

Convexity Maven

A Commentary by Harley Bassman

January 29, 2018

“It’s Never Different This Time”



Led Zeppelin, October 22, 1976

If you have found this Commentary, then you well know the Maven’s Mantra:

It’s always about character;
It’s never different this time.

And thus once again so many well-remunerated pundits bleat that now is the richest, highest, tightest, lowest, scariest, riskiest, illogical and most outrageous [*fill in the blank*] of all-time. Of course, this is not the case; it is just that one’s window of investment sentience is usually shorter than the macro-political or -economic cycle.

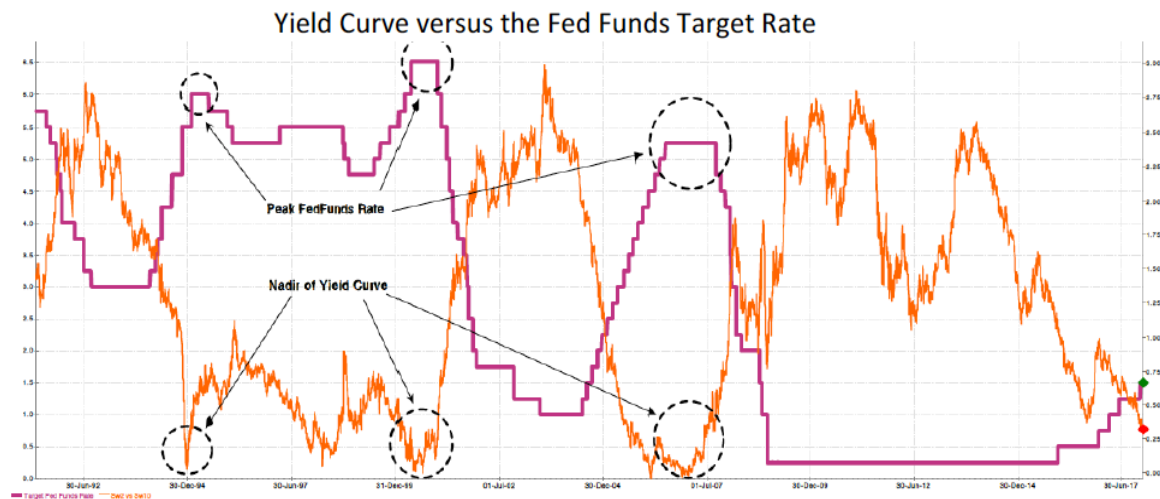
Is our current President the worst ever ? Hardly; or at least not yet. Notwithstanding the coarse tweets, I might suggest James Buchanan who supported the Dred Scott decision and so contributed to a polarized nation that the Civil War commenced a mere five weeks after his term.

Has the Fed manufactured a uniquely low interest rate structure, which radiates newly found financial distortions ? Perhaps nominally, but real interest rates, both policy and term, were lower in the mid-1970s; and we know how that ended.

There is a reason the Greek classics and Shakespeare are still required reading in the freshman humanities courses: They both keep the focus on humankind's inability to conquer (or at least control) Hubris and Greed. And since both of these human desires can seemingly never be satiated, financial markets (as a numerical measure of emotion) will traverse between these two extremities.

It is never different this time.

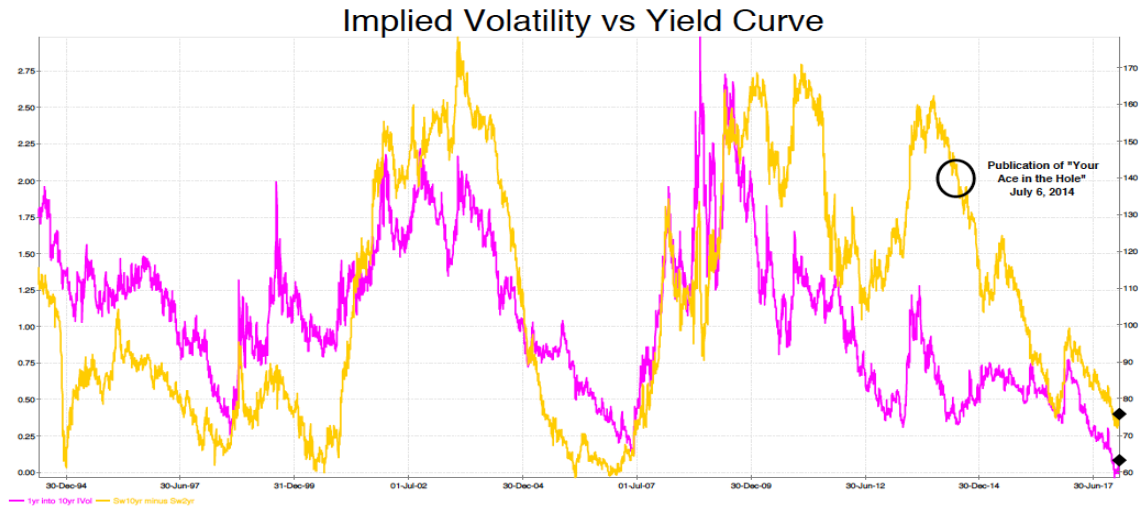
In the chart below, the **-rubidium line-** is the target Fed Funds rate where I have highlighted the peaks of the hiking cycle. In near polar synchronicity, the **-calcium line-** is the Yield Curve as measured by the difference between the two-year and ten-year swap rates, which not by happenstance reaches its (highlighted) nadir in the same window of time.



