Market Expects 6% CAIGR (Cyclically Adjusted Implied Growth Rate)
**Dr. G. Kevin Spellman, CFA**
Coach Investing.com
Date: 2/21/17

The implied long-term earnings growth of the S&P 500 is 5.74%, which at best realistic given recent growth rates. This is important since the return of the market is a function of dividends, earnings, and expectations (quantified by the P/E multiple). Current P/E looks extended and is a concern, and while cyclically adjusted implied growth rate (CAIGR) is low, actual long-term earnings growth has slowed and CAIGR is up over the last five years which signals caution.

Since 1989, S&P 500 earnings per share have grown at about 5% since 1989 (figure 1), with operating earnings growing slightly faster than reported earnings (5.3% versus 4.9%). Overall EPS growth is about the rate of nominal GDP. Operating earnings, which remove the impact of one time charges (mistakes of corporate management), are less volatile than reported earnings (standard deviation of 21% versus 120%). Recently, the gap between the two numbers has widened which is normal during earnings recessions when management writes off assets and may want to hide the real results. Earnings growth is tied to long-term price appreciation (figure 2).
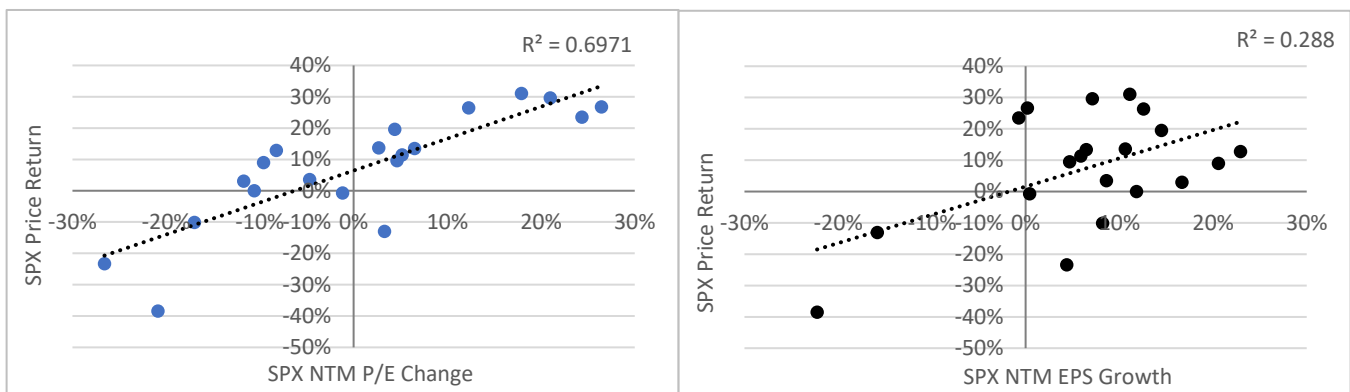
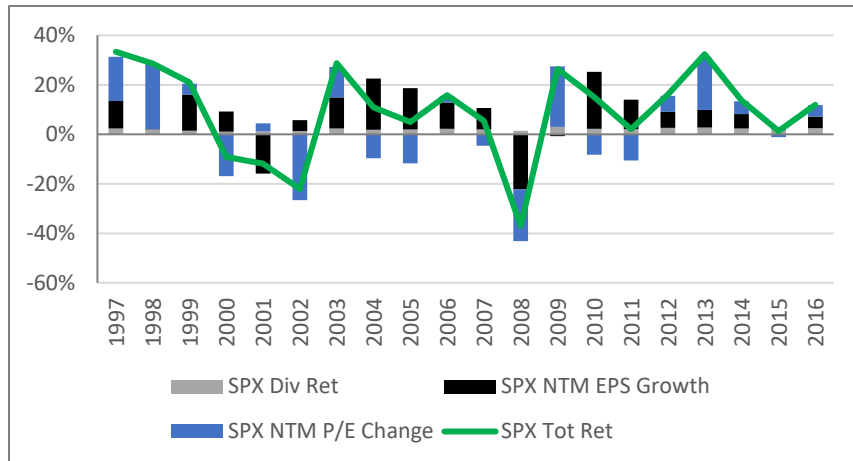Figure 1: S&P 500 Operating and Reported EPS
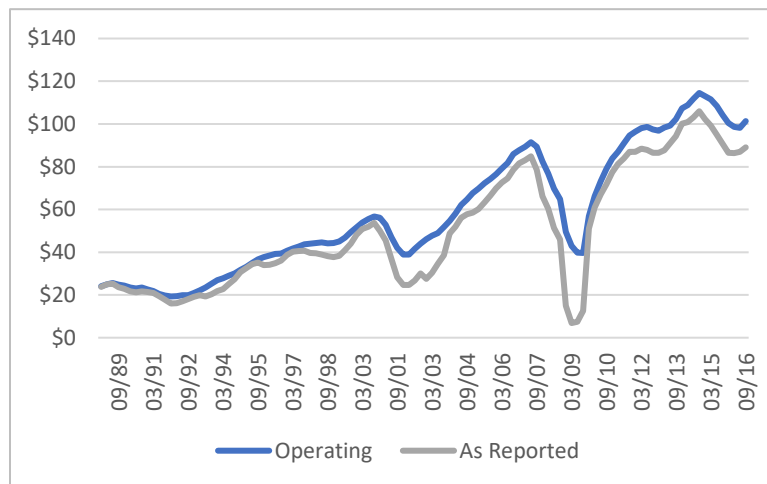
Source: Spellman, Standard & Poor's

