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*Musings from Harley Bassman:*

# The Convexity Maven

Value Concepts from the BofA Merrill Trading Desk
December 6, 2010

## "A Delicious Gift from QE2"

The primary tool the FED uses to meet its dual mandate of low unemployment and stable prices (inflation) is the adjustment of short-term interest rates via the FED Funds target level. As the FED raises and lowers this key overnight rate, its level is supposed to radiate out the Yield Curve to either add or subtract from the economy's "Animal Spirits".

However, as the FED Funds rate reached zero near the end of 2008, the FED needed to dig deeper into its quiver to find additional tools to support the economy. Thus was born the notion of Quantitative Easing whereby the FED purchased securities well past the typical 0 to 30 day maturity to systematically grow their balance sheet and pump longer-term liquidity into the system.

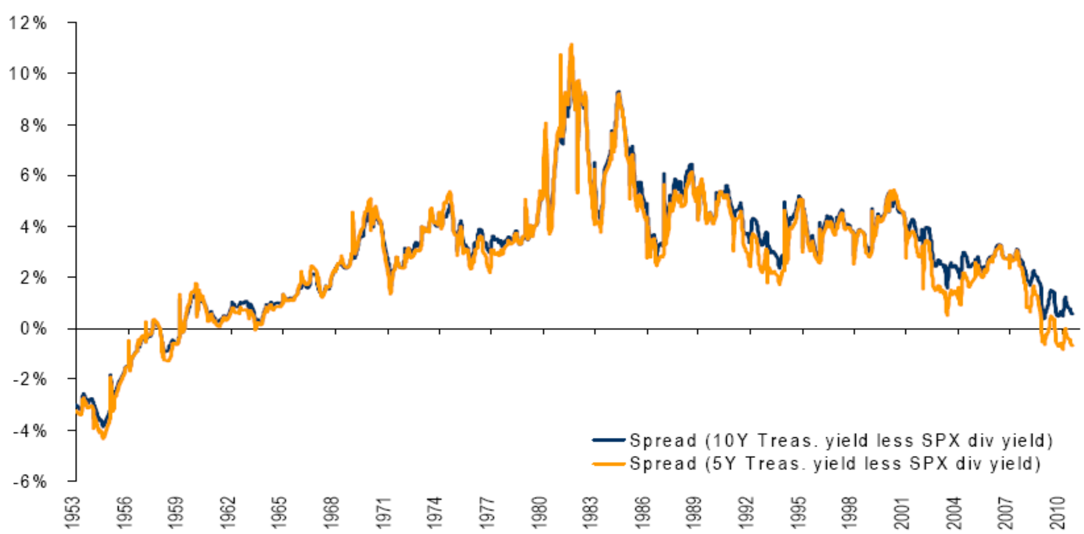
While one can debate whether QE is a long-term inflationary event, what is indisputable is that unless these funds circulate within the system, QE will not be effective. This notion of "Velocity" is what underpins the classic Monetarist equation:

$$\mathbf{M*V = P*Q = GPD}$$

Velocity is a difficult variable to measure and is usually discovered via induction, that is, if we know the supply of money and we know the size of the economy, we can deduce the velocity required to balance the equation. But our focus here is not a lesson in economics, but rather the interesting "knock on" effects from the FED's QE policy that has created some interesting opportunities.

The goal of QE is to lower rates to such a level that investors move their funds out of safe Treasury bonds and into other investments, such as equities, corporate bonds, CMBS, direct real estate, commodities, start-up business ventures, etc. In short, any investment vehicle that will circulate funds and increase Velocity. What follows is an investment opportunity that owes itself almost completely to magic of QE.

## Rate Differentials




**All charts, unless otherwise noted, are sourced from BofA Merrill data**

What undergirds all financial market analysis is the concept of "Arbitrage Free" Forward pricing. This is the process of discounting forward (or anticipated) cash flows at the appropriate "risk free" interest rate.

The chart above shows the first interesting outcome of QE: For the first time since the 1950s the Treasury Five year rate is below the current dividend yield of the S&P 500 stock index. Moreover, depending upon the dividend growth rate applied, it is possible that the forward dividend yield exceeds the Treasury Ten year rate.

