

NASDAQ 100 Smiles During Market Frowns

Every now and then you just have to accept you do not understand something. In your correspondent's case, trading a volatility index or a derivative thereof when you are motivated by a price opinion falls into that category. If you think the market is going to go down, there are plenty of price-based futures, options and ETFs capable of executing your opinion precisely and with a well-behaved and liquid instrument; going long volatility instead recalls a long-ago comment made about self-impressed slugger Reggie Jackson, "There isn't enough mustard in the whole world to cover that hot dog."

With all of that noted, some volatility-based products are very successful trading instruments indeed, and volatility patterns are useful in market analysis, particularly in sniffing out relative anxieties between buyers and sellers. The VIX can be discussed in terms of time-adjusted retracement of gain and proximity to last new low in the market, both of which reflect traders' psychological regrets over loss and fear of further losses (see "Balancing Fear And Greed," September 2003).

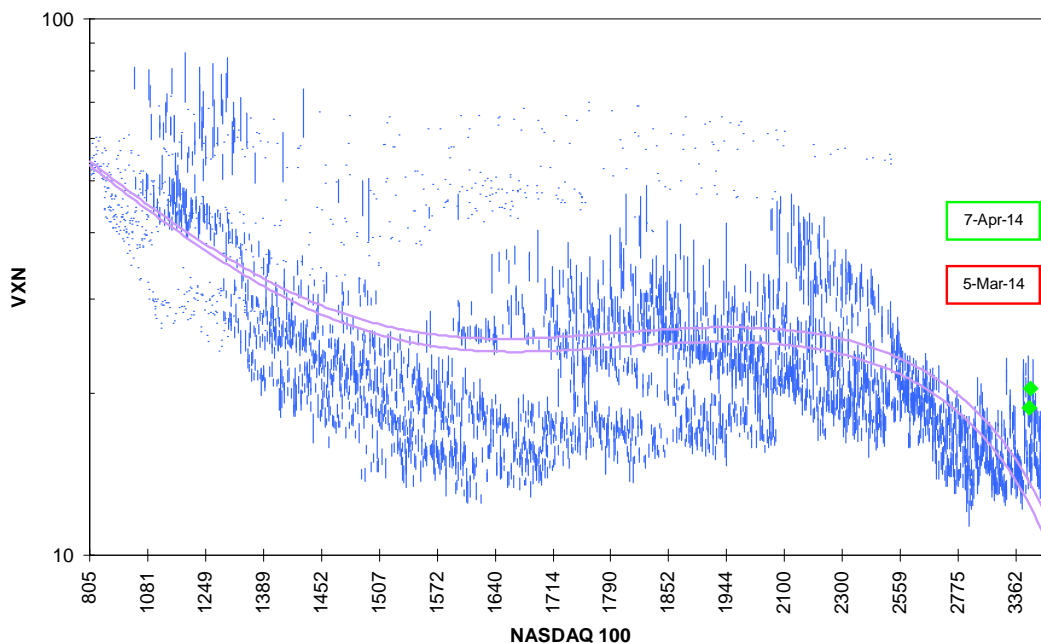
NASDAQ 100 Volatility

If the S&P 500-based VIX is not hot enough for you or if you find the trading-hour misalignment between the STOXX 600-based VSTOXX and the VIX challenging, then consider the NASDAQ 100-based NDX volatility index or VXN. The differences between the S&P 500 (SPX) and the NASDAQ 100 (NDX) in terms of both historic and implied volatility are obvious to anyone who has traded them, and the sector composition of the two indices creates a potential for rapidly moving spreads.

Rather than focus on these differences or even on the different responses of the VXN to the NDX when compared to the VIX-SPX relationship, let's focus instead on some signals generated by the VXN. First, let's map the VXN-NDX relationship over the post-February 2001 history of the VXN not as a function of time but rather of price. Each vertical line in the chart below represents a day's high-low range in the VXN, mapped on a logarithmic scale, against the day's closing NDX level. Two cubic trend-curves through the VXN highs and lows are superimposed.

Two dates are marked below, the March 5, 2014 post-dotcom bubble high in the NDX and the April 7, 2014 reaction low associated with a selloff in the technology and biotechnology sectors. The 5.89 percent pullback in the NDX looks very small indeed. The 4.83 point increase in the VXN over the same period is in line with previous experience.

