



Future Volatility for SPY and EEM

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One of the big questions on many investors' minds is how volatile the next couple of years are going to be in domestic and emerging markets. Are we likely to see the emerging markets get substantially more volatile? Aside from opinion, there are a couple of ways to tackle this question. The first is to look at where long-term options are trading. I have previously written about the use of VIX as a short-term guide to volatility, but there are long-dated options on SPY and a range of sector ETF's that can provide guidance regarding the options markets' expectations for the future volatility in various sectors out to the start of 2009. I have examined options on SPY and also on EEM to get some sense of where the options markets think volatility is going on domestic and emerging markets over the next couple of years.

VIX is calculated by calculating the 'implied volatility' of the underlying market using the prices at which options are trading, the price of the underlying, the expiration date, and the risk-free rate of return, along with an options pricing model. This is a straightforward exercise—e*Trade has tools that will do it for you and many financial calculators have this capability. Long-dated options can be used to determine the market's consensus outlook for volatility in a given sector. There is a whole body of research on the relationship between implied volatility and realized volatility—the actual volatility in returns that occur. Implied volatility is a meaningful predictor of future realized volatility. Christensen and Hansen wrote a nice review article and updated analysis in 2002 for the *European Journal of Finance* (link at end of this article). The punch line, for those who do not wish to delve into the academic literature is given here:

“implied volatility is an unbiased and efficient forecast of future volatility, and subsumes the information content of historical volatility.”

The great thing about realized volatility—the volatility that investors will actually experience-- is that it is somewhat predictable, and implied volatility reflects this predictability.

The vast majority of investors are unaware of this predictability, but it is highly valuable. In an article in the New York Times on August 13th, Mark Hulbert discusses recent

academic work that shows that the options markets contain substantial information about future market returns (link at end of article). The article cited by Hulbert is but one example—there is a whole body of information on this topic. Paying attention to the future volatility of your investments seems to provide options traders with a substantial edge.

The most basic reason to pay attention to estimates of future volatility is that volatility is a measure of risk associated with an asset. It is very hard to be effective as an investor if you don't pay attention to the level of risk in an investment and in your portfolio as a whole. Capital markets are predicated on the idea that investors balance expected future return with the risk that they will bear if they invest in some asset. Clearly, an investor who has access to a meaningful prediction of future volatility in assessing this balance of risk and return will tend to do better than an investor who does not.

The *Quantext Portfolio Planner* (QPP) is a Monte Carlo tool that projects the future risk-return balance of a portfolio of assets. QPP generates a forecast of market volatility and average return for each asset in the portfolio (as well as accounting for correlations between assets). We periodically benchmark QPP's forecast of volatility with the implied volatility in the options markets. We recently performed this benchmark for the S&P500 (using options on SPY) and the MSCI Emerging Markets Index (using options on EEM). To make this comparison, we simply calculated the value of long-dated call options using the volatility that QPP automatically generates for SPY and EEM. The detailed analysis is available at <http://www.quantext.com/MarketRisk3.pdf>. When QPP simulates SPY and EEM, it automatically accounts for the correlation between them so that potential future changes in the volatility of SPY impact the projected future volatility in EEM as accurately as possible. The results of our August 2006 analysis of implied volatility in options on SPY and EEM going out to the start of 2009 has some striking results.

QPP and the options markets for SPY and EEM agree quite closely and they suggest that the future volatility that we are going to see for both SPY and EEM will be about twice

what we have experienced over the past several years. The agreement between QPP and the long-dated options is not conclusive by any means, but it suggests that there is a high potential that these markets will see substantially escalating volatility. These are independent results that agree very well—QPP does not use options quotes in its calculations—only its proprietary analytical process called risk-return balancing and historical market data.

What would be the best response to this kind of information? The first point is that if you are risk-sensitive, this is a warning that you may want to look at whether you are carrying too much portfolio risk on a forward-looking basis. The second point is simply that these values give a sense that it could be a very bumpy ride in emerging markets and, to a lesser extent in the domestic markets, over the next few years. We are not talking about unprecedented volatility—just a return to historical levels. Many investors will get jumpy though, because these historical levels are much higher than what we have seen in the last several years when many investors have taken on substantial emerging markets positions for the first time. High volatility is not a bad thing—this is what we take on in return for the promise of high returns--but it does require what professional traders that I have worked with refer to as ‘intestinal fortitude.’ For myself, simply having estimates of the expected levels of volatility helps me to determine whether the level of swings in my portfolio are within expected ranges—and thus helps me to deal with big swings.

Christensen and Hansen Article

http://www.econ.au.dk/vip_htm/chansen/bjc_csh_ejf02.pdf

Hulbert NY Times Article (free subscription required)

http://www.nytimes.com/2006/08/13/business/yourmoney/13stra.html?_r=1

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