Federal Reserve U.S. Sovereign Debt S&P 500 Correlation

Executive Summary

The Great Financial Crisis (GFC) of 2008 ushered in a new era of Federal Reserve Federal Open Market Committee (FOMC) monetary policy in effort to increase liquidity, repress interest rates, stave off credit contraction, and ultimately achieve the Congressional FOMC mandates of: maximum employment, stable prices, and moderate long-term interest rates. To this end the FOMC lowered short-term interest rates near zero and undertook a massive expansion of its balance sheet purchasing U.S. sovereign debt and agency securities in the secondary market in what came to be known as quantitative easing (QE).

While not explicitly stated as a goal by the FOMC the excess liquidity generated by these policies helped drive asset prices, specifically U.S. equity indexes, to record highs. QE was executed in tranches and not open ended. Beginning Q4 2017 the FOMC began gradually liquidating securities from its balance sheet informally referred to as quantitative tightening (QT). The high degree of positive correlation between Federal Reserve balance sheet holdings and equity indexes may prove problematic during QT.

The unintended benefit of steadily rising equity indexes is challenged to continue in this new monetary policy environment. This paper explores the relationship between Federal Reserve holdings of U.S. sovereign debt and the performance of the S&P 500 stock index from the months prior to GFC to present. If the positive relationship persists financial stability as measured by equity index levels is at risk.

Notes on Data

Unless specified otherwise all data is sourced as follows.

Original Data Source

- S&P 500 via S&P Dow Jones Indices; A Division of S&P Global
- Board of Governors of the Federal Reserve System
- Federal Reserve Bank of St. Louis FRED Economic Data

3rd Part Data Providers

- DTN IQ Feed
- Quandl

Analysis Software

- Updata Analytics
- Microsoft Excel

Macro View

The level of U.S. sovereign debt in millions held by the Federal Reserve during the relevant time period is detailed in Figure 1.

