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#### IN THIS ISSUE

We get back to basics and examine five common misconceptions about VIX.

## VIX – Fact & Fiction

Hailed as a revolutionary benchmark when it was first introduced by CBOE in 1993, the CBOE Volatility Index® (VIX®) rapidly gained traction as the preeminent barometer for measuring market volatility. VIX soon was closely followed, widely quoted, and highly publicized, but never more so than in the recent past as investors looked to VIX and other indicators for insights to a global market meltdown and record levels of sustained volatility. Amidst heightened investor and media attention, it became evident that some market observers were making overly generalized interpretations of VIX, or were looking to VIX for information it was not designed to convey. The purpose of this Research Note is to explore five common misconceptions (see “Myths” below) that have surfaced about VIX and, in the process, to separate fact from fiction.

### Myth #1: VIX Measures Fear

VIX is commonly called the investor’s “fear gauge” because investors tend to be more fearful when market volatility is high and less so when volatility is low. While it may be a handy nickname, the “fear gauge” is really a bit of a misnomer and, when taken too literally, may lead to some confusion. It is important to remember what VIX truly measures: the market’s expectation of future volatility implied by S&P 500® stock index (SPX®) options prices. In other words, VIX uses options pricing as a way to measure perceived market risk and uncertainty.

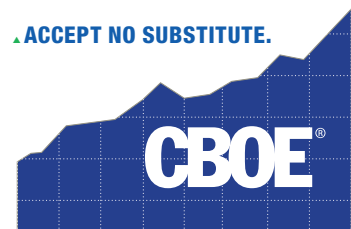
### Myth #2: Fear and Uncertainty Are the Same Thing

While fear and uncertainty are close cousins, they are not identical, and the distinction between the two is important when it comes to interpreting VIX. For instance, it’s fair to say that – by any measure – most people were very “fearful” about the economy and the market throughout the last quarter of 2008 and the beginning of 2009. In fact, an undeniable sense of fear grew each day as the stock market continued its dramatic decline. In this scenario, a “fear gauge” would be expected to continue to rise as the market continued to slide. Indeed, VIX continued to rise and reached new peaks in October and November 2008 as the U.S. banking system and the global financial system appeared to be on the verge of collapse. Daily market fluctuations of 5% or more were regular occurrences. Huge intraday price swings were common, with many of the most violent moves taking place in the last hour of trading.

Yet as the market continued to decline and the economic tsunami continued, VIX – to the surprise of some – actually began to decline in early 2009 although there was still considerable “fear” in the marketplace, causing some observers to wonder if VIX was working properly.

In fact, despite all of the bad news and continued fear, some of the market uncertainty had dissipated. More information was available about the government’s plans (TARP, TALF, etc.) and, although the market continued to lose ground, it began to do so in a more regimented

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fashion; daily moves were no longer as big as they were in October and November when VIX continually hit new highs.

As a result, options traders were not willing to pay the same high prices for protection as they had at the end of 2008, and the decrease in options prices was expressed in lower VIX levels. The decline in VIX levels, therefore, was not surprising at all; instead, it was expected and normal for a measure of market uncertainty.

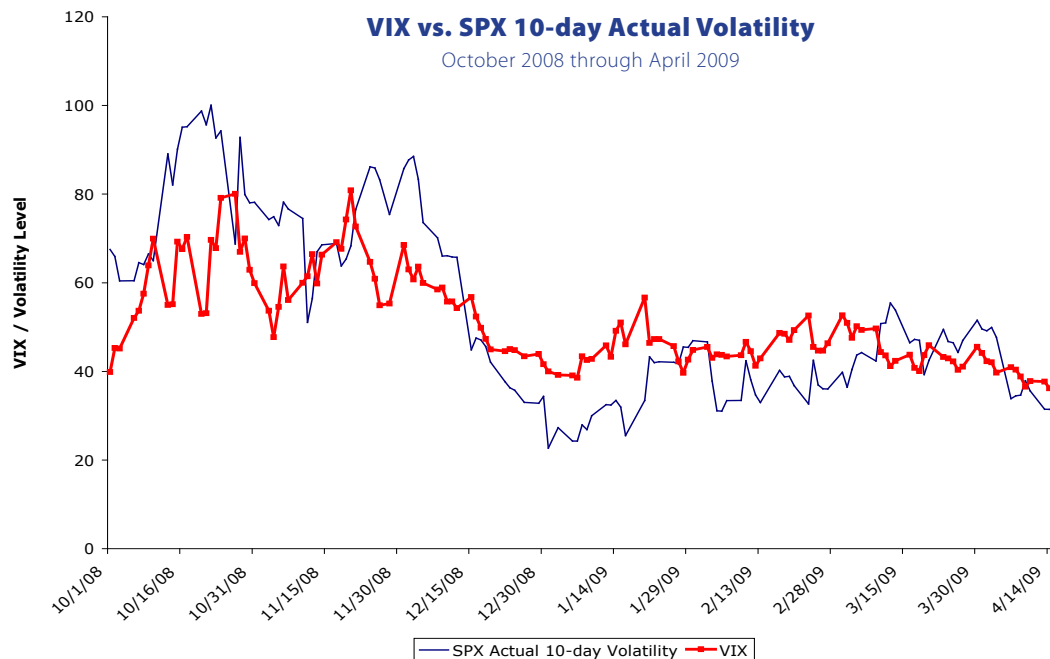
### Myth Number #3: VIX Measures Present Volatility

