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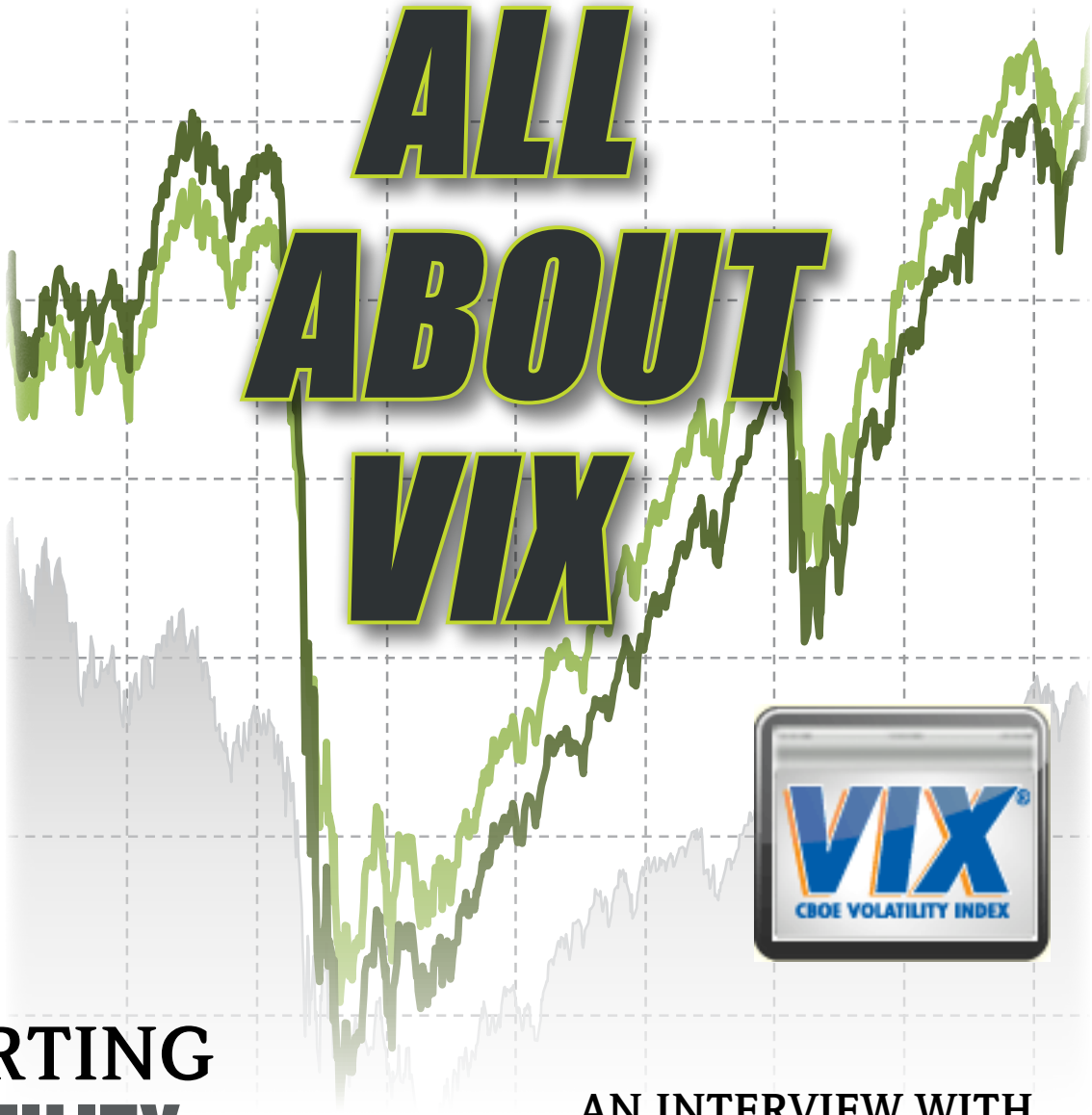
EXPIRING MONTHLY

THE OPTION TRADERS JOURNAL



ALL ABOUT VIX

VIX® CBOE VOLATILITY INDEX

SHORTING VOLATILITY SPIKES

AN INTERVIEW WITH
Jamie Tyrrell

Trading the Expanding VIX Product Space

EXPIRING MONTHLY
THE OPTION TRADERS JOURNAL

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About the
Expiring Monthly Team

Bill Luby

Bill is a private investor whose research and trading interests focus on volatility, market sentiment, technical analysis, and ETFs. His work has been has been quoted in the Wall Street Journal, Financial Times, Barron's and other publications. A contributor to Barron's and Minyanville, Bill also authors the VIX and More blog and an investment newsletter from just north of San Francisco. He has been trading options since 1998.

His first book, *Trading with the VIX*, is scheduled to be published by John Wiley & Sons in 2011.

Prior to becoming a full-time investor, Bill was a business strategy consultant for two decades and advised clients across a broad range of industries on issues such as strategy formulation, strategy implementation, and metrics. When not trading or blogging, he can often be found running, hiking, and kayaking in Northern California.

Bill has a BA from Stanford University and an MBA from Carnegie-Mellon University.

Jared Woodard

Jared is the principal of Condor Options. With over a decade of experience trading options, equities, and futures, he publishes the Condor Options newsletter (iron condors) and associated blog.

Jared has been quoted in various media outlets including The Wall Street Journal, Bloomberg, Financial Times Alphaville, and The Chicago Sun-Times.

In 2008, he was profiled as a top options mentor in Stocks, Futures, and Options Magazine. He is also an associate member of the National Futures Association and registered principal of Clinamen Financial Group LLC, a commodity trading advisor.

Jared has master's degrees from Fordham University and the University of Edinburgh.

Mark Sebastian

Mark is a professional option trader and option mentor. He graduated from Villanova University in 2001 with a degree in finance. He was hired into an option trader training program by Group 1 Trading. He spent two years in New York trading options on the American Stock Exchange before moving back to Chicago to trade SPX and DJX options For the next five years, he traded a variety of option products successfully, both on and off the CBOE floor.

In December 2008 he started working as a mentor at Sheridan Option Mentoring. Currently, Mark writes a daily blog on all things option trading at Option911.com and works part time as risk manager for a hedge fund. In March 2010 he became Director of Education for a new education firm OptionPit.com.

Editor's Notes

Bill Luby

The wave of volatility that shook the financial markets at the beginning of August has continued throughout the options expiration cycle, with investors anticipating that it will extend into 2012.

For this reason, the September issue of Expiring Monthly is long articles on the CBOE Volatility Index (VIX) and volatility, as we present research and analysis on these topics that you will not find anywhere else.

Guest contributor Russell Rhoads authors this month's feature article, *Shorting Volatility Spikes*, in which he examines the performance of a variety of VIX products following large spikes in the VIX.

In this month's feature interview, Mark Sebastian sits down with Jamie Tyrrell, the Designated Primary Market-Maker on the CBOE for the VIX and VIX ETNs.

Mark also outlines three issues he has with the VIX in Fix the VIX—and details his thinking on how the index might be improved.

Jared Woodard offers up a thought piece on strategies for selling naked calls, with some intriguing results, even for the 2009–2011 bull market.

I am responsible for two related articles this month: *Trading the Expanding VIX Products Space* covers the waterfront in terms of VIX products and strategies; while *A History of VIX Futures Roll Yields* delves into the role of the VIX futures term structure and its impact on the returns of various VIX products.

Once again, the EM team is back to answer reader questions in the Ask the Xperts segment and last but not least, Jared returns to the Back Page pulpit to debunk some of the myths associated with liquidity in an era of deregulation and compressed time frames.

As always, readers are encouraged to send questions and comments to editor@expiringmonthly.com.

Have a good expiration cycle,

Bill Luby
Contributing Editor

Ask the Xperts

The Expiring Monthly Editors

***Q:** Conceptually, I understand that a delta neutral strategy isolates you from directional moves, but mechanically I'm having a hard time thinking that through. Could you elaborate further on the way delta hedging works? What happens when there is directional movement in the underlying asset (what happens to your P&L), and how does buying/shorting more stock affect that picture?*

—Rob V.

