

Convexity Maven

A Commentary by Harley Bassman

June 27, 2018

“Catch A Wave...”



THE BEACH BOYS – SEPTEMBER 16, 1963

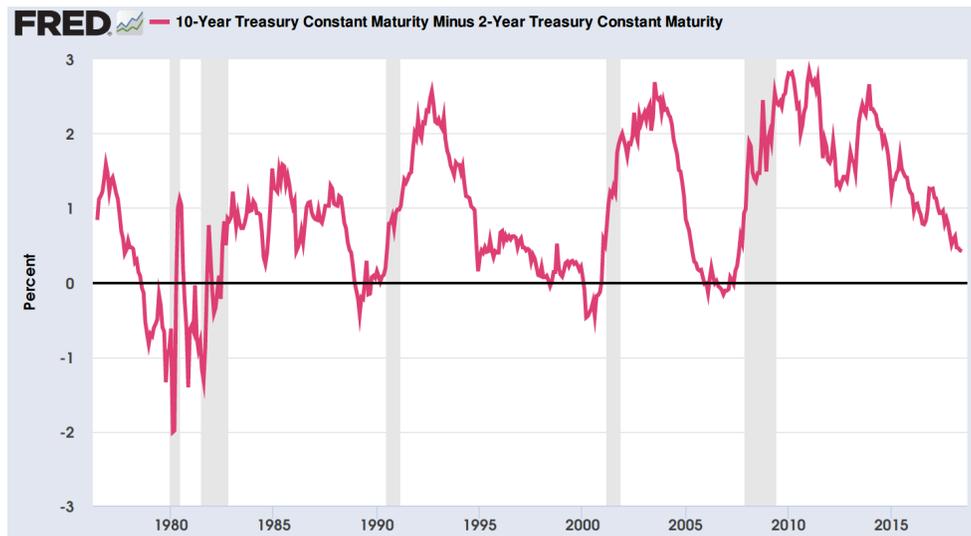
History does not seem to repeat (or rhyme) because our fates are pre-ordained by the Almighty. Rather life moves in cycles because humans are social beings whose flaws of greed and ego never wither. Described as hubris by the Greek playwrights, like lemmings over the cliff, we simply cannot help ourselves.

Thus mankind's advance from the cave to the stars in a mere few score thousand years has been marked by a recurring pattern of a few steps forward followed by a small step back. This is as true for prices in the financial markets as it is for the weaving (and tearing) of our social fabric.

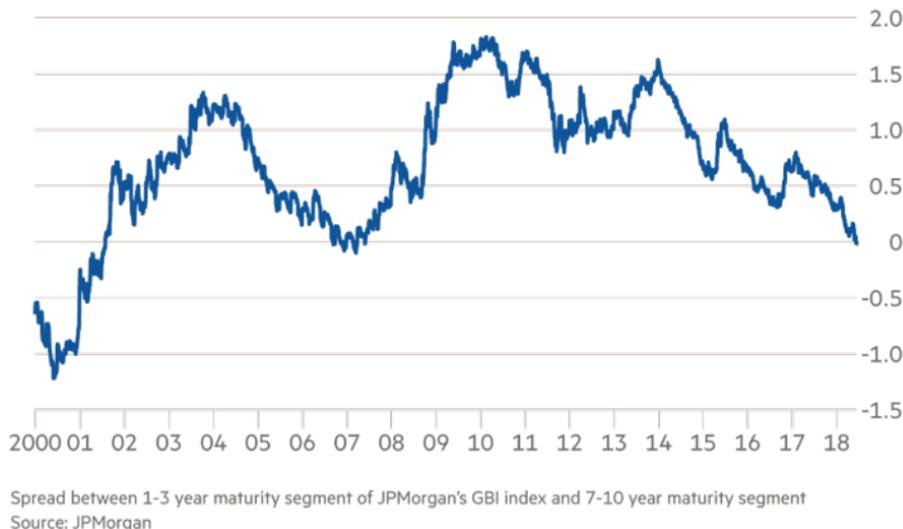
Over the fullness of time, one can discern the rhythmic regularity of such waves; this is in contrast to their perceived uniqueness (“it’s different this time”) when one is between the crests. Hold this thought, as I now suggest it is time to grab your surfboard and head to the beach; the next wave is coming.

Quipped Dave Rosenberg recently:
"Cycles die; and you know how they die ? The Fed puts a bullet in its forehead."

