

CAPITAL MARKETS RESEARCH

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Special Update

Are U.S. Equities Under-Valued?

- **We survey a variety of equity valuation measures applied to U.S. markets. Our broad takeaway is that equities are cheap only if one confines one's market memory to the period of the 1990s onward, and are likely fairly valued in a longer-run context that we feel makes for a more plausible reference period.**

Even just a quick scan of the headlines would leave investors torn between sharply divergent opinions on equity valuations. Some scream that, like early 2009, current market conditions represent the buying opportunity of a lifetime. Other headlines still point to equity over-valuation, while even gloomier headlines warn of sharply further declines in valuations due to shifting investor demographics.

What is needed is perspective that we attempt to provide through a wide variety of U.S. equity valuation measures over long periods of time so as to avoid the trap of making extreme pronouncements based upon solitary pet measures and narrow time references, given that each conceivable valuation metric has its pitfalls and each time period throughout history has been subject to different macroeconomic and geopolitical factors. In so doing, we're approaching the issue through the lens of economists looking at broad markets and with a focus upon the longer-term attractiveness of equities.

In what follows, a key point is that what one thinks about current valuations may depend upon whether one's experience was acquired during the equity cycles of the 1990s onward or over a longer time-frame. Several metrics point to cheap equity valuations now compared to the past two decades or so, and this may be the market's 'memory' that is guiding the under-valuation bias in some corners. But a longer time-frame doesn't really support this perspective by either portraying equities to be dear, or fairly valued at present. That obviously doesn't preclude the possibility that individual companies range from extreme under-valuation to over-valuation as we focus solely upon the broad market.

Tobin's 'Q'

One such measure is Tobin's 'Q' which divides a firm's market value (equity and all debt) by the replacement cost of its assets. The thinking here is three-fold. For one thing, the higher this ratio, the more attractive it is for a firm to invest in capital goods since the value the market attaches to the firm exceeds

Chart 1

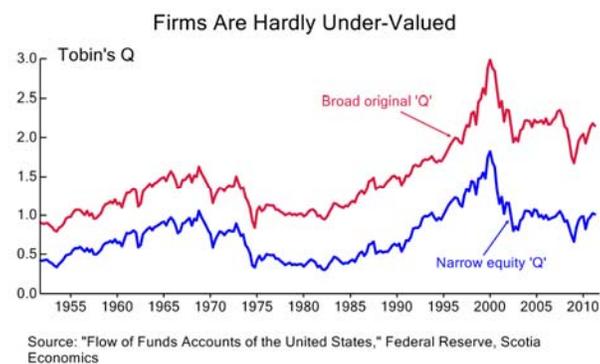


Chart 2



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the replacement cost of its assets. Second, this measure is also useful as a guide to whether markets have gone too far in assigning high market values relative to the cost of growing organically by acquiring the underlying assets at their replacement cost. Third, Tobin's Q recognizes that one is not just buying a stake in the future earnings of a firm; one is buying the underlying assets net of its debts under present market circumstances and thus the 'Q' ratio complements a more traditional price-earnings ratio.

There are actually two versions of this ratio that can be calculated on an economy-wide basis using the U.S. Federal Reserve's Flow of Funds accounts for non-financial corporations. Chart 1 (blue line) depicts a popularly represented version called an equity Q ratio which was the foundation of analysis in a best seller that pointed toward equity over-valuation during the dot-bomb period via referencing an inflated market value relative to the replacement cost of company assets.¹ It just takes the market value of equities and divides that by the replacement cost of the firm's assets net of its liabilities with the latter calculated by Fed economists. We think this measure is flawed because it does not fully consider how shifts in the capital structure decisions of firms over time can influence the total value of the firm (chart 2).