A: Let's say we sold a put with a 33 delta and sold short the same number of shares. If the stock rises $1, we know that we'll lose $33 on the short stock position. But we will gain $33 on the short put based on the delta exposure alone.

Now, the option delta depends in part on its distance from the spot price of the underlying, so as the stock rises, the delta of that OTM put will gradually approach zero. For a $1 move in a $37 stock, the delta might change a bit, let's say to 30. Now we're short 3 more shares than we need to be, so we can buy back those three shares to keep the position balanced. Now, if the stock falls $1, we'll lose $30 on our put and will gain $30 on our short shares.

Assume a) there's no volatility premium in the option price, b) that there are no transaction costs, and c) that we can constantly rebalance, tick by tick, 24 hours a day (no price jumps). In that world we would expect to break even at expiration—the cash flows from our buying and selling shares would perfectly match the profit or loss on the option contract.

But there is a volatility premium, and that's what we're trying to capture, so the idea with delta hedging is to replicate the delta exposure of the option contract so that the delta-related P/L of the option and the P/L of the share flipping will offset each other, leaving us with the vol premium in the option as our profit—assuming our volatility forecast is correct.

—Jared

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***Q:** I know that VIX options expire on Tuesday, but is the last day of trading for the VIX options on Monday? I'm short some calls and am basically trying to figure out when is the last day they could spike and hurt me. Is that day Monday?*

—M.

A: The last Trading day is Tuesday, with settlement at Wednesday's open.

Good trading,
Bill

.....

[A follow-up question came in at about 3:45 p.m. ET on Tuesday, the last trading day for the August VIX expiration cycle.]

***Q:** I guess the VIX options technically trade until around 4:15—so they can still hurt me until then?*

—M.

A: Yes you can get hurt in the next half hour, but your biggest risk is overnight risk and the possibility of a huge gap up in the VIX when the options and futures settle at tomorrow's open.

With respect to the overnight risk, something could happen in Europe, there could be a strong reaction to tomorrow's PPI data (fear of stagflation, etc.), some international data might be an issue, etc.

Don't forget that the VIX can spike 10% at the open without too much trouble, which is why these options usually carry a fairly large premium right up to the end of trading. The issue is not so much a high probability risk, but a high magnitude move if that low probability event spikes the VIX.

—Bill

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***Q:** I am new to options and am interested in learning about how options work and how to trade options. What*

would you suggest is the best route to learn options?

—Philip

A: That is a great question, one that I get asked all of the time. There are a lot of unscrupulous organizations out there charging people to learn things that are entirely free. To start begin by picking up a good beginner book try my former colleague Mark Wolfinger's *Options for Rookies* to start. At the same time go to the OIC website www.optionseducation.org or the CBOE's Option Institute www.cboe.com. From there I would pick up an intermediate book like *Option Pricing and Volatility* by Sheldon Natenberg and begin reading some of the great blogs out there (like the 3 the writers here run). I would also begin playing with options in a paper money account. Only at that point would I consider paying someone like me to teach you about trading, and you don't even have to do that. There is a cost associated with working with an education company; one must weigh the cost of learning some of the hard knocks of trading on one's own vs. the amount of potential losses that could be saved getting a mentor. If you are quite certain you can learn on your own by reading more advanced books, doing a ton of research, and taking some monetary losses at a cost less than enrolling in an education firm, do it. If you are not sure then weigh your options and shop around. The first thing most traders can do to improve trading returns is to spend as little as possible for the most education. Hope that helps.

—Mark

Stocks Don't Crash Upward: Returns from a Naked Call-Selling Strategy

Jared Woodard

I was talking to a friend recently about the hedge fund manager Victor Niederhoffer, who is perhaps best known for blowing out his funds in 1997 when he was naked short puts on S&P 500 futures amidst a major decline in the index. Niederhoffer later filed suit, alleging that floor traders in the S&P pits at the CME conspired to drive the market down to force him out of his positions. He is probably the best known option seller in the business, and is held up now by educators as an object lesson in the dangers of naked short positions.

Selling naked puts in size will forever have a bad reputation, and maybe deservedly so. Markets can crash down, and since at least October 1987, out of the money puts have been priced to reflect that fact. But as I was thinking about Niederhoffer, it struck me that I had never heard of an option seller who focused on naked calls.

A Thought Experiment

This is more of a thought experiment than anything else, so bear with me. We know that the skew reflected in OTM puts relative to ATM options exists because of the non-normal historical distribution of equity returns. The tail is fatter on the left side of the curve, which makes investors willing to pay higher prices for puts in IV terms. But not all of the volatility risk premium is attributable to jump risk—calls are often overpriced, too. Many of the papers I reviewed for *Options and the Volatility Risk Premium* noted the presence of excessively bid calls, and a 2010 paper from Constantinides et al. reaches the same conclusion. The abstract:

> American options on the S&P 500 index futures that violate the stochastic dominance bounds of Constantinides and Perrakis (2007) from 1983 to 2006 are identified as potentially profitable trades. Call bid prices more frequently violate their upper bound than put bid prices do, while violations of the lower bounds by ask prices are infrequent. In out of sample tests of stochastic dominance, the writing of options that violate the upper bound increases the expected utility of any risk averse investor holding the market and cash, net of transaction costs and bid ask spreads. The results are economically significant and robust.

What then, should we think about call-selling strategies? One intuitive point in their favor is that stocks don't tend to crash up. They can move higher at a rapid pace, to be sure, especially during volatile periods and after large declines. And the bigger worry that occurred to me was the presence of momentum-driven markets in which stocks march steadily higher. The quantitative easing operations conducted by the Federal Reserve in 2010 created just this sort of environment, so I backtested a call-selling strategy beginning to 2009 to see what the returns were like.

Naked Call-Selling Returns

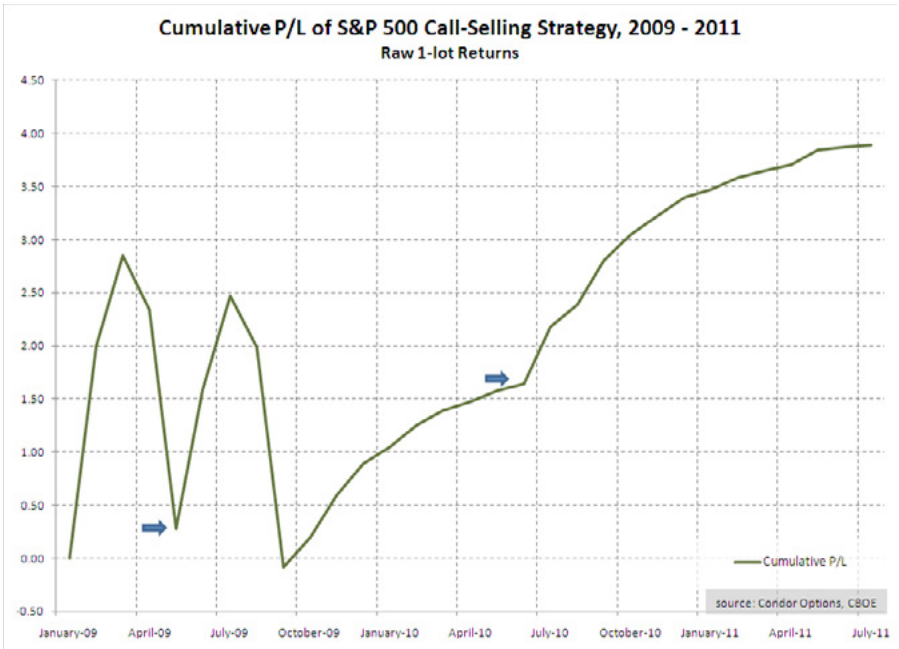
On expiration Friday, this strategy sells two-month S&P 500 index call options and holds them until expiration. The calls selected are those struck closest to the underlying price with moneyness greater than or equal to 1.10. For example, with the S&P 500 trading at 1170, we would sell the first two-month call with a strike equal to or greater than 1287. Calls are sold at the bid plus one tick.