I am not so ready to point a finger solely at the Fed since the US regularly experienced "financial panics" half a dozen times (1819, 1837, 1857, 1873, 1893, and 1907) before the creation of the Federal Reserve in 1913. But what is definitive is that an inverted yield curve, in coincidence with a tighter Fed monetary policy, has preceded our last four recessions. Shown by the **-pitaya line-**, the UST-2yr rate has flipped above the UST-10yr rate about eighteen months prior to the NBER officially designating a recession (shaded bars).



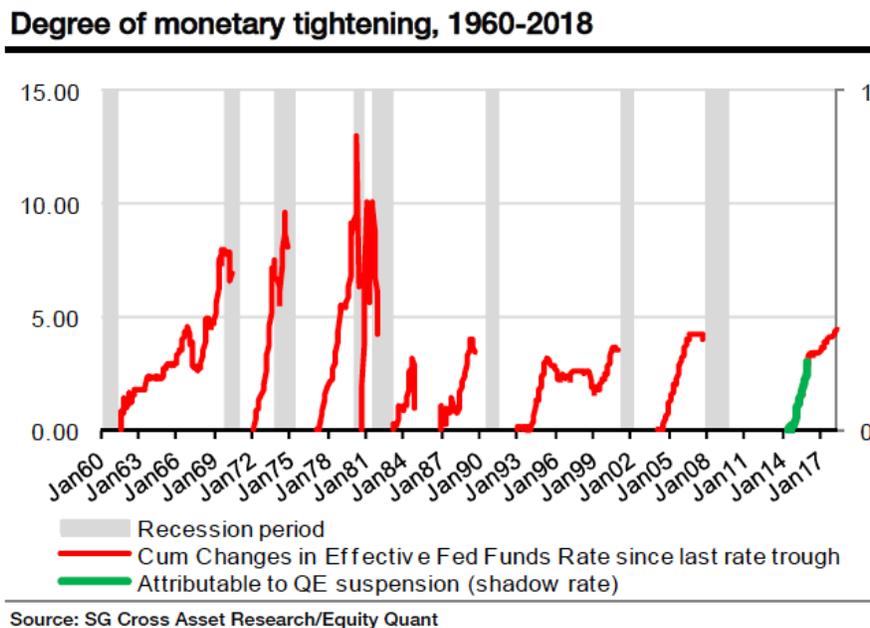
Happily, the US yield curve is still positive at +36bps; but pessimists will note that a similar **-bilberry line-** of JPM Global Bond Indices has already inverted.



For simplicity, let's stipulate that the modern Federal Reserve manages short-term interest rates to implement its monetary policy. Furthermore, recessions occur once interest rates increase enough to restrict economic growth. So while perhaps not a "bullet in its forehead", the Fed is usually at the scene of the crime with a smoking gun when a recession occurs.

Since the diversified US economy is more than just a leveraged financial business, an inverted yield curve can only be a symptom; it cannot be the cause of an economic malfunction. This is because the slope of the yield curve is a relative measure, not an absolute. Thus we need to consider the Fed's scalar increase in the cost of money.

Borrowing heavily from Albert Edwards at SocGen, the **-lychee lines-** are the cumulative increases of the effective Fed Funds rates prior to a recession. Of particular note is that a recession was preceded by about a 450bps increase in this rate in the post-Volcker era.

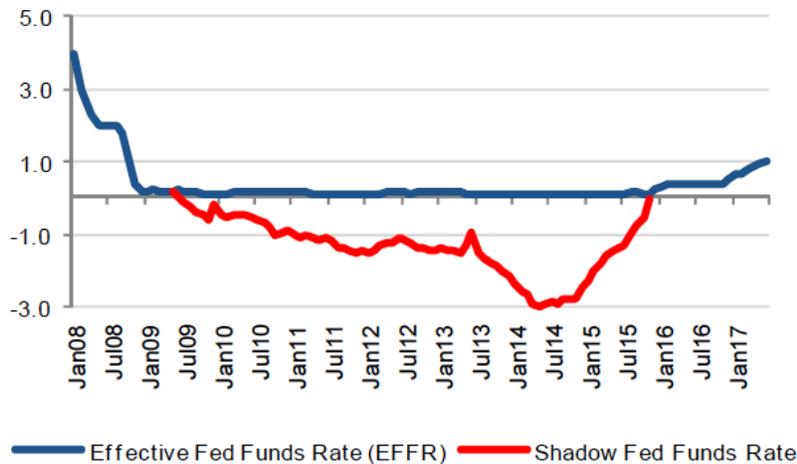


Taken on its face, we should not be too concerned about an imminent recession since the Fed has so far only increased its policy rate by 175bps. However, as cleverly discerned by SocGen on the next page, one needs to make a few adjustments to align an apples-to-apples comparison.