Chart 1 (red line this time) accounts for this latter point by expressing Tobin's 'Q' in the less popular but originally intended form that relates the market value of all types of short- and long-term debt and equity to the replacement cost of assets. It will more fully account for swings in capital structure and how they can impact equity holders in a classic Modigliani-Miller capital structure theorem sense which posits that the mixture of debt and equity within capital structure positions matters in a world marked by 'frictions' such as bankruptcy costs. We also observed that a gap opened up between the broad 'Q' and the narrower equity 'Q' from the late 1970s through to the early 1990s when the debt-to-equity ratio soared, and then narrowed in by 2000 at which point the debt-to-equity ratio had fallen sharply. This demonstrates our earlier point about which one better captures leverage. The gap between the two measures has opened up again over the past decade as corporate leverage increased.

So which measure is best when it comes to correlating with actual stock market performance? Charts 3 and 4 show that the broader Tobin's 'Q' does a better job at lining up with movements in broad stock market gauges like the Wilshire 5000 over time. Note, however, that whether stocks are fairly valued or dear depends partly upon whether one uses the narrow or broader 'Q' ratio. The narrow 'Q' ratio was roughly in line with its longer-run historical average as at June 30th 2011 (up to which point flow of funds data is available), but the broad 'Q' was still well above its longer-run average. Indeed, today's broader 'Q' ratio can really only be said to be 'cheap' in relation to the dot-bomb bubble. By shocking equity values in accordance to what has been experienced since June 30th we arrive at an updated narrow 'Q' that is marginally cheaper than at June 30th, but not by enough to alter our longer-run oriented conclusion.

Of further interest, note that Tobin's broad 'Q' ratio is well correlated with M&A volumes in the U.S. (chart 5). This represents a bit of a conundrum in that firms, in theory, shouldn't be feeding strong merger activity when market values are high relative to the replacement cost of the assets. They should tend to have a bias toward organic growth and divesting assets, although the correlation between Tobin's 'Q' and the business investment cycle in productive equipment and structures is relatively weak over the post-war era.

Chart 3

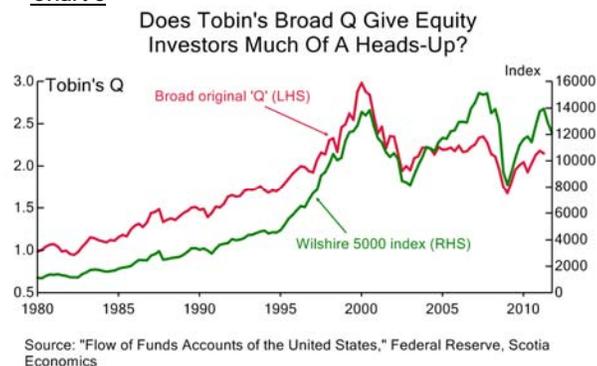


Chart 4

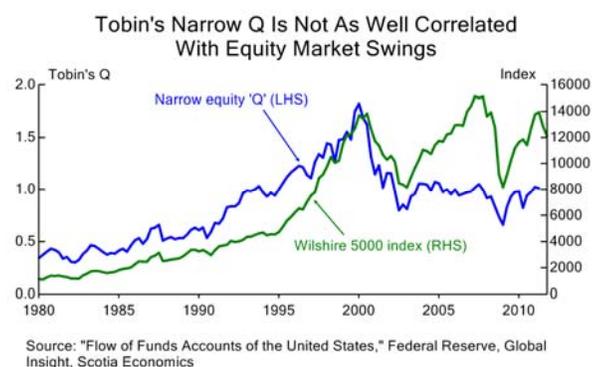
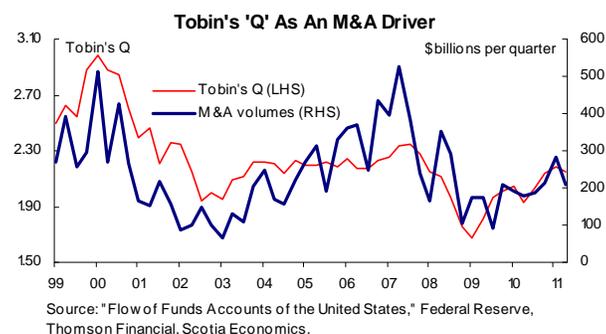


Chart 5



¹ Smithers, Andrew and Stephen Wright *Valuing Wall Street: Protecting Wealth in Turbulent Times*, McGraw-Hill Companies, 2000.