Figure 2: S&P 500 EPS and Price Return
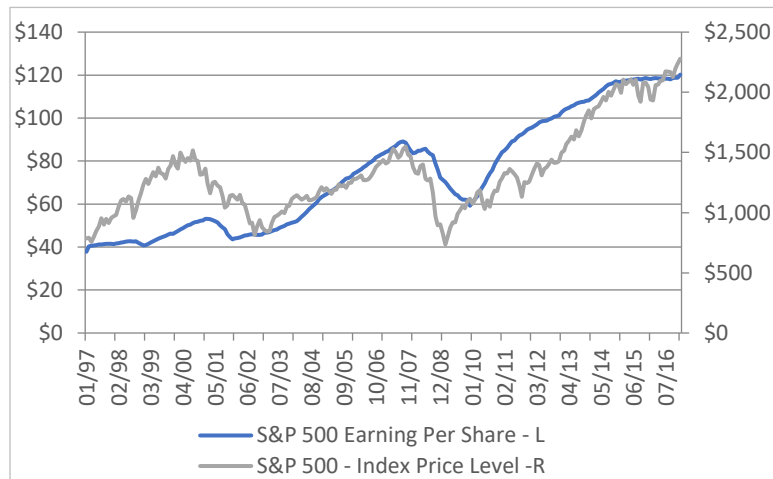
Source: Spellman, FactSet, Standard & Poor's

Figures 3-5: Drivers of S&P 500 Returns

Source: Spellman, FactSet, Standard & Poor's

Although, returns since 1997 have been driven by P/E more than EPS growth (figures 3-5). The R-squared between next 12-month P/E changes (using operating earnings) and S&P 500 price return is 0.70, versus only 0.29 for forward earnings growth. Can the P/E continue higher and propel markets? The trailing 12 month P/E using reported earnings was 24.2 as of the end of September (figure 6). Excluding the internet bubble and recessions, this is the highest level since 1950.

Figure 6: S&P 500 TTM P/E (Reported)
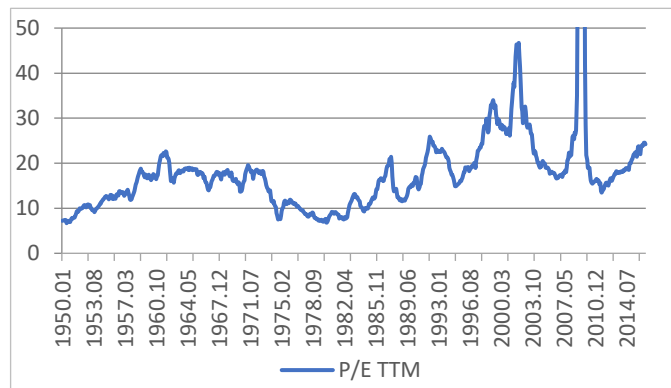
Source: Spellman, Shiller (data only)

What makes this even more alarming is that this P/E is on reasonably high EPS (figure 1). Shiller's CAPE, cyclically adjusted P/E, normalizes earnings (10 year average). Since price is not just a function of todays earnings, but a function of the normalized earnings power, growth, and risk, we can improve the

standard P/E model by dividing price by the average earnings of the last ten years. Ten years is a little long, but the point is to determine the normal earnings power over an economic cycle (about six years). The CAPE is also trading at a high (figure 7), and this does not bode well for future returns. Since 1987, the CAPE has had an inverse relationship with five-year forward S&P 500 returns.

