Trading the VXX -- 2nd Edition

by Len Yates, President and Founder of OptionVue Systems

In the Feb 23, 2012 issue of The Option Strategist, Larry McMillan wrote about a system for trading the VXX and XIV which seems remarkable in its simplicity and its high rate of return – a tenfold increase in 5.5 years' time. This only involved 14 trades, so it doesn't even require you to become an active trader. Intrigued by this trading approach, I decided to develop some tools and information to assist in my own trading and I built them right into the OptionVue program. As you will see, the OptionVue tools help generate even greater returns.

Let's cover the basics. This is not an option trading strategy per se; but rather a strategy for trading two of Barclays' Volatility ETNs – the VXX and the XIV. Note that the XIV is a mirror image of the VXX, so the XIV is useful when you would like to be short the VXX but are not allowed to short stocks in your account. You simply buy the XIV when you want to be short the VXX.

Now, what are these two ETNs about and what is the advantage to trading them?

Quoting McMillan, "Both VXX and XIV are constructed in such a way that they actually own (or are short) the two $VIX nearest-month futures. Each day, part of the position is rolled forward [so that a constant 30-day forward position is simulated]. When the term structure slopes upward (which it does most of the time), that daily roll is a debit, and is a drag on the performance of VXX vis-à-vis $VIX. However, since XIV is the opposite, it is a boon to XIV. Conversely, when the term structure of the $VIX futures slopes downward, the daily roll forward for VXX is a credit, allowing it to out-perform $VIX (and consequently is a detriment to XIV)."

Continuing, "The idea behind the trading system is simple enough: when the $VIX futures slope upward 'steeply enough', that is a roaring bull market, and we want to own XIV (i.e. we want to be short $VIX) because the daily roll is beneficial *and* because $VIX is expected to decline. On the other hand, when the slope is *downward*, we want to do the opposite: own VXX, because the market is bearish, $VIX is increasing, and the daily roll is beneficial to VXX. We tested entries when the differential in the first two months, or in months one and three, was of a certain level. The exit criterion that worked best in all cases was to terminate the trade when the term structure flattened enough so that the two futures in question were within a half point of each other."

To understand the VXX and McMillan's system for trading it, I suggest that you subscribe to his newsletter and read the recent articles. In addition, the prospectus for the VXX is available online at http://www.ipathetn.com/us/product/VXX. *Do not dive into these instruments without first learning about them and becoming familiar with them.* I also suggest you read about the differences between an ETN and an ETF: http://www.zacks.com/stock/news/65833/etfs-vs-etns-what%92s-the-difference

A New Proprietary Index

Since this approach focuses on the term structure of the VX futures, and in particular the difference between the prices of the nearest two of them, I decided to create a new index that constantly computes this difference and displays it for OptionVue customers. I named this index $VXDIF, and it represents the price of the 2nd VX contract minus the price of the 1st VX contract. The difference between the two VX futures can be a negative number, so I had to give this index a neutral bias number because our quote system cannot handle an item with a negative price. So when the difference between the two futures is zero, the $VXDIV will display 10 as a Last price.

To help matters even further, since the $VXDIF is meant to be viewed as an instantaneous number (i.e. all that matters is the current value), I programmed it to always have a Prev of 10, with the result that today's Change computes out to be precisely what we are interested in – the price difference of the two VX futures. So when you see that the $VXDIF Change is +3.05, for example, that tells you that the 2nd VX contract is 3.05 points higher than the nearby VX contract, indicating a steep upward slope (contango) in the VX futures term structure. Or if the $VXDIF Change is -0.75, for example, there is a mild downward slope (backwardation) in the VX futures term structure. Therefore, when looking at the $VXDIF in your quotes display, Change is the number to focus on.

In addition to providing $VXDIF on an instantaneous basis, we were able to construct a history of this index back to July 2007, approximately the time when VX futures began trading. You can obtain a copy of this history simply by opening the Price Chart of $VXDIF (and it will be important to do so before you can perform the following steps).

I would like to show how the $VXDIF could be used to give signals on trading the VXX. Open a Price Chart on the VXX. Click on the button to view/change indicator settings (left of the "pencil" button). In the Lower Chart section, at the bottom, select "Moving average of" – a choice that was made available in OptionVue version 7.05. In the field that becomes available next to that, enter "$VXDIF" and for the number of periods, enter

"15". Click OK to close the dialog. Now, click the "Show lower chart" button. Expand the Price Chart form if necessary to get a nice, big view. It should look like this:

This new indicator (the solid blue line) simply displays a moving average of the value of the $VXDIF itself, except that the built-in bias of 10 is removed so as to display values that swing above and below zero. Also included whenever you display the $VXDIF this way is the Lentz Volatility indicator (olive colored bars). You'll see later why this is useful.