Source for all charts unless otherwise noted: Credit Suisse LOCUS

The FOMC "dot plot", market prices, and professional economists all cluster around the notion that the Fed will raise its official rate two to three times in 2018; which could well pressure the Yield Curve a bit flatter. And while a flat Curve does not cause economic instability, a flat Curve is often found lurking nearby when markets shake. Let's examine why this may be the case.

As detailed in "Your Ace in the Hole" - July 16, 2014, Implied Volatility closely tracks the shape of the Yield Curve. Notice that the **-lithium line-** of 1y-10yr Implied Volatility generally tracks the **-sodium line-** of the Yield Curve. The exceptional divergence that occurred in mid-2014 (circled) prompted publication of that commentary.

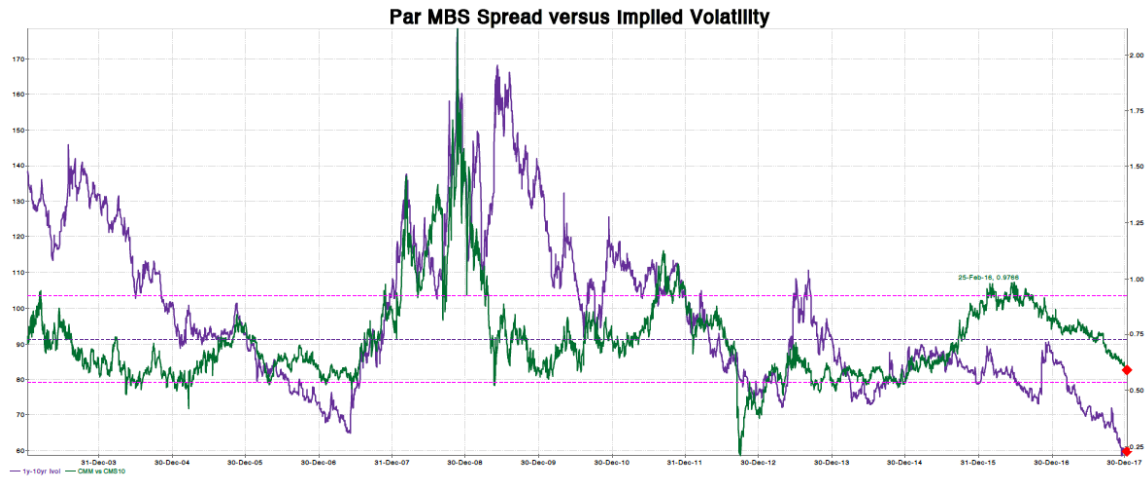


In a nutshell, the shape of the Curve suggests a degree of uncertainty for the path of interest rates. If the Curve is steep, then the Forward rate must be higher than the Spot rate (via bond math); so the steeper Curve, the wider the separation between the two rates. Since time can only go forward, these two rates must converge at some point; thus a wide spread insures that one of these rates must move a lot. As such, a steeper Curve fundamentally (and economically) creates greater uncertainty, and thus is associated with a higher level of Implied Volatility.