Figures 7 and 8: CAPE (left) and CAPE versus Returns (right)
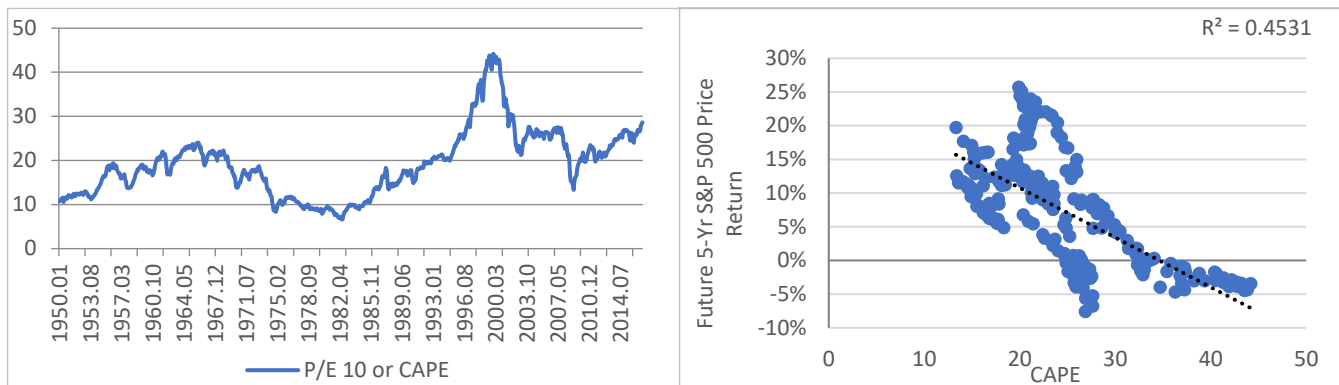
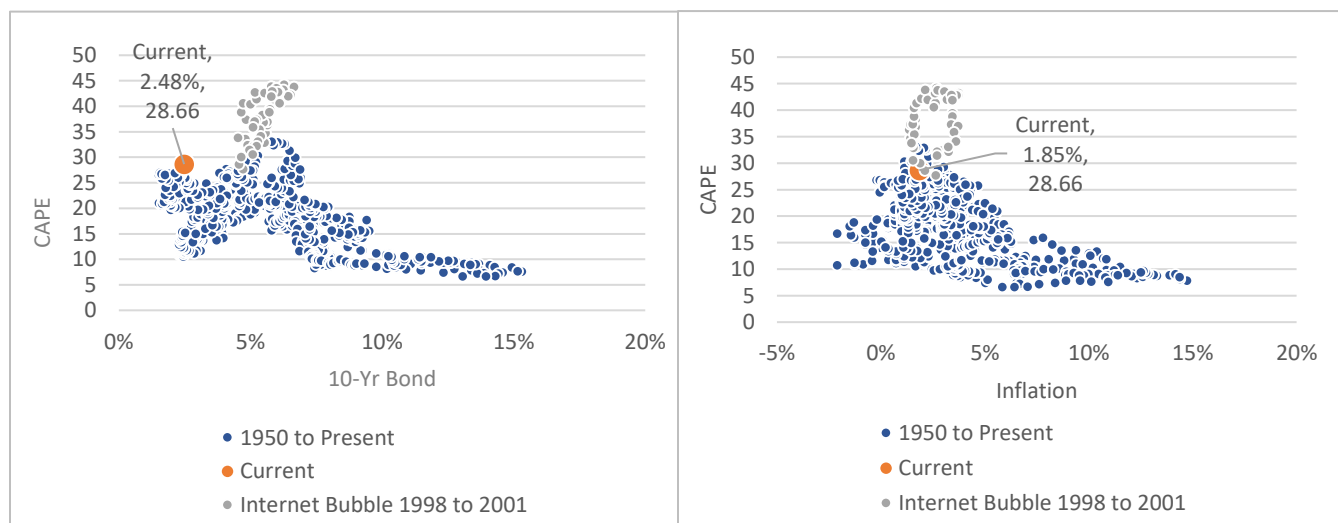Source: Spellman, Shiller (data only)

While the CAPE adjusts P/E to normalize earnings, it does not adjust for other variables that directly impact P/E. The Gordon Growth Model shows that price is a function of earnings, payout, risk, and growth. Thus, the price, and therefore P/E, is influenced by than earnings.

$$P_0 = E_1 * \text{payout ratio} / (r - g)$$
$$P_0 / E_1 = \text{payout ratio} / (r - g)$$

The discount rate that we apply to earnings is heavily influenced by current interest rates. It is also influenced by inflation which impacts rates (since 1950, the 10-Year Treasury Bond has averaged 1.87% over inflation). Figures 8 and 9 show the inverse relationship between P/E and the 10-Year Treasury Bond and CPI. Lower interest rates and inflation tend to drive up P/E, as theory would predict, to a certain extent. Extremely low inflation and rates may be a sign of stress, which would boost the risk premium (r = risk-free rate + equity risk premium) and negate the lower rates.

