

Volatility Cones Come In New Flavors

Donald Schlesinger, Guest Contributor



[Editor's note: A version of this article first appeared in a publication by Morgan Stanley in 1995. It was republished a year later in Futures Magazine. It has been revised and updated for Expiring Monthly.]

When it comes to forecasting volatility, it seems that the old axiom about weather is applicable: "Everyone talks about it, but no one can do much about it!" Volatility cones are a tool that may be useful in one's attempt to do something about predicting the future volatility of an asset. But first, let's briefly review the two major types of volatility so we may better understand how these measurements relate to volatility cones.

"Asset" or "statistical" volatility can refer to the past or the future, while "historical," or "realized," volatility is strictly a backward-looking statistical parameter. One simply defines a previous period of time and studies the fluctuations in price of the asset under consideration. Mathematically speaking, historical volatility (usually expressed as an annualized number) is the standard deviation of the (continuously compounded) log-returns of the asset. The figure, expressed as a percent, tells us what has happened in the past. When

referring to the statistical volatility that an asset might display in the future, we'll use the term "forecast volatility."

As with the weather, knowing what a market or underlying asset has done for, say, the past month is not always helpful in predicting the future path of returns. For a variety of reasons, some of which have little to do with actual forecasting, the number that market participants ascribe to the asset, in an apparent effort to predict future volatility, often is different from historical measurements. This second kind of volatility, which can be ascertained from the prices of options trading on the underlying, is known as "implied" volatility. In essence, it represents the aggregate, and somewhat biased, estimate, by all those who trade the options, of the future volatility of the asset.

When we enter the options arena, in an effort to "trade volatility," we want to be able to compare current levels of implied volatility with recent historical volatility in an effort to assess the relative value of the option(s) under consideration. Volatility cones can be an effective tool to help us with this assessment.

A volatility cone is an analytical application designed to help determine

if the current levels of historical or implied volatilities for a given underlying, its options, or any of the new volatility instruments, such as VolContract™ futures, VIX futures, or VXX and VXZ ETNs, are likely to persist in the future. As such, volatility cones are intended to help the user assess the likely volatility that an underlying will go on to display over a certain period. Those who employ volatility cones as a diagnostic tool are relying upon the principle of "reversion to the mean." This means that unusually high levels of volatility are expected to drift or move lower (revert) to their average (mean) levels, while relatively low volatility readings are expected to rise, eventually, to more "normal" values.

Cone Design

Not all volatility cones are constructed in an identical manner. At The Volatility Exchange, we have incorporated into our version several enhancements to the traditional cones (see www.volx.us, Data, VolX Cones). The ones created by VolX have these features: 1) a variable historical period of data, specified by the user; 2) 12 different periods of historical volatility data, from as long as one year to as short as one month; 3) for each of the volatility time periods, the maximum and



minimum historical volatility displayed by the underlying during the life of the study, and the 90-, 70-, 50-, 30- and 10-percentiles for the historical volatilities (see the cones for the Euro and S&P 500, below), and 4) a tabular array of all of the foregoing data (available on the web site only).

In our featured examples, the underlying assets are the S&P 500 E-mini futures contracts and the Euro FX futures, both of which trade on the CME. The historical period studied is August 2006 to August 2011. [Note that VolContract futures are currently offered on the Euro FX, and there are plans to roll out other VolContract futures on many more assets.]

Suppose we're about to purchase a six-month at-the-money straddle on the S&P 500 E-mini futures contract and we want to know how the level of implied volatility that we'll pay (approximately 27%, as we write these lines) compares to the likely future volatility that the S&P 500 will display over the life of our options (the next six months). We consult the cone and focus on the “-6” entry on the horizontal axis. Directly above it, we find, along the various curves provided, the following information: maximum six-month historical volatility for the past five

