

## Forecasting Expected Returns

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*“Price is what you pay. Value is what you get.” -Warren Buffet*

How can investors know the value of an investment? Bond yields remain very low and stocks continue to climb higher across the globe. Using typical valuation measures, markets everywhere look very expensive. However, investors continue to pour money into them, so they must see value. The value of an investment is subject to an uncertain future, so how can one quantify future value with information available today?

There are many valuation metrics available, but they all fall short in one way or another. One of the problems with using standard equity valuation ratios, such as Price-to-Earnings, is that there is a lot of noise in any given quarter. Companies can manipulate earnings over short periods of time through accounting rules which can distort the E in the P/E ratio and give false signals. One way to look through the noise is to take a longer time horizon and consider average earnings rather than a single point in time. This idea was first espoused in the 1930's by famed value investors Benjamin Graham and David Dodd. In 1988, economists Robert Shiller and John Campbell authored a paper which popularized a 10yr rolling average as the standard lookback period<sup>1</sup>.

This method has become known as the Cyclically Adjusted PE Ratio (or CAPE). In short, the CAPE is a valuation measure of a market that is equal to its current price divided by the average of 10 years of earnings adjusted for inflation. In their paper, Shiller and Campbell find that “Long historical averages of real earnings help forecast present values of future real dividends.” Since dividends have historically been highly correlated with total return, the CAPE should explain equity market returns. This relationship between CAPE and returns has also been found to exist across every equity market<sup>2</sup>.

### Putting Theory to Practice

If a P/E ratio tells investors how much they are paying for a given stream of profits, the reciprocal will tell investors what they should expect to earn. This is known as an Earnings Yield. We can test if an Earnings Yield, more specifically a CAPE Earnings Yield, could predict future returns with accuracy. By running a simple regression between Earnings Yield and realized returns, it looks like there is almost no relationship or predictive power. However, this simple analysis left out a very important part of returns – inflation.

Shiller's CAPE uses real earnings. This means that the effects of inflation were removed, with all profits across the time horizon adjusted to be the equivalent of the current value of money. This allows for CAPE to be studied across time horizons free from the distortion of inflation. However, real world market returns are subject to inflation, so we must add back inflation when comparing a CAPE-based expected return with a realized return.