Prior to the Great Financial Crisis (GFC), the Fed used only its policy rate to help it adhere to its twin mandates. This last time, because of the zero-boundary of interest rates, the Fed pulled the Quantitative Easing (QE) arrow from its quiver. Certainly QE added some value; otherwise the Fed would not have employed it. So the question is: What was the implicit Fed Funds equivalent of \$4 Tn of QE ?

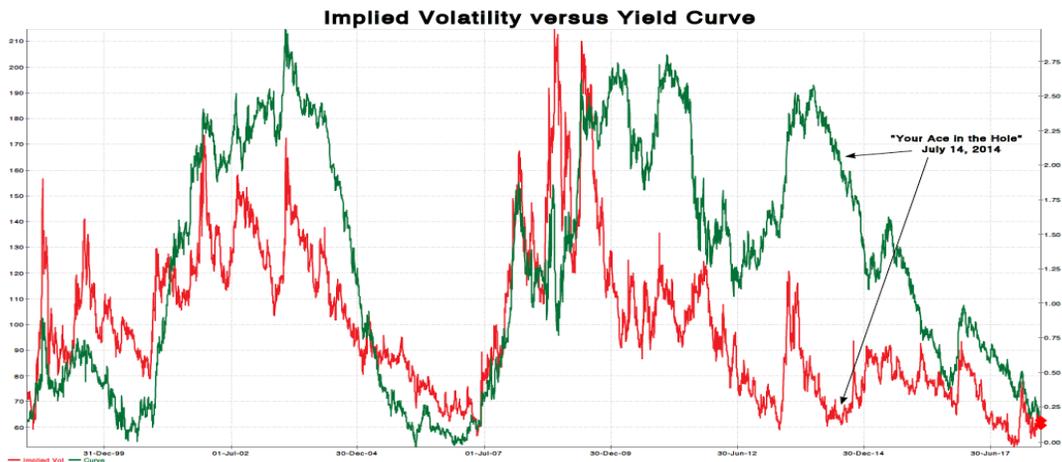
I will trust the math that created the **-tobasco line-** "Shadow Fed Funds Rate" below. The important observation is that this Shadow rate bottomed at negative 3% in mid-2014. Thus, as shown by the **-pesto line-** on the above chart, the Fed has already effectively increased their policy rate by 475bps.

Shadow Fed Funds rate, 2008-16



But let's not lose the forest for the trees; I have little interest in being the umpteenth pundit to warn of imminent economic disaster. Instead let's focus upon how to prepare and profit from a turn of the cycle.

What is perhaps my favorite chart is updated below. Here the **-durian line-** is the yield curve, as represented by the difference between the Sw2yr and the Sw10yr rates while the **-rambutan line-** is the implied volatility of a 1yr option on the 10yr swap rate.

