

Volatility And Treasury ETF Returns

Traders lament low volatility in markets the same way twelve year-olds complain there is just not enough action in this town for them. In both cases they should be careful for what they wish, and while I cannot speak for the nation's adolescents, I can note liquidity tends to disappear and trading activity diminishes during times of extreme market stress. Returns tend to disappear, too: The 2015 year-to-date returns through October 21, 2015 for the macro/CTA hedge funds as reported by Hedge Fund Research were -3.31 percent.

Regardless, traders spent the first half of 2014 complaining about low volatility, comparing it to the previous low volatility regime of 2006-2007 and noting portentously how the financial crisis of erupted thereafter. The two periods had some major differences, such as 2006-2007 being a period of strong global growth led by China and having a credit bubble produced by years of lax lending standards while 2013-2014 was a period of slack growth and no credit bubble despite central banks' best efforts to produce one. The quiet ended in mid-2014, first in May with an engineered downturn in the euro and then in June with what was to be the start of a vicious bear market in crude oil.

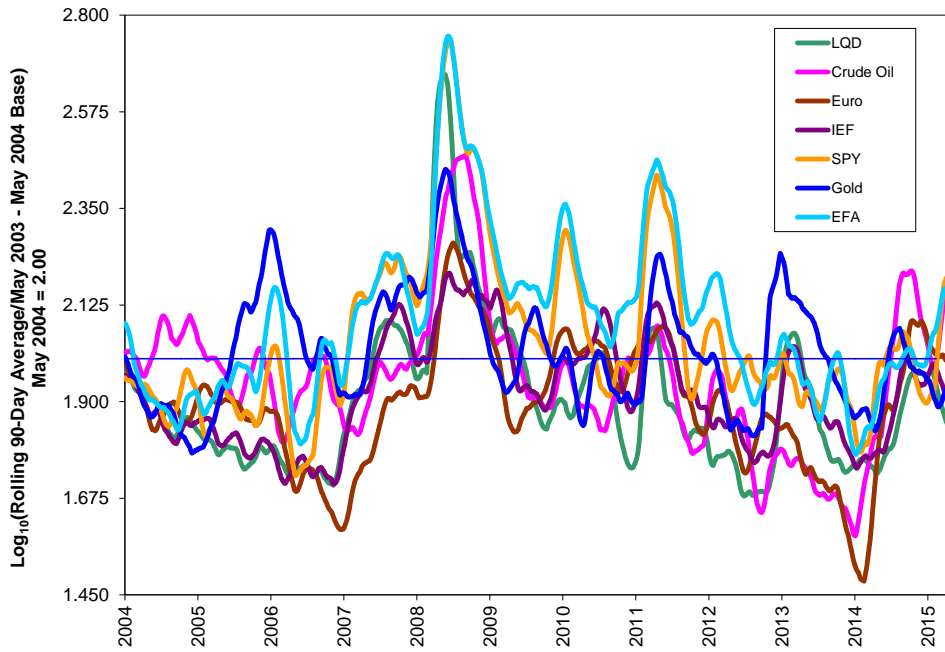
However, the two periods of quiet did have one huge similarity and that was parallel monetary policies from the major central banks. The post-financial crash period led everyone to drive short-term interest rates toward zero percent, to engage in policies of competitive devaluation and to expand national debt levels. The results were short-term interest rates ceased moving, yield curves did not move much, currencies' connections to interest rates lapsed in favor of their connections to relative asset prices and equities moved into persistent bull markets as they were the only places where investors could find even the potential for increasing returns.

Intermarket Comparisons

Before we move into the topic of volatility compression and Treasury ETF returns, let's take two snapshots of various markets' 30-day actual and implied volatility levels. These will be depicted as the rolling three-month average of 30-day volatility compared to the May 2003-May 2004 one-year period. The results are displayed on a common logarithmic scale to emphasize comparative rates of change. The SPDR Trust (SPY), the iShares 7-10 Year Treasury Bond ETF (IEF), the iShares MSCI EAFE Trust (EFA) and spot market prices for gold, crude oil and the euro are compared.