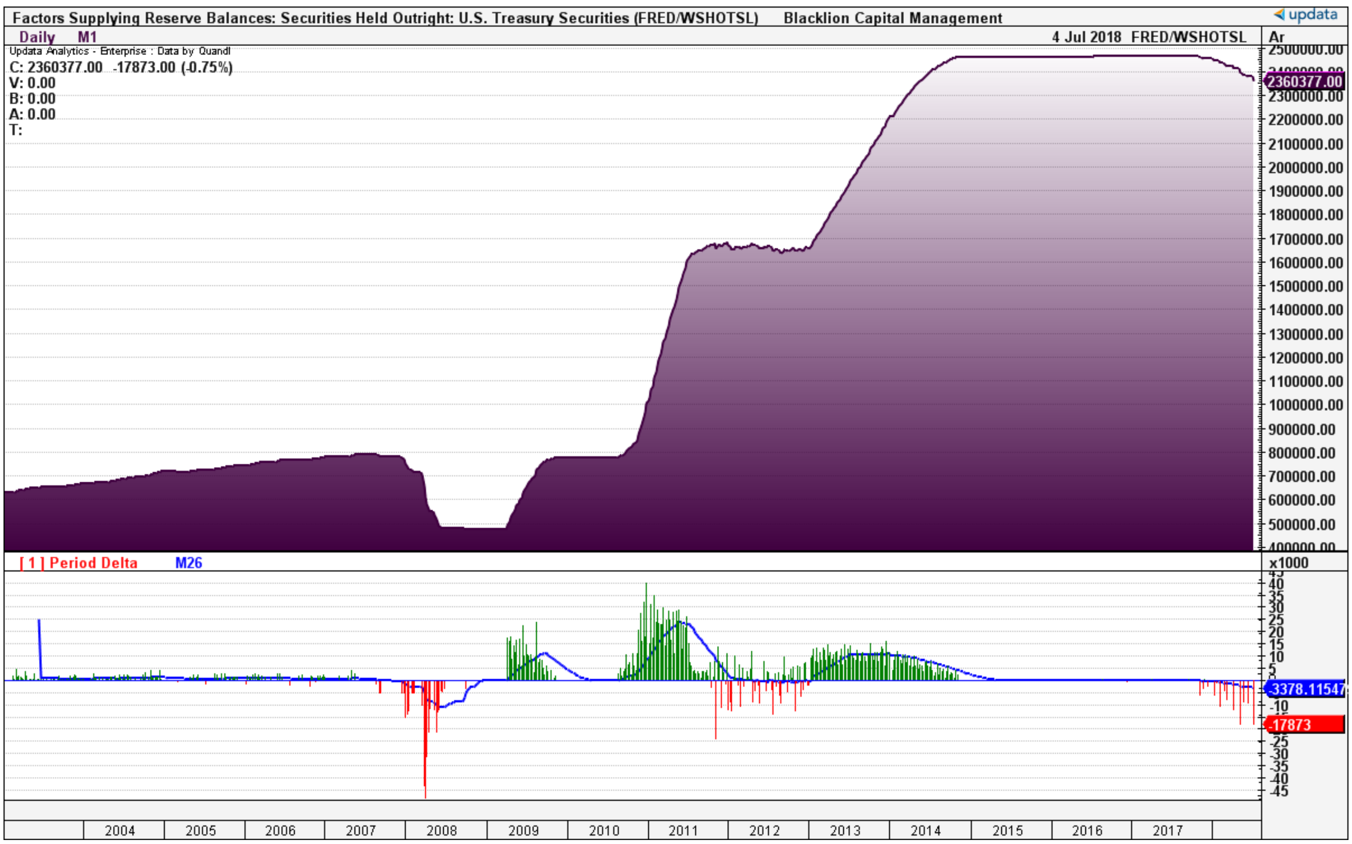


Figure 1 Federal Reserve Securities Held Outright: U.S. Treasuries

The period preceding GFC, during GFC, QE, and now beginning QT are apparent and each will be discussed.

This paper analyzes the relationship between the S&P 500 and the Federal Reserve holdings of U.S. sovereign debt which are plotted together in Figure 2.

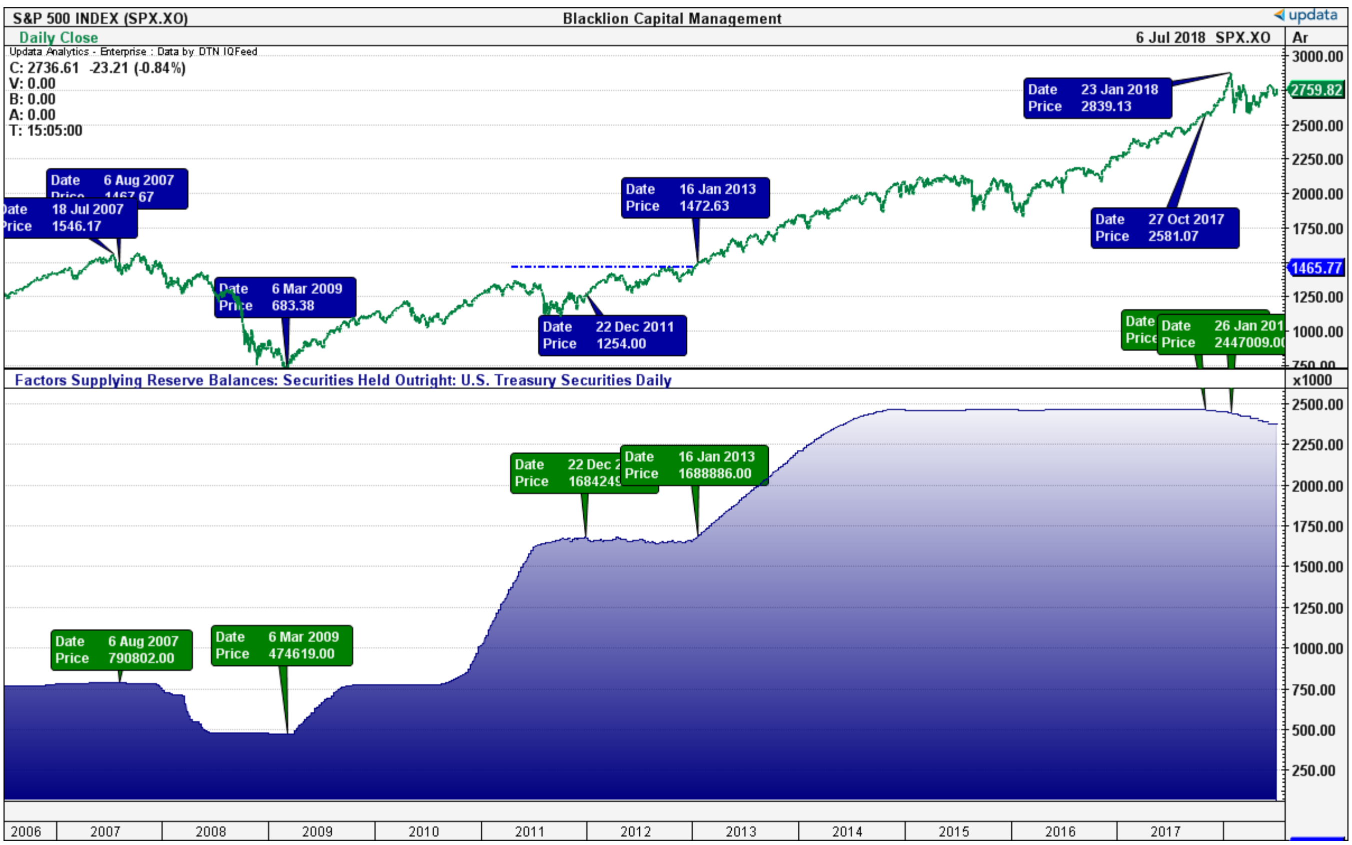


Figure 2 S&P 500 versus Federal Reserve U.S. sovereign debt

Key dates are highlighted in Figure 2 and discussed in detail in following sections.

