

## Volatility Tail, Market Dog

Recall the scene in the 1983 movie *Trading Places* wherein Dan Aykroyd awakens and says out loud, “pork bellies.” No further introduction is needed; the viewer is cued that Louis Winthorpe III intends to spend a good portion of the day dealing mischief in the quintessential bare-knuckle trading instrument of that era.

Would a remake of this movie today require a far different character, most likely one without Roman numerals behind his name, to awaken and proclaim to no one in particular, “swaptions on credit default swaps?” It might be an appropriate update, but I would be willing to wager very few would understand what exactly was to be traded. A CDS swaption gives the holder the right to buy or sell credit protection at a given strike or price, and let’s just limit the description to that.

This thought and others crossed my mind last week while chairing a conference called, “Investing & Trading In Volatility.” That we are viewing volatility as a separate market in and of itself is unremarkable; the history of financial markets over the past three decades has been a continuous progression away from trading tangible instruments such as stocks and bonds, to all manner of increasingly exotic derivatives based on increasingly conceptual underlying assets and concepts. Indeed, much of what was considered exotic only five years ago is considered plain vanilla today.

Many of these markets exist only in the world of large investment banks and hedge funds. What they do to each other behind closed doors is their business, and for the most part you and I can go about our daily affairs unmolested while they trade some vapor like CDS swaptions with each other. But there are some things that may affect the real world.

### Margin Rules

When governments move loudly, it is usually for public relations purposes; when they move quietly, the changes are likely to be important. Has there been anything quieter than the SEC’s [pilot program](#) to change margins from the familiar Regulation T and strategy-based rules to the kind of risk-based portfolio margin familiar in the world of futures? If adopted for proprietary trading desks, hedge funds and high net worth individuals, this will be the biggest change in margin rules in more than 40 years.

I believe the proposal makes sense on an economic basis, and in the interest of full disclosure I argued for portfolio margins while I was involved in the world of single stock futures. As a case in point, the margin on a stock plus a put option, a pretty standard trade, is 50 percent of the stock’s price plus the full amount of the put option. Under the proposed margin rule, the margin would be equivalent to a theoretic 15 percent loss in the stock offset by the theoretic gain in the put option. The savings in margin can be more than 90% in many cases.

While I do not think this is dangerous at all – global currency and interest rate markets have been sloshing trillions of dollars around with greater leverage for years, and all investment banks and hedge funds of significance do not as a matter of course increase positions as a function of margin costs – I know I am in the minority. Even advocates regard lower margin levels as a potential danger to the integrity of the financial system.

If adopted, expected those who were blindsided by the very quiet treatment of this proposal to start pointing to increased stock margin levels with the usual warnings we are setting ourselves up for a fall. The rules will be different, and past performance will not predict future results.

### Variance Swaps And Market Behavior

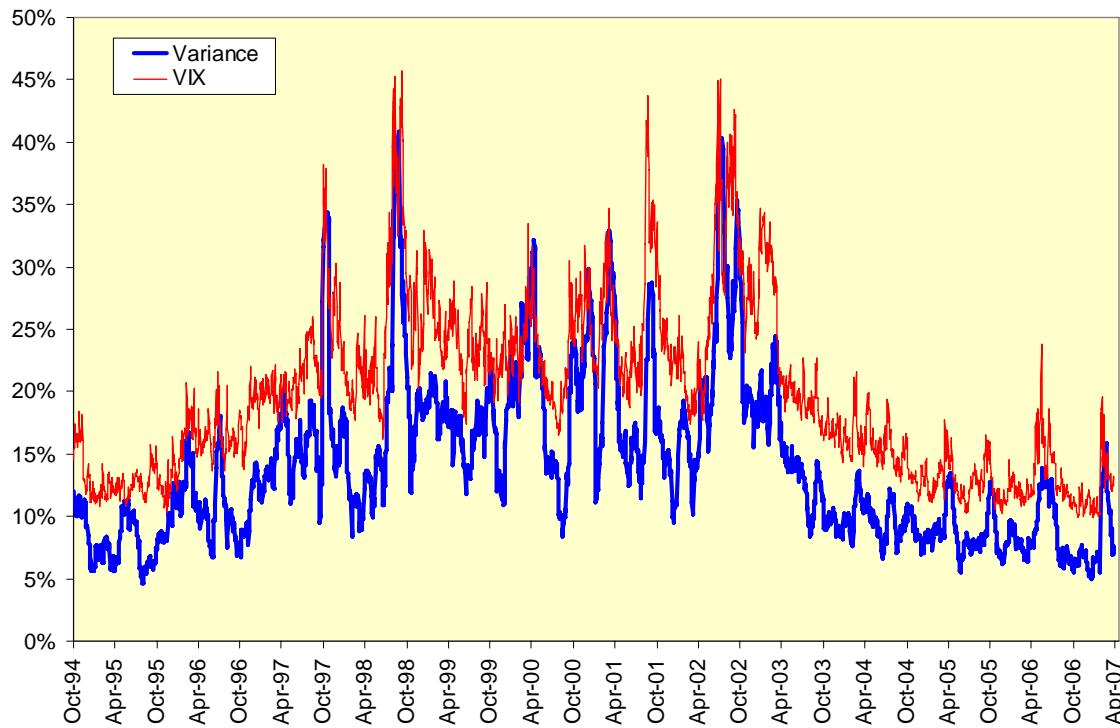
Here is an interesting setup for a schizophrenic market. I asked the attendees who thought the VIX was “too low.” Only two people raised their hands, and given that being long U.S. stock market volatility has been a losing trading since the bear market ended, that is well and good. However, the real purpose of volatility trading is to take advantage of the known spikes that occur whenever the stock market falls out of bed. The market is filled with traders who know the winning side of the trade has been the exact opposite of the market’s entire reason for being.

