusted Price to Earnings (CAPE) ratio, Tobin's Q-ratio, the regression trendline, market capitalization-to-GNP<sup>1</sup> (which is widely known as Buffett's valuation indicator), and the trailing price-to-earnings ratio.

In the discussion that follows, we summarize each one of these valuation tools. We conclude this paper by offering our opinion on the market's current valuation status.

## CAPE

Nearly three quarters of a century ago, Benjamin Graham advocated using average earnings as a way of approximating the earnings power of a company. Graham differentiated between earnings power based on past earnings and future earnings by terming them *past earnings power* and *future earnings power*. In his book, *Irrational Exuberance*, Robert Shiller expanded upon *past earnings power* by using 10-year average of inflation-adjusted earnings, a measure that is now widely known as CAPE or P/E10.

CAPE is in the CFV class of valuation tools, i.e., cash flow based valuation tools. By using a 10-year smoothing process, CAPE tackles the problem of sustainable level of cash flows related to the ebb and flow of business cycles. Figure 1 plots the CAPE ratio along with its long-term mean and standard

deviation bands<sup>2</sup>. Given the extreme nature of the dot-com technology bubble<sup>3</sup>, we have excluded CAPE ratios between 1994 and 2003 while calculating the mean and standard deviation bands. As is seen, CAPE ratio is currently two standard deviation levels above its mean.

**Figure 1** <sup>4</sup>

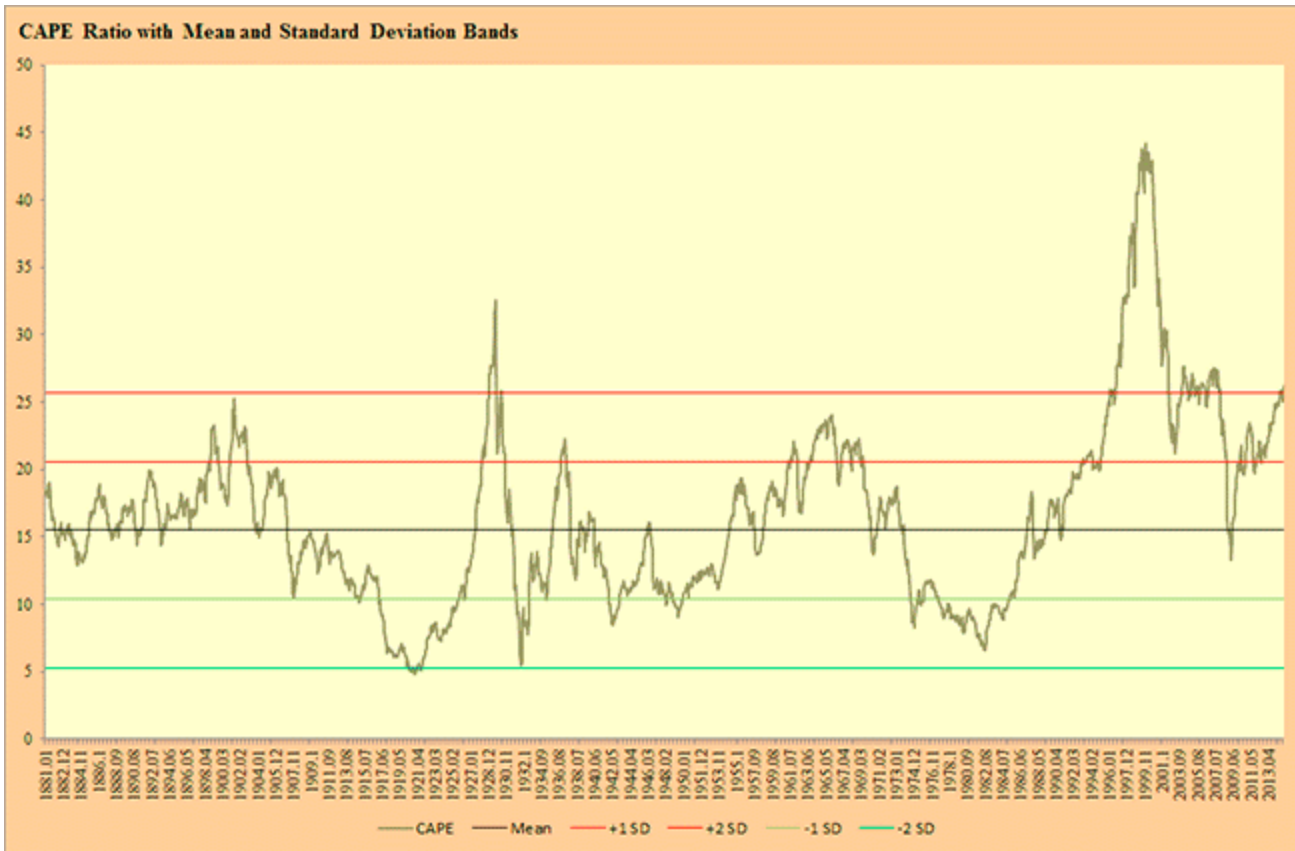
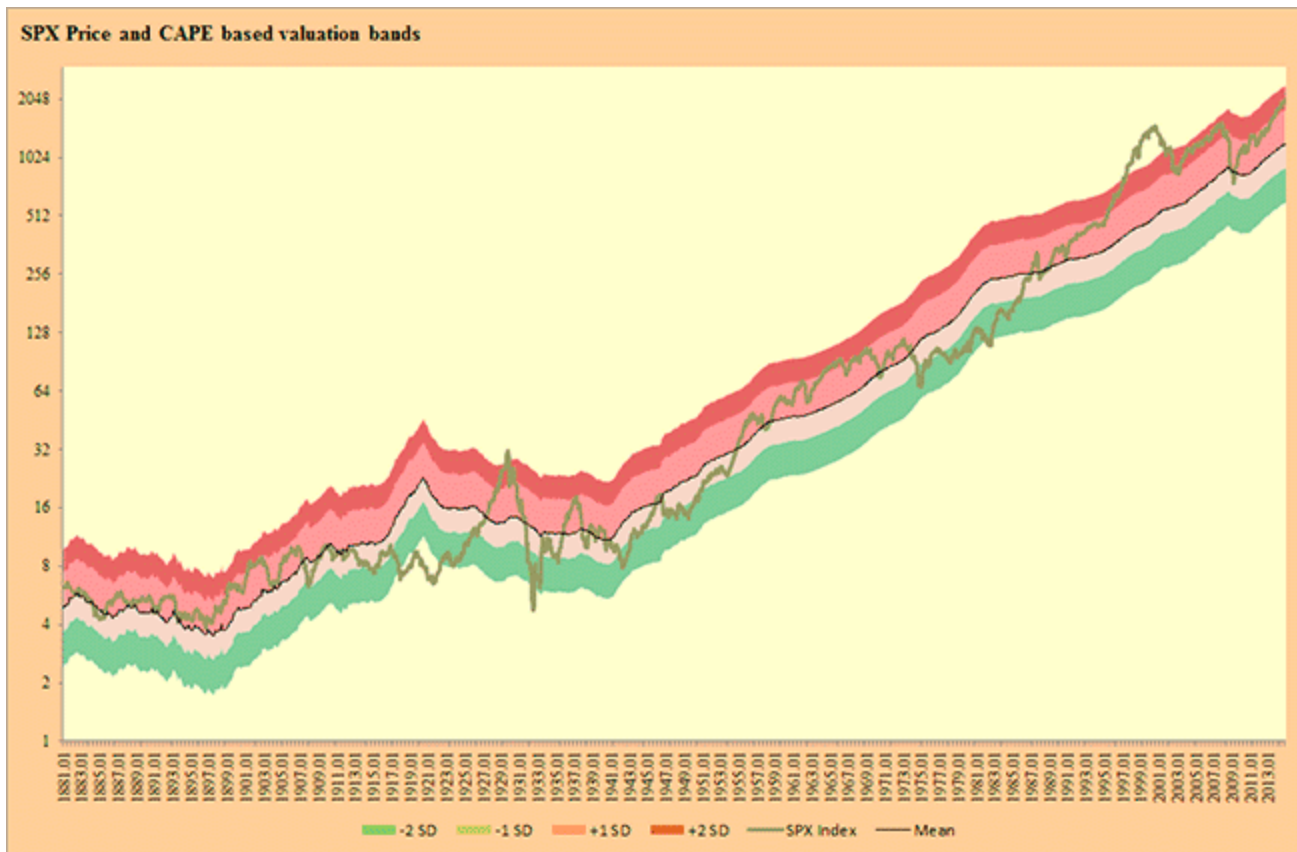