Browse back in time through an $SPX price chart and it will not take long to notice that, in general, when the 15 day moving average of $VXDIF is positive, the stock market is moving up and it is ok to be short the VXX (or long the XIV). When the moving average of $VXDIF is negative, the stock market is experiencing a rough time and it is ok to be long the VXX. The trends in this period have been long lasting and effective for this trading approach. It is possible that in the future the stock market in general, or the VXX in particular, might not trend for long enough periods to keep this trading approach profitable. Nevertheless, it is interesting to take a look at what could have been accomplished in just the past 3 years.

Initial Results Using $VXDIF

Using just the $VXDIF 15-day MA (denoted "$VXDIF 15" from now on), a simple system where you are long the XIV when the $VXDIF 15 is positive and switch to being long the VXX when the $VXDIF 15 is negative could be tested. Beginning in January 30, 2009 when the VXX first became available, the trades signaled by this approach would have been as follows:

Long/Short	Enter Date	Enter Price	Exit Date	Exit Price	Days Held	Trade Profit	Percent	Cum NAV
								1.00
Long VXX	1/30/09	418.32	4/13/09	401.48	73	-16.84	-4.0%	0.96
Long XIV	4/13/09	0.72	5/18/10	3.69	400	+2.97	+412.5%	4.92
Long VXX	5/18/10	116.52	5/27/10	113.32	9	-3.20	-2.7%	4.79
Long XIV	5/27/10	3.91	8/5/11	11.71	435	+7.80	+199.5%	14.34
Long VXX	8/5/11	30.31	11/23/11	48.60	110	+18.29	+60.3%	22.98
Long XIV	11/23/11	4.99	(open)	16.65	356	+11.66	+233.7%	76.68

The result is an amazing 76.68 times your money in the 3.8 year period. Note that the final position is still on and I wrote in the price on the date of this writing (11/13/12).

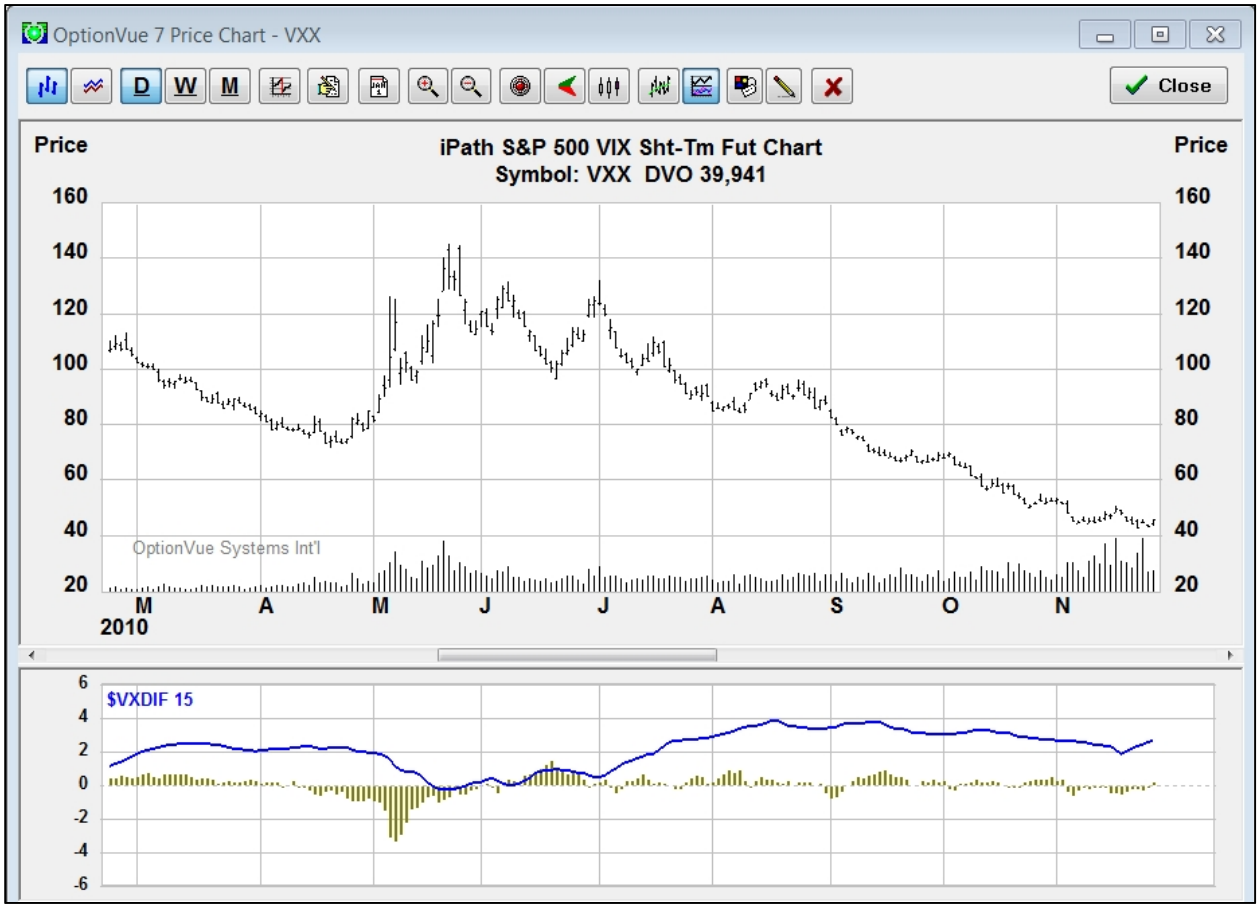
Note: The XIV hasn't been around long enough to be tradable during this entire period, so for the sake of this study I augmented the historical data in the XIV by assuming mirror image percentage daily moves vis-à-vis the VXX, going back to the first day of the VXX's existence. This augmented history is available in OptionVue, and as you look at the XIV's historical price chart in OptionVue, remember that data prior to Nov 30, 2010 is theoretical, while data from Nov 30, 2010 on is actual trade data.