Figures 8 and 9: CAPE versus 10-Year Treasury Bond (left) and Inflation (right)

Source: Spellman, Shiller (data only)

Thus, the highest P/E has been when rates were higher than today (about 2.48%), so higher rates may not negatively impact P/E. Rates are also low relative to inflation (1.85%), so higher rates are justified. While rates and inflation justify the CAPE, it should be noted that the only time CAPE was higher since 1950 was during the internet bubble of the late 1990s.

Thus, the CAPE, while cyclically adjusted for earnings, does not adjust for the discount rate which can have a huge impact on P/E. To more fully adjust for the economic cycle, I have created a cyclically adjusted implied growth rate (CAIGR). The CAIGR normalizes earnings, payout, and rates, as it calculates implied growth using 10 year average earnings, 10-year Treasury bond rates (or inflation) plus an appropriate normal risk premium, and 10-year average payout ratio. Using the Gordon Growth Model, one can solve for long-term growth.

$$P_0 = E_1 * \text{payout ratio} / (r - g)$$
$$r - g = E_1 * \text{payout ratio} / P_0$$
$$g = r - E_1 * \text{payout ratio} / P_0$$

CAIGR is growth where E_1 = 10-year average EPS, payout ratio = 10-year average payout, and r = 10-year inflation rate plus a stable equity risk premium

The higher the implied growth rate, the higher expectations, and the more pricey the market.

Traditionally, the required rate of return (r) equals the 10-year Treasury bond rate plus an equity risk premium; however, the 10-year Treasury bond rate is manipulated by the Federal Reserve and is artificially low today, thus calculating a premium to inflation is better. Currently, the treasury bond is 0.63% above the rate of inflation, compared to an average of 2.03% premium since 1950 and a median premium of 2.21% (figure 10). Thus, Treasury bonds appear to be overvalued. If we utilized the T-bond in the CAIGR instead of inflation to compute the required return, then the implied growth rate calculated would appear to be low.

Figure 10: 10-Year Treasury Bond versus CPI Y-Y % Change
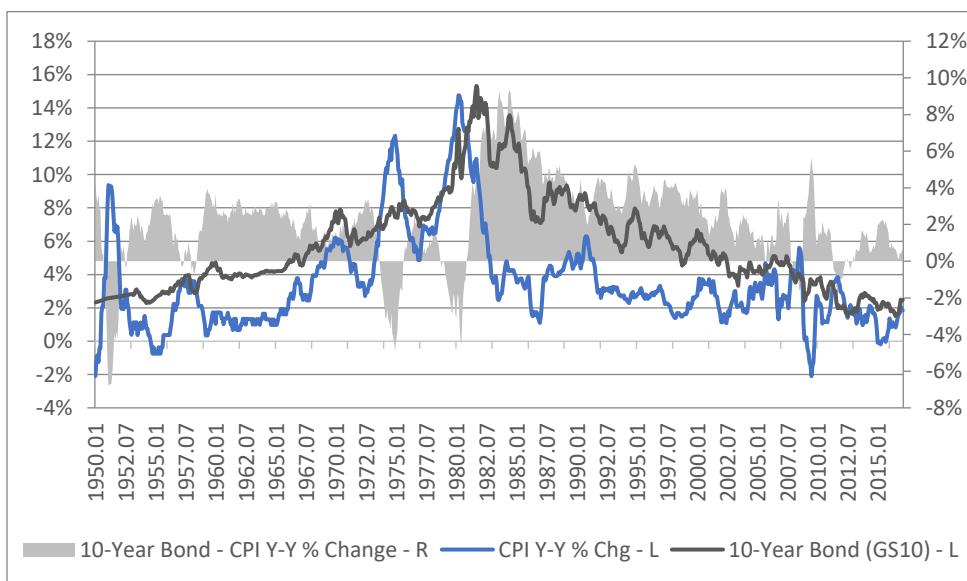
Source: Spellman, Shiller (data only)

From 1928-2016, 2967-2016, and 2007-2016, S&P 500 stocks have outperformed 10-year Treasury bonds by 4.62%, 3.42%, and 2.30%, respectively (Damodaran, New York University, www.damodaran.com). If we assume that stocks outperform bonds by 4%, and bonds yield 2% more than inflation, then the appropriate equity risk premium to add to inflation is 6%. Since inflation is also

variable from year to year, and the price of the market should incorporate a normal rate, the inflation rate utilized is a 10-year average.