Figure 1 shows the "raw" cumulative returns for the strategy on a 1-lot basis, i.e. if we sell one call each month and take the sum of the returns in the series. The strategy does exceptionally well under normal market conditions, even in the presence of strong upside momentum. Setting the moneyness parameter at 1.10 was apparently sufficient to avoid

drawdowns from rising markets during the QE2-dominated period, and obviously the tumult of August and September 2011 had no adverse effects. I have marked the May 2010 "flash crash" and the 2009 market lows with arrows to call attention to the fact that after periods of high volatility, inflated call premiums contribute excess returns subject to favorable price action. In plain English, high implied volatility makes any option selling more attractive, and as long as the market doesn't rise too quickly, the strategy does particularly well.

The strategy suffered only four losing months during this period, and two of them were small enough to have been recovered completely one month later. The two sizable losses came in the March–May 2009 period and the July–September 2009 period. The first loss is obviously attributable to the rapid rise in the index off of the March lows. Likewise, the index gained more than 20% from July to September expiration.

But a more thorough implementation of the strategy would not rely so heavily on changes in implied volatility to generate profits. In Figure 3, we are varying the number of contracts sold each month to bring in a constant credit of $5000



Condor Options, CBOE

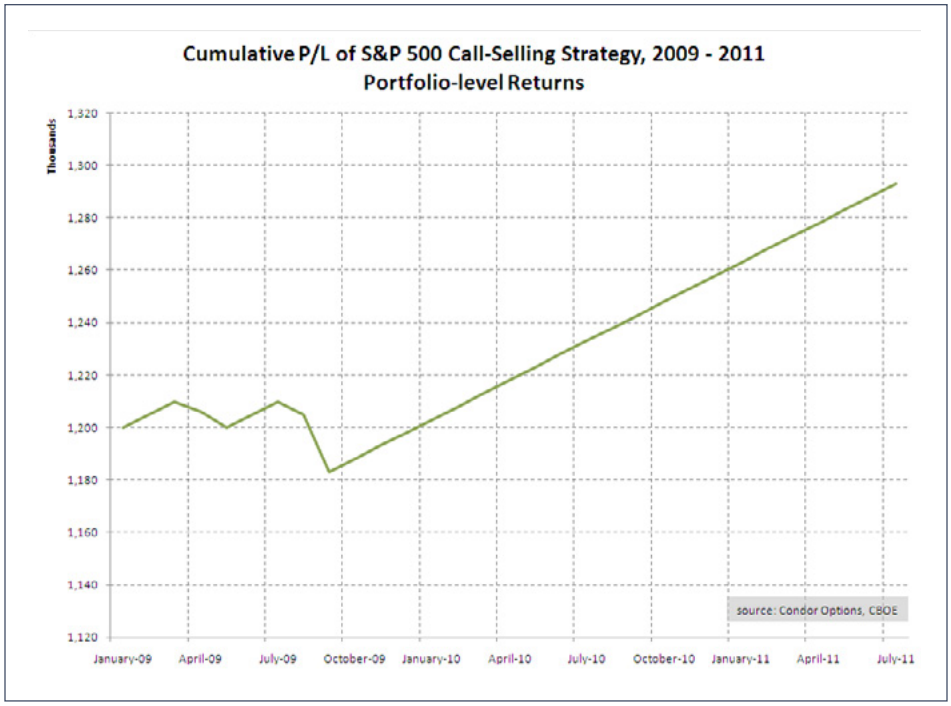
FIGURE 1 *Cumulative P/L of S&P 500 Call-Selling Strategy, 2009–2011, 1-Lot Returns*

thinkorswim

FIGURE 2 *S&P 500 prices, 2008–2011*

for each sale. I have sized the cash portfolio to reflect maximum Reg-T margin requirements. As you can see, this implementation significantly dampens the effects of early return volatility. The net return of about 7% over the period is obviously lower than the 30% S&P return, but with a 2% maximum drawdown, it offers a much better Sharpe ratio (0.462) than the market index (0.155).

As I said, this is a thought experiment, rather than a pre-packaged strategy, but the case for call-selling is stronger than I had anticipated. The application of some volatility and trend filters along with margin management techniques should further improve the returns shown here. EM



Condor Options, CBOE

FIGURE 3 *Cumulative P/L of S&P 500 Call-Selling Strategy, 2009–2011, Portfolio-level Returns*

To view this video go here

Expiring Monthly Interview with
Jamie Tyrrell

Mark Sebastian

Jamie Tyrrell has been a CBOE member since 2006 and for five years has been a CBOE Volatility Index options (VIX) specialist on behalf of Group One Trading—one of the largest proprietary options trading firms in the U.S. and the Designated Primary Market Maker in VIX options and other products.

A regular contributor of market color for CNBC, Bloomberg, and other financial news outlets, Jamie previously also traded equity and SPY options.

Prior to joining CBOE, he was involved in financial management at Accenture, after studying political science and business at the University of Notre Dame.

Expiring Monthly: *Tell us about yourself.*

Jamie Tyrrell: I work for Group One Trading, the designated primary market maker on the CBOE for VIX and VXX options. I am one of the DPMs that trades VIX and the VIX ETNs.

EM: *How did you get into trading?*

JT: I got into trading with Group One. I enrolled in their training program. Started as a clerk for a year, and then started as a junior trader in the DPM. Eventually I became a full trader in the VIX DPM.

EM: *Talk a little bit about the daily routine of the VIX options from open to close.*

JT: The VIX is obviously derived off of SPX options, so every morning I come in and look at what the S&P 500 has done overnight, what kind of range it has had and where it is heading leading up to the open. VIX futures open at 7:20 (soon to be 7:00) and VIX options open at 8:30. The first hour of the day is typically the busiest as customers adjust options positions and we take the other side of their trades. We also have an uptick in activity around 10:30 central as European indexes are closing down and European customers turn their attention to VIX. The lunch hours are the slowest and then after 2:00 p.m. there is usually another burst of activity heading into the close.

EM: *Talk to us about the difference between trading a cash settled index. Do you think trading VIX is more like SPX options or options on say, Apple or Best Buy?*

JT: I think it is more like trading SPX options. In individual equities, traders are really looking at company specific news to drive their markets. In VIX and SPX, we see the same kind of macro news events drive customer paper. Lately there have been big moves in vol in both VIX and SPX after announcements out of Europe or the Fed and after 9:00 a.m. economic numbers.

EM: *How do you manage movement in futures? The spreads between different months can really change.*

JT: In the VIX, to keep things clean market makers will often hedge each individual option trade with that month's future. Market markets typically hedge September options with September futures, October options with October futures. The reason being you

can see giant moves between the front couple months' futures. Over the last few days we have had the September decline $4 and the October decline $1, so the spread between the months moved $3. There are many VIX customers who trade the one future against another, but they trade the spreads between the different futures as more of a directional prop play and not as a direct hedge to option trades. A customer who hedges an October trade with a September future is really making a play on if backwardation continues or if we go back into contango, rather than hedging delta.

EM: *Do you ever see the SPX firms using the VIX product to lay off risk on what's going on the big product?*

JT: Certainly, you will see the activity in upside VIX calls which is very highly correlated to downside SPX downside puts. There will be spreads quoted in the pit where a firm will want to trade those products as a spread where they will want to buy a VIX call and sell SPX put (or vice versa) because they think one is over-priced and under-priced.

EM: *What is the institutional customer base in VIX like, highly sophisticated, or a mixed crowd?*

JT: I'd say the players who play VIX are larger. We see a lot more retail interest in the VIX ETNs, just because of the barrier to enter in futures execution capabilities. We tend to see very large customers in the VIX. More of the 1, 5, 10 lot gravitates towards the VXX and VXZ.

EM: *What are some of the major complaints you hear from retail customers?*

JT: I think the VIX is complicated, so we will get frustrated retail customers who start to trade the VIX options without realizing September options priced off of September futures and are not priced off of the VIX cash. Retail customers really need to read up on the VIX and understand the term structure before trading it.

EM: *In general, how have the VIX ETNs affected trading VIX futures and options?*

JT: The VIX ETNs are driving more volume into VIX futures. More firms are now looking at the VIX futures and making markets in them. Markets have expanded getting tighter and deeper. That has enabled option market makers to make deeper more liquid markets in the underlying options. The VIX option trading crowd can handle bigger orders now because the VIX futures are more liquid, which has been huge in the increasing the popularity of VIX.