Next, the cash market 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 a something linked to the ups and downs of the VIX itself.

Realized variance differs from implied volatility in three important facets. 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 up-front 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; bond traders recognize this as convexity. Implied volatility and 21-day realized variance are compared below.

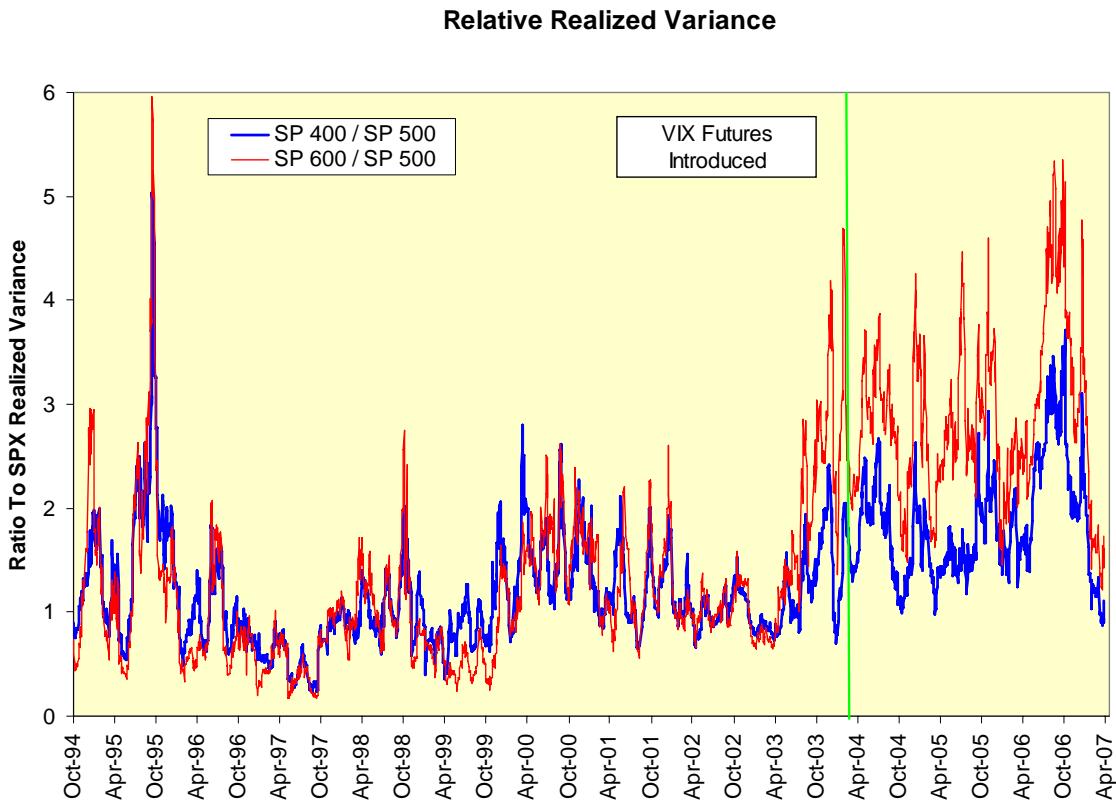
### Comparing Implied Volatility And Realized Variance



This squaring effect is critical. Anyone short variance has to hedge themselves by selling the S&P 500 short in one form or another on a daily basis; one leading bank referred to his hedging needs as a “daily market-on-close” order. On a big down day, as we had on February 27, 2007, the jump in variance requires more selling in a cycle reminiscent of the portfolio insurance made infamous in the 1987 crash.

But remember, as volatility jumps on those days, the options with their time-decay become more attractive to sell. Most hedge funds and professional option traders are quite eager to sell this higher implied volatility once the market shows signs of bottoming. This behavior will combine to exacerbate the one-day spikes down and rapid recoveries we saw in February and March.

Finally, does the presence of volatility trading instruments change market behavior? It most certainly does. As most trade is concentrated in S&P 500 derivatives, we should expect the pattern of realized variance in the S&P 500 to have changed as variance trading grew. The chart below compares the realized variance of the mid-cap S&P 400 and small-cap S&P 600 to that of the S&P 500; the introduction of VIX futures is noted as well.



The relative variance of the smaller indices has grown relative to that of the S&P 500. Sharp downward movements in the ratio, such as the most recent readings, indicate rising relative S&P 500 realized variance; sharp jumps as in late 2006 indicate a collapse in relative S&P 500 realized variance. The change in market behavior is statistical as well as visual: F-tests to determine whether the pre- and post-VIX future periods were different indicated differences at the 98.1 and 99.9 percent levels for the S&P 400 and S&P 600, respectively.

Overall, the presence of volatility trading has and should continue to suppress general volatility levels. However, as the trades get larger, we will see more of the one-day end-of-the-world crises that we saw in February. In other words, the tail has wagged the dog and has compressed what used to be normal higher levels of volatility into a mix of a few bad days and a large number of quiet days.