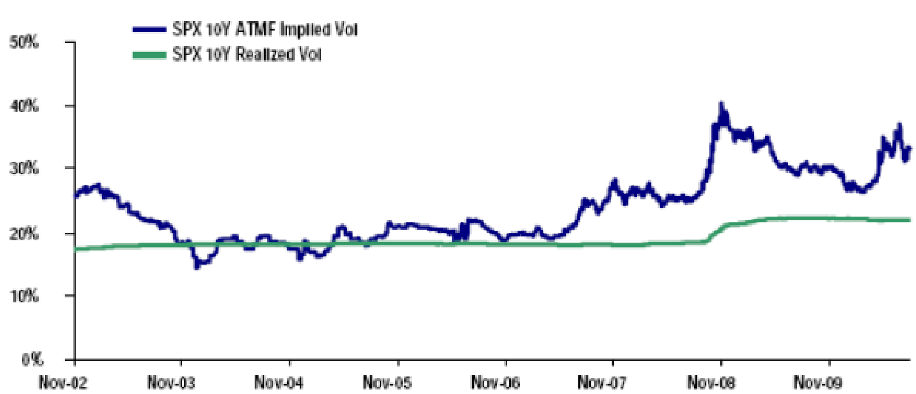
Why is this important ? The arbitrage free forward price of the S&P is created via the rate differential of the dividend rate and the risk free rate. An S&P rate above the Treasury rate creates a forward S&P price that is LOWER than the spot price. All else equal, this makes fixed strike calls cheaper and puts more expensive. This will become a valuable insight soon.

## Elevated Long-dated Volatility

The VIX index is the benchmark measure of Implied Volatility for the stock market. Similar to our famous MOVE Index, it is basically the Implied Volatility of one month options on the S&P Index. Over the course of time, the VIX has recorded an average index level of about 21 versus the slightly lower Realized Volatility of the S&P of about 19. This 10% "premium" of Implied over Realized is fairly standard for options across most markets. It reflects a mixture of the non-linearity of the payout function with the fact that investors are risk averse (as opposed to being mathematically risk neutral).

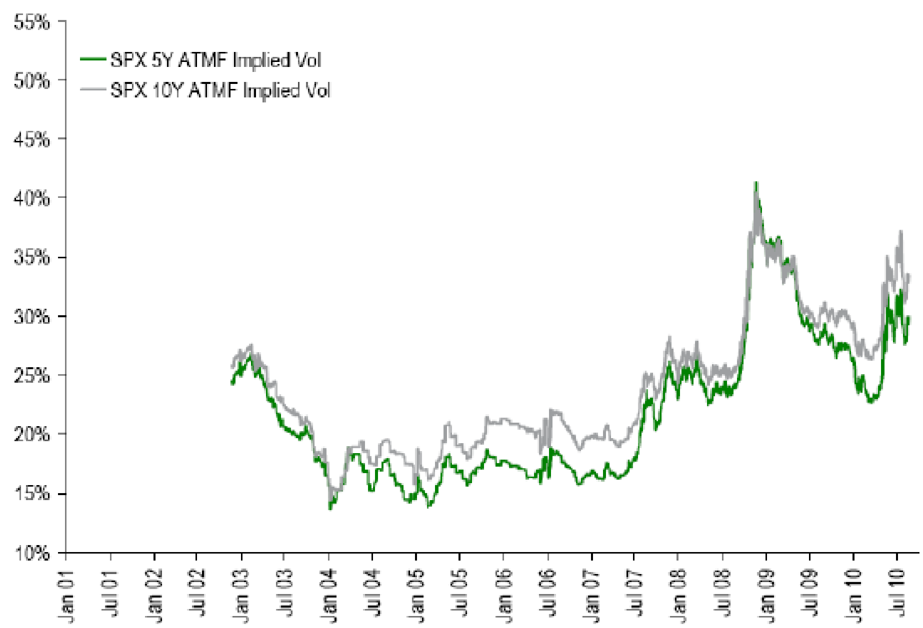
This brings us to the second risk vector that has been distorted by QE.

The VIX is a short-dated measure that captures the near term relationship of fear versus greed. And while more famous, an equally informative risk measure is what one might call the "Long-dated VIX". This would be the implied Volatility for five year and ten year expiry options on the S&P.



One would expect both of these measures to hug closely to the Realized Volatility of the S&P, and this was true until recently. But as the preceding chart shows, the spread between the Implied and Realized Volatility gapped apart as the FED cut rates to near zero in late 2008.

The proximate cause, as is often the case in trading anomalies, has to do with regulatory accounting. As rates declined, long liability financial managers noticed a widening spread between the future value of their assets and liabilities. Specifically, insurance companies with equity exposure were coming close to having too little regulatory capital under stress conditions. Without digressing into actuarial science, suffice it to say that as rates declined, insurance companies had to either add duration or reduce equity exposure. Since buying thirty year bonds with a 3%-handle was not a career enhancing proposition, they chose to reduce their equity exposure via the purchase of long-dated put options. This accounting need had to be satisfied, almost without regard to the fact they were paying an Implied Volatility of over 30% while long-dated realized Volatility has rarely exceeded 22%.