Post 9/11 to Start of Great Financial Crisis 2008

The era from the attacks of September 11, 2001 until months before GFC is characterized by low short-term rates until the FOMC embarked on a series of increases between 2004 and 2006 in Figure 3.

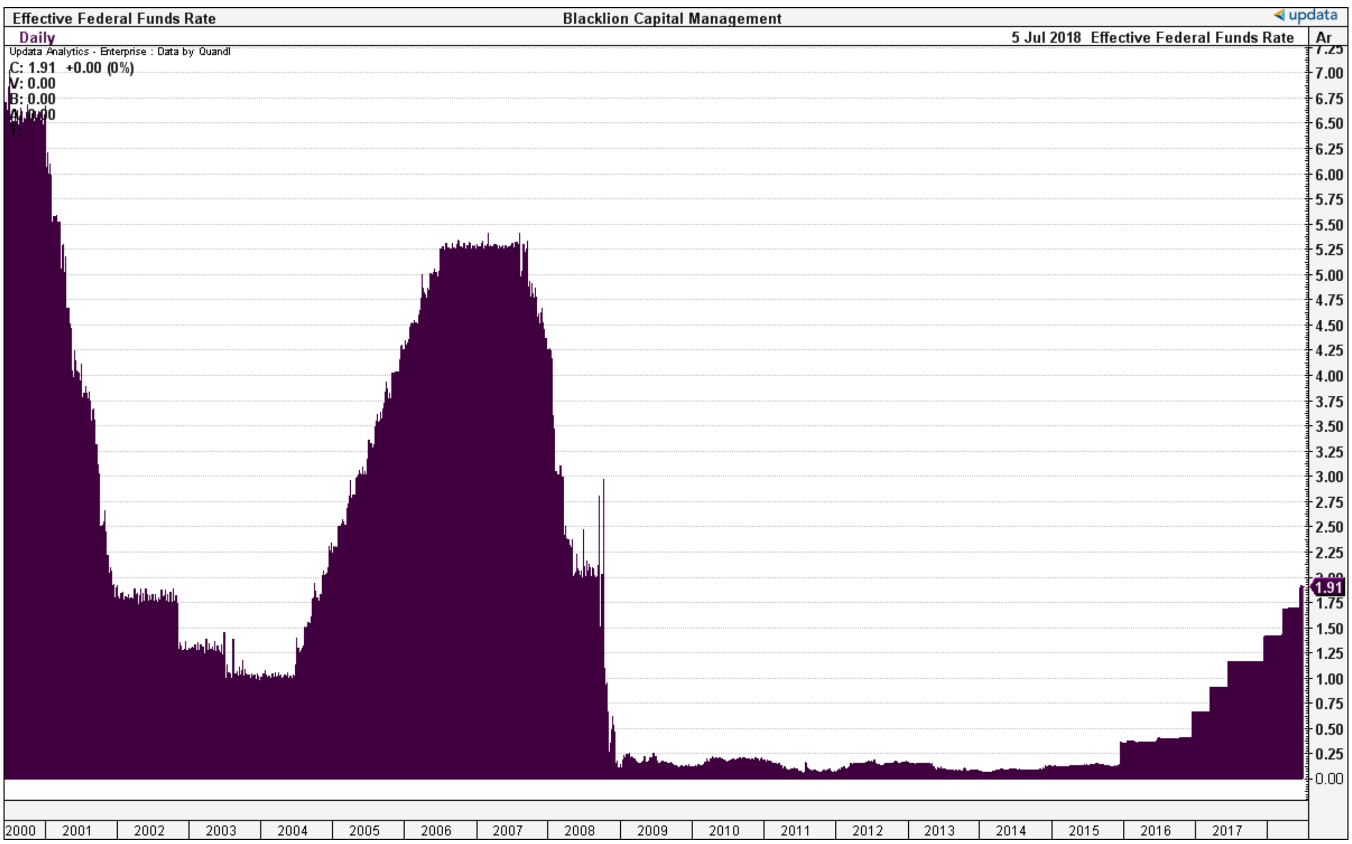


Figure 3 Effective Fed Funds Rate

During this period the Federal Reserve balance sheet was stable, gradually increasing.