In order to more meaningfully interpret VIX, it is also important to remember that VIX is a measure of expected future volatility. The following chart shows the SPX Actual 10-day Volatility ("present" realized volatility based on historical prices) in October 2008 reached a high of about 100, which equates to actual daily price moves of over 6%. At the same time, the corresponding level of VIX (future volatility), while at a record high of over 80, suggested future daily moves of just 5%. In other words, VIX predicted that the realized levels of market volatility were unsustainable.

#### Options Pricing and Volatility

One way to gain an intuitive understanding of the relationship between volatility and options prices is to think of options as a form of insurance. Insurance carriers charge premiums based on their expected losses: the greater the risk, the higher the premium charged. The CBOE Volatility Index is calculated using options prices. Like insurance premiums, options prices reflect the market's perception of risk. When risk is perceived to be high, investors are willing to pay more for options than when perceived market risk is low.

Options prices also reflect the expected variability -- a qualitative description of volatility -- of stock prices. When the market expects large changes in stock prices, as it often does in times of uncertainty, options prices tend to rise. As uncertainty wanes, and the market factors in smaller expected price changes, options prices tend to fall.



VIX turned out to be an accurate predictor of falling volatility. As governments around the world worked to restore confidence in the global financial markets, 10-day realized volatility fell below a level of 50. S&P 500 Index options traders simply weren't as willing to pay up for protection as much as they had been, and the corresponding VIX levels settled into a range between 40 and 50. In early 2009, VIX trended lower despite rising levels of realized volatility. By mid-April, 10-day realized volatility had fallen from 50 to 30, a 40% drop from the end of March. As a measure of future volatility, VIX worked very well.

## Myth #4: VIX and SPX Always Move Inversely

Given the general tendency for VIX to move inversely to the overall market, some observers have erroneously assumed VIX was created as an indicator of market direction rather than market volatility, a measure of stock prices rather than stock price changes.

VIX was never intended to predict the direction of stock market moves. VIX is a measure based on options prices, and one artifact of options prices is that they tend to rise during turbulent times and fall when uncertainty subsides. As a result, the VIX and the S&P 500 Index typically move inversely to one another, but this is not always the case. In fact, since 1990, VIX has moved opposite the SPX an average of 3 out of 4 days. This variation is normal and expected, depending on market dynamics.

There can be tremendous variation in the behavior of options prices – and VIX – given any number of other market variables. For example, in a prolonged bear market, participants often see volatility decrease, even as the market goes down. Again, if there is less perceived uncertainty, there also is less perceived risk, so market participants aren't typically willing to pay as high a price for options protection. This is one example of why the VIX and S&P 500 don't always have a negative correlation.

## Myth #5: VIX Predicts Future Stock Prices

VIX levels reflect how options investors feel about the future, regardless of the current level of the S&P 500 Index. In other words, there is no fixed level for the VIX when the SPX is, for example, at 600, 700 or 1,000.

