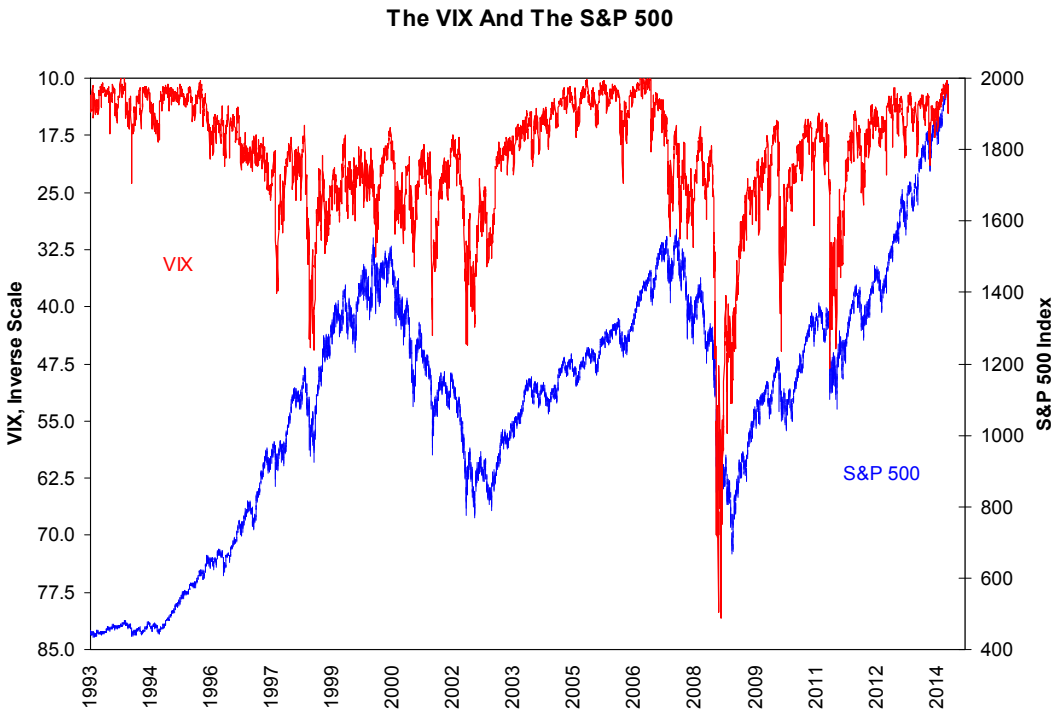
Absolute Dollar Risk Matters For The VIX

There is a joke so old it probably requires carbon-dating to place about a retiring sea captain whose safe never was opened. After goodbyes were said and the ancient mariner left the ship, the officers decided it was time to see what secrets lay in the metal box. It was opened and contained a slip of paper on which the words, "Port, left. Starboard, right" were written.

Volatility traders in general and VIX traders in particular seem to have a similarly straightforward guide to how the world operates we could summarize as, "Market up, VIX down" and vice-versa. It is really not so simple, though. A glance at the chart below should tell us several things, including how the VIX behaves as if it has a lower bound, how spikes in the VIX are very temporary features of the trading landscape and how it can and does rise during long bull markets.