EM: *At the close of business there is a lot of interesting activity. I assume you watch the futures. What effect does the ETNs rolling out futures have on options trading?*

JT: In the last 30 seconds of trading every day, there is a huge amount of volume in VIX futures, especially the front two months. That volume that you see at the end of the day isn't driving options trading, it's traders covering their exposure in VIX ETNs. Every day the value of the ETNs is calculated off of the closing price and by sending in orders at the very end of the day, traders are trying to capture that closing price. But, does that volume have much of an effect on options trading? I would say for the most part, no.

EM: *As the host of Volatility Sonar, you must get a lot of questions from the general public. What are common misconceptions that people have? People should know before trading?*

JT: The term structure is something a lot of outside investors don't know a lot about. A lot of investors start to look at VIX and want to trade

the cash VIX and don't understand that the VIX cash is just a calculation and it can't be bought or sold. I think traders need to be familiar with the idea that VIX options are options on futures and not options on the VIX cash before trading VIX.

EM: *Would you say the SPX volume leads the VIX or vice versa? Or is it more of a which came first, the chicken or the egg in terms of trading?*

JT: It used to be much more so that you would see SPX activity long before we would see any resulting play in VIX. Now, there are many times traders will put on a position in VIX and then SPX. In long run, SPX volume really in some ways needs to lead the VIX. VIX is derived from the SPX options; VIX settlements comes from the prices of SPX options. The VIX has been created as an outgrowth of SPX activity and I think the success of VIX can lead to more trading in SPX options as well.

EM: *Let's talk about settlement. Sometimes there are some idiosyncrasies with settlement. What advice would you give an outside trader and what do you do to prepare for settlement?*

JT: VIX settlement is something that is hard to predict based on the VIX cash. In September VIX is settling entirely to SPX October options. Take all the bids and offers in October options you will get a bid and ask on the VIX, and SPX bid-asks can be a couple of dollars wide. It is hard to predict with great certainty where the VIX will settle. The order flow we see in morning SPX will greatly determine to great degree if the settlement will be higher or lower than expected.

EM: *Jamie, you started trading with Group One in the 2006, you have traded almost exclusively the VIX products in the pit since then. What has the progression been like for the product and for you as a trader since 2006? In that time the product has moved from having a lot of potential to being a full-fledged blockbuster.*

JT: It's been really interesting to watch the product grow. The physical pit has moved twice. It started as one trader no brokers. Then 8 traders and brokers all around. Then a second pit had 20 traders and 5–10 brokers. The current pit has 40 market makers and 20 brokers coming in to do business all day. VIX options volume has gone from under 100,000 contracts to a day 400–500 thousand. Volume in VIX futures has increased from 3–4 thousand contracts to over 50 thousand since I have been there. With that increase in activity the markets have tightened and different players have begun trading the product. Now, a new class of investor is interested in VIX, big banks, doing 50 thousand options at a clip. Three years ago they had the trouble finding liquidity to do a decent sized VIX spread. And now a VIX call could trade inside of the screen market for 50 thousand contracts and not see much change in the volatility or futures price.

EM: *Where do you see the VIX products and vol products going over next few years?*

JT: The VXX, the first ETN that Barclay launched on VIX futures has been very successful in term of volume. Recently, there have been even more ETNs coming into the volatility space. VIIX, VIXY, VXZ, all of them have options on them that trade in the VIX pit. I think more ETNs launches are possible with options. Inverse VIX ETNs trade a lot of volume, but I don't think we'll see options on them in the near future. A number of index VIX calculations have been launched, including the Gold VIX (GVZ) which trades off of the GLD like VIX trades off of the SPX. I think it's possible we could have more sector VIXs launched in the pit.

(continued on page 26)

Trading the Expanding
VIX Products Space

Bill Luby

The last time a major financial crisis hit, three years ago this week, investors were faced with a volatility storm that was unlike anything since the Great Depression. At that time, most investors did not think of volatility as an asset class and very few were comfortable trading futures and options based on the VIX, formally known as the CBOE Volatility Index. The opportunities in the volatility space were so large, however, that it was not long before institutions and retail investors began using VIX futures and options as both speculative vehicles and portfolio hedges.

In January 2009 the VIX products landscape changed dramatically when Barclays launched the first two exchange-traded notes (ETNs) based on the VIX:

- iPath S&P 500 VIX Short-Term Futures ETN (VXX)
- iPath S&P 500 VIX Mid-Term Futures ETN (VXZ)

The Barclays products took a while to gain acceptance, but once investors warmed up to them, the corresponding volumes and asset bases grew exponentially. Over the course of the last 2 ½ years, interest in VIX ETNs and ETFs has grown to the extent that a total of thirty VIX and volatility-based exchange-traded products (ETPs) have been launched in the U.S. alone. The intent of this article is to provide a framework for understanding the increasingly complex VIX products space and provide some insight into how VIX products can be employed in various volatility-based strategies.

The VIX Products Space

Starting briefly with the basics, at the root of the VIX products space is the S&P 500 index (SPX) and the 500 component companies that comprise the index. The SPX has a wide array of options associated with it and the implied volatility data for a critical slice of those options is used in the calculation of the VIX. In 2004 the CBOE launched VIX futures, which now typically span seven consecutive months into the future. In 2006 the CBOE added VIX options to the mix. For the most part, the VIX futures are relatively straightforward, but the options trip up quite a few investors in that they are priced not off of the VIX index but on the VIX futures. They also have some other quirks, such as Wednesday expiration (30 calendar days prior to each SPX options expiration) and a settlement process based on a special opening quotation that occasionally strays a fair distance from the VIX opening print for that morning.

While VIX futures and options form the core of the VIX products space, it is the VIX and volatility-based ETPs where investors have a chance to order off the menu and express their opinions about volatility in a more nuanced and complex fashion. VIX ETPs generally target a constant maturity, with the two most common maturities being 30 days (VXX, XIV, TVIX, etc.) and 5 months (VXZ, VIXM, TVIZ, etc.) Investors who invest in VIX ETPs also have to contend with **roll yield**, where the daily rebalancing needed to maintain that **constant maturity** of the VIX

In the short-term, changes in implied volatility will be the driving factor of returns, but over the long-term, changes in volatility take are dwarfed by considerations of roll yield and term structure.

ETPs will either add to or subtract from the volatility component of the total return.

VIX ETPs also provide investors with exposure to a broad selection of inverse ETPs, as well as some leveraged products (TVIX, TVIZ, VZZB and CVOL) and even three ETPs (XVIX, XVZ and VQT) which include internal rules for dynamically allocating exposure to volatility on a daily basis, due to various market conditions. For this reason, I sometimes refer to these ETPs as "strategy-in-a-box" products.

The VIX ETPs are also the area which is driving most of the innovation and growth in the VIX products space. Earlier this month, for instance, UBS dramatically expanded the universe of VIX-based ETPs with the release of a dozen new products consisting of long and short versions targeting VIX futures maturities for every month from 30 days out to six months out. These products begin to blur the line between the VIX futures and VIX ETPs and allow investors to be long or short just about any portion of the VIX futures term structure.

As if all this were not enough, a handful of the VIX ETPs also have their own options and there are weekly options linked to the mini-VIX, which is 1/10th the size of the standard VIX futures contract.

In sum, the universe of VIX product offerings is now an embarrassment of riches, making it easy for the uninitiated to be confused, but providing a wealth of opportunities for those who take the time to learn the idiosyncrasies of each product.

DEFINITIONS

Roll Yield *The amount of return generated rebalancing a portfolio of futures contracts to maintain a constant maturity. Typically an ETP will rebalance its portfolio on a daily basis by selling near-term contracts and buying an equal amount of longer-term contracts. If the near-term futures are less expensive (contango) the result is a net loss and is known as negative roll yield; if the near-term futures are more expensive (backwardation), the rebalancing results in a gain and termed positive roll yield.*

Constant Maturity *A weighted average of maturities in a portfolio that is constant from day to day, due to continuous selling of shorter-dated instruments and buying of longer-dated instruments.*

Contango *An upward sloping futures term structure in which the front months are less expensive than the back months*

Backwardation *A downward sloping futures term structure in which the front months are more expensive than the back months*

VIX Strategies

The most basic volatility strategy is undoubtedly a simple directional bet on volatility. Traders bet that volatility will either increase or decrease and they typically do so when volatility reaches extreme levels relative to historical volatility or recent levels of implied volatility. The most common trade is a volatility mean-reversion trade, where traders bet that extremely high or low levels of volatility will be temporary and will ultimately return to prior historical norms. On the other hand, because volatility does show some evidence of auto-correlation, traders sometimes prefer to bet that volatility trends continue and perhaps intensify. These trades are best executed with VIX futures or VIX options.

