Equity-Bond Correlation: A Historical Perspective

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Abstract
The equity-bond correlation has been negative since the early 2000s. A certain conventional wisdom has developed that this negative correlation is natural and enduring. However, when we take a much longer historical perspective and examine data going back to 1870s, we find that the equity-bond correlation is highly dynamic and has gone through prolonged periods of positive correlation. As such, we should not dogmatically assume that the equity-bond correlation will be negative going forward, especially in the context of asset allocation and portfolio management.

Keywords
Correlation; Stocks; Bonds; Beta

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1. Introduction

Equity-bond correlation is immensely important for a multitude of portfolio management tasks ranging from asset allocation to risk management. Despite a developing conventional wisdom over recent years that equity and bond prices are negatively correlated, the reality is far more dynamic.

Over time and across a variety of monetary policy regimes, equity-bond correlation is actually more likely to be positive than negative. Since the 1870s, equity-bond five-year correlation has been negative in 635 months compared to 1,063 months when it was positive. The modern regime of negative correlation really began around the late 90s. Since 2015, it has been slowly moving back towards zero. As a result, we should be wary of making hard assumptions about the magnitude or direction of future equity-bond correlation.

2. Economic Background

There is no generally accepted model for equity-bond correlation despite the rich volume of literature on this topic in macroeconomics. Significantly, academic research has yet to even reach agreement on whether bond and equity prices should move together or in opposite directions.

For example, Shiller and Beltratti (1992) managed to find theoretical motivation for both positive and negative correlations based on a discounted dividends view of equities. Equity valuation is linked to bonds through the discount factor. In the most basic configuration, equities should have positive correlation to interest rates. However, this is not observed (Leibowitz and Kogelman, 1993).

Baele (2010) tried to decompose the time-series of the equity-bond correlation onto a set of macroeconomic factors. Interestingly, they found that fundamental factors such as inflation and output gap do not generate the kind of time-variability that is observed in the realized equity-bond correlation. They did find, however, that additional factors, such as liquidity proxies, play an important role in mediating the relationship between equities and bonds. Taken together, these results suggest that the equity-bond correlation is not the strict result of monetary policy regimes, but responsive to a wider set of market sentiments.

Equity-bond correlation can be volatile, time varying, and not easily explained by any given set of fundamental factors. There is no exact set of known factors that can explain it or provide a basis for forecasting.

3. A Historical Perspective

For our analysis, we use Shiller's monthly data set[1] for equity returns and long term bond yields (see Figure 1 for S&P 500 levels and long yields since 1872). This data set is particularly remarkable for its longevity, stretching across multiple monetary policy regimes all back to the 1870s. While the period that predates the Federal Reserve System may not be as relevant, we hope to use it as additional context for considering what equity-bond correlation may look like under a system completely different from the current one.

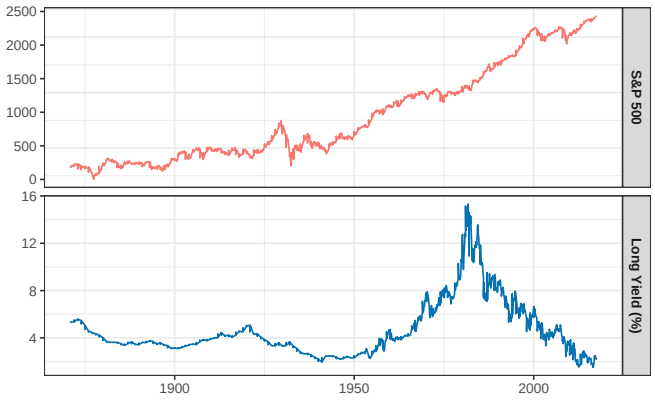

Figure 1. S&P500 level and long yields dating back to 1872.

[1] This data is available courtesy of Shiller (2005) and can be found here: `http://www.econ.yale.edu/~shiller/data.htm`.