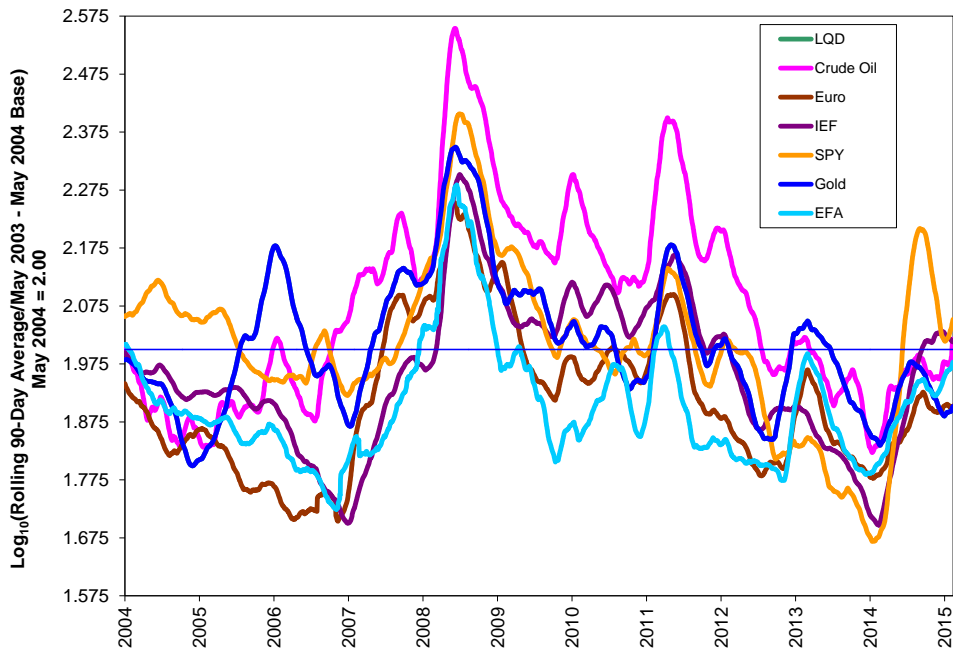
The volatility histories are something of a Rorschach Test. Yes, 30-day actual volatilities declined in 2013-2014 across most markets, and yes, they rebounded in parallel during the first half of 2015. However, volatilities diverged during the third quarter of 2015 as equities sold off hard in August and produced a general "risk-off" response. This divergence is even more visible in a comparison of 30-day implied volatilities. It would be nice to say all markets enter risk-on and risk-off phases at the same time, but the data simply do not support that conclusion.

30-Day Actual Volatility Across Markets



Source: Bloomberg

30-Day Implied Volatility Across Markets



Source: Bloomberg

Treasury ETFs

While almost any investor can go out and buy individual Treasury securities, many have chosen to have someone else package them up into exchange-traded funds of various maturities, including some of the leveraged and inverse variety that shall remain unaddressed here lest we be accused of encouraging children to play with matches. The one nice thing about turning Treasury securities into packages of equities is these equities support well-behaved equity options whose implied volatilities can be measured alongside realized volatilities for the benefit of market analysts.

Five ETFs correspond to the maturity ranges of 1-3, 3-7, 7-10, 10-20 and 20+ years (SHY, IEI, IEF, TLH and TLT, respectively; if the ETF industry proliferates at its historic pace we will need to start employing the Greek, Cyrillic and quite possibly Hebrew alphabets to supply the need for tickers). We can calculate a realized high-low-close (HLC) volatility for each of these ETFs and compare it to implied volatility levels. HLC volatility is defined as:

$$\sum_{i=1}^N \left[\frac{.5 * \left(\ln \left(\frac{\max(H, C_{t-1})}{\min(L, C_{t-1})} \right) \right)^2 - .39 * \left(\ln \left(\frac{C}{C_{t-1}} \right) \right)^2}{N} * 260 \right]^{1/2}$$