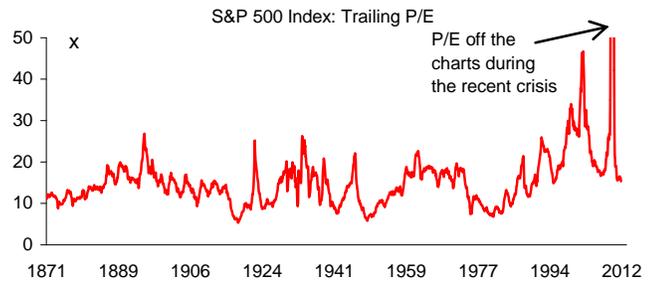
This leads to our point that on balance, we're not too fond of either 'Q' measure in no small part because they don't really give investors much of a heads-up on when valuations may swing. Witness the highly contemporaneous movements in Tobin's Q and equity valuations (charts 3 & 4 again). In fact, it's not clear that observing either 'Q' ratio really tells one much beyond simply observing the level of the stock market index itself. That's because there is little to no lead-lag relationship between 'Q' and the stock market, and indeed there is double counting involved through comparing Tobin's 'Q' to equity indices in that, as stock indices fluctuate, they will by definition swing 'Q' around given that Tobin's Q includes market valuations in its definition. As for the relationship between M&A volumes and Tobin's 'Q', it may well be that the relationship is spurious because a third factor — the simple level of the stock market and/or economic growth — plays a role in driving both measures simultaneously.

Price-Earnings Ratios

Like 'Q' ratios, price-earnings ratios can be computed in various ways. One way is to compare price to trailing earnings of the past year for all firms on the S&P500 far back in time using Robert Shiller's carefully crafted data set (chart 6).² Price-to-forward earnings one year into the future is a preferable approach since it is the future expected earnings stream that one is paying for (chart 7). Like Tobin's 'Q', whether or not stocks are cheap depends upon one's time reference. P/E's are only low in comparison to the recent past. They are not low in relation to the environment prior to the 1990s. Note that both of these measures are potentially distorted by where we sit in the earnings cycle. As chart 8 demonstrates, we're not far off the all-time high in earnings per share after adjusting for inflation so whether or not stocks are cheap by price-earnings ratios depends critically upon to what extent you believe such earnings strength will be retained. The same holds true for being at an all-time high for forward earnings that are typically largely extrapolated by analysts off of the recent history and with a consistent bias to boot (chart 9). That's why even though we have a shorter history for price-to-forward earnings in chart 7 than price-to-trailing earnings in chart 6, we infer that P/E ratios are low today in relation to the 1990s-onward environment regardless of whether one uses forward or trailing earnings. Here too, however, analysts may be too bullish going forward, making reliance upon price to an earnings forecast dicey. But our point here is that to those who would exclude from the sample the low in earnings during the peak of the US recession when comparing Shiller's ratio to the past, we think they would also have to exclude from the sample the upper outlier of today's record high earnings in the absence of abject clarity regarding its sustainability from a growth perspective.

What may be of further interest is to shock price-earnings ratios in accordance with other stress values for earnings should one not necessarily believe the consensus of analysts. Chart 10 does just this. The plotted line is price-to-trailing earnings over time. The upper dashed band line is where price-to-earnings would stand today if earnings per share were to test the lows of December 2009;

Chart 6



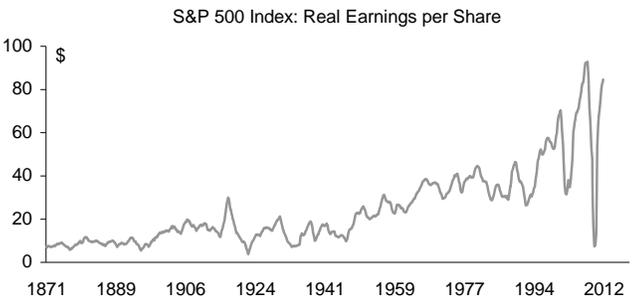
Source: Shiller, Robert, "Irrational Exuberance," Princeton University Press, 2000, 2005, updated; Scotia Economics