Figure 2 shows fair value based on CAPE and upper and lower ranges around that fair value. Fair value is derived by multiplying the mean CAPE value by the cyclically adjusted earnings applicable to that period. We then calculate and plot upper and lower ranges around the fair value so calculated<sup>5</sup>.

**Figure 2**



## Q-ratio

Q-ratio is in the ABV class of valuation tools, i.e., asset based valuation tools. The Q-ratio, propounded by James Tobin, is calculated by relating the market value of assets to their reproduction cost. The ratio is calculated by taking the market value of all equities as numerator and net worth as denominator<sup>6</sup>.

As the Q-ratio is calculated using balance sheet data and does not rely on income statement, this ratio is not affected by cyclicity of profit margins. However, to the extent that intangibles have become a larger part of the corporate net worth, the quality of net worth declines and becomes susceptible to write-offs of intangibles. Figure 3 shows the Q-ratio along with its long-term mean and standard deviation bands 1 above. Much like the CAPE, this ratio paints an over-valued picture with current valuations close to two standard deviation levels above the mean.

**Figure 3**

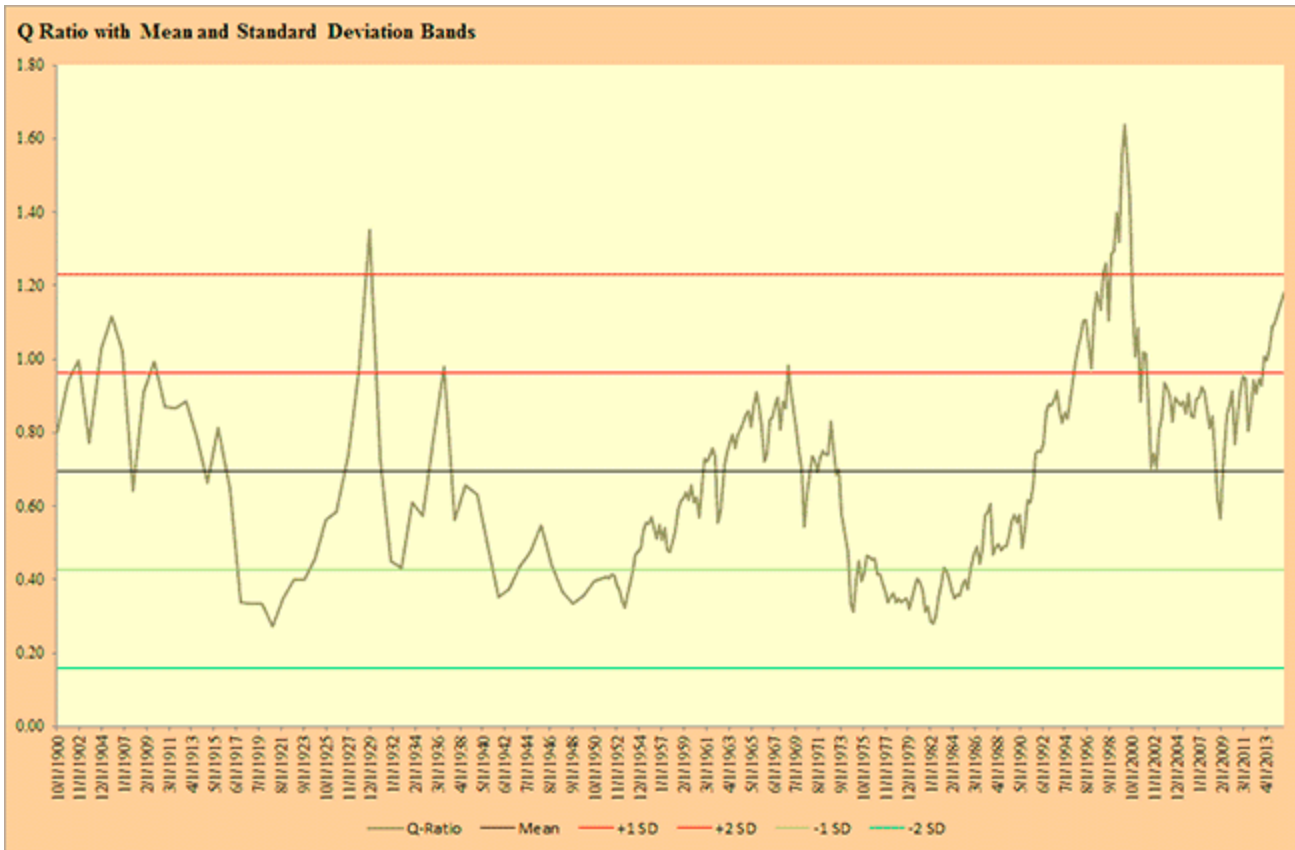
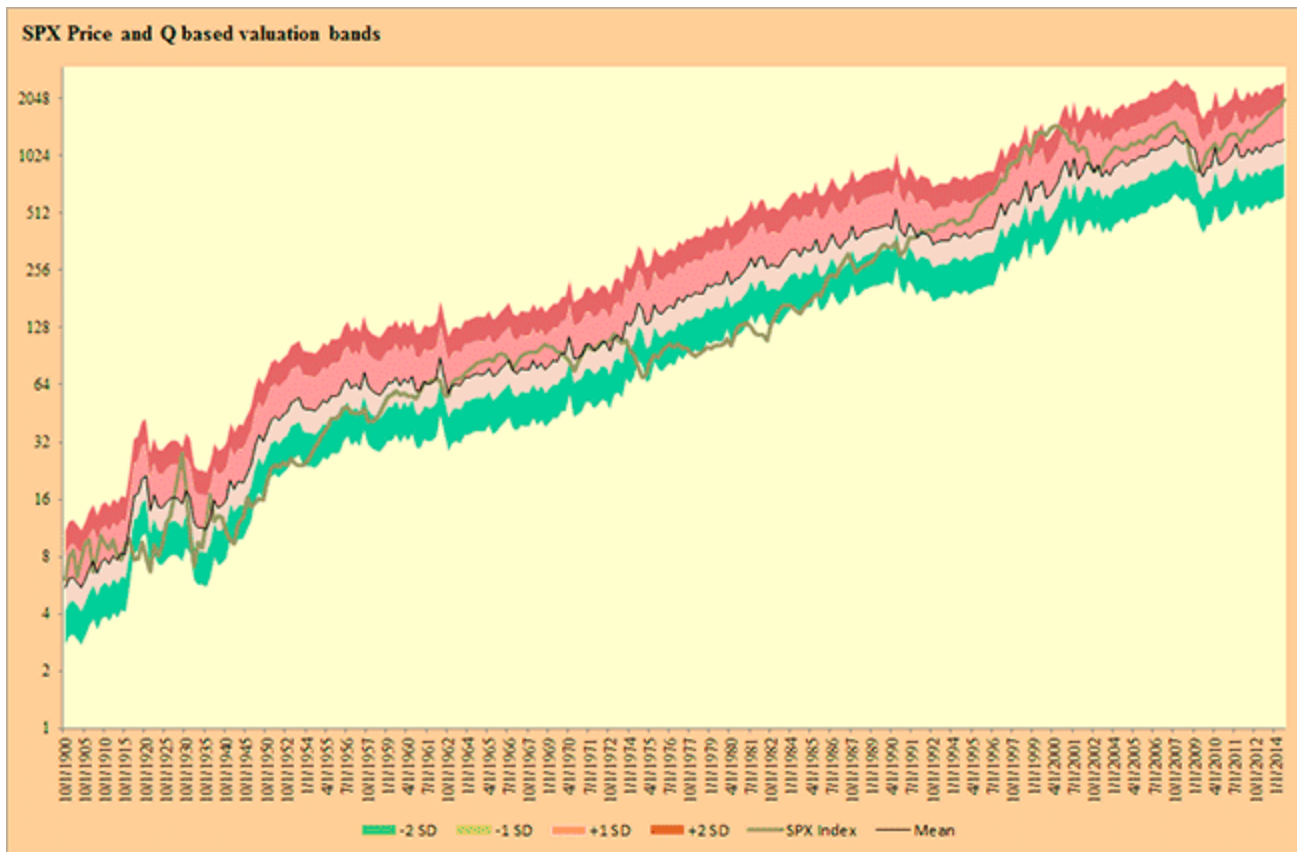


Figure 4 shows the S&P 500 index's price along with its fair value based on Q and upper and lower ranges around that fair value. Fair value is derived by adjusting SPX price to the mean Q-ratio. We then calculate and plot upper and lower ranges around the fair value so calculated<sup>4</sup> above.

**Figure 4**



## Regression trendline

In our article “Sources of Long-term Investment Returns,” we showed that equities have generated annualized returns of 8.9% over the last 130 years. Over the very long-term, this return approximates the exponential trend of the market portfolio that reinvests all dividends. The trend, as shown in Figure 5, is derived simply by running an exponential regression that uses time as the independent variable and inflation-adjusted S&P 500 price as the dependent variable<sup>7</sup>. Doug Short offers a summary of this process over time.

The trend model isn’t truly a valuation method *per se* and can, at best, be classified as a quantitative pricing model. This model relies on an implicit assumption that earnings/net worth of the S&P 500 will continue to grow at inflation-adjusted rates that are consistent with their historical inflation-adjusted growth rates. Figure 5 shows the inflation-adjusted S&P 500 price along with the regression trend based fair value and upper and lower ranges<sup>4</sup> above.