Where H, L, and C are high, low, and close, respectively, and N is the number of days between 4 and 29, inclusive, that minimize the function:

$$\frac{1}{N} * \sum_{i=1}^N \frac{N}{Vol^2} * |(P - MA)| * |\Delta MA|$$

Volatility And Prospective Returns

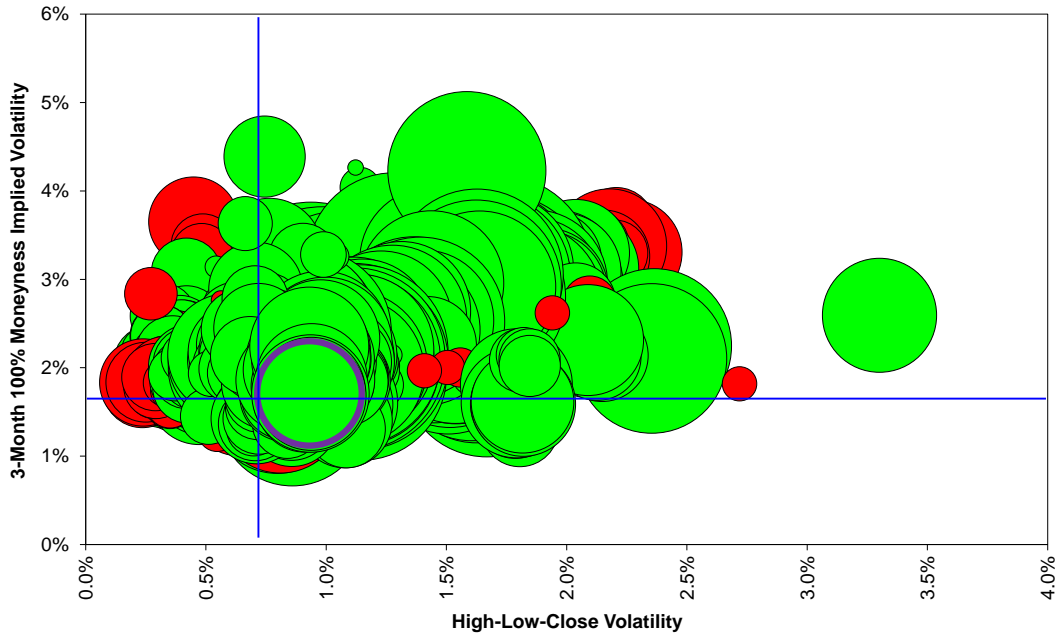
Instead of creating an excess volatility measure defined by the ratio of implied volatility to HLC volatility, let's go directly to the question of whether these two measures have any apparent relationship to three month-ahead returns for the Treasury ETFs.

In all of the cases below, three month-ahead returns will be mapped as a function of the volatility measures. Positive prospective returns will be depicted with green bubbles, negative returns with red bubbles; the diameter of the bubbles corresponds to the absolute magnitude of the return. The environment on October 22, 2015 is marked with a bombsight and the last datum used, from July 27, 2015, is highlighted.

The comparative histories will begin with the adoption of zero interest rate policy in the U.S. on December 16, 2008. While this may seem to prejudice the market environment in a bullish direction, it really does not. Both 2009 and 2013 were negative years for Treasury returns within the context of what proved to be a resilient if artificial secular bull market. We can extend that statement all the way back to the peak of interest rates in 1981; each upturn in yields proved to be temporary in a bull market enduring for more than a trading generation.

Let's take the Treasury ETFs in ascending order of maturity beginning with the SHY. We should not expect much in the way of negative returns, and we are not disappointed in this regard. There are some minor clusters of red bubbles at HLC volatilities less than 0.50%, but these really are not tradable.