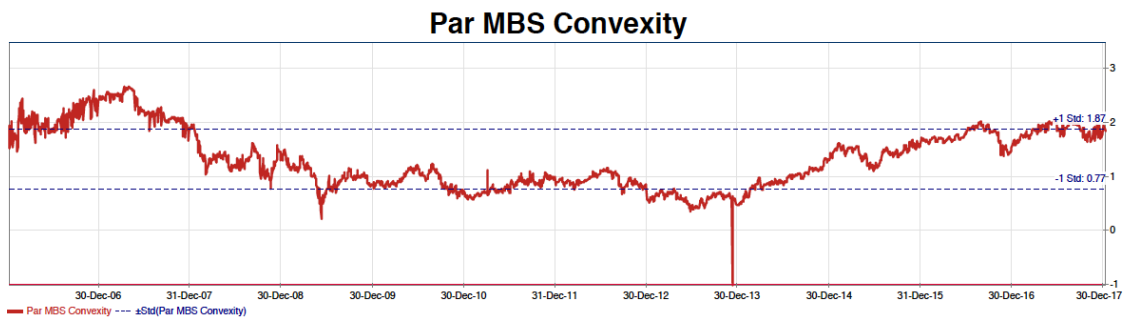
On the contrary, a flatter Curve offers a Forward rate much closer to the Spot rate, therefore anticipating less uncertainty. This does not mitigate interest rate volatility, but it does mean there must be an exogenous shock to move rates since the merger of the Forward to the Spot rate will not be as great. While the shape of the Yield Curve does not directly drive the level of Implied Volatility, there is indeed an economic rationale for them to be correlated.

Interest rate Implied Volatility is one of the main inputs to discern the value of options embedded in callable securities; particularly fixed-rate Mortgage-backed securities (MBS). In broad strokes, the yield of a standard MBS is determined roughly by the price of a vanilla amortizing bond minus the embedded prepayment option. As Implied Volatility increases, the cost of this option grows, thus decreasing the price of the MBS. Bond math 101 states that lower bond prices produce higher yields, so all else equal (which rarely occurs), higher Volatility leads to a wider yield spread of MBS over a benchmark.

The **potassium line** below is the Implied Volatility of a one-year option on the ten-year swap rate while the **barium line** is my favorite measure of MBS value, the Constant Maturity Mortgage (CMM) rate versus the matched ten-year swap (CMS) rate. [See "*Nessie, Yetti and CMM*" – February 12, 2009] Because "all else" is often not equal, these vectors do not track perfectly, but they generally move in unison as both Wall Street dealers and Investment Managers tend to rely upon option-adjusted spread (OAS) as a primary valuation metric.



Lower Volatility being associated with tighter a MBS spread is not newsworthy any more than "water is wet"; however, there is a secondary implication that should be considered. As will be detailed soon, all else equal (gee, I need to quit this phrase), lower Implied Volatility will mathematically increase the Convexity (gamma) of an option. And this is exactly what is shown in the **Luxardo line** below. Notice the calculated Convexity (negative, because an MBS is short the option) of a Par MBS bond (similar in concept to CMM above) is nearing levels last reached in late 2006, when volatilities and spreads both bottomed.

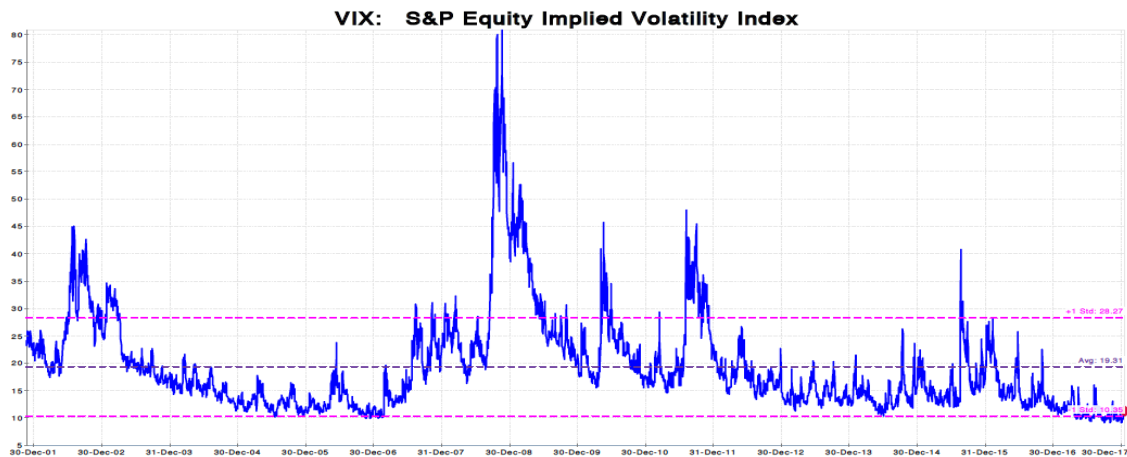


The investment implication is that greater negative Convexity leads to a less stable option price. (The "delta" of the option and the duration of the MBS become more sensitive to rate changes.) As such, an interest rate shock can quickly disrupt a portfolio strategy that seeks to hug a certain maturity profile.