Trading the VIX futures roll yield is a strategy favored by many VIX traders and one that has blossomed with the spread of VIX ETPs. Historically the front two months of

Strategy Approaches	Strategy Types	Preferred VIX Products
Volatility - Directional	➢ Mean Reversion or Trending ➢ Continuation or Reversal	➢ VIX futures ➢ VIX options ➢ VIX ETPs
Roll Yield	➢ Long Contango ➢ Long Backwardation	➢ VIX ETPs ➢ VIX futures
Strategy-in-a-Box	➢ Dynamic VIX Allocation ➢ Term Structure Spreads	➢ VIX ETPs
Custom Strategies	➢ Pairs Trades ➢ Ratio Trades ➢ etc.	➢ VIX futures ➢ VIX options ➢ VIX ETPs

FIGURE 1 *VIX Products and Strategies Overview*

VIX futures have been in **contango** about 75–80% of the time [see *A History of VIX Futures Roll Yields* on page 22], which has helped to develop a cadre of traders who favor being short the 30-day VIX ETPs or long the comparable inverse product. Other traders focus on always being on the side that benefits from the roll yield, regardless of whether the term structure is in contango or in **backwardation**. As a rule, most traders seek to benefit from a continuation of the current term structure, but depending upon the amount of the roll yield, sometimes trades which seek to profit from a reversal of the term structure can be more attractive. In some respects the roll yield play is similar to selling naked calls in that one benefits a little each day as time passes, with the risk being that sudden sharp changes in the term structure can overwhelm the benefit gained by being on the right side of the roll yield.

As mentioned previously, there is another set of pre-packaged strategies that I call strategy-in-a-box ETPs. The strategic intent of each these three ETPs (XVIX, XVZ and VQT) is quite different, but VIX traders should at a minimum monitor these to determine how these strategies are performing in current market conditions and use the backtesting data described in each prospectus to understand how these strategies have performed in the context of various historical volatility environments.

In addition to the strategic approaches mentioned above, there are a wide variety of custom strategies which can be profitably applied to the VIX products space. These include pairs trades [see *Follow That Trade: VIX Minotaur* in the December 2010 issue of Expiring Monthly], ratio trades and many other strategies that are beyond the scope of this article.

Conclusion

While the VIX index seems to have captured the imagination of the media, when it comes to trading the VIX products space, the VIX futures are the key to understanding the forces which influence prices not only for VIX futures, but also for the VIX options and ETPs.

With a broad spectrum of VIX futures, options and ETPs to choose from, investors have a great deal of flexibility in matching the most appropriate VIX products to just about any volatility strategy that can be dreamed up, whether the VIX products are used for speculative purpose or as hedges.

Finally, when it comes to VIX strategies, an often overlooked consideration is the anticipated holding period. Properly matching strategies and VIX products to time horizons is critical in that in the short-term, changes in implied volatility will be the driving factor of returns, but over the long-term, changes in volatility are dwarfed by considerations of roll yield and term structure. EM

Shorting Volatility Spikes

Russell Rhoads, Guest Contributor

At the beginning of August the VIX ran from 32.00 to 48.00 in a single day. As volatility tends to revert to the mean, many traders that follow and take positions based on the VIX will start to think about a way to benefit from the VIX dropping after such a spike. Keeping this in mind, I did a little research on what may have been the best method of getting short volatility after this recent spike.

Along with the VIX index becoming a mainstream topic among market professionals, there has been a dramatic increase in the number of methods available to take a position on the future direction of volatility. Looking back at the price action in the VIX after the run to 48.00, within a week the index was back below 32.00 at 31.87. For comparison's sake I took a look at some of more liquid products that current derive their value from the VIX index.

Ticker	Instrument	8/8/11	8/15/11	% Change
VIX	VIX Index	48.00	31.87	33.60%
VXQ11	August VIX Future	36.55	32.10	12.18%
VXU11	September VIX Future	30.20	26.70	11.59%
VXX	iPath S&P 500 VIX Short Term Futures ETN	34.78	32.18	7.48%
VXZ	iPath S&P 500 VIX Mid-Term Futures ETN	58.12	54.47	6.28%
XXV*	iPath Inverse S&P 500 VIX Short Term Futures ETN	33.27	33.75	1.44%
XIV*	VelocityShares Daily Inverse VIX ST ETN	10.00	10.10	1.00%

TABLE 1

Table 1 shows the five day performance for a variety of direct methods for shorting volatility after the quick run to 48.00. Just below the VIX index I show the performance for the first two month VIX futures contracts over the five trading. Although the futures have moved lower, the return is calculated as a positive as the assumption is we took a short position in these contracts. The returns of approximately 12% for both instruments are pretty impressive when view individually, but not in comparison to the 33% drop in the VIX Index. This is typical of volatility spikes where the index moves to a premium relative to the futures contract.

Four exchange traded notes (ETNs) are listed, two that offer long exposure and two that offer short exposure to the VIX. The VXX focuses on short term volatility taking a balanced position in the front two month futures contracts. The VXZ focuses on volatility a little farther out representing positions in the fourth through seventh month VIX futures contracts. A short position in either of these ETNs would have a pretty paltry return when compared to the returns from the index or the future contract.

What was really surprising was the return generated from the two inverse ETNs on the list. As assumption is made that a long position would be taken in either the XXV or XIV based on an outlook for a lower VIX over the near term. Using either of these would actually have returned about 1% over the five-day period.

After comparing these methods of trading the VIX, shorting the front month future worked the best with a return of a little over 12%. Remember that VIX index options trade closely with the VIX futures pricing, so strategies using VIX options would likely have yielded much better returns.

To see if this sort of price action around a VIX spike was common I took a look at what happened the last time we had a quick run in the VIX to the upside. Scanning a chart, there appeared to be a similar instance of a VIX run in March of 2011. The table showing this move appears below (Table 2).

The interesting part of this move is that the VIX dropped 34.8% over the five day period following a run up on March 16th. This price drop is pretty much in line with the drop of 33.6% that occurred in the

Ticker	Instrument	3/16/11	3/23/11	% Change
VIX	VIX Index	29.40	19.17	34.80%
VXJ11	April VIX Futures	24.50	20.50	16.33%
VXK11	May VIX Futures	25.15	21.60	14.12%
VXX	iPath S&P 500 VIX Short Term Futures ETN	37.63	31.26	16.93%
VXZ	iPath S&P 500 VIX Mid-Term Futures ETN	63.30	56.15	11.30%
XXV*	iPath Inverse S&P 500 VIX Short Term Futures ETN	32.85	34.06	3.68%
XIV*	VelocityShares Daily Inverse VIX ST ETN	11.04	13.20	19.57%

TABLE 2

previous example. This is basically just a circumstantial occurrence, but works out nicely to see how our trading vehicles performed over the same period.

First, the two front month futures contracts were down less than the VIX index. A short position in the front month April contract would have returned 16.33%. Shorting the May VIX contract would have resulted in a gain of 14.12%. As in the first example, the futures did not run up as much as the index which again is typical when the VIX moves up in a short period of time.

The results from shorting the two most liquid long ETNs were a little bit better than in the previous example. Shorting the VXX would have returned 16.93% and a five trading day short position in the VXZ returned 11.30%. Again, neither matched the spot index drop, but in this case both compared well versus shorting the futures.

The poor performance was repeated by one of the two inverse VIX related ETNs. A long position in the XXV would have returned 3.68%. In this instance, the XIV actually performed exceptionally well, gaining 19.57%. This performance makes the XIV the best performing method of trading the move higher in the VIX in March.

Let's go back one more price run and drop in the VIX to see what seems to work. So far consistency appears to be on the side of the futures contracts. So we can give this one more look by checking out catching the drop in the VIX that occurs right after the market in May 2010. For those with short memories, May 2010 will be remembered by market participants as the occurrence of the 'flash crash'. The causes of this event are still debated to this day.