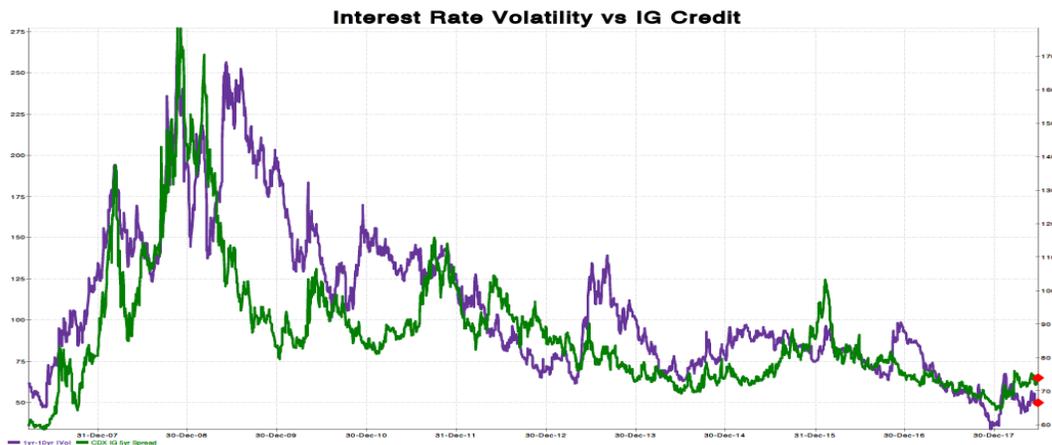


Source for this chart and all subsequent charts: Credit Suisse LOCUS

Cribbing from "Your Ace in the Hole" – July 14, 2014, when the Spot yield curve is flat (2yr rate = 10yr rate), the Forward yield curve will also be flat at about the same level. In Wall Street parlance, rates are expected to be unchanged in the future. However, when the Spot yield curve gains some shape (positively or negatively sloped), Forward rates will diverge from Spot rates; and the greater the slope (steeper or inverted) the greater the distance between Spot rates and Forward rates.

Since time can only go forward (no wormholes, please), the Spot and Forward rates must converge as the future becomes the present. The wider the distance between these two rates, the greater the uncertainty as to how they will traverse this spread. Implied Volatility is the price of uncertainty, so it is perfectly reasonable that Implied Volatility should rise (and fall) as the yield curve steepens (and flattens).

Similarly, since all financial risks are related at the macro level (rate, credit, currency, etc.), it should not be a leap to appreciate that Implied Volatility on interest rates is loosely correlated to Credit (default) risk. The **–pomelo line–** below is the investment grade (IG) credit spread (CDX) while the **–anthocyanins line–** is (again) the Implied Volatility of a 1yr option on the 10yr swap rate.



Let's take a moment to reflect. The cycle starts with the Fed reducing interest rates to spur the economy. Lower borrowing costs increase business activity (earnings) that elevates the stock market; this also tightens credit spreads as default risk is lessened. Lower rates propel CIOs to reach for yield, so bond covenants can be eased; this in turn encourages CFOs to buy back stock with cheap debt. Bullish stocks allow greed to dominate fear, and thus the VIX declines. In sympathy to a lower VIX and CDX, the MOVE rate volatility index declines. Finally, this virtuous cycle is turbo-charged with expanding P/E ratios as future earnings are discounted at a lower rate. When this wave crests, the virtuous cycle becomes vicious; and all these risk vectors reverse course.

I suppose if this were a standard market letter, I might suggest:

- 1) Sell the SPX via a short in SPY; or
 - 2) Sell credit via a short in a junk-bond ETF (such as HYG); or
 - 3) Buy the UST 2yr and sell the UST 10yr (using CBOT futures).
- ...but hopefully you know me better than that.

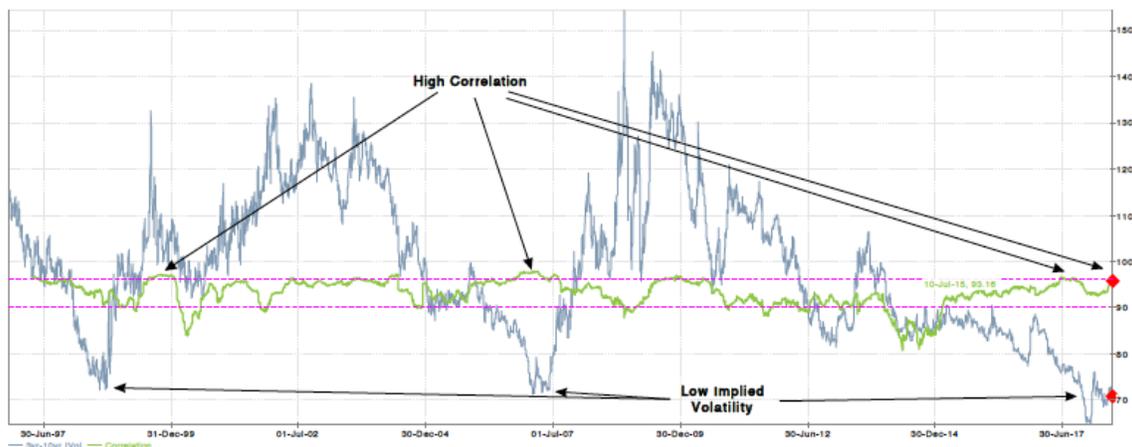
All of those tickets have unlimited risk and can be stressful if entered prematurely. Perhaps surprisingly, I am not a fan of long-dated options on the SPY since a two-year expiry 10% out-of-the-money put would have a break-even about 27% below the current market; or presently about 2000 on the SPX.