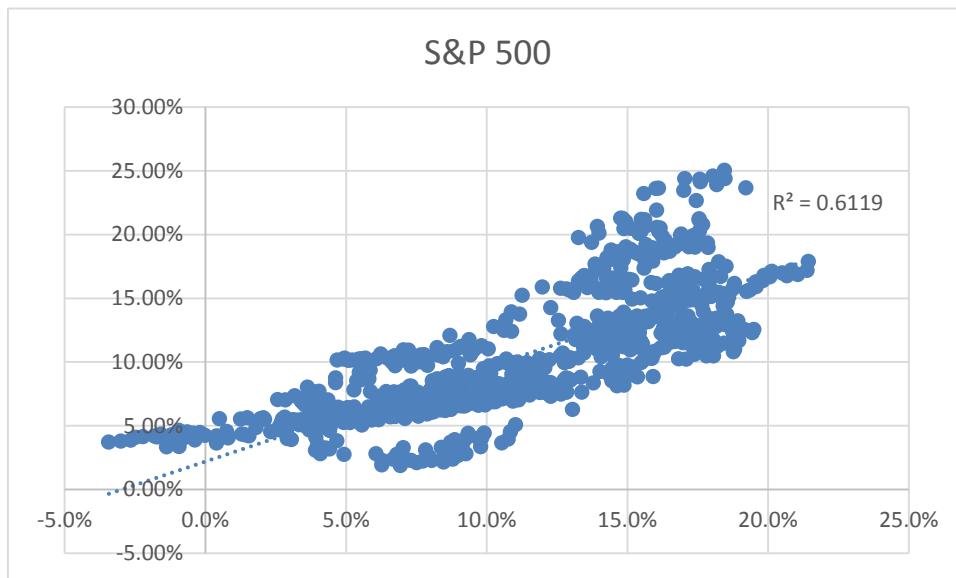
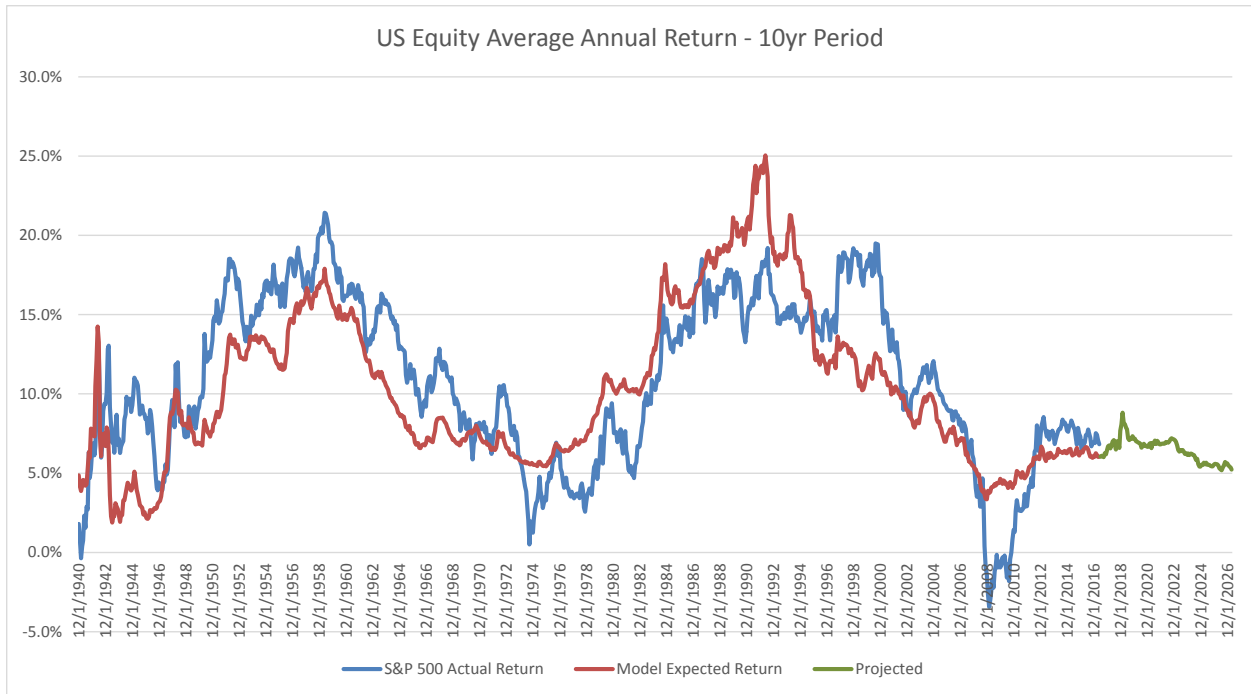
The goal is to produce a model that will provide an expected return in the future. To be most reliable, it would be best to use an estimate of future inflation rather than current (or past) inflation. Thankfully there is a readily available market-based estimate of future inflation. The 10yr Treasury Inflation Protected Security (TIPS) Breakeven Rate is simply the difference in yield between a 10yr nominal Treasury bond (whose yield includes a built in premium to compensate for inflation) and a 10yr TIPS bond (which is a real yield with no inflation premium). These bonds have the same term and credit, so the difference in yield is assumed to be the inflation premium investors demand for owning the nominal bond. This leaves a simple expected return model for equities that looks like this:

$$E(R) = \frac{\text{Real Avg Earnings}}{\text{Price}} + \text{Expected Inflation}$$