Figures 11 and 12: CAIGR versus EPS (as Reported) Growth using 10-year Averages (left) and 5-year Averages (right)
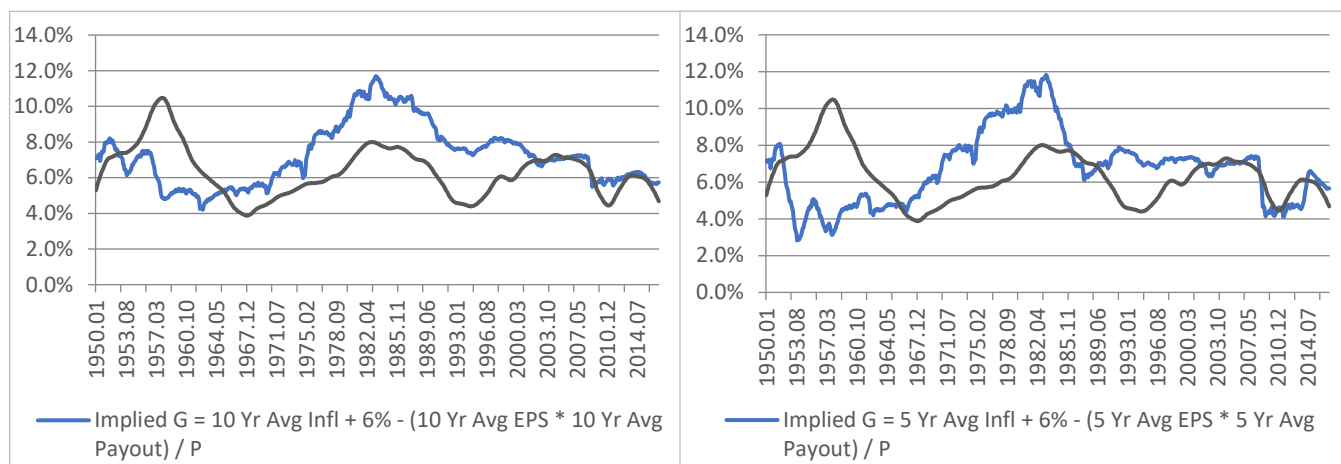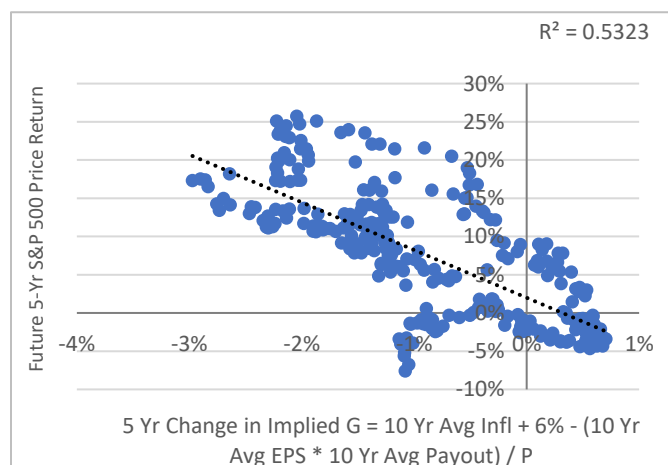

Source: Spellman, Shiller (data only)

CAIGR using the 10-year inflation methodology is show in figure 11. The same method using five year averages (for inflation, EPS, and payout) – five years is approximately the length of one economic cycle – is illustrated in figure 12. The current – using the 10-year methodology - CAIGR reading is 5.74%, which is above the historical rate of growth (about 5%). However, CAIGR has been overly optimistic since the 1960s. It has also moved up and down somewhat in tandem with average 10-year EPS growth. The highest implied growth occurred in the early 1980s when inflation was high (thereby skewing implied growth higher); however, this was also the period with the highest EPS growth (high inflation yields high nominal growth rates). In the last 20 years, the highest CAIGR (about 8%), second highest during the financial bubble (about 7%), and third highest in mid 2014 (about 6.3%) as 10-year growth drove higher (to around 6.1% versus 4.7% right now).

While there is low explanatory power between CAIGR level and future returns, change in CAIGR is has been negatively related to future returns since 1987. CAIGR has dropped from 6.3% in mid-2014 to 5.8% now, and the latest monthly change is -0.2%.

Given low rates of productivity, low population, and moderate to low inflation, the current CAIGR reading of 5.74% is realistic to optimistic despite the fact that it is lower than historical averages.

Figure 14: Change in CAIGR and Future Returns

Source: Spellman, Shiller (data only)