XIV and SVXY – What Really Happened?

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Introduction

The volatility markets have already experienced two seismic events in 2018. First the sharp devaluation of inverse VIX Exchange Traded Products (ETPs) on February 5th leading to the retirement of the Credit Suisse issued VelocityShares Daily Inverse VIX Short-Term ETN (XIV) and the lesser known Tokyo listed Nomura Next Notes S&P 500 VIX Short-Term Futures Inverse Daily Excess Return Index ETN (2049:JP), and then the deleveraging of the popular ProShares Short VIX Short-Term Futures ETF (SVXY) and Ultra VIX Short-Term Futures ETF (UVXY) on February 27th. How did this happen, should we have seen it coming, and what if anything could have been done to avoid it?

The Internet is unfortunately awash with opinions and misinformation. We hope this article will help clarify a few facts and put an end to some of the more absurd speculation. If you haven't already read my article from August 2017 entitled 'VIX ETPs: A Crowded Trade?'[1] I highly recommend you do first. In that article I lay out in simple terms the mechanism by which VIX ETPs are linked to the S&P 500 (SPX) volatility market, how this link ties into the broader SPX cash market, and how this pointed to a crowding of the inverse VIX ETP trade. Since February 5th that article has received thousands of views and has been the topic of several financial news articles and online discussions.

Over the last 20 years, I have written extensively about the history of volatility trading and the meteoric growth of Assets Under Management (AUM) in inverse VIX products and their popularity with retail investors, and I have made a career out of managing volatility exposure for institutions, high net worth individuals, and more recently, sophisticated retail clients. Perhaps the most notable take away from this experience has been the shift in volatility trading from the centralized trading floors of large investment banks to the far more decentralized retail accounts in the last five or so years. This shift changed the way volatility markets work, and more importantly, created new risks that, until now, have been poorly described.

The idea of introducing an exchange traded volatility product was first discussed in the US in the early 2000s. At the time the thinking was that fund managers would be attracted to a long volatility product that would allow them to make efficient short-term portfolio hedges using a liquid product that traded like a stock on a major stock exchange. This was the genesis of the Barclays Bank PLC iPath S&P 500 VIX Short-Term Futures ETN (VXX) launched in 2009 and if you'd like to read more about the history of this product and other volatility products in the US I recommend my article 'The VIX and a Brief History of Volatility Trading'.[2] As that article points out, there was little expectation at the time that retail investors would take much interest in the product, and this was indeed the case at least in its early years.

However, things quickly changed and more recently a great deal of the interest in VIX ETPs has come directly from retail investors looking to take short volatility positions either by shorting the VXX and/or by buying one of the popular inverse VIX ETPs like XIV and SVXY. With hindsight the popularity of this trade is understandable. Until January 2018, the inverse VIX ETPs had delivered astonishing returns putting short VIX products on the radars of even casual stock traders.

All this changed on February 5, 2018. After a 4.1% correction in the SPX, and, in what looked like a flurry of after hours trading, the XIV lost more than 96% of its previous day's value, and the SVXY followed suit with a similar, although slightly smaller, decline. So why did a relatively mild correction in the SPX cause these products to lose so much value so quickly? The answer lies in two related but separate facets of the VIX ETP market: the size and popularity of the short VIX ETP trade, and the mismatch between VIX futures risk and SPX options risk. Let me explain.

[1] https://www.investinvol.com/single-post/2017/08/28/VIX-ETPs-A-Crowded-Trade

[2] https://www.investinvol.com/single-post/2017/11/06/The-VIX-and-a-Brief-History-of-Volatility-Trading

XIV and SVXY - What Really Happened?

Mismatch

In my August 2017 article I explained how the short VIX ETP trade was showing signs of being crowded and explained how a mismatch between the risk on VIX futures and the risk on SPX options resulted in a residual risk exposure for market makers and dealers. I explained there were limits to how much of that risk the market could digest, and that a dangerous feedback loop could eventually be created if the short VIX ETP trade continued to grow. That article I think was the first to point this out, and is probably still the only resource available to retail investors that explains this important mechanism that underlies the correction on February 5th.