Finally, the first trade was put on right when the VXX became available for trading and the $VXDIF 15 was negative at that time. It could be argued that this trade does not belong in the study because it was not triggered by $VXDIF 15 crossing the zero line. However, it was just a small loss and therefore it doesn't matter very much.

Refining the $VXDIF Results

As remarkable as this system seems to be, I was troubled by the fact that the "flash crash" was not handled very well by using the $VXDIF 15 alone, so I looked for ways to improve upon the entry and exit rules by adding an indicator or two. Naturally we want to avoid complicating the system too much and we should guard against "curve fitting" – where you fine tune several parameters until you have a system that would have worked nearly to perfection in recent history. What happens with curve fitted systems is that as soon after

you begin to trade them you discover that they don't work. (I know from personal experience.) First, let's take a look at the period of time in question:

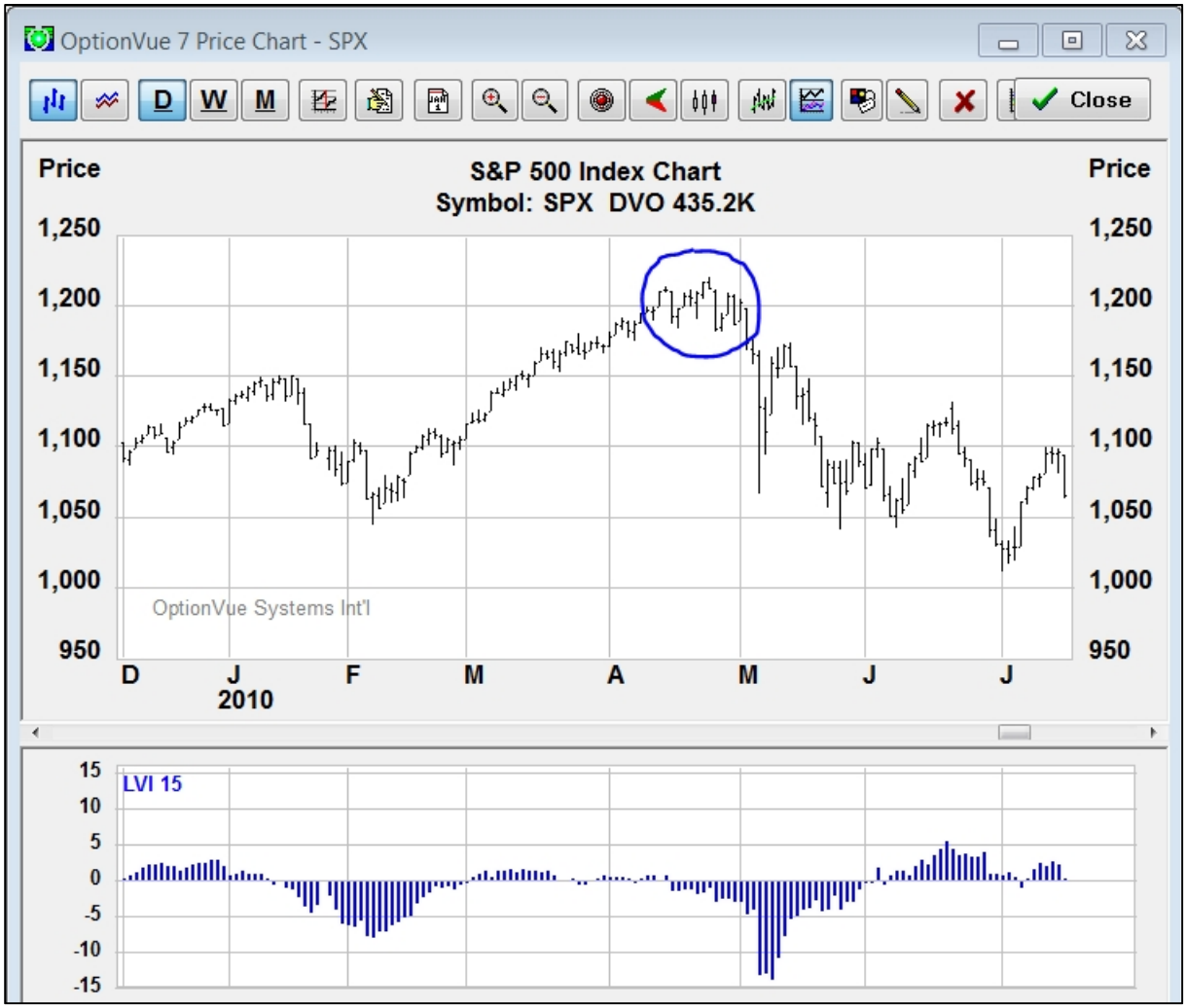


We are focusing on the period from May 1st until July 15th, in the chart above. This was the flash crash and subsequent rough period lasting 3-5 months. We would have liked to see the $VXDIF 15 line (the solid blue line) swing more firmly into negative territory during this period. Instead, it waffled close to, and mostly above, the zero line. Following the system as we did in the study, this switched us out of short VXX and into long VXX way too late, and arguably switched us back into being short the VXX more early than it was comfortable to do so.

That is why I looked for something else that could help us. Mainly, we need to be tipped off to the beginning of a rough period, even if that beginning is as sudden as the flash crash turned out to be.

I explored several concepts over a period of several days, and I found one indicator that seemed to help and that could be used to augment the system – the Lentz Volatility indicator on a 15-day MA (denoted "LVI 15" for short). We have it measuring the increasing or decreasing volatility of the $SPX.

Incorporating the LVI 15, here are the revised entry and exit rules: Go long the XIV near the end of a rough period when the $VXDIF 15 crosses from negative into positive territory and LVI 15 is in positive territory (indicating that volatility seems to be coming down). However, refrain from taking this entry any sooner than 2 months into the rough period. This rule should help prevent us from entering