The S&P 500 reached its pre-crisis high of 1,553.08 on July 19, 2007 while Federal Reserve holdings of U.S. sovereign debt prior to GFC peaked three (3) weeks later at $790.8 billion. Figure 4 below is Figure 2 zoomed in to the period of interest for in depth analysis.

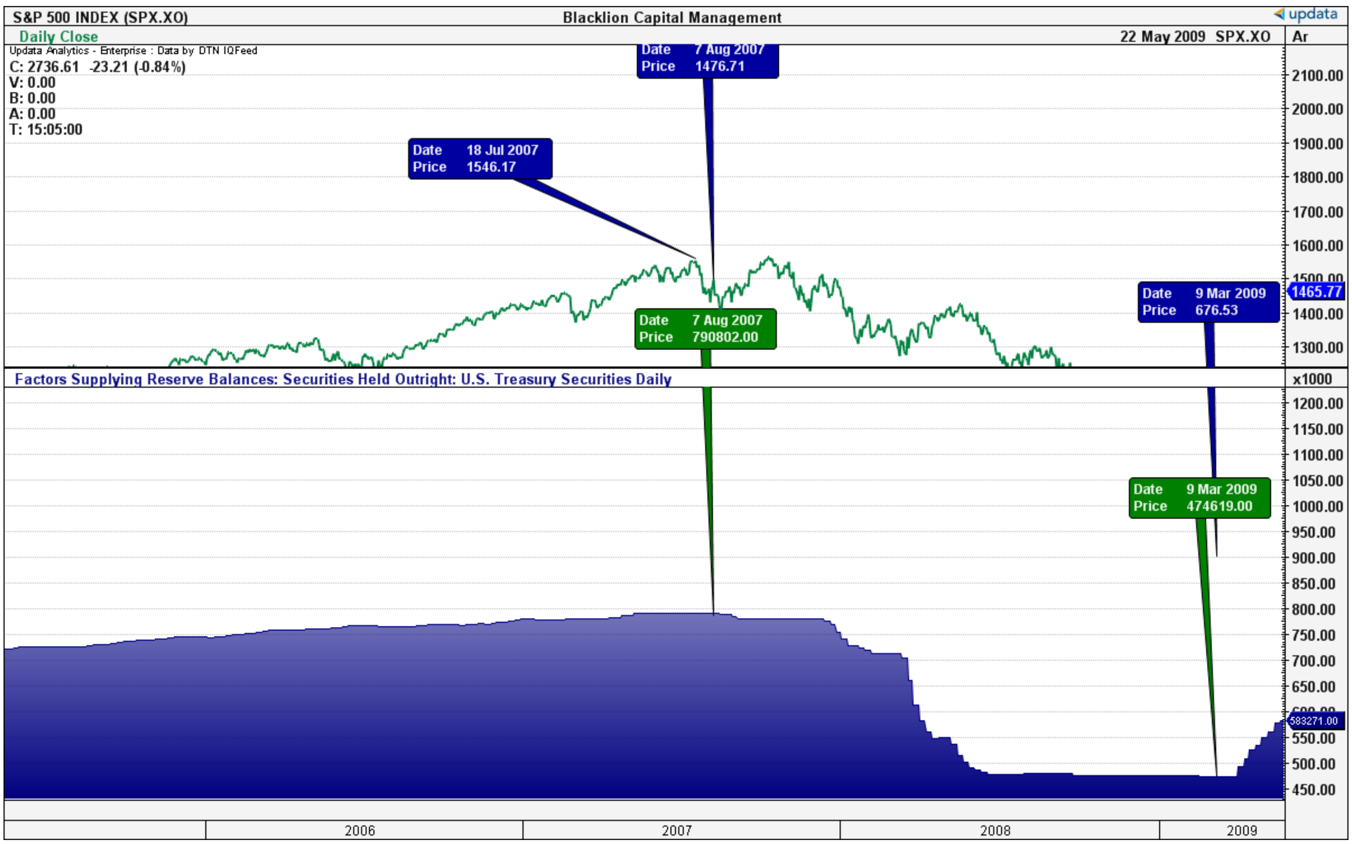


Figure 4 S&P 500 Versus Federal Reserve U.S. Sovereign Debt – Pre-Great Financial Crisis

Equity indexes are generally efficient at pricing in future events. It is notable that the S&P 500 peaked three (3) weeks before the Federal Reserve began liquidating its sovereign debt holdings preceding the GFC.

Additionally, it is notable that the Fed was aggressively selling sovereign debt in the first half of 2008 including March 2008 when Bear Stearns collapsed and was sold to J.P. Morgan Chase on Sunday night March 16th for $2 per share with Federal Reserve and U.S. Treasury support.