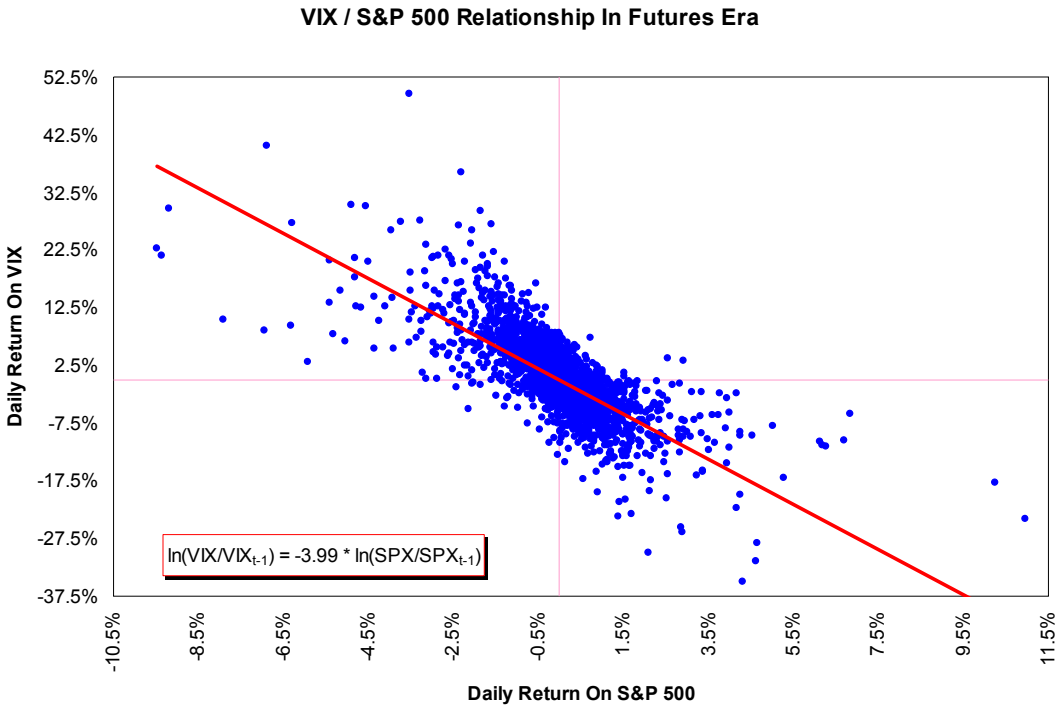
The lower bound-like condition and the short-lived spikes are to be expected. As volatility is the price of uncertainty and as some measure of uncertainty always exists, the VIX or any other insurance measure will not be offered at a price too low to compensate the writer against observed and quantifiable risks. The spikes reverse quickly in reflection of insurance buyers being unwilling to pay more for insurance than justified by their own perceived risk of ruin; at some point it makes more sense to be uninsured than to pay the 80% volatilities seen during the financial crisis.



Let's go back to the long bull market of the 1990s. The S&P 500 rose from less than 500 at the start of 1995 to more than 1500 in March 2000 before embarking on two devastating bear markets interspersed with a powerful 2003-2007 rally and another long and powerful rally from 2009 onwards. Did the VIX decline during the late 1990s bull market? No, it rose from levels near 11 at the start of 1995 to levels in the mid-20s during the heady days of 1999. A similar phenomenon happened between the start of QE2 in late 2010 and the beginning of QE tapering in late 2013; there the VIX was unable to punch significantly lower from levels near 16 in November 2010 even as the S&P 500 advanced more than 50% by November 2013.

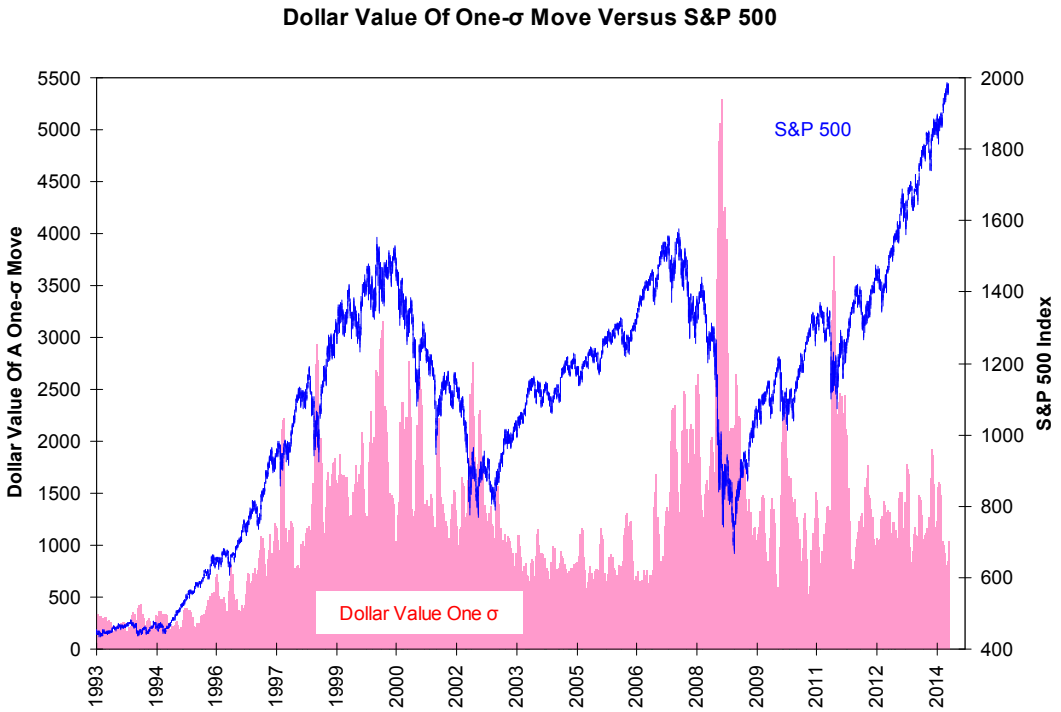
The process is not symmetric, however; all of the upward spikes in the VIX are associated with sharp moves lower in the S&P 500. However, it is a little more linear than we might expect if we convert the VIX and S&P 500 to daily returns. A scatter plot of these returns since the introduction of futures on the VIX in March 2004 shows a largely linear relationship with a strongly negative elasticity or relative percentage movement of -3.99. The data are limited to the futures trading era in recognition that once the VIX became a tradable asset its behavior changed relative to the days when it simply was a derived indicator; there were changes in the computation of the VIX as