Three Month-Ahead SHY Returns As A Function Of Volatility

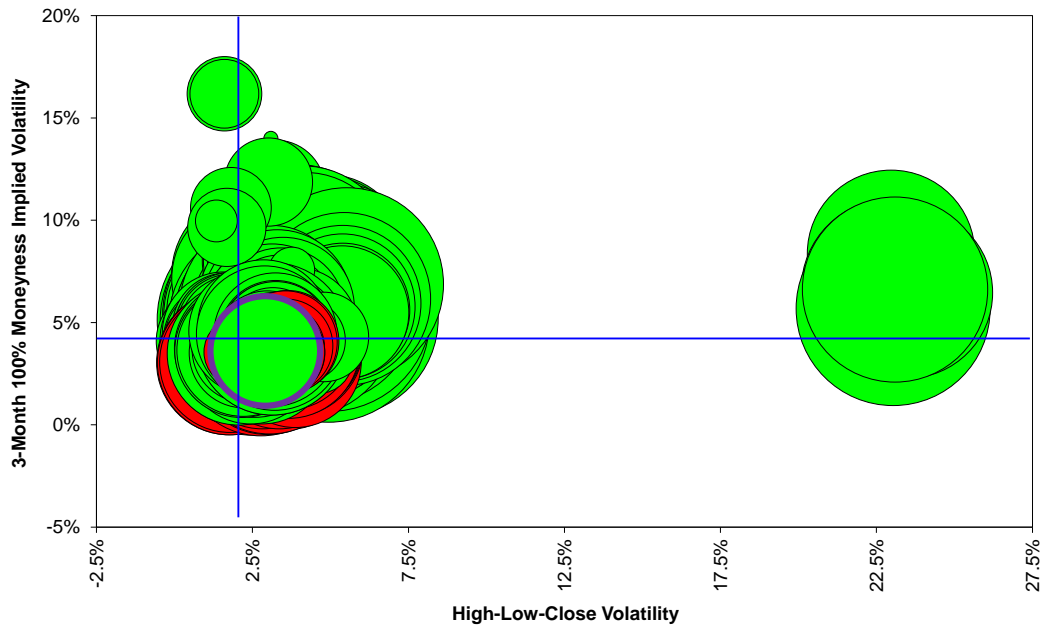


Source: Bloomberg

The IEI presents a more interesting case as it has a small cluster of very high HLC volatility observations stemming from the May 2010 Eurozone sovereign debt crisis and the “flash crash” of that month. Stock exchanges cancelled many of those trades, but the IEI’s outliers were not sufficient to warrant anything more than a shrug and a “party on” nod.

