

## The VIX Will Not Call The Bottom

Myths die hard. Make room in your trash bin for VIX readings over (insert arbitrary number derived in an ad hoc manner from a small-sample data-mining operation here) marking a bottom in the stock market. Wrap it in a newspaper if your town still publishes a dead-tree edition and place it lovingly next to “Dow 36,000,” “Stocks For The Long Run,” and anything ever written extolling the virtues of diversification.

I cautioned in a [Columnist Conversation](#) posting last Wednesday against selling the VIX at 57.88; by Friday it punched to 76.94 before closing at 69.95. That advice was offered as opinion; I thought it best to elaborate as to why the VIX could go higher in the present crisis environment.

The analysis will be split into two pieces out of size considerations, with the second one appearing next week.

### Volatility Tail, Market Dog

Let's get to the most complex part of the argument first, and that is a revisit of a [May 2007](#) column on volatility trading. I wrote at the time:

*[T]he cash market for trading volatility grew up around variance swaps, whose payoff is linked not to the implied volatility measured by the VIX but rather the forward realized variance of market returns. As an aside, the future on the VIX, last discussed here in March, is really much more of what is called a forward-start variance swap than something linked to the ups and downs of the VIX itself.*

*Realized variance differs from implied volatility in three important ways. First, implied volatility is forward-looking and represents the price of insuring against uncertainty, while realized variance is a backward-looking measure of what actually transpired. Second, trading implied volatility with options involves upfront costs and exposes traders to time decay and interest rate costs of carry.*

*Third, the formula for calculating variance effectively squares volatility. That means that as realized variance jumps, the payoff for being long variance in the swap increases far more rapidly than does the payoff for being short variance in the swap as realized variance falls.*

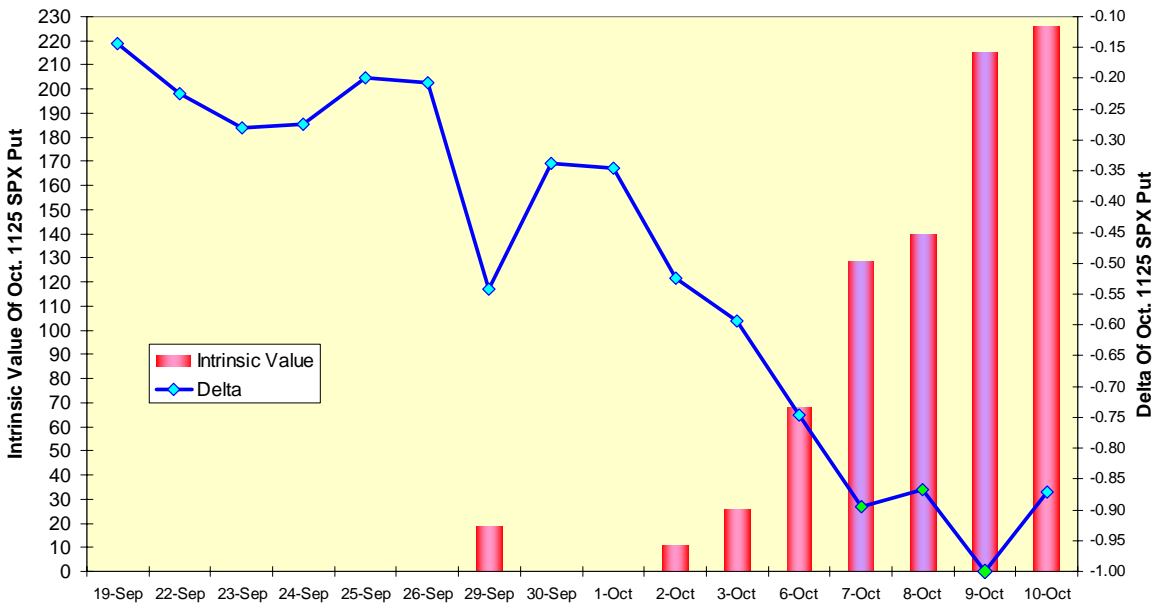
This mechanism has operated with a vengeance during the crisis. Anyone who has written put options has lost thrice-over. The first loss is the drop in the underlying stock or index; this is the intrinsic value portion. The second loss comes from the expansion of volatility; this is the time premium portion. The third loss comes from the expansion of put option delta as the market declined. Delta is the expected change in the option's price for a change in the underlying asset's price. For a put option, it can go to -1.00.