prematurely, and helps deal with the kind of situation like what happened in the rough period following the flash crash, where our signals would have gotten us long the XIV sooner than it was safe to do so. Stay long the XIV as long as $VXDIF 15 is positive. However, you may close earlier after a sustained market advance on signs of increasing volatility as indicated by the LVI 15 showing negative bars. Increasing volatility is sometimes easy to discern by looking directly at a price chart. See the example below where shock tremors were being felt a few days prior to the flash crash. Note especially the lower low that was made during that period and then *another* lower low.



Note that the stronger the $VXDIF 15 is, the more confident we can be in continuing to hold our long XIV position. Numbers higher than +1.50 are strong and we must resist the temptation to jump out of our position prematurely. The only exception would be, as mentioned, the onset of volatility after a sustained market advance.

We will be long the XIV more of the time than being long the VXX, and being long the XIV is where most of our gains will come from. We must see our position through the smaller market corrections.

Go long the VXX at the beginning of a rough period, as signified by the $VXDIF 15 falling into negative territory. Close the position when $VXDIF 15 moves out of negative territory. Unfortunately this does not usually capture the peak price of the VXX, but it is difficult to find anything that can help signal the top. In practice, we might decide to take the nice, quick gain that usually presents itself in just a few weeks. If we do that, we will be satisfied with our gain and wait out the remainder of the rough period without re-entering the VXX.

You see, the period of time when you want to be long the VXX is very different in nature from the period of time when you are long the XIV. The VXX typically shoots up quickly, reaches a peak and then seesaws downward from there to the point where we get the signal to close it. So our signal never seems to get us out at an optimal time. For this reason it might be better to use the "dilated pupils test". When you open the quotes display and see that your VXX position has gone very far very fast and for a moment your pupils dilate with greed, then sell. Once you sell, in my opinion it is best to never attempt to re-enter long the VXX during this particular rough period, as the VXX is more likely to go down than up. So it is best to just sit it out until the signal to buy the XIV comes along.