Instead, I want to offer an investment I last detailed in: "*Yield Curve Options*" - December 8, 2006.

A Yield Curve option (or for that matter, any spread option) is based upon the relationship between two assets, not the absolute level of either instrument. So a yield curve spread of 150bps between the 2yr rate and the 10yr rate could be either 1.0% vs 2.5% or 3.5% vs 5.0%; it's about the spread, not the level.

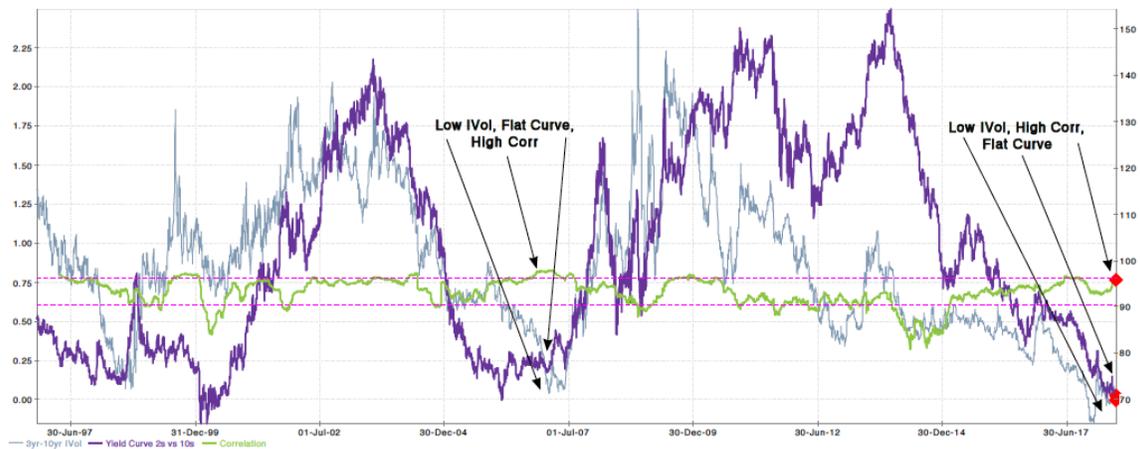
Boiling down the math, a spread option is priced as a blend of the implied volatilities of the two assets minus the correlation. So if the 2yr rate and the 10yr rate each move 5bps a day in the same direction, they would have 100% correlation and the spread option would be valued near zero. If the 2yr rate moved more randomly than the 10yr, that would be a low correlation and the spread option would be more valuable. If these rates moved in opposite directions, the spread option would be quite costly, almost regardless of the underlying volatilities.

As shown in the (hard to read) chart below, the **-borage line-** is Implied Volatility while the **-kiwi line-** is the correlation between the daily changes of the Sw2yr and the Sw10yr rates. The **-cotton candy line-** is one standard deviation around this correlation.

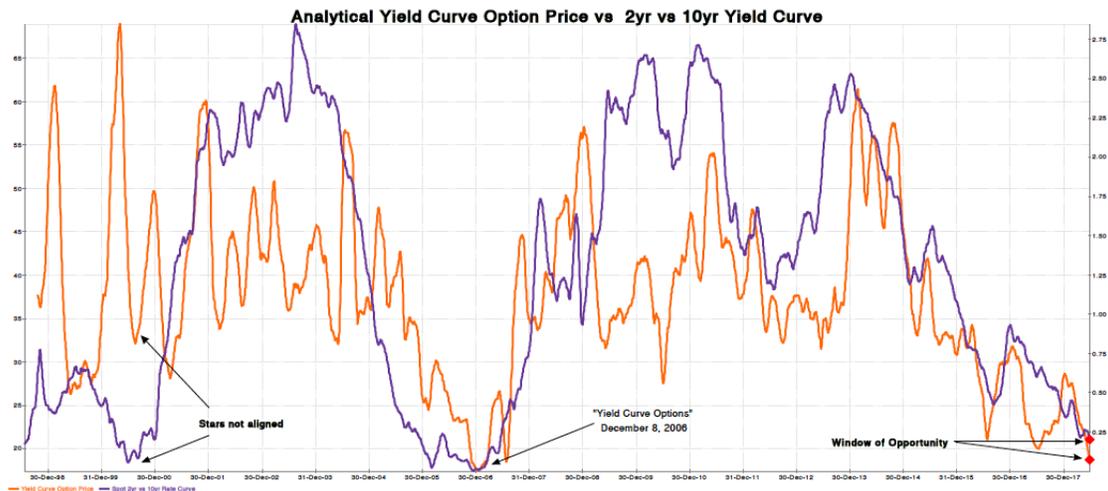


At 30,000 feet, one will notice that the correlation between interest rates on different parts of the yield curve is elevated when overall volatilities are at extremes. When the level of volatility is high, an elevated correlation will reduce the cost of a spread option, but it will still be costly since the underlying asset volatility is high. However, when Volatility is low AND the correlation is high, spread options become inexpensive.