Let's suppose you took the bait on Friday, September 19, 2008, when stocks rallied on the rumors of a federal bailout, the TARP plan. The S&P 500 (SPX) settled at 1255.08 that day, and you thought you would pick up some free money by writing the October 1125 put option. That option settled at \$10.15, and as it was 130 index points out of the money, a moneyness of 89.64%, it seemed like a good way to have the market pay you \$1,015 per contract for being so smart.

That option's delta that day was -.144. You could have hedged it, as professional traders do, by selling the SPX in a 1:7 ratio. The option's volatility was 38.5%. As the market collapsed over the next three weeks, what happened to this trade? First, volatility exploded on that particular option to 123%. Second, the delta expanded to -.872, meaning a hedge would require you to sell the SPX in a 7:8 ratio. Third, the option which had been out of the money by 130 index points now had an intrinsic value of 225.78 index points. And the price of the option expanded from that original \$10.15 to \$235.5.

That seemingly free money turned into a three-way loser on intrinsic value, volatility and delta. If you were hedging it, you had to keep selling ever greater quantities of stock at ever lower prices.

### Anatomy Of A Real Bad Trade



This trade was repeated on a large scale by virtue of volatility and variance trading instruments. If you were short VIX futures or call options on the VIX, you lost on price movement; the VIX' expansion from 32.07 to 69.95 saw to that. If you were short a variance swap, a trade generally confined to professional traders who like to lose colossal amounts of money in sophisticated trades beyond your ken, you lost even more: The December three-month variance swap traded at the CBOE rose from 700 to 3716.

That is correct, while implied volatility increased by 118%, expected realized variance rose by 431%. The professionals who were smoking that exploding cigar had to sell exponentially greater quantities of stock at ever-lower prices to hedge their brilliant trade of being short variance. No amount of money is too great to reward that sort of expertise.

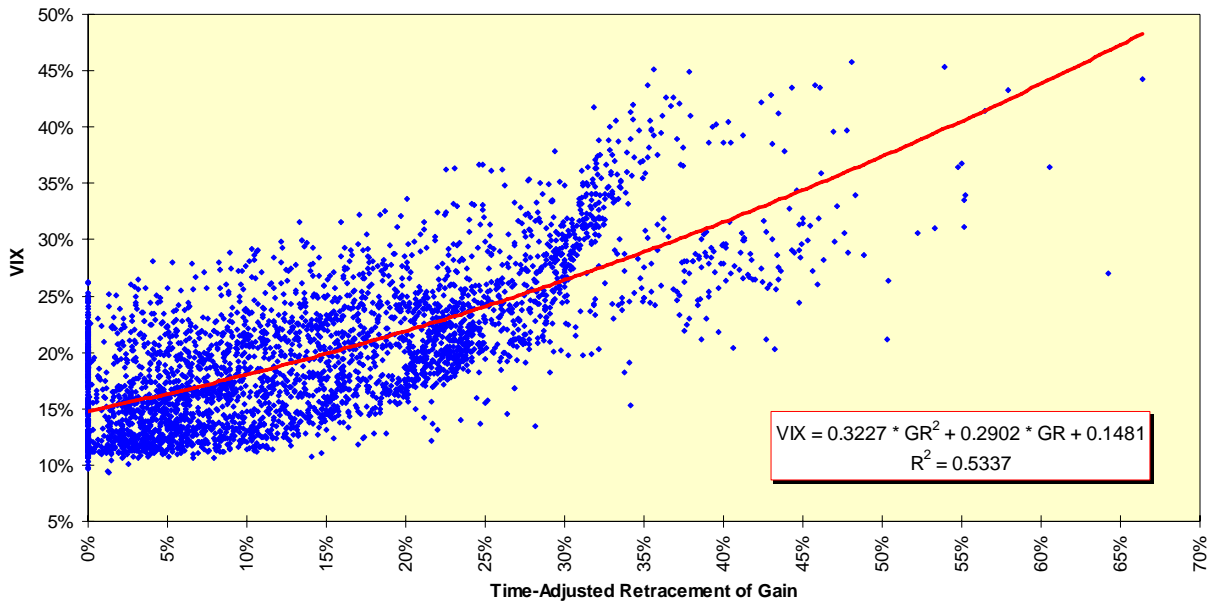
But, cheer up; there is nothing new under the sun. We have seen such ungoverned strategies of self-accelerating selling before. The portfolio insurance trade of 1987, the one that contributed to the October crash of that year, did the same thing.