The actual date of the 'flash crash' was May 6th, but the closing high in the VIX around that price action occurred on May 20th. On the 20th the VIX peaked at 45.79 and then over the next five days it lost around 35% dropping down to 29.68. Again, just by coincidence, the drop is very close in level on a percentage basis as the previous two examples. The comparison table does not include the two VIX related inverse ETNs as they had not been issued in May 2010 (Table 3).

The futures contracts have similar performance as in the previous two examples. The front month, June contract moves down just over 17.5%

Ticker	Instrument	5/20/10	5/27/10	% Change
VIX	VIX Index	45.79	29.68	35.18%
VXM10	June VIX Futures	35.95	29.65	17.52%
VXN10	July VIX Futures	35.70	30.95	13.31%
VXX	iPath S&P 500 VIX Short Term Futures ETN	34.07	28.33	16.85%
VXZ	iPath S&P 500 VIX Mid-Term Futures ETN	94.85	88.88	6.29%

TABLE 3

and the second month July contract was down 13.31%. The consistency for both futures is pretty interesting, since theoretically there is not truly a financial relationship. This relationship is non-existent due to the lack of an arbitrage relationship between the two. That is the performance of the VIX index may not be replicated by buying or selling securities.

Short positions in the two long VIX ETNs would result in positive performance. The VXX returns 16.85% and the VXZ returned only 6.29%. In all three comparisons of big moves in the VIX index, a short position in the VXX has outperformed a short position in the VXZ. This is to be expected as the VXX has exposure to shorter dated VIX futures contracts that are more sensitive to a change in the VIX index.

So what have we learned from analyzing past performance of VIX trading vehicles in times of high volatility? First, even though trading vehicles that derive their value from the VIX do not move in the same magnitude as the underlying index, they do move in the same direction. Also, different trading methods move in the same direction, based on the same drop in the VIX they all have very different final results. Finally, short positions in the VIX futures did not profit nearly as much as would be expected by looking at the drop in the index, the performance shorting these contracts was pretty consistent relative to the index weakness. **EM**

Russell Rhoads, CFA, is an instructor with The Options Institute at the Chicago Board Options Exchange. He joined the Institute in 2008 after a career as an investment analyst and trader with a variety of firms including Highland Capital Management in Memphis, Caldwell & Orkin Investment Counsel, TradeLink Securities and Millennium Management. He is a financial author and editor having contributed to multiple magazines and edited several books for Wiley publishing. Also he is the author of three books, in 2008 he wrote Candlestick Charting For Dummies, Option Spread Trading *was released in January 2011 and* Trading VIX Derivatives *was published in August 2011. In addition to his duties for the CBOE, he instructs a graduate level options course at the University of Illinois-Chicago and acts as an instructor for the Options Industry Council. He is a double graduate of the University of Memphis with a BBA ('92) and an MS ('94) in Finance and also received a Master's Certificate in Financial Engineering from the Illinois Institute of Technology in 2003.*

FIX the VIX

Mark Sebastian

I like the VIX, I really do, but the index has major issues that need to be fixed. Some problems I have spoken on in the past, and other issues have been brought up by such notables as my co-editors, Jeff Augen, Adam Warner . . . basically about every person that has appeared in this periodical. The issues I want to address today and use to improve the VIX are:

1. The VIX and the weekly options (me, Bill)
2. The differences between VXO and VIX sometimes working to VXO's advantage (Jared, me)
3. Crazy expiration (Bill, Adam)

Let's recap the three issues on the VIX and the weekly options:

> *If one reads the white paper on the VIX, it clearly states that it stops counting options that have less than one week to expire. This excludes every weekly option! If the VIX is supposed to be a measure of how IV is moving, how can it discount a huge portion of the activity playing a specific event? It shouldn't!*
>
> *The index, while still a good index, is probably going to have to change at some point in order to take into account the activity that has begun playing event risk in the weekly options. Another option might be to have some sort of short term VIX that takes into account the action on the weeklies. If nothing is done, traders will notice the VIX actually begin to smooth out. This will also cause the 'vol of vol' to fall. This might eventually cause the VIX to become an obsolete product.*[1]

On the VXO sometimes being a more useful index:

> *the most notable of which is that the VIX already factors some skew in it. With that in mind, I switched from using the VIX to the VXO, the OEX based volatility index that tries its best to capture "ATM" IV of the S&P 100 index.*[2]

On crazy expiration:

> *VIX options and futures cash settle on the open. But it's not really the open of the VIX, it's a calculated price based on where all the SPX options open. And they all open, as series you have never thought about all trade on the open of VIX expiration day. The market itself opened up on the day, so one would reasonably expect VIX to open either down or up small. Yet it "opened" near that 21.41 settlement. And proceeded to drop right back to 20.80ish within the first 5 minutes of trading (probably about where a non-jiggered VIX would have opened).*[3]

These are some really important issues with the VIX that really hurt the index as an indicator of market volatility. There are others that are problematic but I am going to attempt to solve all three issues listed above at once using one inter-related solution.

What is volatility, what has real implied volatility? From the time I was a junior trader to the current day I have never considered an option that is worth .05 to have 'volatility' in it. A nickel option we would have called a 'unit' back in the day. The term unit represented an option that still had some tradable value to it, but only because of its ability to protect against a catastrophic movement in the underlying. A unit option was easy to sell, but could really bite you in the end. Units have little to no real Greeks, cannot be used as a hedge, and have a high likelihood of expiring worthless.[4]

The value of these options, and the reason they do still have a bid comes from their ability to pay off in the event of a major catastrophic loss. My friend Jeff Quinto always asks this question:

"There is a jar with 2,000 jelly beans. All you have to do is pick one out, eat it and you get fifty dollars. Oh, by the way, one is made of arsenic."

That above question is why traders don't and shouldn't sell nickel options. Yet it doesn't mean that it's a great idea to include them in a volatility index. The 'arsenic pill option', may not be something that traders want to sell for nothing, but that doesn't mean they are something that should be used to measure volatility. Options worth .05 can have a registered volatility that is in the three figures on SPX, but that doesn't mean it's a real number. Cheap options don't have vol, they have a price. Solution number 1 drops any option that has a value that is less than 10% of the call that is nearest to a 50 delta as calculated by the CBOE or any option worth less than 1.50, whichever is greater. I would also calculate all options currently trading that have at least at least one trading day left before expiration.

This will not only eliminate much of the gaming that goes on in the cheap options during expiration of the VIX options, it will also give the index a more readable and accurate number. This method could potentially be better than VXO, while not being as 'skewtensive' as the current VIX (with any luck it might help with some of the price sensitivity).

"There is a jar with 2,000 **jelly beans.** All you have to do is pick one out, eat it and you get **fifty dollars.** Oh, by the way, one is made of **arsenic.**"

Using the above method in one form or another might also have another desired effect: the ability to take the VIX later into the cycle than it is currently allowed to be taken. If the VIX is not calculating all of those worthless options that get crazy volatilities in the final week it may actually stay a somewhat accurate number.

Traders will tell you that, while the OTM options can get crazy leading into expiration, for the most part the ATM straddle in SPX is such an efficiently traded product, traded so accurately, that it could, and maybe should, be used in the calculation for the VIX. By dropping everything that is worth less than 10% followed by every option worth less than 1.50 (this would really only matter on expiration Thursday in the late afternoon), the VIX could potentially be an accurate measure of market volatility as late as expiration Thursday. This method would also allow for the VIX to include the weekly options through Thursday night. The reason I want Thursday night included is because then the VIX will be able to factor in such things as weekly option prices the day before the employment report, or a major vote in Europe.

This may not be a perfect solution; there are still issues with the VIX. There may be hundreds of other ideas that are better than this one. Here is the challenge: for next month I want one of you to write a piece improving on this idea, rebutting it, or confirming it.