**Figure 5**

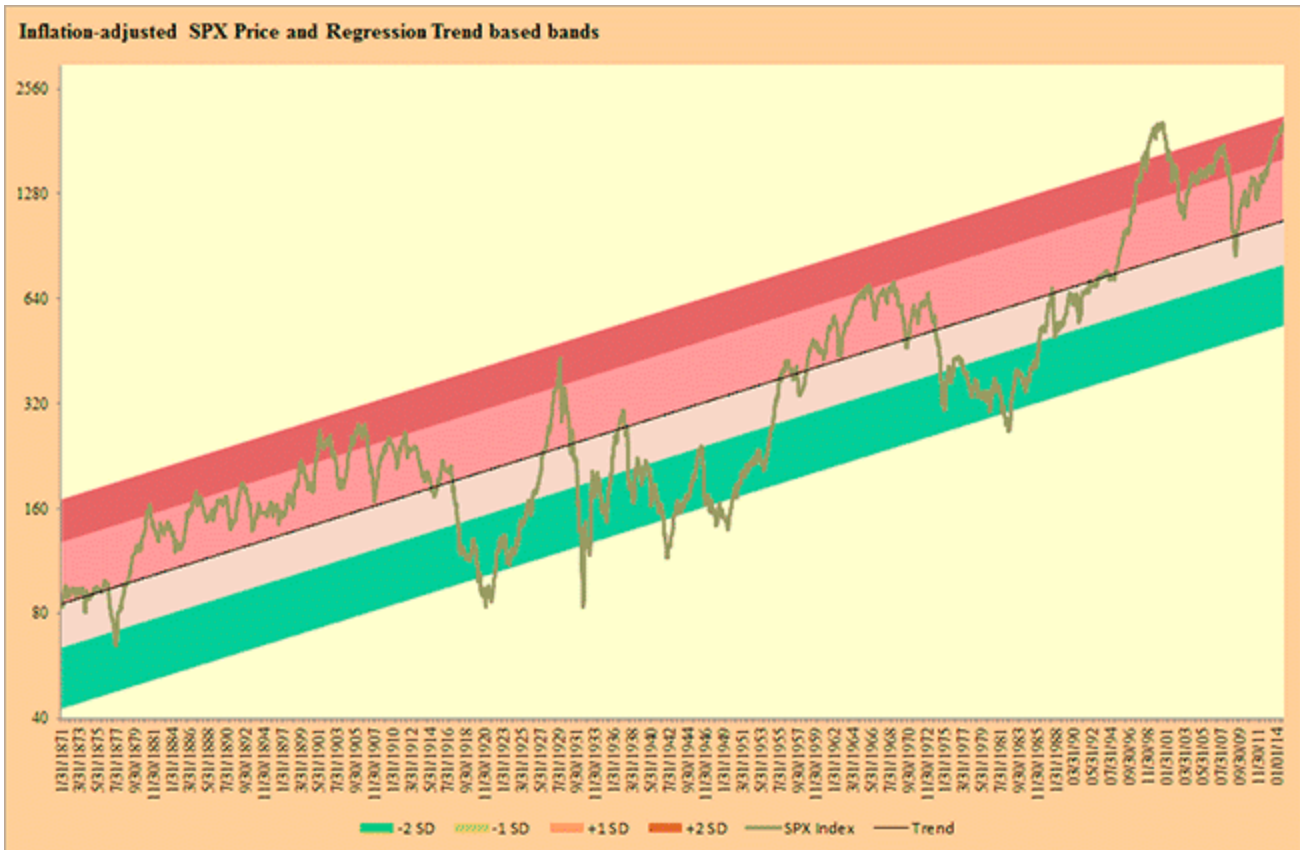
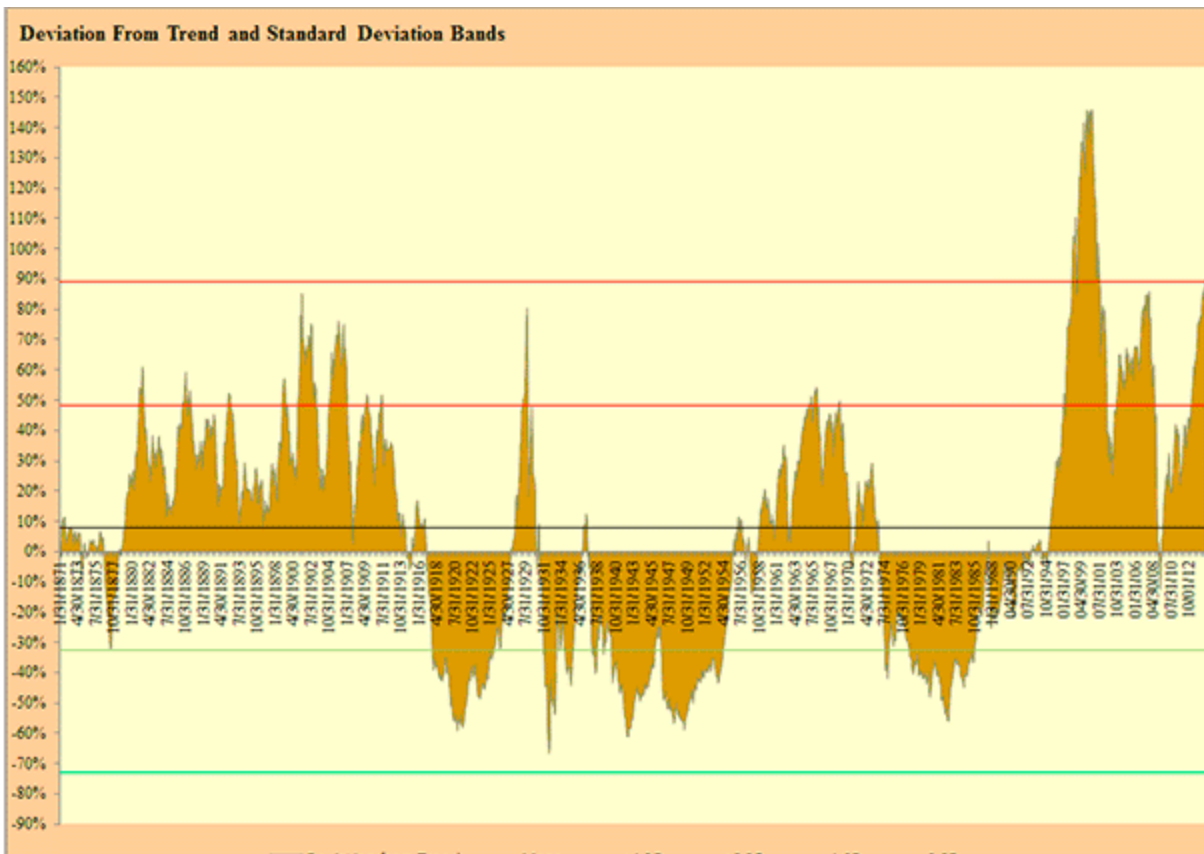


Figure 6 shows S&P 500's deviation from its trend with the black line representing the mean of deviations from the trend and standard deviation bands plotted around the mean. With valuations close to two standard deviation levels above the mean, this ratio is clearly in the caution zone.

**Figure 6**



## Market capitalization-to-GNP

Known as Buffett' indicator, this tool relates market value of equities to the country's GNP and belongs to the CFV class of valuation tools. This ratio is essentially an effort to simulate the price-to-sales ratio for the market with GNP serving as the proxy for sales. As is true with any sales based valuation multiple, profit margins are the essential bridge between sales and value. As we discussed in our article, "Why Jeremy Grantham is Right about Corporate Profit Margins," corporate profit margins are way above their long-term mean and susceptible to mean-reversion. The corporate profit margins are the key in understanding the divergence between this ratio and the price-to-earnings ratio.

While Buffett used the market value of publicly listed securities, we have calculated the ratio based on the market capitalization of all nonfinancial corporate equities. Market capitalization of all nonfinancial corporate equities represents the estimated market capitalization of all C and S corporations, publicly as well as privately held<sup>8</sup>. GNP is the market value of goods and services produced by U.S. residents, regardless of where they are located. Figure 7 shows the market capitalization-to-GNP ratio along with its mean and standard deviation bands around the mean<sup>1</sup> above. In terms of standard deviations from the mean, this ratio is the most extreme of all valuation ratios profiled in this article and paints a sobering picture of what investors should expect from equities over an extended investment horizon from here.