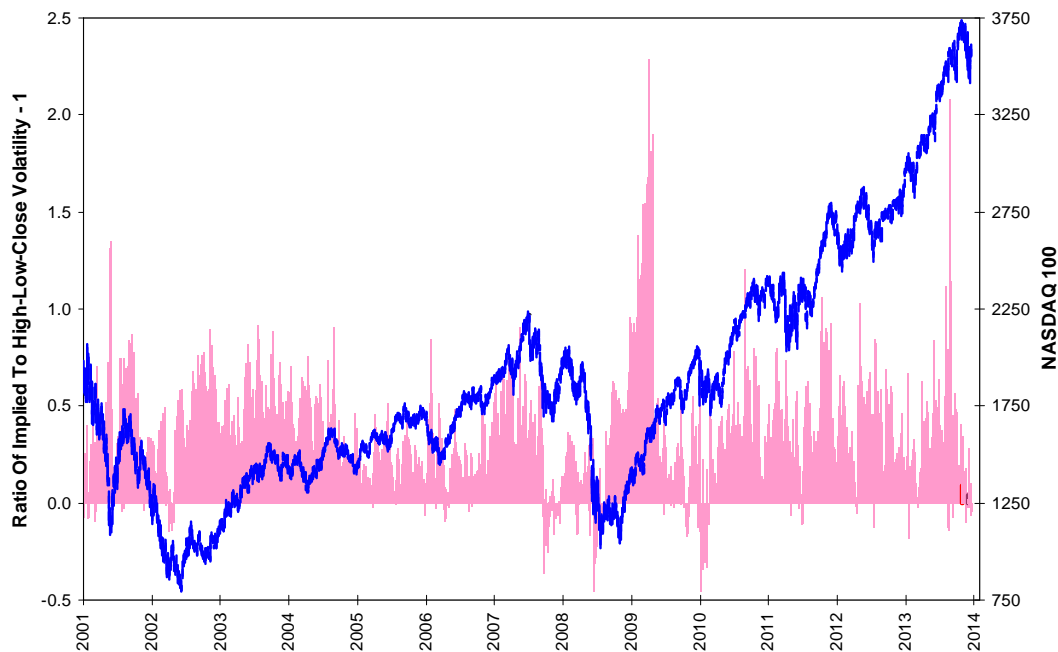
VXN Shock & Regress Since February 2, 2001



Excess Volatility

Statements of the VXN or any other volatility measure being “too high” or “too low” are meaningless unless placed in context against a market environment such as realized volatility or the aforementioned time-adjusted retracement of gain or proximity to a last new low. Let’s normalize the VXN to high-low-close volatility, a measure that incorporates intraday range as well as interday change. If we map this ratio minus 1.00 against the NDX itself, we see a pattern likely different from what you might expect. The two largest increases in excess volatility came during bull phases for the NDX, the QE1-induced rally in 2009 and the postponed-tapering rally of late 2013. High-low-close volatility fell during those rallies as the market formed tight uptrend channels. Conversely, excess volatility turned negative during phases such as the Bear Stearns and Lehman Brothers collapses in 2008 and during the May 2010 flash crash and Eurozone sovereign credit kerfuffle. The March 5 and April 7, 2014 dates are marked; please note how excess volatility was very normal on both days and how it actually declined as the NDX retreated.