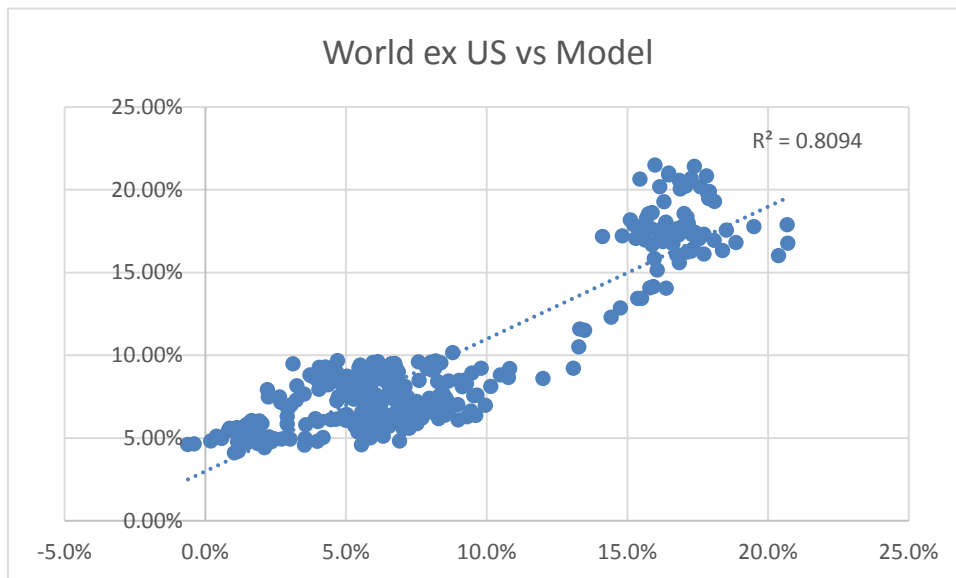
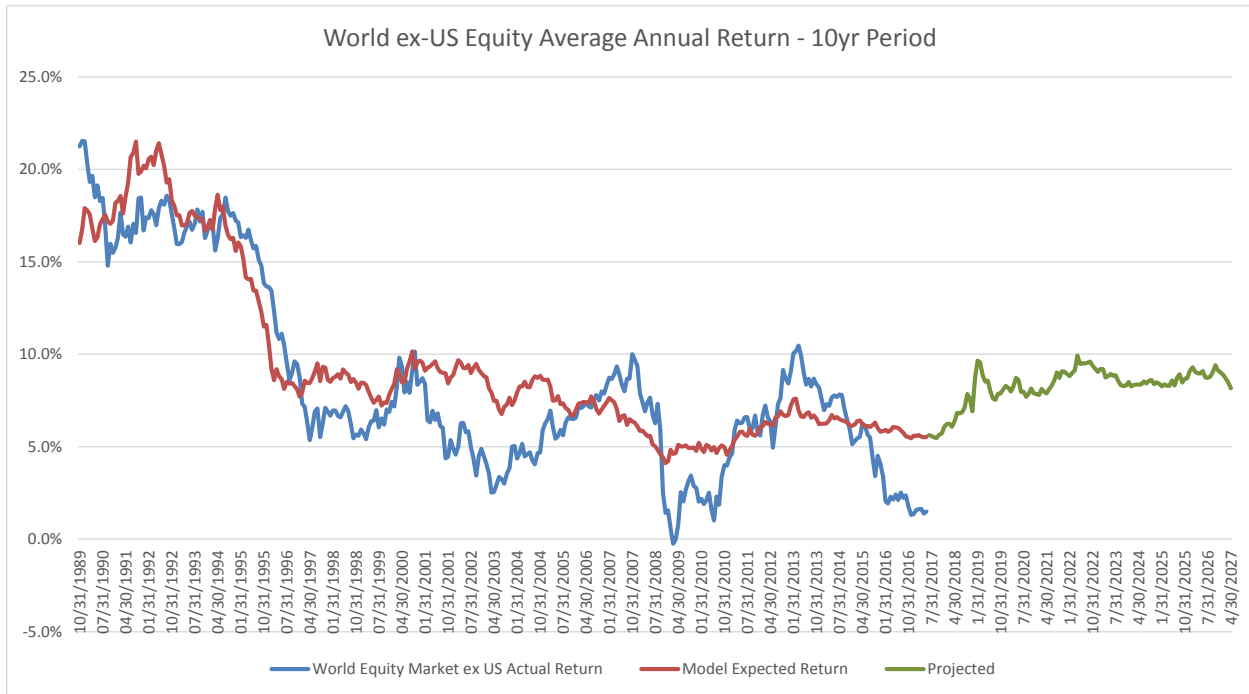
The following charts test this model against realized index returns in both US and World Equity markets as well as the US Fixed Income market. The Blue lines represent the actual average annual return for the preceding 10yr period. The Red lines represent the model's expected return for the same period. The Green portion shows the model's expected returns continuing into the future (this is a continuation of the Red line, just for periods that include a forecast). Looking at the charts it is evident that this combination of CAPE and inflation expectations correlates with actual performance.