The mismatch between VIX futures risk and SPX options risk is central to understanding what happened in February because, while it is on the VIX futures that VIX ETPs are constructed, it is on the SPX options market that most equity volatility is traded. It is important to remember that VIX futures and options act like contracts for difference - for every buyer there is a seller and every trade merely moves identical risk from one party to another – a kind of zero sum game, whereas SPX options facilitate the transformation of SPX Vega risk (a derivatives term for exposure to changes in volatility) to SPX cash risk through their Gamma risk characteristics (more on Gamma in just a minute).

There are of course limits to how much SPX Gamma the market can digest, mainly because there are limits on how much Delta risk dealers are willing to take on large moves! If dealers are uncomfortable with the risks involved in hedging their resulting SPX Gamma mismatch they will raise their selling price for VIX futures, and may even withdraw their offers altogether.

This would have been happening on February 5th, and this is where the VIX ETP market ultimately became too fragile. The most liquid hedge for the broad US equity market is the CME's S&P 500 E-Mini futures that leading up to February 5th had been trading with good volume of almost 2 million contracts per day - amounting to almost $300bn of S&P 500 Delta traded each day. Given the Gamma mismatch that could have existed as a result of the VIX ETP market, a 4% move down in the SPX could have required a 4 x $40bn Delta hedge, or the sale of more than 50% of the average daily volume in SPX futures contracts. This is probably more risk than many dealers were willing to accept. Remember an unhedged $160bn Delta position would result in a $1.6bn dollar loss for every 1% further the market fell!

Size Matters

The second facet of the VIX ETP market that played its part in the events of February 5th is the rebalance risk associated with inverse and leveraged products. Unlike unleveraged linear products like the SPY for example, leveraged and daily inverse products require rebalancing each day. This rebalancing results from the products offering leverage – say 2x or -1x – of the daily returns of an index. If an index increases in value in one day for example, the 2x products would need to buy more futures to maintain their leveraged exposure for the next day, and the -1x products would need to also buy futures to reduce their exposure for the next day. I won't go into much more detail here, but if you'd like to learn more about how these products work I recommend Vance Harwood's excellent articles including 'How Does SVXY Work?'.[3]

The size of the daily rebalance needed for leveraged and inverse products is proportional to the AUM they manage and the size of the movement in the index that they track - large movements requiring the largest rebalances. This rebalance risk is sometimes referred to as Volga (anther derivatives term that expresses volatility convexity risk, or the amount by which Vega changes for every 1 point change in volatility). The most extreme, but simplest to illustrate example of this, would be the case of an inverse product rebalancing after a doubling of the underlying index. If the index was up 100% in a single day, then the ETPs delivering the inverse daily return would be expected to be down 100% - or in other words fall to zero value. In such an event those ETPs would no longer require any futures and their daily rebalance would equate to buying back their entire short VIX futures portfolio. A similar, although slightly less severe situation occurred on February 5th.

[3] https://www.investinvol.com/single-post/2018/02/09/How-Does-SVXY-Work

XIV and SVXY - What Really Happened?

However, as I've described in the first part of this article, by February 5th VIX ETPs had come to dominate the short dated SPX volatility market, and the risks tied up in them may have approached what the market was able to digest. Attempting to make a large VIX futures rebalance in such a market was likely the reason we saw the VIX futures move so much further than some would have expected concurrent with a 4.1% move in the SPX. Furthermore, the rebalancing of VIX ETPs in an already strained VIX futures market probably catalyzed a feedback loop, where the expected rebalance caused a sudden rise in VIX futures prices that resulted in a further need to rebalance, and so on, and so on.

VIX ETPs and the indexes they track make their rebalance based on the settlement levels in the VIX futures – published shortly after the futures' close at 4:15ET. Dealers and issuers hedging their rebalance typically place orders into the Trade At Settlement (TAS) market or execute market and/or limit orders going into the futures' close – typically between 4:05ET and 4:15ET. This is probably the reason the market witnessed the spike in VIX futures prices after the cash close at 4PM ET, and why the ETPs appeared to lose so much value after the equity market closed that Monday. Once the settlement price of the futures was known, the values of the ETPs were also known. In the case of XIV – a formulaic note issue by Credit Suisse – its closing Net Asset Value of $4.22 was known with some certainty. Trades made in the aftermarket at prices well in excess of this value were a clear indication that a number of traders did not know how to value the ETPs, or perhaps misunderstood what the product was.