Excess Volatility Often Rises In Rallies

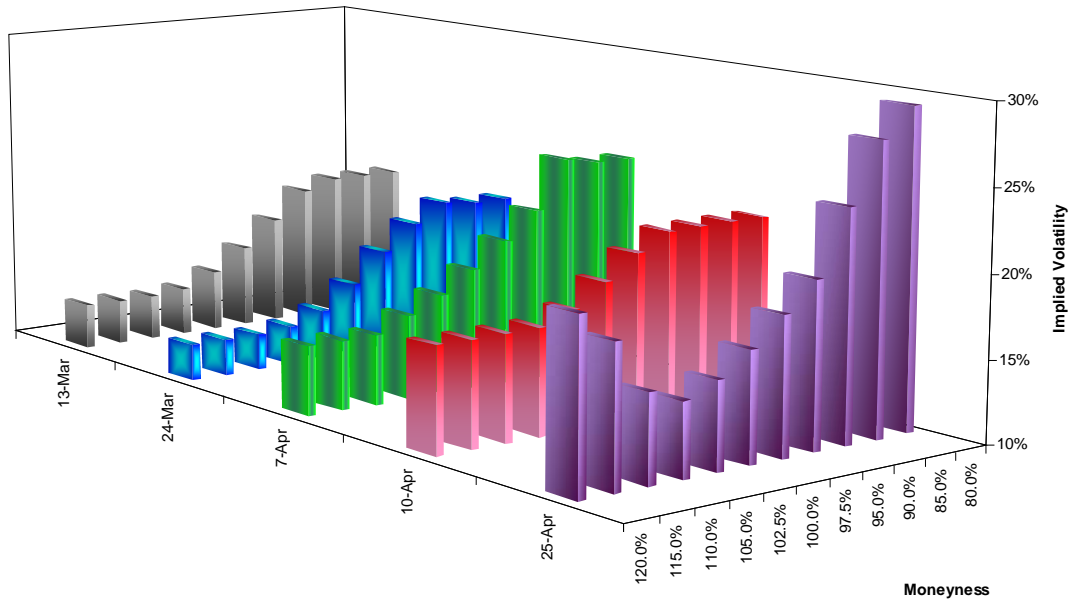


NDX Smile

The volatility smile of an index is not the same as one for an individual stock for the very good reason a stock is exposed to a real risk-of-ruin, or going to zero, while it would take a literal end-of-world experience for an index to go to zero. When a stock is threatened with risk of ruin, we should expect volatility at the higher-moneyness strikes to increase relative to both the at-the-money strike and to the lower-moneyness strikes. Moneyness is expressed as a percentage of the current price. The same mechanism operates in the case of an index, but in a muted fashion.

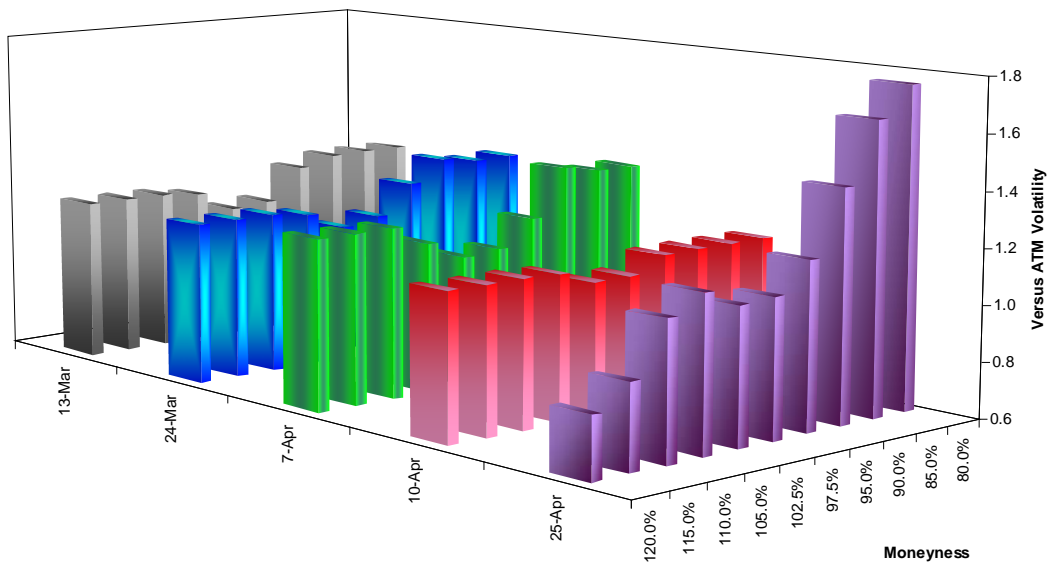
If we map one-month implied volatilities on a series of down-days for the NDX since its March 5, 2014 high, we see a succession of higher volatilities in the higher-moneyness strikes. However, this pattern is not perfectly mechanical; please note the high volatilities for the lower-moneyness strikes on April 25, 2014. This down-day for the NDX came after a fairly strong rally and not after a succession of weak days. A reasonable explanation would be a number of traders had written out-of-the-money put options on the way up and were scrambling to cover them as the market declined. This urge to write out-of-the-money put options after decades of experience demonstrating it is a good way to lose a large sum of money over a short period of time is another one of life’s mysteries.