Consider US Equity Markets. Since 1940, the expected return has tracked very closely to the actual return on the S&P 500. There are just three periods where they diverge substantially; the 1987 crash, the dot-com bubble, and the housing crisis. In other words, while generally correlated it fails to predict extreme markets.

The chart below quantifies this correlation. By regressing the two sets, a clear relationship emerges. With an R-squared of 0.6119, the model explains 61% of the returns of the actual index.



Next, consider how this works with Global Equity markets. The available data set is shorter, so this study begins in 1989. Again, there is a strong relationship between the model's expected returns and the actual returns of the index. From a statistical standpoint, the relationship is stronger with an R-squared of 0.809.

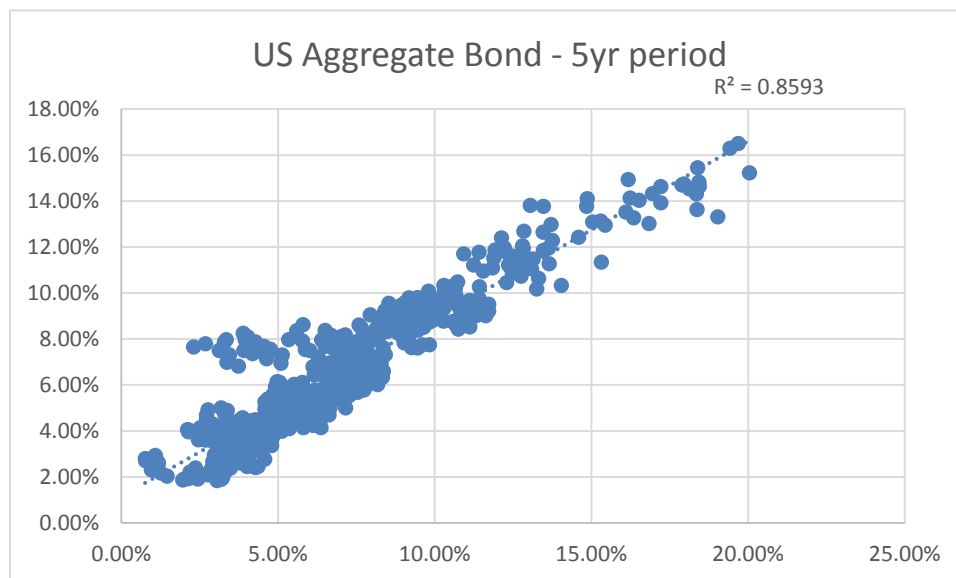
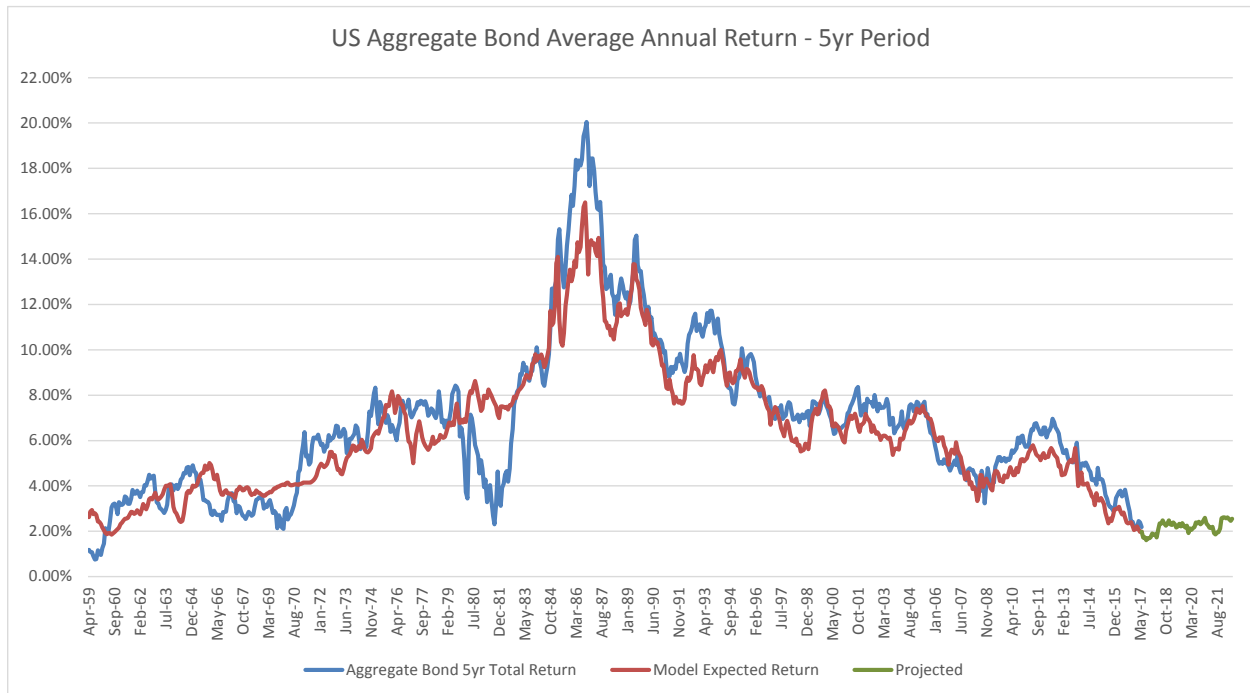