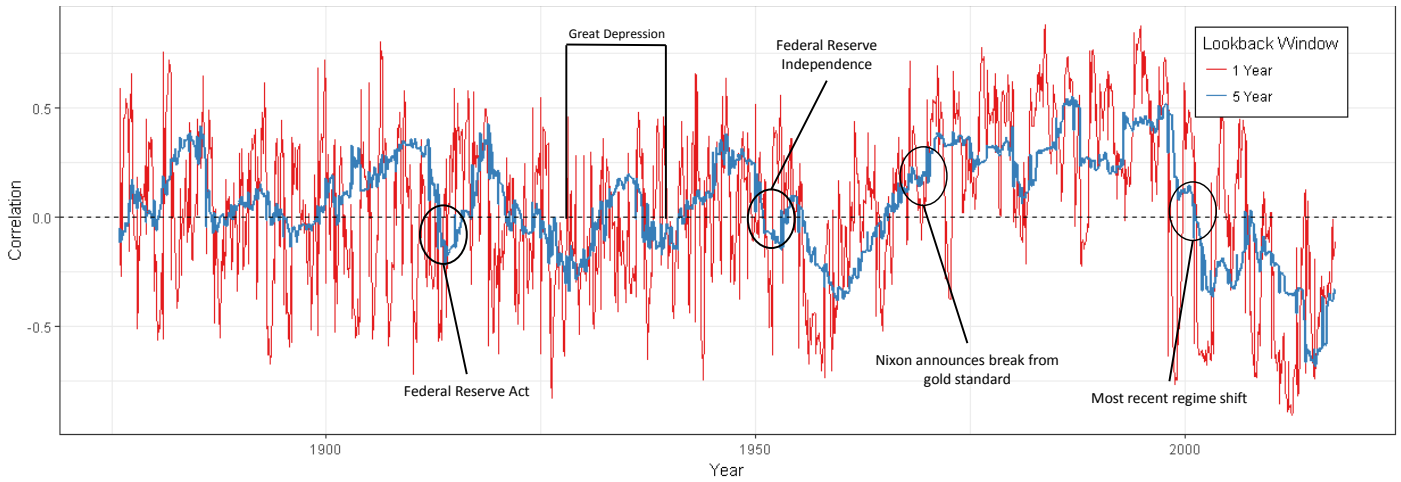

Figure 2. Rolling one-year (red) and five-year (blue) correlation between monthly equity and bond returns dating back to 1871.

We approximate the returns of a ten-year treasury bond from the bond yields. Treasury total returns is comprised of two components: price change and carry. The monthly price change we derive by multiplying change in yield level for that month by a hypothetical fixed duration of nine years. For the carry part, we use the prorated par yield of the previous month. Our approximation is not perfect as it ignores curve roll down at the very least. However, in our experience it is a reasonable method of estimating total returns for treasury bonds.

We then compute the rolling one-year and five-year correlations between equity and bond returns over this very long historical period. The results are plotted in Figure 2. The averages of both one-year and five-year correlations between equity and bonds are very close to zero (3% and 7% respectively) over their entire history. However, equity-bond correlation cycles through periods of significant positives and negatives. This underlines our view that we should not think of their nature as static, but rather as a dynamic process that evolves over time.

Equity-bond correlation appears to be very volatile prior to the modern monetary policy system anchored by the Federal Reserve, fluctuating between positive and negative. There was a sharp drop in correlation leading up to the Recession of 1913, which, perhaps as a result of the Federal Reserve Act, seems to abruptly and rapidly reverse to become positive.

Two major subsequent events seem to presage the relative stable periods in equity-bond correlation: in 1951 when the Federal Reserve System asserted its independence from the Treasury Department and when the U.S. dollar broke from the gold standard twenty years later.

There does not seem to be a stable relationship between recessions and correlation. The sign of correlation between equity and bond changed twice over the course of the Great Depression. Five-year correlations were positive in six out of the last ten recessions as defined by NBER[2]. The same is true if we look at one-year correlations as well.

During the initial periods of growth and inflation through the 1980s, correlation between equities and bonds was positive (over a 5- year rolling window), peaking in 1997, but remaining positive until the early 2000s. From then on, correlation turned negative. Campbell et al. (2014) suggests that this is a result of transition from being focused on bond risk in the 1980s to output fluctuation and the persistence of monetary policy shocks.

The length and magnitude of the current negative correlation regime that started in the 2000s has been unprecedented. June 2012 registered the lowest one-year correlation at -91% and March 2015 registered the lowest five-year correlation at -68%. The highest one-year is 88% in September 1983 and 56% in December 1986 for five-year correlation.

Since 2015, equity-bond correlations have been rapidly rising. We could attempt to ascribe this to fundamental factors such as increases in inflation expectation and/or expectations for a tighter monetary policy. However, we caution restraint in interpretation but note that one should not be surprised if equity-bond correlation breaks into positive territory for a sustained period of time

4. Conclusions

Equity-bond correlation is not a static number. It can be both positive and negative. The observed correlation is the result of rich and dynamic interaction between a multitude of macroeconomic factors. There is no economic theory or empirical model that fully captures this dynamism.

Our long historical analysis of equity-bond correlations going back over 140 years shows that equity-bond correlation has gone through many regimes. The most recent period of negative correlations began in the ‘90s. Prior to that, equity-bond correlation was positive for over 40 years.

As the current period of negative correlation seems to be closing in towards zero, we should not be constrained by any preconceived notion about what this correlation ought to be. As history can readily demonstrate, equity-bond correlation can be positive for quite some time.

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[2]See `http://www.nber.org/cycles.html`

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