**Figure 7**



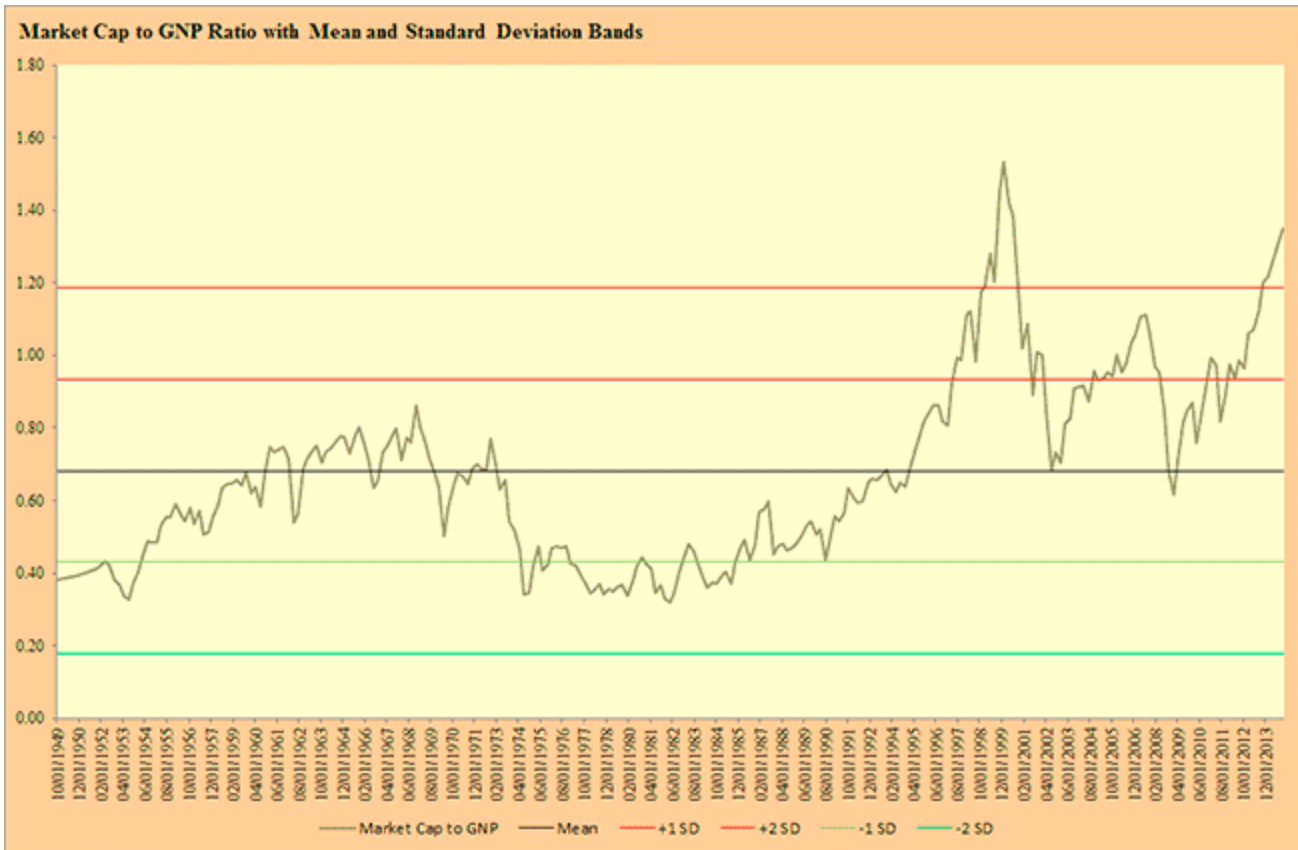
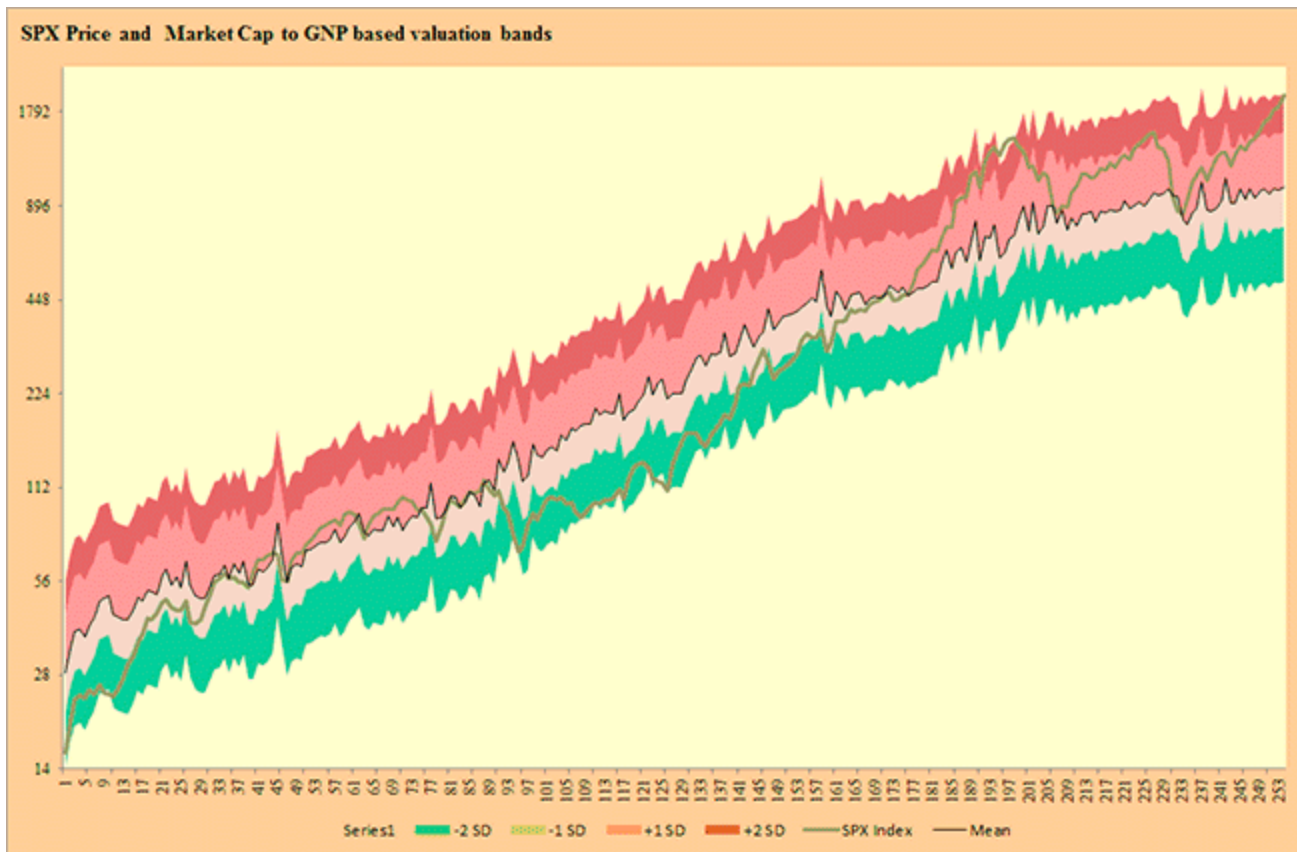


Figure 8 shows the S&P 500 index's price along with its fair value based on market cap-to-GNP ratio and upper and lower ranges around that fair value. Fair value is derived by adjusting SPX price to the mean of market to GNP ratio. We then calculate and plot upper and lower ranges around the fair value so calculated<sup>4</sup> above.