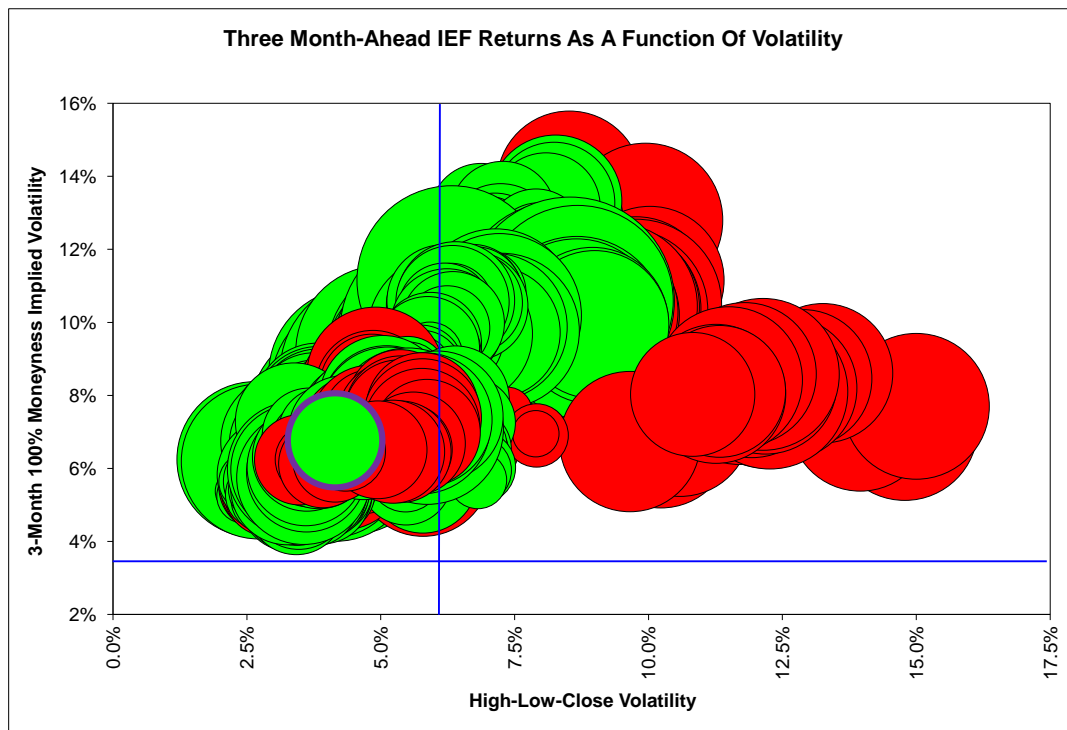
There is, however, a very well-defined cluster of red bubbles in the southwest corner corresponding to the case of both volatilities being at or near the low end of their observed ranges. The old adage of “never short a dull market” can be turned on its head here: Never buy a dull 3-7 year Treasury ETF market.