Given the Fed's penchant for increasing its holdings of sovereign debt after the GFC it is curious why it was an aggressive seller reducing its holdings 40% between August 2007 and March 2009 – the height of financial market volatility.

Great Financial Crisis – Begin Quantitative Easing

The Fed's sovereign debt holdings and the S&P 500 both reached their 21st century nadir during the week of March 6, 2009 detailed in Figure 5.

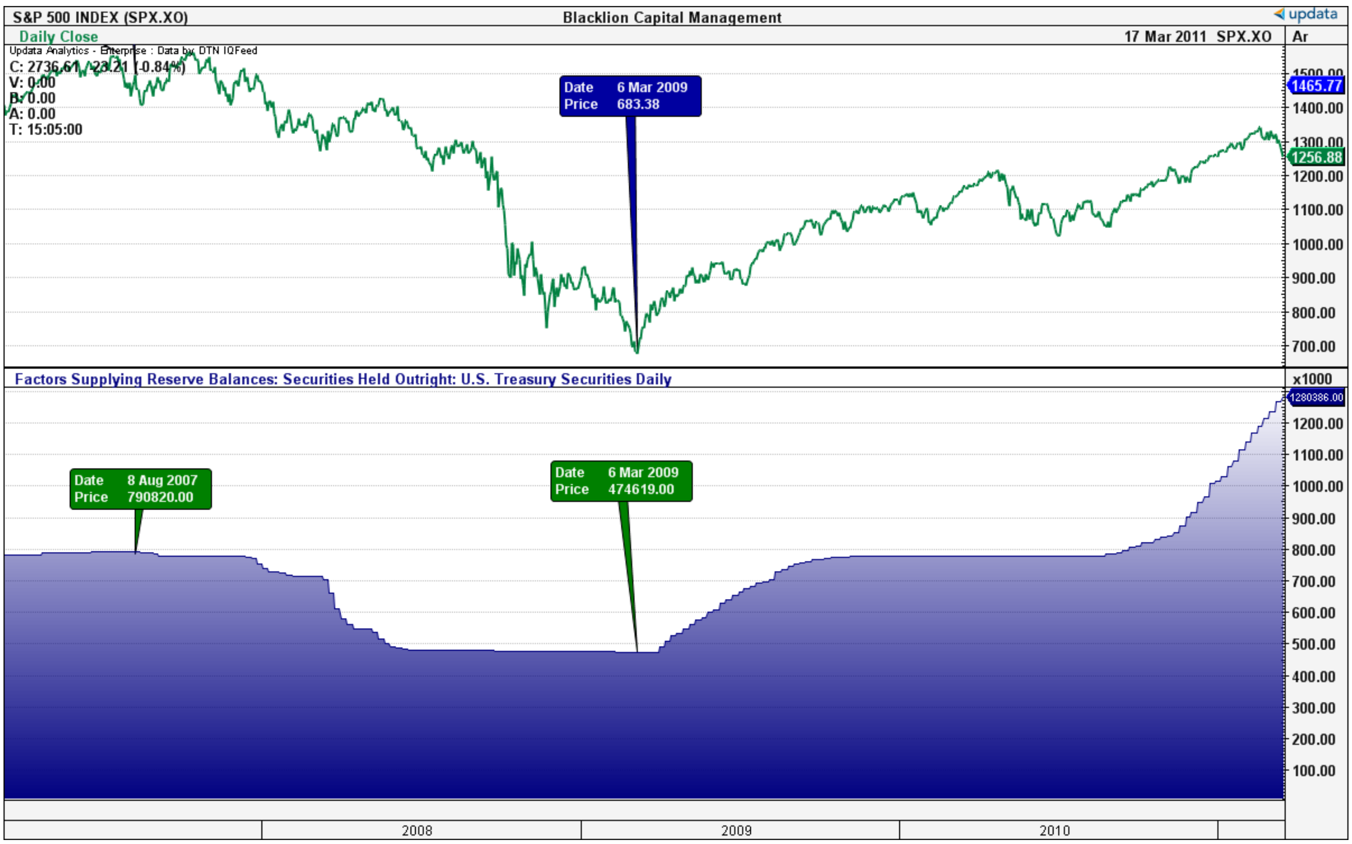


Figure 5 S&P 500 versus Federal Reserve U.S. Sovereign Debt - Great Financial Crisis

Consistent with the stock market's efficiency as a leading indicator the S&P 500 reversed sharply higher as the Federal Reserve began aggressively purchasing U.S. sovereign debt and agency securities in the secondary market.