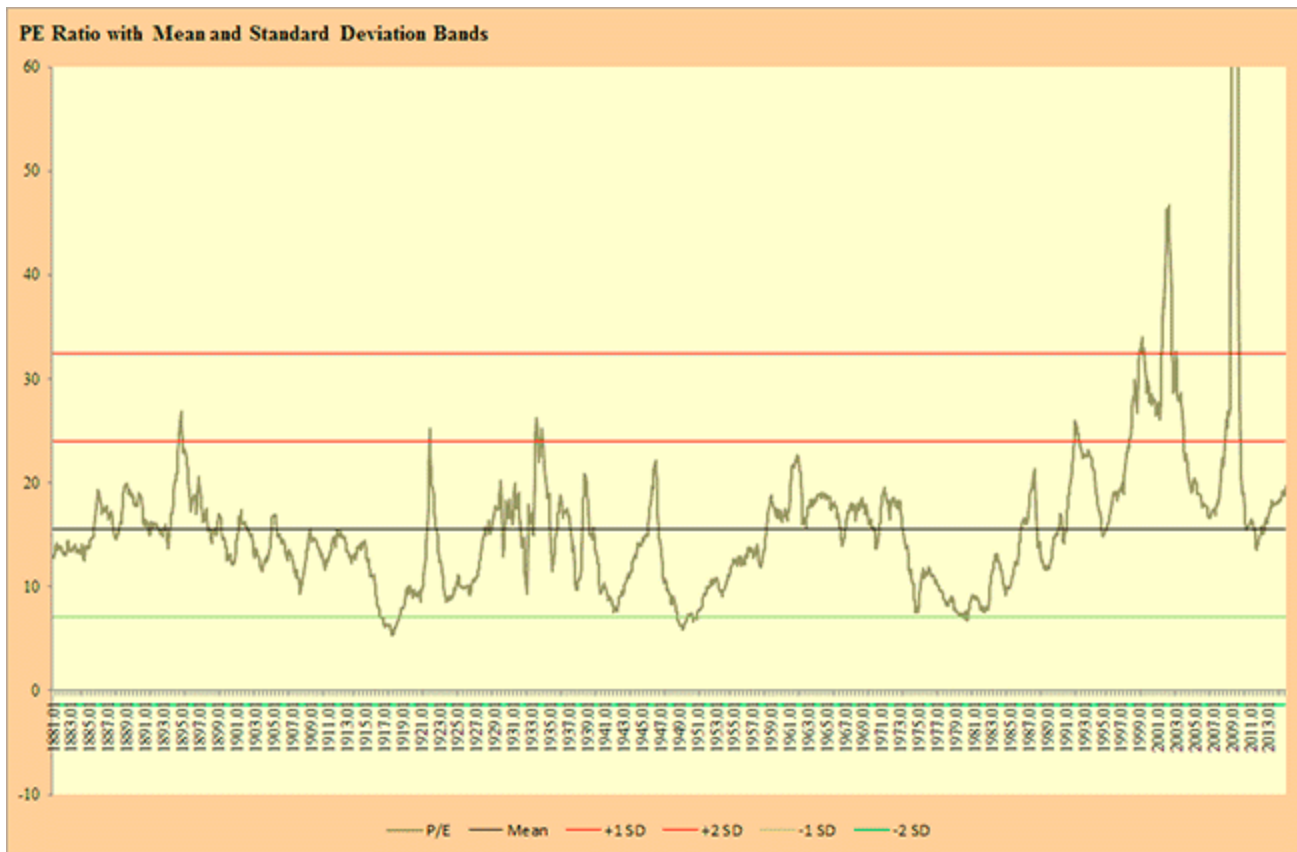
**Figure 8**



## Price-to-earnings ratio

We now come to Wall Street's favorite ratio, the P/E ratio. Figure 9 shows the P/E ratio along with its mean and standard deviation bands around the mean<sup>1</sup> above. As is seen, this ratio is the noisiest of all valuation tools profiled in this article and isn't very effective at identifying over or under-valuations. The primary issues with this ratio include problems related to cyclicity of earnings and the tendency of corporate profit margins to fluctuate quite significantly around their mean.