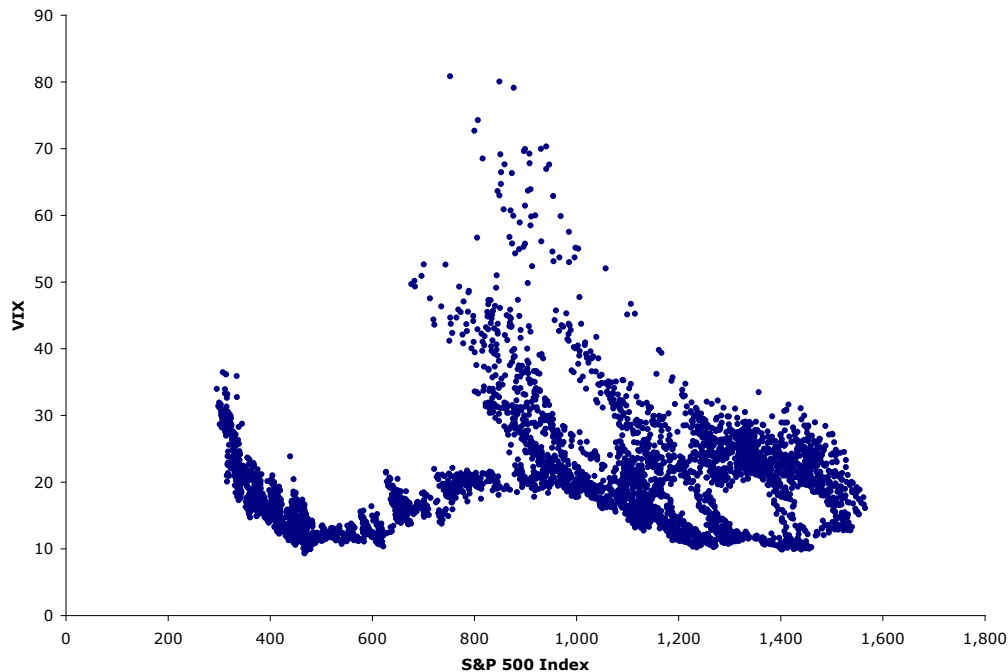
In February 2009, SPX broke through the November 2008 low of 752.84, and then fell another 10% to 676.53 by early March 2009. As SPX dipped to new lows, VIX never closed higher than 60, significantly lower than the record highs over 80 just a few months before. Some observers expected the new SPX low to be "confirmed" with a higher VIX reading, but there was arguably much less uncertainty in March 2009 compared to late 2008. The Federal Reserve, U.S. Treasury and Congress had taken aggressive and unprecedented actions to restore confidence in the financial system and stimulate the economy. Even though stock prices continued to fall, daily and intraday price changes (i.e., volatility) were smaller than before.

The chart below displays SPX and VIX levels from 1990-2009. Given any value of SPX, VIX has ranged anywhere from 10 to 80, with most VIX values concentrated between 10 and 30. The chart illustrates that low/high S&P 500 levels don't necessarily translate to high/low VIX levels.

Although not its intended purpose, some traders nonetheless do use VIX to glean information about the stock market and to predict bullish and bearish market activity. They believe that high VIX readings are a sign of extreme "oversold" conditions and can predict market bottoms; and that low VIX readings indicate investor complacency, a signal that the market is ripe for a correction. Likewise, some technical analysts look for signs of investor "capitulation" in order to identify a market bottom, the theory being that when there are no more sellers, the market has nowhere to go but up. Historically, some of the highest VIX readings have been recorded on days when this capitulation has taken place. However, as noted before, there is no evidence to suggest that a particular level of VIX is tied to a particular SPX price at the bottom.

**VIX & SPX Price Levels**

1990 through 2009



## Conclusion

VIX is a measure of expected future volatility derived directly from S&P 500 Index (SPX) options prices, which reflect the overall market's opinion of how stock prices may move in the future. Dubbed the investor's "fear gauge," it is more accurate to think of VIX as a yardstick of investor uncertainty. Although VIX has a general negative correlation with the stock market, and some traders use VIX in conjunction with other indicators to assess the market, VIX was not devised as a crystal ball to predict stock prices, the direction of the market or market highs or lows. The VIX was meant to predict the market's expectation of future fluctuations and, as recently seen amidst one of the most turbulent and uncertain periods since the Great Depression, VIX continues to accurately measure anticipated future volatility and to work exactly as intended.

For additional information on VIX see [www.cboe.com/Volatility](http://www.cboe.com/Volatility).

**More information on the VIX futures and options may be found at the CBOE website:**

**[www.cboe.com/VIX](http://www.cboe.com/VIX)**

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