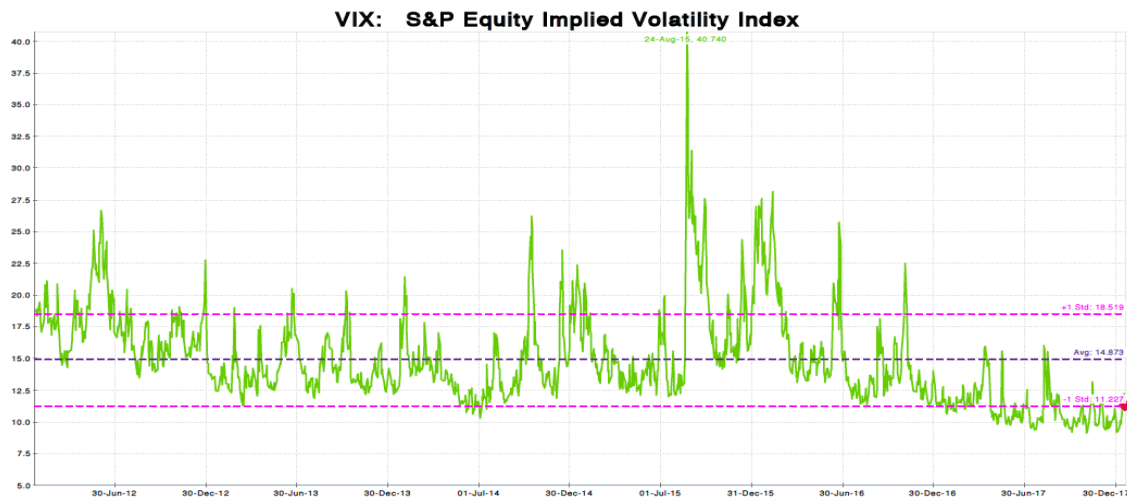
To be clear, a more negatively convex MBS market will not cause a market shock, but when one does occur, investment managers will need to make greater adjustments at a faster pace to their portfolios to maintain a duration target.

To save space, please trust me that Implied Volatility also tracks Credit spreads on a macro basis. [*"Building a Better Volatility Mousetrap"* – September 6, 2012]

More salient is that these risk vectors also correlate with equity Implied Volatility, as measured by the **–Brady line–** of the VIX since 2001. This popular index is now one standard deviation below its 19.3 average.



Many investment analysts wave off this 19.3 level as biased north because of the spike during the GFC, so the **–Foles line–** below is the VIX since 2012. By this measure too, the VIX is 1SD below its post-QE average of 14.9.



Similar to how the heightened negative Convexity of the MBS market can reduce market stability, so too will a low VIX contribute to a less stable equity market.

The table below offers the prices and greeks for vanilla one-year options on the SPX (or SPY times 10 for viewers at home). The first column is for an at-the-money straddle (SPX = 2750), priced with an Implied Volatility of either the near current 13% or prior cycle level 26%. The second column offers values after an instant 9.1% decline to 2500, a round number that is also about a 50% retracement since the election.

Most eyes will quickly focus upon the **-magnesium row-** of the price change and notice that an investor with a short position in an IVol = 13% straddle will take a much larger mark-to-market loss (\$57) than the holder of an IVol = 26% straddle (\$10), as measured either on an absolute or a percentage basis.

But it is the **-strontium row-** that offers why investment managers (and the FED) should presently be so fearful of the current low volatility environment.

SPX Straddles

Strike = 2750
Expiry = 1 year

	SPX = 2750	SPX = 2500	Price change	Position Change
	<i>Ivol = 13%</i>			
Price	\$280	\$337	-\$57	
Delta	-5.40%	49.20%		-54.60%
Gamma	-6.00	-4.77		
Vega	-21.50	-15.55		
	<i>Ivol = 26%</i>			
Price	\$559	\$569	-\$10	
Delta	-10.30%	18.60%		-28.90%
Gamma	-2.98	-2.91		
Vega	-21.37	-19.00		

Source: Bloomberg

I am not going to "dive deep" and explain why an at-the-money straddle does not have an initial delta of zero; so let's keep our eye on the prize. (Hint: It has to do with a Log versus Normal Distribution)