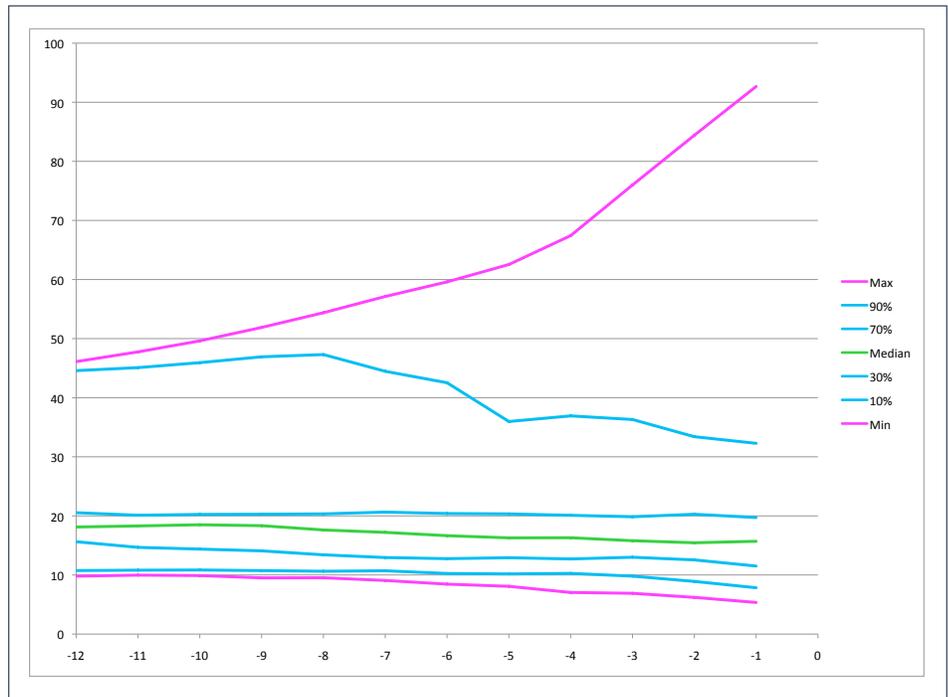


FIGURE 1 ES: S&P 500 Index Futures E-Mini – CME

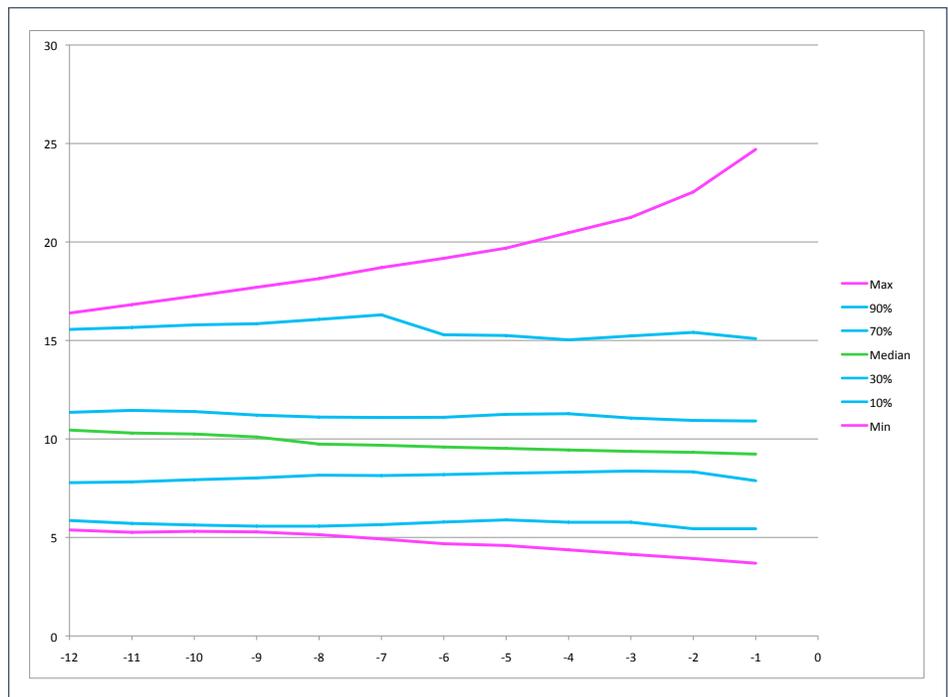


FIGURE 2 CU: Euro FX Futures – CME



years is 59.60; 90% of the time, six-month volatility has been below 42.53; 70% of the time, volatility has been below 20.40; 50% of the time (the median value), volatility has been below 16.65; 30% of the time, volatility has been below 12.76; 10% of the time, volatility has been below 10.25, and the lowest (minimum) six-month volatility for the period was 8.45. Clearly, it would be safe to say that paying 27% implied volatility is at the upper end of the spectrum and that it might be very difficult to sustain those levels over the coming six-month period. Again, the cones provide a level of guidance as to just how “difficult” this may be.

Of course, by now, we hope that you have become familiar with our flagship product, VolContract futures. Currently offered on the CME on the Euro FX, VolContract futures are the first exchange-listed product to settle to the realized volatility of an underlying asset. Clearly, the above use of volatility cones for options trading is also applicable to the trading of VolContract futures. One would simply compare the current price of the VolContract futures to the percentile values and matching time duration of the appropriate cone to receive guidance as to the likelihood that future volatility would, or would not, exceed the price

of the VolContract futures under consideration, during the designated time period.

Interpreting the Data

Suppose we consider a Euro FX VolContract futures with a three-month Realized Volatility Period (“3Vol™”), and that it is offered at a price of 15.23. The cone tells us that 90% of the time, over the past five years, three-month historical volatility for the Euro has remained below this level. Perhaps we’re paying too much for this contract, using history as a guide. Similarly, suppose our VolContract futures is offered at a price of 8.37. Only 30% of the time has three-month historical volatility been that low over our five-year window. In other words, 70% of the time, the Euro has demonstrated a three-month volatility greater than the level of our purchase, so maybe this is a relatively “cheap” contract. By ascertaining the various historical levels of volatility corresponding to a given time horizon for the VolContract futures under consideration, we’re better prepared to judge the relative “cheapness” or “expensiveness” of the instrument.

Conclusion

Remember, as with all interpretation of financial data, “past performance

is not necessarily indicative of future results.” But, in the absence of a better crystal ball, volatility cones can be an effective and simple forecasting mechanism to “get a handle” on future volatility. Of course, the cones shouldn’t be used in a void. One should attempt to assess future volatility on one’s own, before consulting the cones. Do you think volatility will be higher than normal? If so, by how much? The cone can help you to define “normal” and just how high “high” really is. A similar logic applies to forecasts of lower volatility. Finally, in the absence of any strong opinion about future volatility on your part, or if your forecast is simply for a period of normal fluctuations, the cone, once again, will help to define just what normal really is.

At VolX, we are dedicated to providing cutting-edge technology and research for volatility traders. We hope that you will find our interactive volatility cones both useful and informative, and we would be delighted to hear from you regarding your experiences in using the cones. **EM**

Donald Schlesinger is Chief Strategy Officer of The Volatility Exchange, www.VolX.us