Chart 7



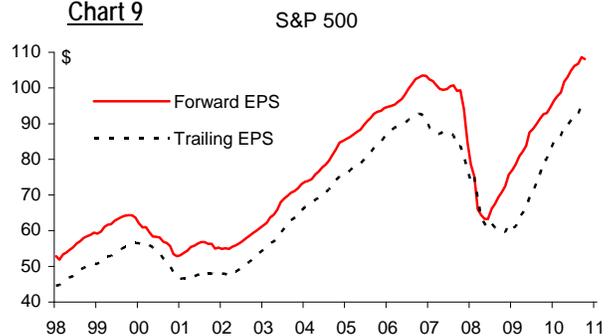
Source: Thompson Financial, Scotia Economics

Chart 8



Source: Shiller, Robert, "Irrational Exuberance," Princeton University Press, 2000, 2005, updated; Scotia Economics

Chart 9



Source: Thompson Financial, Scotia Economics

² See: <http://www.econ.yale.edu/~shiller/data.htm>

should such a scenario unfold again, then stocks are by no means cheap. The lower dashed band is where P/Es would sit today if earnings were to come in line with rosy forward expectations. The middle dashed line is where P/Es would sit today if earnings per share came in on top of its longer-run average.

Price-to-Cyclically Adjusted Earnings

The U.S. academic economist Robert Shiller prefers his measure of price-to-cyclically adjusted earnings. Cyclically adjusted earnings are calculated as a ten year average of past earnings, and the measure is adjusted for inflation over time. This measure is designed to track a full cycle’s earnings and is therefore less susceptible to volatility surrounding a single year’s earnings at a particular point in an evolving cycle. While lower than the equity cycles of the late 1990s onward, this measure is by no means low compared to the very long run (chart 11). Note that this metric closely tracks Tobin’s Q as it likely should since the sum total of a firm’s earning cycle will be highly correlated with the sum total of the replacement cost of a firm’s assets acquired over the years in part through reinvested earnings, and because both Shiller’s measure and ‘Q’ contain a measure of the market value of equities in their numerators.

Dividend Yield

For a certain segment of buy and hold investors in it for a regular income stream, it may make sense to focus upon what dividend earnings stream is being earned over time relative to the up-front price of acquiring the equities paying this stream. Chart 12 continues our theme that equities look cheap if one compares current dividend yields to the experiences of the relatively very recent past, but not so cheap in the longer run.

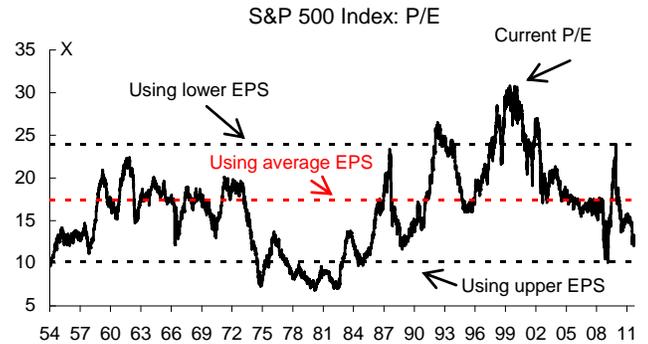
Price-to-Book Ratio

To the extent to which a firm’s book value may represent the cost of building the firm from scratch, comparing price to book value may be instructive. Note the difference here to replacement cost, in that replacement cost values a firm’s assets at their going investment rate, versus book value which is the historical cost of the acquired assets. Chart 13 depicts the results by using a proxy measure derived for nonfinancial firms from the US Flow of Funds accounts simply by comparing the market value of outstanding equities to the net worth of firms at historical cost. Like several other measures, while today’s price-to-book ratio is materially lower than it has been at times over the past decade and a half, that is not the case over the full history back to 1945. In fact, the current ratio is slightly higher than its long-run average depicted by the horizontal line on the chart.