Submit entries to mark@optionpit.com. EM

[1] http://www.optionpit.com/blog/could-vix-become-obsolete

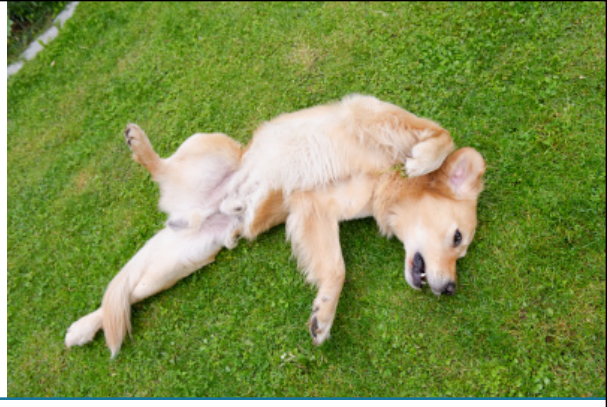
[2] http://www.optionpit.com/blog/cbop-curve-volatility-index-version-20

[3] http://www.dailyoptionsreport.com/2010/10/21/vix-settlement-games/

[4] http://www. optionpit.com/option-education/how-market-makers-buy-units-to-stay-in-business

A History of VIX Futures
Roll Yields

Bill Luby



In the 7½ years since the CBOE launched VIX futures, stocks have experienced several prolonged bull markets and two very serious financial crises that were accompanied by sharp declines in stock prices and a surge in volatility. Across this full range of investment climates, the VIX futures have chronicled the expectations investors have had for future volatility, generally looking ahead seven months or longer.

The purpose of this article is to summarize the history of the VIX futures term structure in the context of roll yields in the front two VIX futures as well as between the fourth and seventh month VIX futures. These two periods have been chosen because they reflect the roll yields for VIX short-term futures exchange-traded products (ETPs) which target a constant maturity of 30 days, as well as VIX mid-term futures exchange-traded products (ETPs) which target a constant maturity of 5 months. The former VIX futures ETPs, which include the popular iPath S&P 500 VIX Short-Term Futures ETN (VXX), achieve the constant maturity of 30 days by selling some front month VIX futures each day and using the proceeds to buy second month VIX futures. In a similar fashion, the ETPs that target a constant maturity of 5 months, including the iPath S&P 500 VIX Mid-Term Futures ETN (VXZ), do so by selling 4th month VIX futures as part of a daily rebalancing process and buying the 7th month VIX futures.

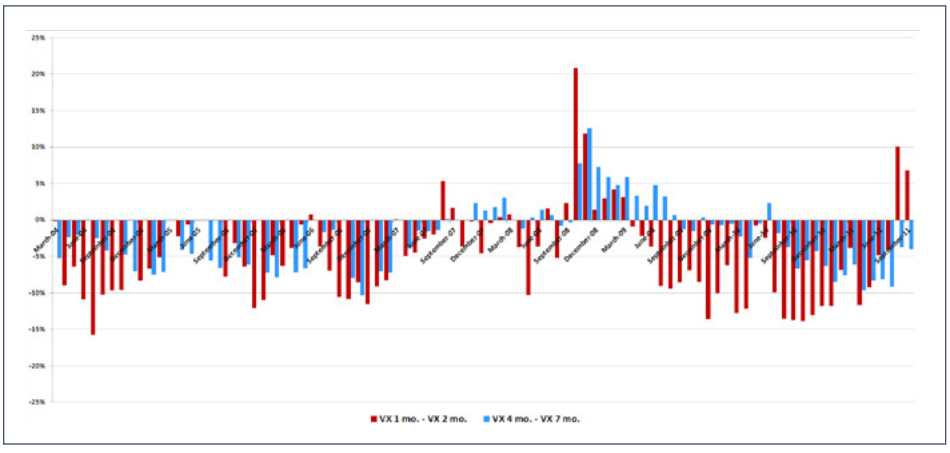
Comparative Roll Yield Data

Throughout their 7½ year life, the front month VIX futures have had a daily closing price that is lower than the second month VIX futures approximately 79% of the time. Over the course of a month, the second month futures are, on average, priced at about a 5% premium to the front month VIX futures.

Of course, these are just averages. There have been instances where the front month VIX futures have been priced at almost a 50% premium to the second month VIX futures, as was the case in October 2008. By the same token, back in July 2004 the second month VIX futures were more than 30% higher than the front month VIX futures for a brief period of time.

Compared to the differential between the front two months, the difference between the fourth and seventh month VIX futures has been less frequent and much less pronounced. During the same 7½ years the fourth month futures closed below the seventh month futures about 65% of the time and on average, the differential has been about 1.8%. In terms of extremes, the maximum differential between the fourth month and seventh month VIX futures appears to top out at about 15%.

Figure 1 below summarizes the average VIX futures monthly roll yields for both the front month and second month roll (red) as well



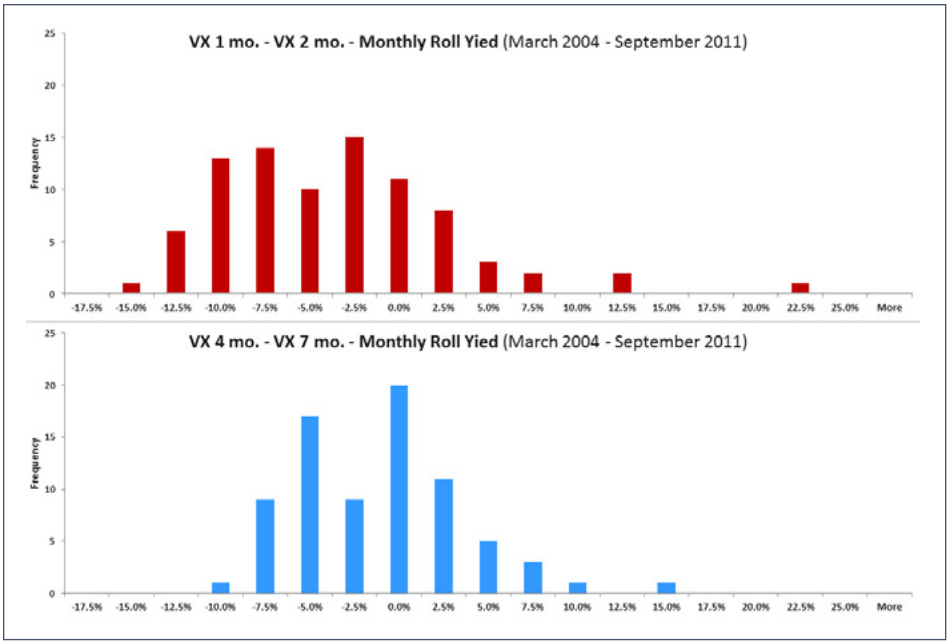
CBOE Futures Exchange, VIX and More

FIGURE 1 *Average VIX Futures Monthly Roll Yields, by Month*

as the fourth month and seventh month roll (blue) going back to 2004. Note that when one converts the daily data to monthly data, the aggregation of data accentuates the extremes. For instance, the front two months of VIX futures have negative roll yields in more than 81% of the months, while months four and seven experience negative roll yields on a monthly basis in more than 72% of the months. In fact, with the exception of the 2008 financial crisis and the last two months, there have been only a handful of instances where the monthly roll yield was positive for the full month.

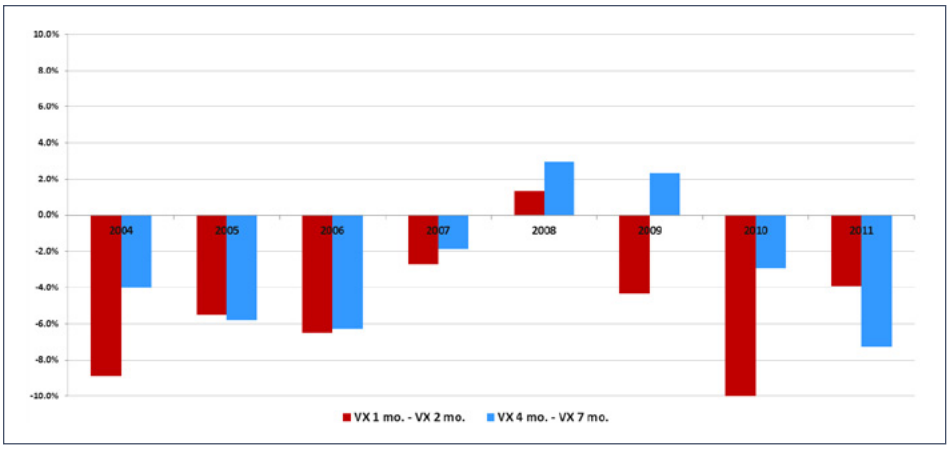
Figure 2 at right aggregates the monthly roll yield data into two histograms, with the front two months on top in red and the fourth-seventh roll on the bottom in blue. Note that the distribution of both of these roll yield data sets is skewed to the right or is positively skewed in statistical parlance. Another way of interpreting the data is to acknowledge that historically the large outliers have been in the context of high positive roll yield, which have happened to coincide with significant financial crises.