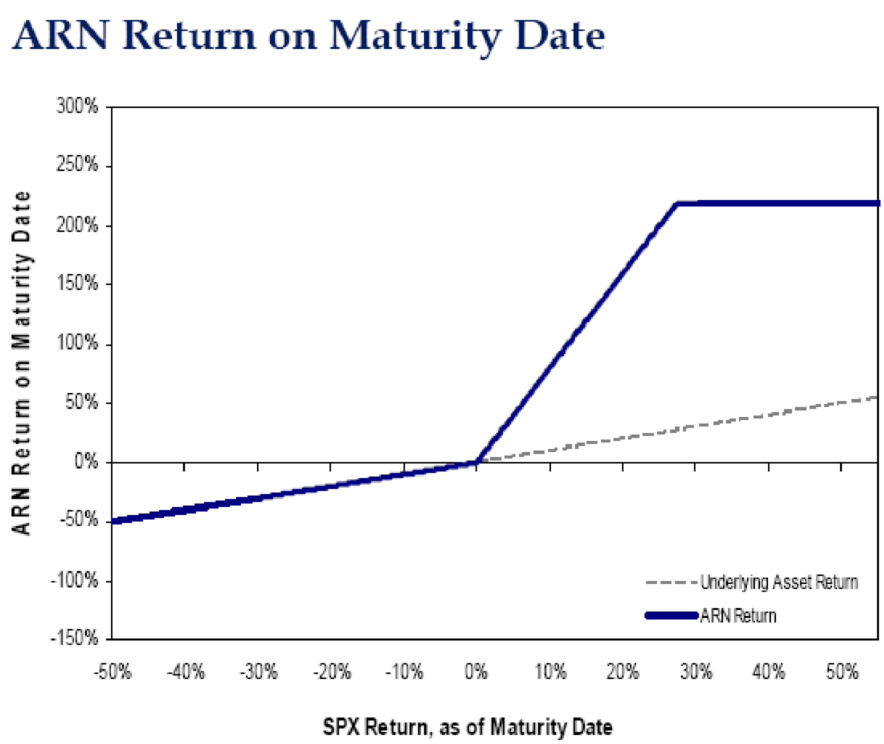

More interesting still was the fact that even as long-dated S&P Volatility rose by over 75% from mid-2007 to late-2010, the positive spread between Ten year expiries and Five year expires was unchanged. This is highly unusual. In most markets, the shorter-dated "gamma" options lead the longer-dated "Vega" options as Implieds rise and fall. As such, similar to Yield and Credit Curves, this risk vector should invert at the highs and steepen at the lows. As shown in the above chart, even with Implieds reaching new historic highs this spread remained anomalously positively sloped.

## The Opportunity

The best investment ideas are often the most simple. Here, we are transparently presented with the twin anomalies of a lower forward price for the large and liquid S&P index as well as long-dated options based upon this index trading nearly 50% above Realized Volatility. Even a novice could recognize that the trade is to buy the S&P in forward space and then sell a long-dated call option against it. Basically, a standard "Buy Write". Unfortunately, executing this trade as a package of vanilla derivatives is problematic for many investors. The booking, accounting and margining involved can make this trade unpleasant for even the most sophisticated accounts.

As a superior alternative, one can invest in a Structured Note issued by a large Financial Institution that has these two risks transparently embedded.

In a nutshell: One pays $100 today for a 10 Year Structured Note (ARN) which pays no coupon.




In ten years, if the S&P is 10% lower, you receive $90. If the S&P is 20% lower, you receive $80. You lose one for one on the downside. However, if the S&P is up 10%, you receive $180. If it is up 20%, you receive $260. You participate on an eight to one basis up to a total 220% return (a $320 final return). As such, your maximum return occurs if the S&P rises by 27.5% over ten years. This is not too much higher than the inflation rate in nominal terms.

Because all cash-flows are embedded into the note, if the upper cap level is reached, one would earn a 12.3% annually compounded return, if held to maturity, over a decade.

How many other diversified and transparent investments can produce a compounded return over 12% for a decade ? Not many is the answer.

**There are risks that you must fully appreciate.**

1) You are taking issuer holding company credit risk;
2) This registered MTN issue will not be highly liquid;
3) The 8 to 1 leverage is terminal, not current. As such, in the early years, you will not realize the terminal return profile;
4) There are risk components other than just the S&P level. [*These "second order" risks should be discussed with your advisor*.]

That said, there should be a place in every portfolio for this type of investment. To be clear, there is no magic here and the firm is working for a fair underwriting spread. This opportunity is strictly a function of:

1) The inversion of the S&P dividend rate to the Treasury rate;
2) An extremely elevated Implied Volatility level for long-dated options;
3) A relatively wide issuer funding spread;
4) No margin calls despite being functionally short options.

*Finally, do not underestimate the value of compounding your return.* There are plenty high yielding investments that toss off a lot of cash in the early years. However, the inability to re-invest those cash flows at a similar rate effectively collapses your long-term total return. The true beauty of this Structured Note is the complete embedding of the risk vectors to create a true IRR investment vehicle.

As they say: "Don't fight the FED". Enjoy the gifts that QE is offering !!

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