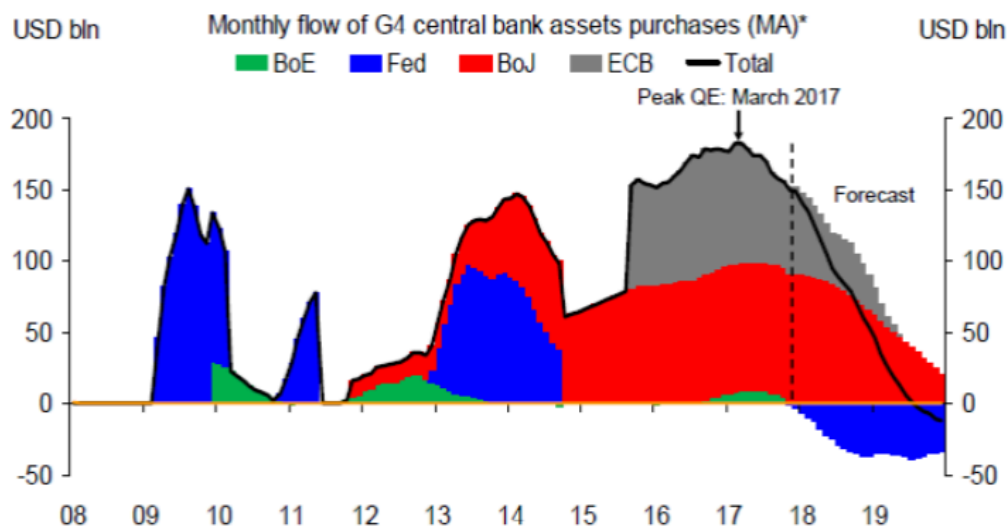
Suppose a large Hedge Fund is short \$100mm of SPX straddles at IVol = 13% and held coordinated positions that created a flat exposure to the market. All else equal, if the SPX declined by 9.1% this manager would need to sell \$54.6mm of SPX to maintain a flat exposure. In contrast, in an IVol = 26% environment, a similar market disruption would necessitate selling only \$28.9mm of stock. This is how low volatility erodes the stability of financial markets.

Low levels of Implied Volatility do NOT cause market disruptions, however low Volatility is usually found loitering near the scene of the crime because its associated negative Convexity acts as an accelerant.

As noted at the outset, it is never different this time, and this cycle will only be a revelation to pundits trying to sell day old sliced bread. The Fed will raise its policy rate, which tends to be sympathetic to a flattening Yield Curve. As the Curve flattens, other risk vectors will diminish, these include Credit spreads and Implied Volatility across asset classes. (I would also note that tighter Credit spreads imply a reduced Implied Volatility on the embedded default option, which decreases the stability of IG and HY assets.)

I have stated that low volatility only adds gasoline to the fire, but am I willing to point to the match that may start the fire ? Yup.....

As offered in "Rumpelstiltskin at the FED" – April 19, 2016, Quantitative Easing (QE) has been employed by the major Central Banks to create Asset substitution that might transmogrify into Monetary Velocity. To the extent this has been successful via the elevation of asset prices, so too should Quantitative Tightening (QT) act as a retardant.



Source: Deutsche Bank Global Markets Research

Forward guidance by the major Central Banks projects that the G-4 will collectively start reducing their balance sheets sometime during Q-1 2019; so for the record I say that this is the "match" that will kindle the fire. Since markets tend to anticipate, I doubt the world will end on March 31, 2019, so perhaps sometime this summer, and maybe even during the dreaded month of October.

The Maven's investment advice: *Sizing is more important than entry level.*

Your comments are always welcome at: harley@bassman.net

Harley S. Bassman

January 29, 2018

Bonus artwork courtesy of the JPMorgan Private Bank:



The Convexity Maven ("CM") is a publisher, not a registered investment advisor, and nothing in CM's Commentary is intended, and it should not be construed, to be investment advice. CM's Commentary is for informational and entertainment use only. Any mention in CM's commentary of a particular security, index, derivative, or other instrument is neither a recommendation by CM to buy, sell, or hold that security, index, derivative, or other instrument, nor does it constitute an opinion of CM as to the suitability of that security, index, derivative or other instrument for any particular purpose. CM is not in the business of giving investment advice or advice regarding the suitability for any purpose of any security, index, derivative, other instrument or trading strategy, and nothing in CM's Commentary should be so used or relied upon.

CM hereby expressly disclaims any and all representations and warranties that: (a) the content of its newsletters is correct, accurate, complete or reliable; (b) any of its newsletters will be available at any particular time or place, or in any particular medium; and (c) that any omission or error in any of its newsletters will be corrected.

Although from time to time CM's commentary may link to or promote others' websites or services, CM is not responsible for and does not control those websites or services.

CM's Commentary is published and distributed in accordance with applicable United States and foreign copyright and other laws.

At any given time, CM's principals may or may not have a financial interest in any or all of the securities and instruments discussed herein.