A lot depends upon discerning whether the market is going through a rough period. There were three rough periods during the past 3 years. The 6 month period beginning in Sept 2008, the 4 month beginning in March 2010, and the 4 month period beginning in August 2011. You certainly know when you're in one, but how can you recognize when one is beginning? Well, a negative $VXDIF 15 tells you for sure. Other than that, as I said, it is good to keep an eye on the LVI 15 after a sustained advance, watching for signs of increasing volatility. The flash crash rough period, which was not well signaled by a negative $VXDIF 15, was certainly prefaced by visible tremors in terms of price action.

Results of Refined $VXDIF System

Again beginning in January 30, 2009, the trades signaled by this approach were as follows:

Long/Short	Enter Date	Enter Price	Exit Date	Exit Price	Days Held	Trade Profit	Percent	Cum NAV
								1.00
Long VXX	1/30/09	418.32	4/13/09	401.48	73	-16.84	-4.0%	0.96
Long XIV	4/13/09	0.72	5/4/10	4.49	386	+3.77	+523.6%	5.99
Long VXX	5/4/10	89.48	6/01/10	120.76	28	+31.28	+35.0%	8.08
Long XIV	7/13/10	4.67	8/5/11	11.71	388	+7.04	+150.7%	20.26
Long VXX	8/5/11	30.31	11/25/11	49.20	112	+18.89	+62.3%	32.88
Long XIV	11/25/11	4.91	(open)	16.65	354	+11.74	+239.1%	111.5

That's 111.5 times your money in 3.8 years. So clearly we have improved the results by paying attention to LVI 15 and applying one common sense rule not to go short the VXX any earlier than 2 months into a rough period.

Two Footnotes:

1) In this study, we dealt with the flash crash and subsequent rough period by assuming we saw trouble coming in late April 2010 and got out at the end of the first bad day going into the crash, May 4, 2010. It might have been possible to do better than this but we could have done worse as well. Then, when the rough period seemed to be over I picked the time to get short the VXX as being after the prescribed 2 months had passed and when the indicators looked strong. This was 7/13/10, which turned out not to be an optimal spot to buy the XIV because it went down for a few days after that, prior to turning our way.

2) In this study, I did not assume a subjective, voluntary exit from long VXX positions as discussed earlier. I simply went by the book and used the exit signal. A subjective, voluntary exit might improve the results.

The VXX and XIV have a high degree of volatility, and as a result I would not necessarily think of leveraging them up using options since they are already, in a sense, leveraged up. (Note that options are available on the VXX but not the XIV.) I suggest that we be content to simply trade the ETNs. This volatility should also be considered as you think of allocating some of your funds to this trading approach. Just to give you an idea, the XIV recently went from 8.30 to 13.37 and back down to 11.00 in just 3 weeks.

A special note if you are going to try back testing this strategy. There was a 1-for-4 reverse split in VXX on November 9, 2010. You would need to adjust the size of your position accordingly when you advance to that date.

Some might wonder if trailing stops would help this strategy. I don't tend to think so, but you are welcome to test this on your own. If you find something promising, please let me know! My sense is that the use of trailing stops would only make returns worse. It also raises the question of when it is ok to re-enter a position in the same direction.

The $VX30 and Other New Proprietary Indexes

In addition to the new $VXDIF, we created a new index named $VX30 to represent the 30-day forward price of the VX futures. It is calculated by taking the appropriate weighted average of the prices of the two nearest VX futures. The prices of the VXX and XIV depend on the 30-day forward price of the VX futures more than anything else, and daily percentage price movements in the $VX30 should be mirrored in the VXX and XIV, theoretically.

In addition, we thought it would be nice to show how much the daily roll yield means to your holdings in the VXX and XIV, so we created the $VXXDRE and $XIVDRE indexes. "DRE" stands for daily roll effect. The $VXXDRE is the effective amount that the daily roll is having on the price of the VXX. For example, at the time of this writing $VXXDRE is -0.08, indicating that the VXX is being pulled down at the rate of 8 cents per day, theoretically. In contrast, the $XIVDRE stands at +0.06 right now, indicating that the XIV is being assisted at the rate of 6 cents per day, theoretically.

The $VXXDRE and $XIVDRE indexes, like the $VXDIF index, have a neutral bias value of 10 and Prev that is always 10, so you can simply focus your attention on the Change value.

OptionVue has packaged all of these tools for trading the VXX and XIV into a new module that sells as an annually renewable subscription for $499. It is available immediately.