Quantitative Easing and Recovery

The Federal Reserve implemented QE in three (3) tranches and modified the duration of its portfolio in a less notable operation. The first tranche extended through the majority of 2009 then the Fed took a break until near the end of 2010 when it again expanded its balance sheet in Figure 6 below.

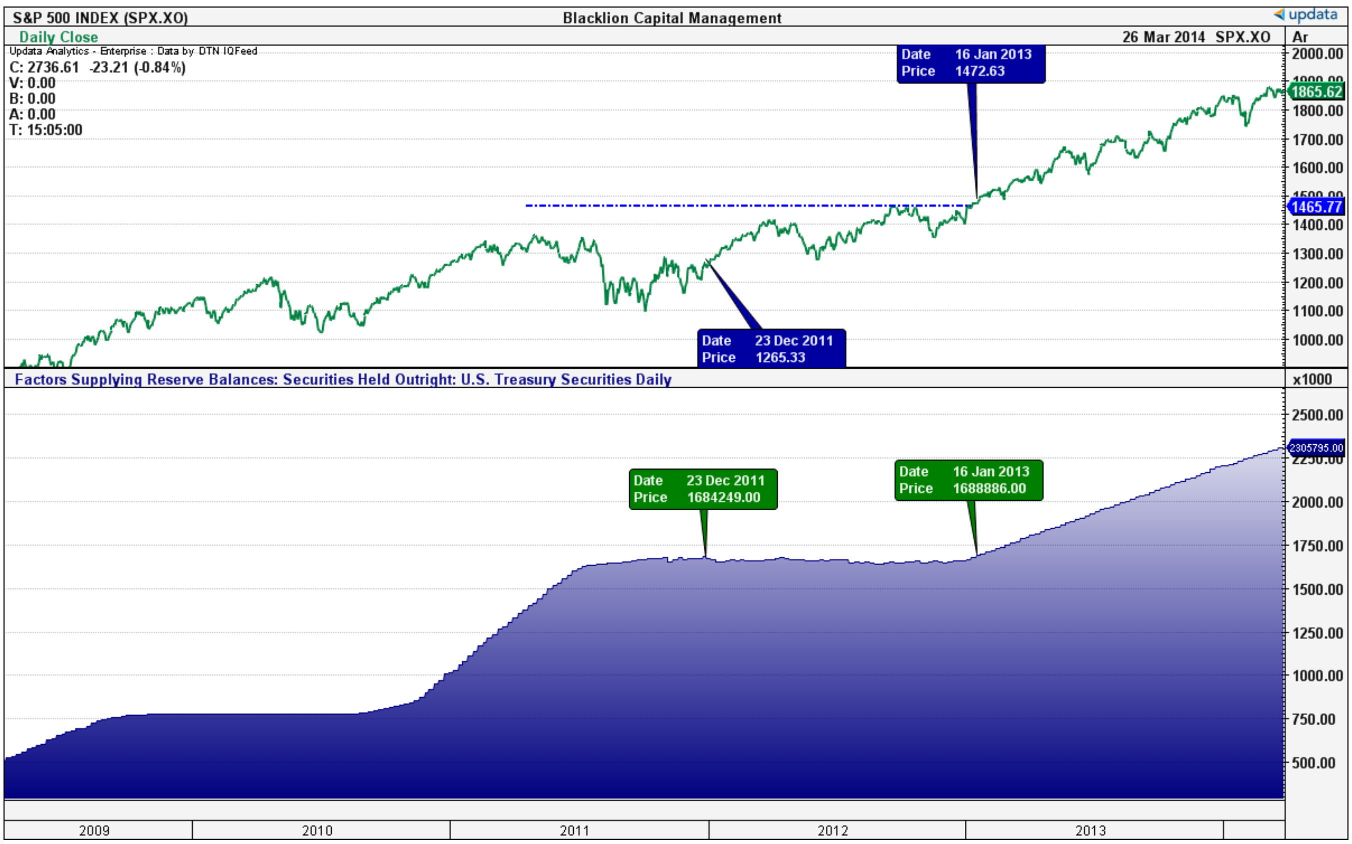


Figure 6 S&P 500 Versus Federal Reserve U.S. Sovereign Debt - Quantitative Easing and Recovery

The period of H2 2011 through Q1 2013 is notable in that the S&P 500 was volatile, but generally made higher highs and lows while meeting resistance at ~1,466 until the Fed's holdings of U.S. sovereign debt began increasing again in January 2013 while the S&P 500 broke through resistance.

January 16, 2013 is the first day the Fed's holdings of U.S. sovereign debt exceeded its previous high of $1.684 Trillion set on December 27, 2011. Simultaneously that day the S&P 500 first closed above 1,466 at 1.472.63 and it has not looked back rising more than 75% to its 2018 peak while the Fed increased its sovereign debt portfolio by 46%.