Three Month-Ahead IEI Returns As A Function Of Volatility



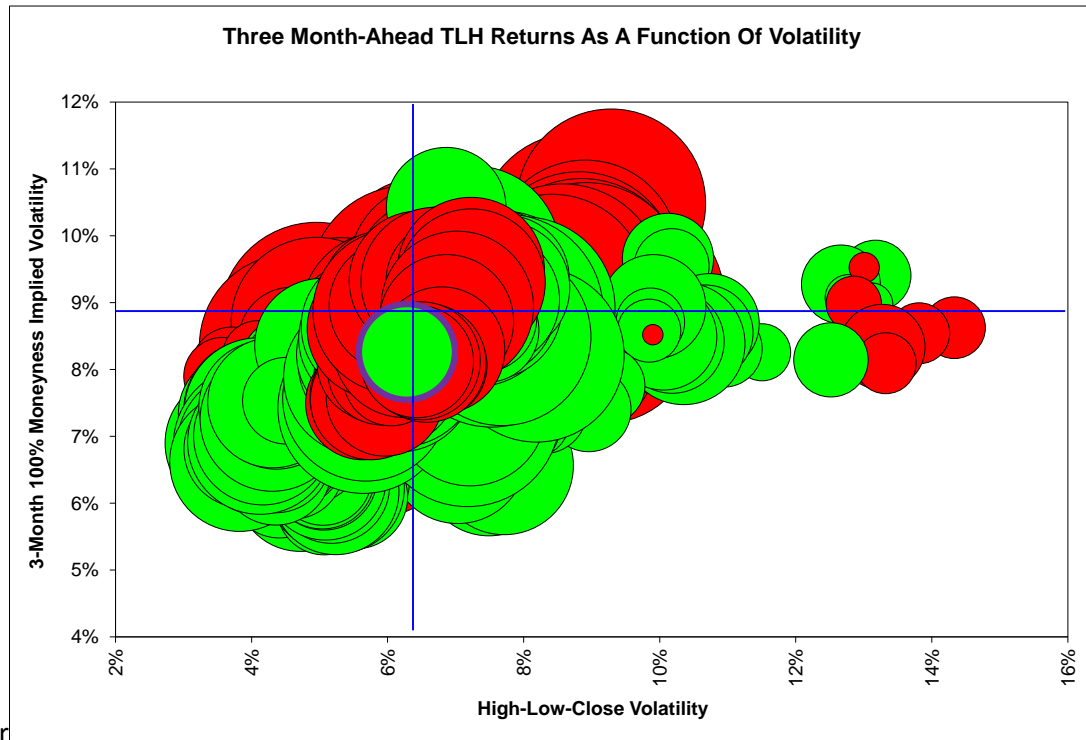
Source: Bloomberg

We now move up the ladder to the IEF, the segment where rates traded a little more freely during the QE era. Here a well-defined pattern starts to emerge with implied volatilities less than 8 percent and HLC volatilities greater than 8 percent both leading negative returns. This is equivalent to saying either a complacent market or one trading very actively is setting 7-10 year Treasuries up for lower returns.



Source: Bloomberg

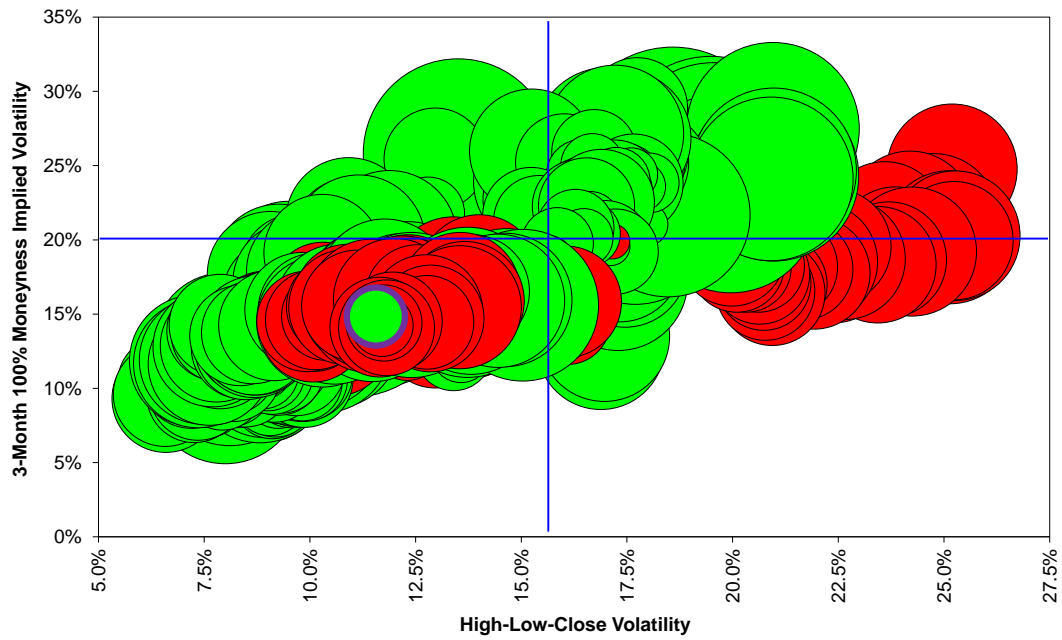
The pattern shifts slightly for the TLH. Here we can describe a market where observations in the northwest corner, a combination of high implied volatility and low HLC volatility lead to positive returns. Restated, a high demand for insurance against higher rates and a low level of trading activity produce gains for 10-20 year bonds.



Source: Bloomberg

The pattern shifts even more for the TLT as the clusters of positive and negative prospective returns alternate. Very low and very high HLC volatility leads positive and negative returns, respectively, while very low and very high implied volatility lead positive returns for the 10-20 year bonds.

Three Month-Ahead TLT Returns As A Function Of Volatility



Source: Bloomberg

The one overriding conclusion we should reach is we can make no blanket conclusions about the effects of either implied or HLC volatility for Treasury ETF returns. If this is the case, we should not regard volatility as a trading indicator but rather as a descriptive variable and, more important, we should not waste anyone's time bemoaning periods of low volatility. They may be interesting discussion points, but that is about it.