Fed’s competing asset model

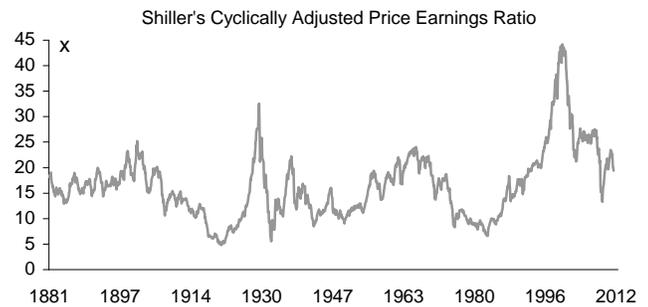
A simple but popular approach entails arguing that stock and bond markets are usually in equilibrium with one another such that the yield on, say, 10 year Treasuries should generally ride in tandem with the earnings yield on a broad stock market measure like the S&P500. This bonds versus equity notion has existed for a very long time, and has been emphasized by such famous investors as Benjamin Graham and David Dodd. More recently, it has been inappropriately labeled the “Fed model” of equity valuation since former Fed Chairman Alan

Chart 10



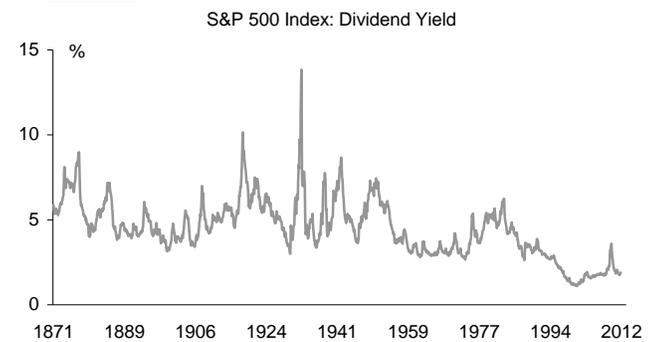
Source: Bloomberg, Scotia Economics

Chart 11



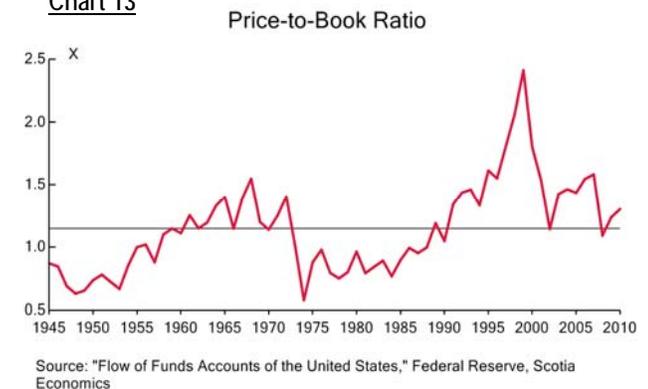
Source: Shiller, Robert, "Irrational Exuberance," Princeton University Press, 2000, 2005, updated; Scotia Economics

Chart 12



Source: Shiller, Robert, "Irrational Exuberance," Princeton University Press, 2000, 2005, updated; Scotia Economics

Chart 13



Source: "Flow of Funds Accounts of the United States," Federal Reserve, Scotia Economics

Greenspan commonly referred to the bond vs. equity interplay and because economists like Ed Yardeni attributed the model to the Fed.

The simplest way to depict this is just to plot the earnings yield on the S&P500 against the yield on 10 year Treasuries (chart 14). The alternative is to compare the actual value of the S&P500 to a fair value of the index over time (chart 15), with the ratio between the two indexed to equal 100 from the beginning. Fair value is calculated as earnings per share divided by the 10 year Treasury yield. Ideally we'd use forward earnings, but this isn't available as far back in time as we'd like and there isn't a tremendous difference in any event since the history that we do have shows that forward earnings are usually just extrapolated off trailing earnings anyway.