Quantitative Easing and Equity Top

Federal Reserve holdings of U.S. sovereign debt peaked at $2.466 Trillion on October 27, 2017 with the S&P 500 at 2.581.07 in Figure 7.

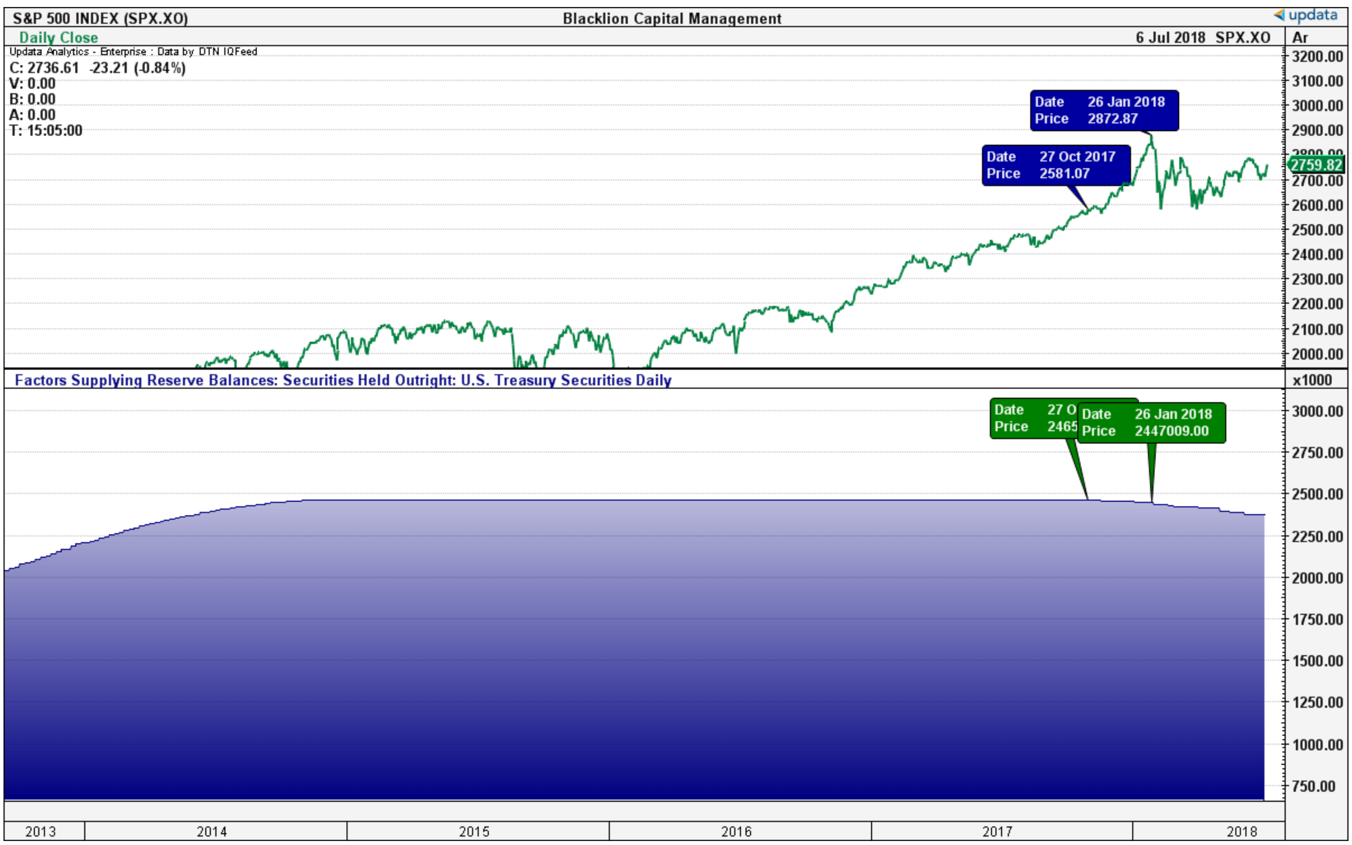


Figure 7 S&P 500 Versus Federal Reserve U.S. Sovereign Debt - Quantitative Easing and Equity Top

There is notable divergence between the Fed's balance sheet and the S&P 500 as the equity index transitioned to a parabolic phase motivated by fiscal stimulus. The correlation between Federal Reserve sovereign and the S&P 500 quickly reasserted itself as equities corrected sharply in February 2018.

Federal Reserve Sovereign Debt and S&P 500 Correlation

The previous discussion implies high positive correlation between the two measures analyzed herein. The correlation is detailed in Figure 8.