**NASDAQ 100 Volatility
March - April 2014 Declines**



If we normalize the volatility data in the chart above to the at-the-money volatility, we can see a succession of smiles or distribution of volatility across strikes. With the exception of the April 25th date discussed above, each smile is unusually flat and is tilted far more toward the higher moneyness strikes than what we would expect to see on an up day in the market.

**NASDAQ 100 Volatility Smile
March - April 2014 Declines**



Credit Default Swaps

Credit default swap (CDS) costs tend to rise when a firm's equity option volatility rises. This is one of those odd little correlation trades that should not exist as much as it does, but CDS writers often hedge their positions with the liquid stock as opposed to the relatively illiquid corporate bonds. Never mind the 'default' part of the name; while equity option buyers have an array of put option strikes between the current stock price and zero, none of them implying financial default, a CDS pays off when the firm cannot meet its bond payments or is downgraded. Think

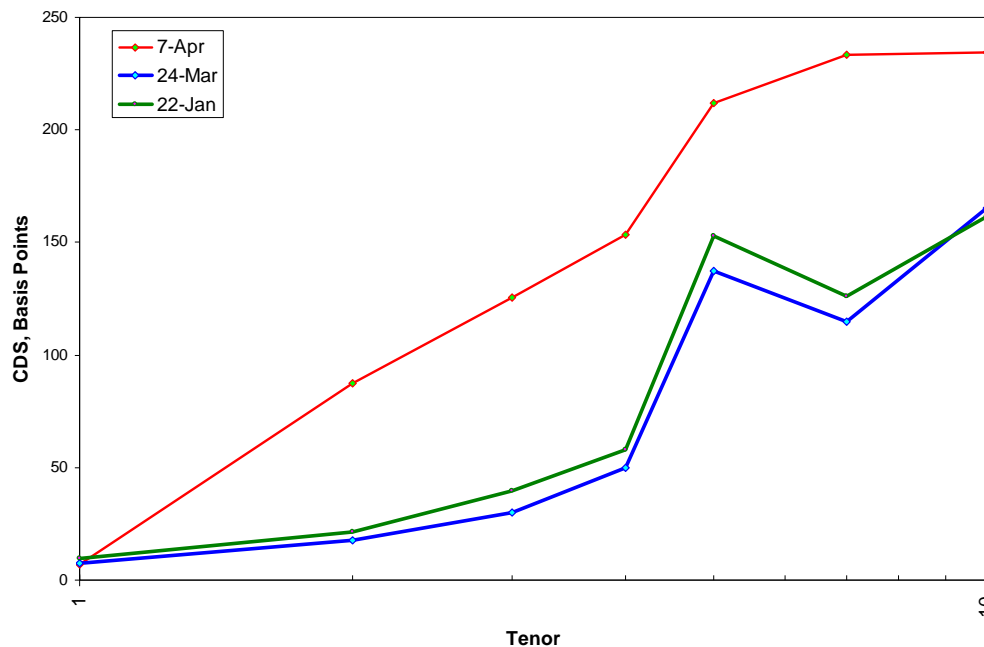
of equity options as frequently used health insurance and CDS as life insurance; you will never be the beneficiary of your own life insurance policy and it comes into play only once.

CDS writers include participants in the synthetic corporate bond market. A bond buyer can create a synthetic corporate bond by buying a Treasury and writing both a swap spread and a CDS. As individual corporate bonds tend to be illiquid after issue, these synthetic bonds are good way for investors to make their own liquidity. This mechanism also keeps CDS costs in line.

For the sake of completeness, swaptions on CDS do exist for those who want to benefit from an increase in a firm's default risk without having to wait for an actual default. Fortunately, these instruments are very fancy and very illiquid and those are never in the room whenever a financial crisis hits, right?

If we construct an average of CDS costs across the computer hardware, computer software and biotechnology sectors across a range of tenors and compare how they moved from a bullish date in late January to the April 7, 2014 selloff date, we see the CDS costs were slow to react. Traders simply did not take the early downturn in the NDX seriously in terms of corporate health at first.

Hardware/Software/Biotech Default Risk Slow To Shift Higher



At the end of it all, the smile of the NDX options can tell you as much if not more about how seriously the market takes any given downturn. If excess volatility remains low and if the smile shifts to the higher moneyness strikes and if the CDS costs of various key market components increases, chances are you are looking at a real problem and not a one-day wonder.