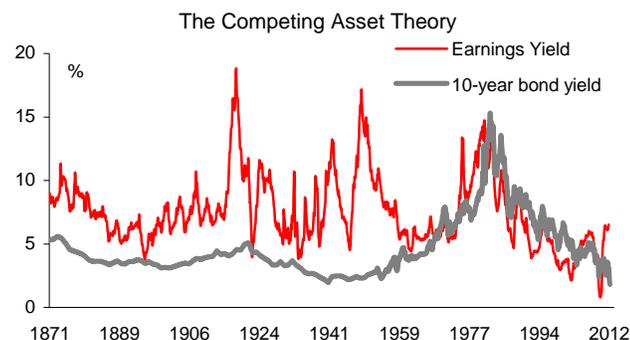
The 'Fed model' suggests that we may have returned to witnessing fair or under-valuation in equities since the actual value of the S&P index is trading below its fair value. There is just one problem: even though it appeared to work for a time, the model hasn't really worked throughout the past decade and didn't work at all prior to the 1970s which translates into a model that isn't terribly robust. There are serious theoretical flaws with comparing earnings yields to Treasury yields as in chart 15. One is that the former is an inflation-adjusted measure by virtue of being a ratio of prices, whereas the Treasury yield is a nominal measure. Second, the Fed model assumes no earnings growth over time in that it values stocks as a zero growth perpetuity. Third, the Fed model also assumes no equity risk premium to valuing equities by using the government's cost of borrowing as the discount rate.

For more on the pros and cons of the Fed model, we refer interested readers to two popular but oppositely positioned and useful papers.³

Conclusion

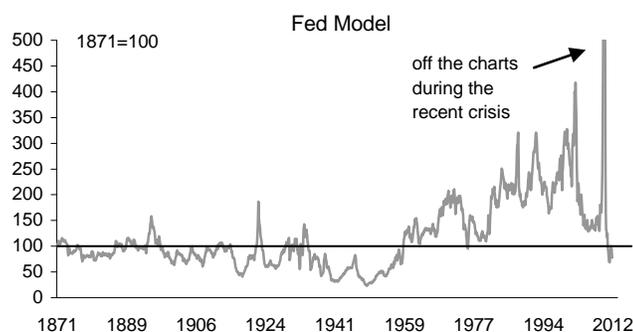
Virtually every valuation metric that we have considered suggests that equities are under-valued only in relation to the fairly recent past from the 1990s onward but not so in relation to conditions prior to this period. In this context, the onus therefore lies upon market participants to explain what makes the period from the 1990s until just before the crisis an appropriate reference period before deciding upon a bullish slant toward current equity valuations. We struggle with this, in that we're biased toward viewing the 1990s-to-crisis period as the anomaly within history, not the benchmark for the future. The 1990s-to-crisis period was marked by excessive risk taking motivated by heavy leveraging and lax regulation that is now at risk of turning excessively tighter. This prompted massive behavioural shifts by investors that had less to do with shifting age structures of the population and far more to do with large intra-cohort shifts in risk taking. For example, 40 years olds in the 1980s held far less debt in inflation adjusted terms and had far lower equity ownership rates than 40 year olds in the lead up to the crisis, and the outcome was similarly portrayed across other age groups through successive U.S. Surveys of Consumer Finances produced by the Federal Reserve. One example of why this is important entails rejecting casual empiricism that naively plots age variables with market performance metrics in that many other macroeconomic and behavioural shifts have occurred in highly correlated fashion to slow moving age trends. Understanding how the psychology of investors may change going forward is therefore at least as important as any fundamental and historical arguments.

Chart 14



Source: Shiller, Robert, "Irrational Exuberance," Princeton University Press, 2000, 2005, updated; Scotia Economics

Chart 15



Source: Shiller, Robert, "Irrational Exuberance," Princeton University Press, 2000, 2005, updated; Scotia Economics

³. Joel Lander, Athanasios Orphanides, and Martha Douvogiannis, "Earnings Forecasts and the Predictability of Stock Returns: Evidence From Trading the S&P" Board of Governors of the Federal Reserve System, January 1997.

Estrada, Javier "The Fed Model: The Bad, The Worse, And The Ugly," working paper, IESE Business School, January 2006.