#### All Pain, No Gain

We can illustrate how volatility trading instruments have changed behavior by mapping the VIX against a time-adjusted retracement of gain, a concept last discussed here in [November 2007](#). Two charts are presented, one from January 1990 through the initiation of VIX futures in March 2004, and for the period thereafter.

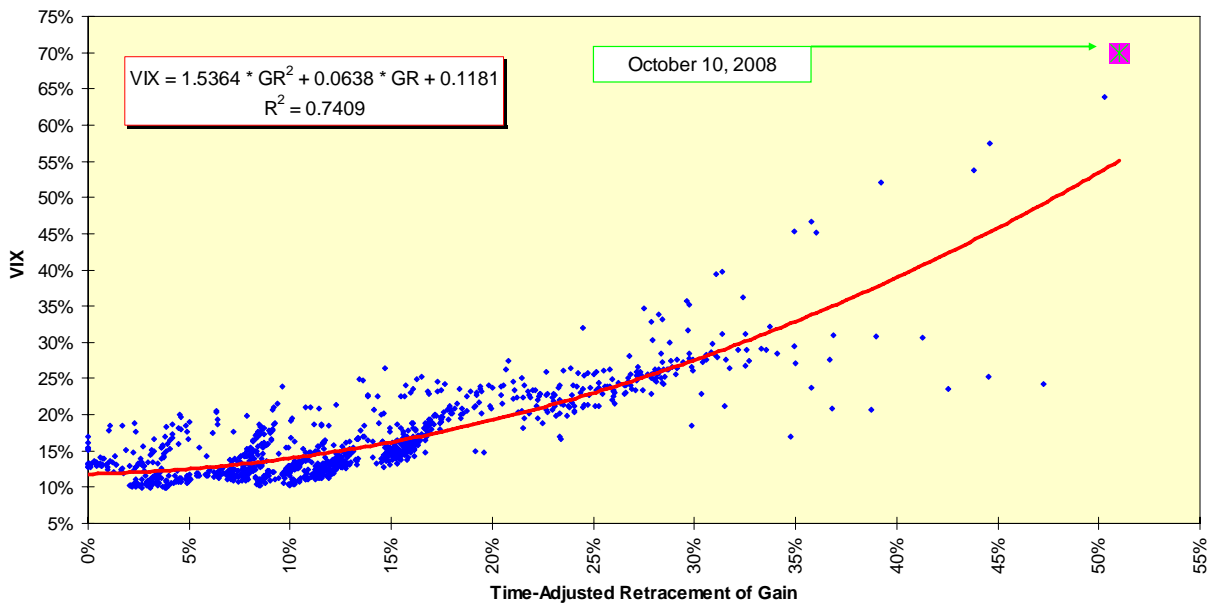
### Volatility And Retracement of Gain

January 1990 - March 2004



### Volatility And Retracement of Gain

March 2004 - October 2008



Note the coefficients in the equation box, especially for the retracement of gain-squared variable. The sensitivity of the VIX to downturns has increased sharply, and vice-versa. Yes, the tail is wagging the dog: In the old days, a spike in the VIX meant traders had bought their insurance and thus felt less need to sell stock. Now an increase in the VIX means a volatility trader has to sell more stock at a lower price. What used to be a blanket to smother the flames is now a gasoline-soaked rag.