In the chart above, I have marked some (not all) of the correlation peaks and volatility troughs. I highlighted the periods around 1998/99, 2006/7, and the present as these were the times when the yield curve was flattening. To make this point a bit clearer (and the chart more challenging), I have added the **-chokeberry line-** of yield curve.



The take-away here is that when the curve was flattening before the "Dot-Com" meltdown, there was never a period of both low volatility and high correlation. In contrast, in late 2006 the curve was near its nadir while volatility was at a record low and correlations were at a local high. This made yield curve options incredibly inexpensive, with a nice strike level: An optimal entry point.



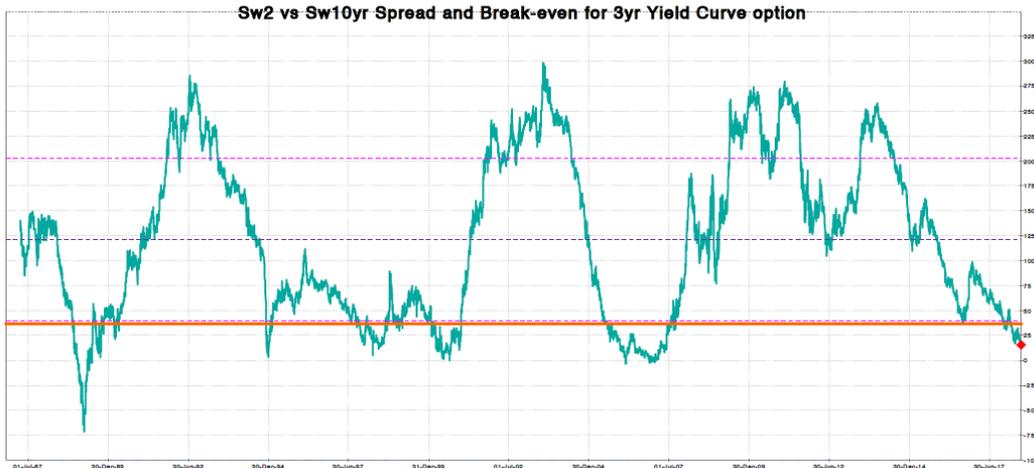
The chart on the previous page repeats the **-cabbage line-** of the yield curve, but now adds the **-galin line-** (ballpark) price of a yield curve option calculated by combining the volatility of the assets with their correlation. I will stress this is an analytical estimate; nonetheless, it will deliver one close to the proper zip code.

The Trade:

- a) Three-year expiry call option on Sw2yr vs. Sw10yr, K = 13bps, Price = 24bps
- b) Five-year expiry call option on Sw2yr vs. Sw10yr, K = 19bps, Price = 28bps

Despite the fact that Yield Curve options were cheaper in 2006, the terminal "breakeven" for the three-year option is now only 37bps (K =13bp + Px=24bp), 14bps lower. [*Please do not ask about a convexity-adjusted forward yield.*]

The **-Tiffany line-** is the spot yield curve, the **-macaroon lines-** are +/- 1 standard deviation, and **-satsuma line-** is the 37bps breakeven for a three-year option.



Most investors will choose the three-year option because of the lower price, superior strike, and the fact that the cycle should turn by early-2020. However, I like the five-year option because of the 'Vega-kicker'. Once the wave crests and the cycle turns, implied volatility will rip and correlations will collapse; this will jump the option value and allow for a more profitable exit in mid-2021.

This may well be the best "risk off" hedge available. It is relatively liquid and transparent (priced on Bloomberg). Struck at-the-money: It is not a "tail hedge". Best of all, the long-dated / limited loss profile will allow you to be early and patient. This wave will soon crest; and I want 'hang ten' all the way to shore.

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

Harley S. Bassman
June 27, 2018

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