**Figure 9**

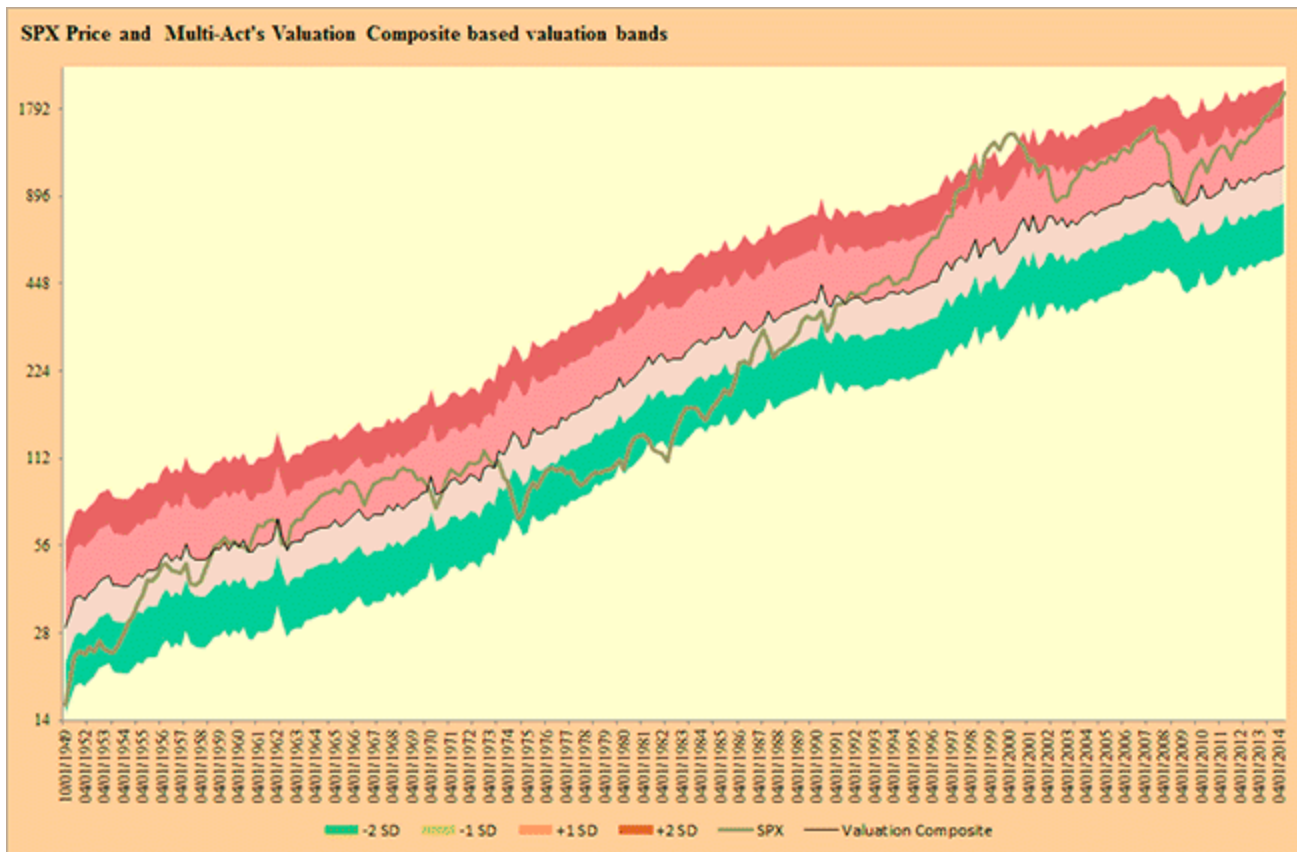


## Multi-Act’s top-down valuation composite

At Multi-Act, we prefer to combine valuation methodologies that offer differing perspectives in our efforts to assess valuation of businesses under consideration. Further, we believe that underlying business values do not fluctuate as wildly as stock prices do. In fact, business values are subject to significantly lower volatility. What this means is that models where valuations invariably follow prices and move in a highly correlated fashion are quite useless. Accordingly, our equity market valuation composite includes the CAPE, Q-ratio, trend and market cap-to-GNP ratios and ignores the P/E ratio.

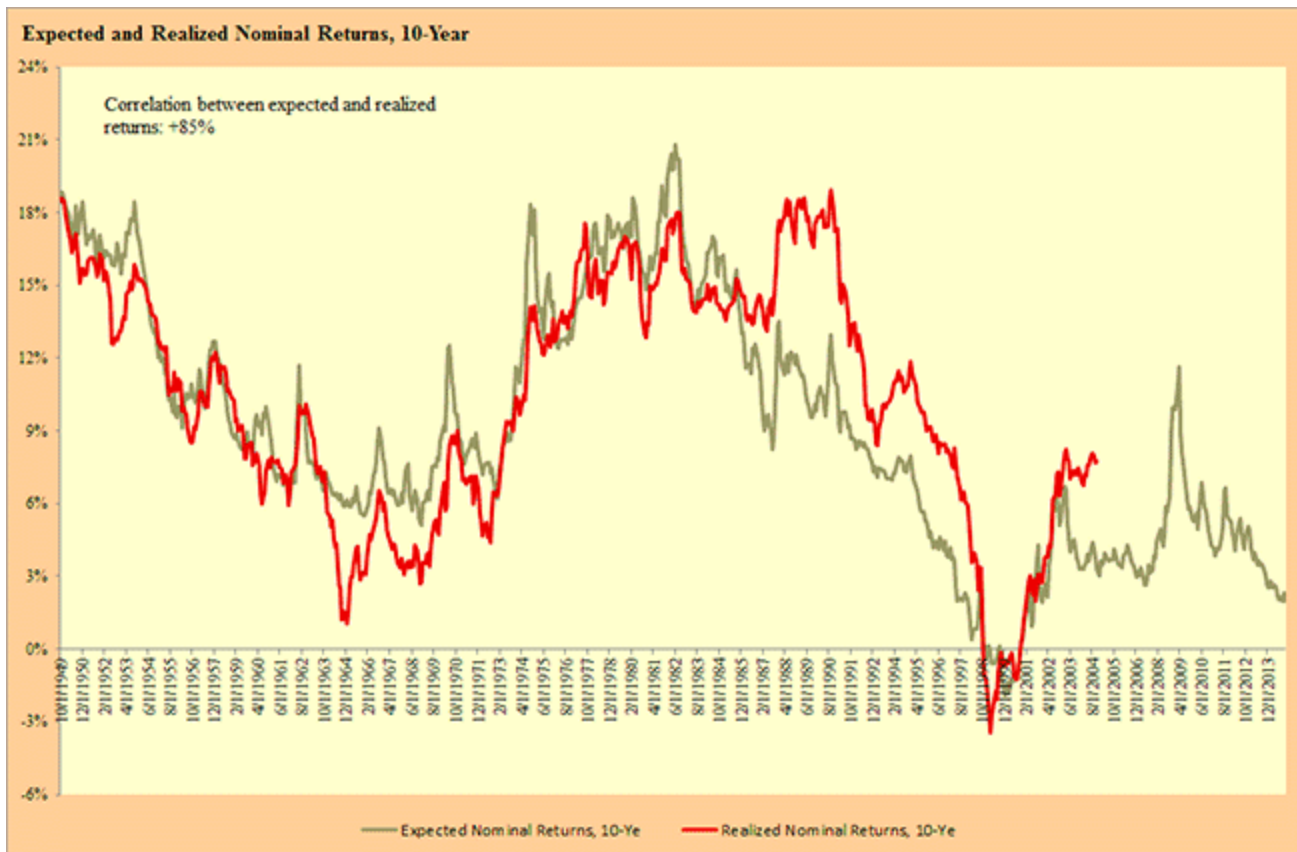
Figure 10 shows S&P 500 along with Multi-Act’s top-down valuation composite bands. As can be seen, SPX has spent a majority of the past two decades in the neutral zone – the area colored as light green and light salmon with almost all of the time spent above fair value. Interestingly, the equity markets currently are more expensive than they were at their peak in 2007.