Figure 3 averages the monthly data over the course of each year since 2004. The variation in the yearly data and the contrast between



CBOE Futures Exchange, VIX and More

FIGURE 2 *Histograms of VIX Futures Monthly Roll Yield Data*



CBOE Futures Exchange, VIX and More

FIGURE 3 *Average Monthly Roll Yield, by Year*

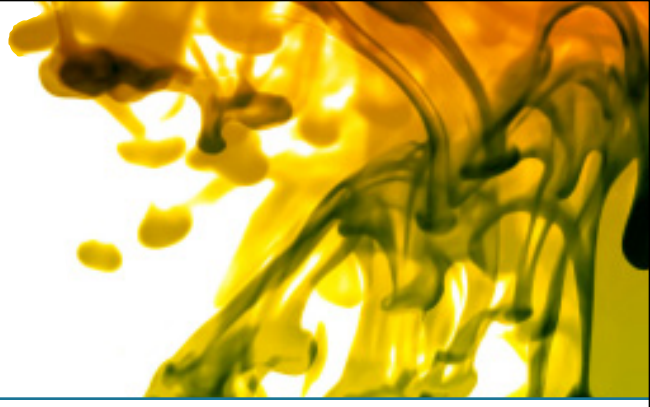
the roll yields in front two months versus the fourth and seventh month is largely a function of the frequency and duration of volatility spikes. It turns out that 2008 and 2009 are the two years with the highest mean annual VIX readings, a fact which is largely responsible for the positive roll yield across the VIX term structure in 2008 and the positive roll yield which persisted at the back end of the term structure in 2009.

By contrast, 2005 and 2006 saw some of the lowest mean annual VIX readings on record, which translated into a negative roll yield of about 6% per month for two years across the VIX futures term structure. Note also the similarities between 2004 and 2010, where there was a substantial negative roll yield in the front two months, but a much milder negative roll yield between the fourth month and the seventh month. The reason for this is that in both 2004 and 2010, the VIX was declining substantially from elevated levels in the previous year.

Conclusion

As noted above in *Trading the Expanding VIX Products Space*, when it comes to VIX-based exchange-traded products, the longer the holding period, the more the roll yield determines the long-term return. These products have an aggregate return which consists of changes in the price of VIX futures, plus or minus the impact of roll yield. In the long run, the VIX is mean-reverting and the changes in volatility approach zero, which means that long-run returns are almost entirely determined by roll yield.

The graphics and data above should provide investors in the VIX ETP space with some ammunition to help them structure strategies which can take advantage of historical tendencies in the VIX futures term structure and the implications it has on roll yields and returns. With options available on three of the VIX ETPs that target 30 days to maturity (VXX, VIIX and VIXY) as well as two of the VIX ETPs which target 5 months to maturity (VXZ and VIXM) considerable opportunities are available in this space to generate some impressive long-term returns. EM



Liquidity: An Economic Speedball

Jared Woodard

Financial markets exist, ostensibly, to connect parties who have excess capital with those who do not have enough. Savers and investors provide their capital to companies who can put it to better use, and who in turn will provide a return to those investors in exchange for the use of their funds. If this description sounds quaint, that's because it is. The speed and complexity of modern financial markets are far in excess of what is required for the match-making purpose just described. But if the breathless pace of "financial innovation" cannot be justified on the grounds that it better enables companies to find the funding they seek, then what is its justification?

Maybe you think that modern financial markets need no justification. The most conspicuous reason why some justification is needed is that the financial system regularly imposes risks on the economy as a whole. Instead of facilitating the smooth functioning of the real economy, financial firms have so insinuated themselves into the economic body that they cannot be torn out or allowed to die without killing the host. And even if large banks were not constantly inviting new risks, consider the size of the financial services industry in the U.S. At 20% of the market capitalization of the S&P 500, financial services companies have become an essential part of the U.S. economy. There is an opportunity cost to this, as well: when most of the brightest college graduates aspire not to the arts, or entrepreneurship, or the sciences, but to careers in finance, something has gone wrong.

Modern equity markets are themselves a net cost to society.

The justification for the massive costs imposed by the existence of the modern financial system is that it provides liquidity. This justification is touted at every level, from the large scale to the trading pits. Ask a market maker why his vig is not just a pure drain on society, and his answer will be something to the effect that he helps markets run smoothly. In the case of anachronistic men in jackets in Chicago and New York, this excuse is actually true. As for the cooled servers in secure basements underneath New York, the excuse is worse than false. As we saw during the "flash crash" of May 2010, high-frequency trading firms holding themselves out as "liquidity providers" are anything but: they provide a form of superfluous pseudo-liquidity in normally functioning markets where it is of no added benefit, and they instantly and en masse withdraw that liquidity in precisely those situations where more market depth is needed.

Liquidity is also a false friend in the world of personal finance. In a world of sub-second latency, it is impossible to be a true investor: you can always get out of the position after lunch, so why bother forming a sound thesis? If financial markets were open for a three-hour session just once each year, investors would have to be ready to make a year-long commitment every time they placed funds. Investors managing self-directed accounts were more likely to sell at the bottom in 2008 and 2009 and less likely to reinvest funds quickly enough to recover losses in 2009 and 2010. While the mutual funds and registered advisors of the world still have plenty to answer for in terms of poor risk management, advisors who performed even the modest function of calming panicked clients provided a valuable service. Liquidity means faster decision-making, and faster decisions are often worse ones.

But my problem is not principally with the foibles of individuals or the

marginal costs of HFT. The problem is that modern equity markets are themselves a net cost to society. The capital-raising justification of old no longer applies, since most capital is raised these days through conduits other than exchange-traded common shares. And we have seen in real time the value to society of the liquidity provided by modern finance. Among countless examples, consider the fate of banks that may (or may not) be fundamentally solvent on a moderate timeline, but who are pushed into crisis by the minute-by-minute perception game played out via collapsing share prices. Even in the cases of insolvent institutions, is there any doubt that taking a failed bank into public receivership via an orderly process would impose fewer costs on investors than a media-driven, frenetic trial by fire?

There used to be a wall protecting the real economy from some of the worst excesses of financial speculation. The Glass-Steagall Act of 1933 imposed a separation of commercial and investment banking so that deposit-accepting institutions could not take on speculative risks and thereby make themselves too big to fail. Of course, the anti-government fanaticism of the Reagan and Clinton years saw that barrier (and many others) removed: many scholars have claimed that the Gramm-Leach-Bliley Act of 1999 severely exacerbated the global financial crisis.

At its best, finance keeps capital flowing smoothly to the organs where that capital can best be put to use. But the financial heart of the U.S. economy is weak, and it pumps too fast. It is prone to sudden arrests. Our ruddy capital is too thin, flowing everywhere and nowhere at once. As a society, we did too much deregulatory cocaine in the 1980s and 90s, and unless we kick the habit, the next heart attack may be our last. EM

Expiring Monthly Interview with Jamie Tyrrell *(continued from page 12)*

EM: *Do you think there is a potential with weekly VIX futures options?*

JT: I think there definitely is. Group One is the DPM for that product as well. The one issue is that it trades on the CFE. I think it is a matter of getting brokerage futures to get access to CFE. This is the first option product listed on CFE, so many customers do not have access. As that changes I see many of the same players entering the VIX futures options.

EM: *Is there anything else you would like to add/say you know how do you like market making the VIX?*

JT: It has been an exciting 4 years that I have been in the pit. I have seen the product mature with lots of new customers and new brokers coming into the product and change the way that it has traded. It has been interesting over the last 18 months; VIX futures really picked up. They are now more liquid and can be a driver of option volume. EM