Conclusion

I described the size of the VIX ETP market back in August 2017 as 'staggering' and warned that continued growth in AUM driven by retail clients with an interest in the short vol trade could make the whole VIX ETP complex fragile and unstable. The subsequent growth in AUM amplified this fragility by increasing the cost of hedging the ETPs and ultimately created a highly risky feedback loop ever more leveraged to the SPX market – the tail had begun wagging the dog.

But if these products had grown too large what could have been done to limit their size prior to February 5th? This is a good question and fortunately we have a recent example that explains why the growth of popular ETPs can be difficult to constrain. In February 2012 Credit Suisse faced a similar problem with their popular VelocityShares Daily 2X VIX Short Term ETN (TVIX), citing internal position limits as their reason for halting new creations and stopping further growth of the product. Unfortunately, after Credit Suisse announced the end of new creations, the outstanding units began trading at a larger and larger premium, as investors apparently appeared to value their rarity.[4] After Credit Suisse reopened creations, TVIX collapsed from its 90% premium back to fair value - seeing many investors lose money and triggering a lengthy legal battle. Furthermore, before the events of February 5th, XIV had already begun trading at a premium to its Net Asset Value (NAV), and any restriction on creations would have probably precipitated a similar mispricing.

So how about deleveraging the product as ProShares have just done with SVXY? This would have reduced the size of future rebalances and probably made the product more stable. But even this approach is not without its problems. By abruptly changing the leverage on an ETP, institutional traders and others with hedged positions could be left with a substantial mismatch, which in itself could have perpetuated a large knock on effect. Furthermore, as we have seen following the deleveraging of SVXY, option holders have taken a large loss following that decision, and this unpopular move is likely to end in another fierce legal battle.[5] While XIV didn't have any exchange traded options on it, it's likely that there were substantial Over The Counter (OTC) derivatives on the ETP – including the swaps used by Credit Suisse and others to hedge the products themselves. A change in the leverage of the products could have brought about a similar adverse outcome.

[4] https://www.forbes.com/sites/ariweinberg/2012/04/17/lessons-from-the-tvix-washout

[5] https://www.barrons.com/articles/volatility-etf-aftershocks-1520044308

XIV and SVXY - What Really Happened?

So how about closing the products altogether? Well this would have been massively unpopular among its users and very unprofitable for its issuers. With issuers charging almost 1.5% of AUM in fees each year, a $2bn product could net almost $30m in revenue, a revenue stream that would have been hard to give up. As you'll no doubt appreciate after reading this article, VIX ETPs are far more complex than many believed.

The events of February 5th have altered the volatility investment landscape in the US for many years to come. FINRA and the SEC have already begun to take action, and it is likely that in the future similar products will be considered 'complex' and perhaps inappropriate for retail investors. If so, it is likely that investors will have to seek advice from specialist investment advisors before the regulators and brokerage firms will allow them to participate in these complex products. Hopefully this article has gone some way in helping investors better understand just some of the complex facets of this evolving market.

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XIV and SVXY - What Really Happened?

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Invest In Vol is a Registered Investment Advisor (RIA) that exclusively focuses on investing in volatility as an asset class. Our team works with clients to deepen their understanding of volatility investing and deliver them the most investable volatility products.

About the Author

Stuart is a volatility trading specialist with 20 years' experience managing volatility portfolios. Stuart holds a PhD in Economic History from the University of Cambridge, an MBA from the University of Surrey, and an engineering degree from the University of Cape Town. Stuart is also a CFA Charter holder. Stuart started his career with Anglo American in South Africa after completing his engineering degree at the University of Cape Town. After returning to the United Kingdom in 2000, and completing his MBA, Stuart joined Barclays Capital as a trader of their FTSE equity derivatives book. In 2004, Stuart moved to New York where he established and grew Barclays' Equity Derivative presence as their Head of US Index Volatility Trading. In 2007 Stuart moved to Hong Kong as Head of HSBC's Asia Pacific Index Trading. In 2014 Stuart returned to New York and co-founded Corpus Partners, an exempt Commodity Trading Advisor managing volatility accounts for high-net worth individuals. Stuart founded Invest In Vol in 2017 to help a broader group of investors and their advisors gain access to volatility investments. Stuart is an Investment Advisory Representative (IAR) and has passed the Series 3, 4, 7, 17, 55, and 63 exams.

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