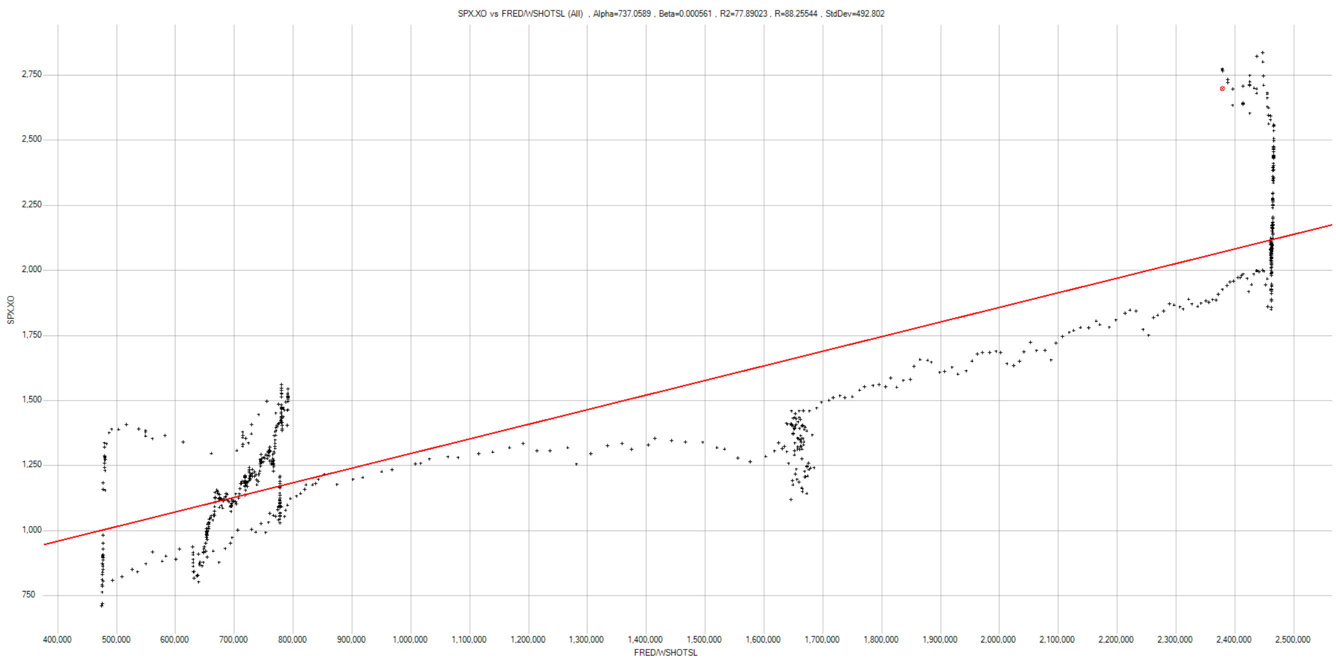
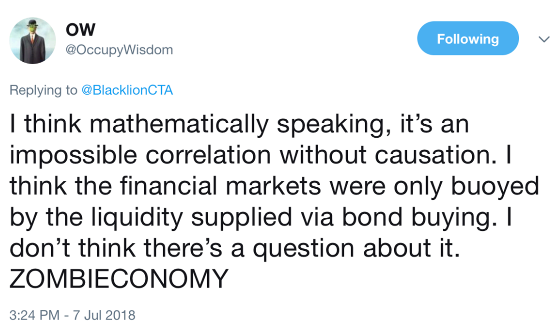


Figure 8 S&P 500 and Federal Reserve U.S. Sovereign Debt Correlation

The analysis is conducted with the sovereign debt holdings as the independent variable and the S&P 500 as the dependent variable yielding the following results:

- R = 88.25544
- R2 = 77.89023

What is the basis of this correlation? The machinations of capital flows from the Federal Reserve through institutions into equity markets is multi-facted and complex and perhaps best summed up by noted economist Frank Jurs (@OccupyWisdom) when reviewing the data:



The high degree of correlation is mathematically demonstrated in Figure 8 and motivates the key question:

Given the high correlation between the Federal Reserve holding of U.S. sovereign debt and the S&P 500 what is the outlook for the equity index while the Fed begins to aggressively reduce its sovereign debt holding? The outlook for equities is volatile at best and a potential sharp correction at worst.

It is naïve to think the FOMC is unaware of this relationship and while they may not have intended it the relationship nonetheless exists. While the Fed continues to reduce its sovereign debt holdings and accelerates the sales it is hard to make a case that equities will exceed the S&P 500's January 2018 peak and may correct sharply though it is unlikely the FOMC will endure a 20% decline and bear market before ceasing sovereign debt sales, lowering short-term interest rates, and possibly beginning to add sovereign debt back to their balance sheet to buoy equities.