**Figure 10**



Over the last few years, John Hussman has presented a useful framework for thinking about market valuations by plotting 10-year expected and realized returns. Currently, Hussman estimates prospective S&P 500 nominal returns of less than 1.4% annually over a 10-year time horizon. Figure 11 plots the expected and realized nominal 10-year returns for the S&P 500 index based on our valuation composite. Our estimate of the expected 10-year nominal returns is currently at 2.0%. This is worse than the expected return at the market peak in 2007, preceding the great financial crisis. However, expected returns are higher than they were at the peak of the tech bubble.

**Figure 11**



## Summary

The realized total return from U.S. equities has been 8.9% annually over the last 130 years. This is often the rate of return market participants require for investing in equities and have priced equities accordingly. Currently, our valuation composite suggests that equities are priced for 10-year expected nominal returns of 2.0%. Unless the required rate of return for U.S. equities has changed from approximately 9% to less than 2%, U.S. equities are overvalued. This doesn't mean that equity markets will drop tomorrow or even within the next year, but, as Warren Buffett has said, sooner or later, value counts. That said, keep this statement by A. Gary Shilling<sup>9</sup> in mind, "The market can remain irrational longer than you can remain solvent."

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## Addendum

### The natural rate of interest and valuations

*“I never attempt to make money on the stock market. I buy on the assumption that they could close the market the next day and not reopen it for five years.” – Warren Buffett*

As discussed earlier, when using CFV methods, valuation is assessed by discounting estimated future cash flows. A key variable affecting the discount rate in this process is the risk-free rate of interest. In general, most market participants utilize the market rate of interest on long-term Treasury bonds as a proxy for the risk-free rate.

We contend, instead, that the natural rate of interest is relevant for the purposes of valuations. While at most times, market rates serve as a good proxy for the natural rates, there are times when market rates are artificially low driven by central bank actions and are significantly different from natural rates of interest. The current environment is one of those times.

The natural rate of interest represents the time preference of market participants, specifically that of entrepreneurs (borrowers) and savers. Time preference is low when future consumption is favored over current consumption and *vice versa*. When time preference is low, people save more to increase future consumption. This, in turn, results in lower natural rates of interest. Without interventions by central banks, market rates of interest match the time preference of entrepreneurs with the time preference of savers. Low levels of interest rates serve as a signal to entrepreneurs that consumers want to consume more in the future, causing them to increase capital investments.

When central bank interventions artificially drive the market rates of interest to levels well below the natural rates of interest, incorrect signals are sent to entrepreneurs about time preference of consumers. Capital investments are made that weren't required by consumers and mal-investment results. Investors, who accept artificially lower interest rates as a proxy for risk-free rate, end up with the same fate.

Consider what can happen if you were to make an investment using discount rates based on artificially low interest rates and markets were to close the next day and reopen only after interest rates reverted to their natural levels. What happens to your investment? In all likelihood, your investment is now priced at much lower levels to reflect the higher interest rates. A much worse outcome could result if the company you invested in wasn't viable at the higher levels of interest rates that now prevail. Clearly, an investment decision that is driven primarily by artificially low levels of interest rates isn't well equipped to handle a situation where markets do not open for an extended period.

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1. We have used the market cap-to-GNP (instead of GDP) ratio because GNP represents all outputs of U.S. residents. Given that the market valuations are of corporations that are resident in the U.S., using GNP as against GDP is a better proposition.
  2. There is a certain look-ahead bias in the way this chart has been setup. The mean and standard deviation bands have been calculated using all data available on the date of calculation and the same mean and standard deviation bands have been plotted historically. As all this data was not available in the past, the mean and standard deviation levels when calculated at any specific point in the past, using data that was available at that time, will be somewhat different. The implicit assumption here is that the ratio's behavior doesn't change when looked over the long-term, i.e., the bands would have been more or less

the same in the past as well, if long-term data was used/available. However, this bias has no impact on the current readings / positioning of the model.

3. As per our calculations, the technology bubble was a six standard deviation event based on CAPE. As of the end of the year 1993, the average CAPE ratio was 14.7 and standard deviation of CAPE was 4.6. While the CAPE peaked at 44.2x, the six sigma threshold was 42.3x.
4. Data source: Robert Shiller, Online Data - Robert Shiller
5. Data source: Data for years from 1900 to 1950 taken from the spreadsheet provided by Andrew Smithers on <http://www.smithers.co.uk/page.php?id=51>. Smithers says that this data was sourced from Stephen Wright. Data from 1951 onwards was sourced from FRED, Federal Reserve Economic Data, Federal Reserve Bank of St. Louis: Nonfinancial Corporate Business; Corporate Equities; Liability, Level [MVEONWMVBSNNCB] and Nonfinancial Corporate Business; Net Worth, Level [TNWWMVBSNNCB]; Federal Reserve, Z.1; accessed December 2, 2014.
6. The upper and lower ranges are simply set at 100% above the fair value for upper limit (UL), 50% above the fair value for half upper limit (1/2UL), 25% below the fair for half lower limit (1/2LL), and 50% below the fair value for lower limit (LL). Note that these cutoffs are rather simplistic, are based on our observations and are not rooted in mathematical properties of the data itself.
7. There is a certain look-ahead bias in the way this chart has been setup. The exponential trend has been calculated using all data available on the date of calculation and has been plotted historically. As all this data was not available in the past, the trend at any point of time in the past will be somewhat different than what is implied by this chart. The implicit assumption here is that the behavior of the trend doesn't change when looked over the long-term, i.e., the trend rate of return of equities would have been more or less the same in the past as well, if long-term data was used/available. However, this bias has no impact on the current readings / positioning of the model.
8. Market capitalization is taken from Federal Reserve's Z.1 report, table B.102, row #39, nonfinancial corporate business market value of equities outstanding. Note that this value is the sum of market value of publicly listed U.S. domestic nonfinancial corporations excluding intercompany holdings (FOF series FL103164115) and the market value of closely held equity (FOF series FL103164123). Market value of closely held equity level estimated as the sum of the market value of nonfinancial C-corporations and S-corporations. The market value of S-corporations is estimated by multiplying the net worth data of S-corporations in nonfinancial industries from the IRS by the average ratio of market value to net worth from Standard and Poor's Compustat for public companies in the same nonfinancial industries. The market value of C-corporations is estimated by multiplying the revenue data of companies that appear on Forbes' annual list of America's Largest Private Companies by the ratio of total market value to total revenue of public companies from Standard and Poor's Compustat with similar industry, employment, and revenue profiles. The total market value of C-corporations and S-corporations is adjusted downward by 25 percent to reflect the lack of liquidity of closely held shares.
9. This quote is attributed by many people to John Maynard Keynes. However, it probably wasn't Keynes who said that. While attributed to Shilling, it isn't clear if this is a quote originally by Shilling or by someone else.