well. Please note the much greater variance of VIX returns when S&P 500 returns are strongly negative. This wider error band should tell any trader the lockstep stocks-down/VIX-up relationship is not as mechanical as assumed.

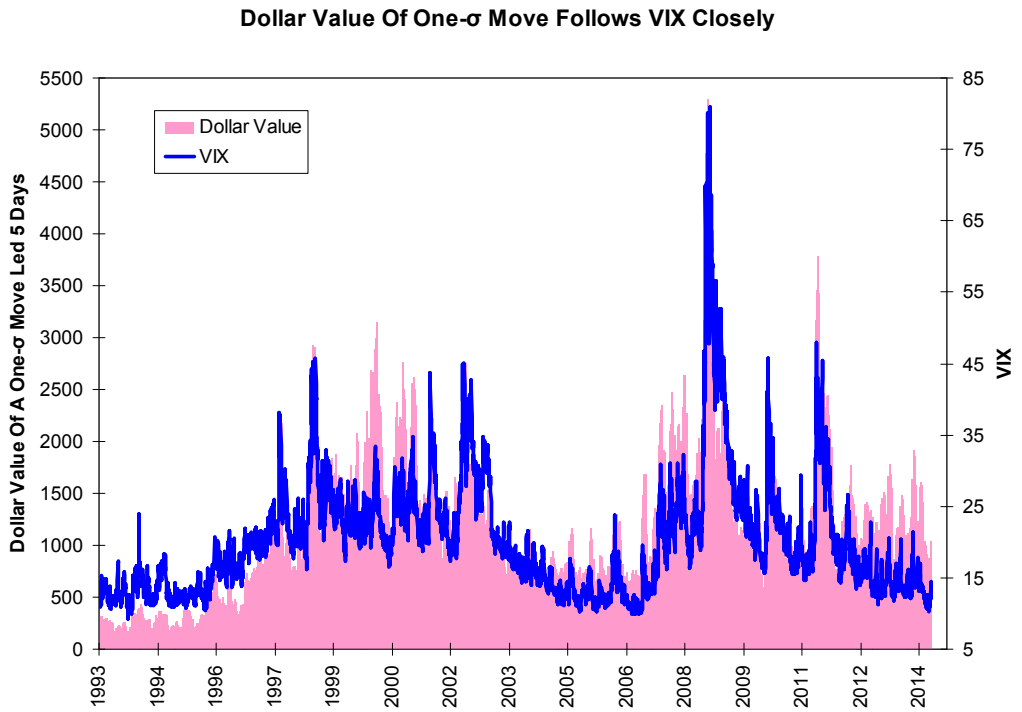


Dollar Value

One possible way to reconcile the asymmetric movement of the VIX as a function of the S&P 500 with its ability to rise during bull markets is to look at the dollar value of a one standard deviation move in the S&P 500. This number is calculated as the rolling 21-day standard deviation of S&P 500 returns multiplied by the $100 times the level of the S&P 500 itself. The history of this time series is much more static than we might expect; it rose during the 1990s bull market, fell during the dotcom bear market, stayed static during the 2003-2007 bull market, rose rapidly into the financial crisis and then retreated to late 1990s – early 2000s levels during the bull market from 2009 onwards.



If we now replace the S&P 500 with the VIX and lead the dollar value of a one standard deviation move by five days, we see a close relationship. Option volatilities set in the marketplace reflect the insurance demands set by option writers in anticipation of absolute risk-adjusted dollar volatility. In practice this is no different than gamblers deciding which level of game to player based on their wealth levels; an option market-maker sets insurance costs not on volatility alone but in accordance with the ability to absorb a given dollar loss level.



One of the ironies here is option traders view themselves as being inured to price trends, fundamental analysis or anything other than setting levels and spreads on a relative basis. More than twenty years of data suggests these option traders do an excellent job of anticipating market movements and realized price volatility. Whether any of them would be willing to step up and accept their award is another matter altogether.