If there is a relationship between equity returns, inflation and earnings, is the same relationship true in Fixed Income? Due to the nature of bonds, this analysis is much more straightforward and simple for bonds than it is for stocks. The “earnings yield” for bonds is simply the yield at which an investor can purchase the bond. As noted above when explaining the Breakeven Rate, inflation expectations are already included in the yield of nominal bonds. Therefore, the expected annual return of a bond is simply its yield. While this seems obvious for individual bonds, it is also true of a constant duration index or a portfolio of bonds.

The chart below uses the yield on the Bloomberg Barclays Aggregate Bond Index as the expected return (red line). The blue line tracks the total return of the index over the same period. Because the

Bloomberg Barclays Aggregate Index has historically had a duration around 5 years, we compared 5yr annual average returns for this analysis (rather than the 10yr periods for equities).

As the chart demonstrates, there is a very strong relationship between yields and future returns. With an R-squared of 0.8593, current yield explains most of the return in bonds over the following 5yr horizon.



Clearly we have a model with some explanatory power of future returns in both stocks and bonds. How should investors use this information? To answer that question, we should first discuss what this is not. This model is not a short term trading strategy. One must remember that these are multiyear average

returns, not the expected return for next month or next year. While 10 years for equities is an arbitrary timeframe, the relationship and explanatory power decline with shorter time horizons.

This is best used as a planning tool. Using this model, one can have mild confidence in what average annual returns on an index will be over the next 10 years. This can help investors to properly set expectations over the near term. Rather than hoping for high returns, investors can take a more realistic approach and change the factors within their control. Those managing a portfolio against offsetting liabilities may need to focus more on reducing the cost of liabilities. Individual investors may want to temper expectations and adjust spending accordingly.

In all three asset classes, expected returns today are extremely low relative to history. The model forecasts a 5.22% average annual return over the next decade for the S&P 500, well below the 10% historical average return. For bonds, the next five years will likely only provide returns just above 2% per year. Global Equities are the best value according to the model, but still only project an average annual return of 8.16%. Just looking at the green section of the charts illustrates how low expectations for the near term should be relative to history.

Today's markets are very expensive relative to past markets. This does not signal an imminent collapse. It just means that investors should anticipate getting less from their investments than what they are accustomed over the next decade.

*Sources:*

Data: Bloomberg, Federal Reserve Bank of NY, Global Financial Data, Robert Shiller Database (Yale)

<sup>1</sup> *Stock Prices, Earnings, and Expected Dividends*, Campbell and Shiller 1988

<sup>2</sup> *Predicting Stock Market Returns Using the Shiller CAPE*, Keimling 2016