

Lessons from the stock price correction induced by the volatility market

1. The volatility market causes a drop in share prices

In February, because of a short squeeze in VIX futures, the volatility market took centre stage as being the catalyst of the global equity markets sell-off. Over two days, the VIX index jumped from 13 to 37 peaking at over 50 intraday. The driving force behind this massive short-covering were short VIX products, in particular the USD 1.5 billion large *XIV* ETN, which was construed to suffer a total loss in the event of a 100% daily increase in VIX futures. The short-covering activities of managers of such short VIX products triggered a simultaneous sell-off in the stock markets. Market participants with short positions in VIX futures hedged themselves by selling equity index futures for lack of a natural offer of volatility. As a result, global stock prices plummeted by up to 10%.

The responsibility for these events does not lie with “evil” hedge funds which some say manipulated the market by using algorithms that triggered these stops. On the contrary, the blame lies primarily with the providers of and the investors in such disproportionately aggressive short VIX products. These products were constructed rule-based and managed transparent to anyone in the market – as such, their bets can be compared to an openly played poker game where they poked way too aggressively with a weak hand.

2. The cause of the failure

When investing in asymmetrical risk concepts (short volatility) it is imperative to pay particular attention to how the interests of the risk managers are aligned to those of the investors. The bankruptcies of LTCM (1998), Lehman Brothers (2008), AIG (2009) and now, most recently, *XIV & Co.*, all have the same cause: managers knowingly took too much risk when handling third-party assets. Due to relative stable performances short volatility concepts such as the *XIV* ETF could for a long time conceal their enormous potential for losses. Their high Sharpe ratio made them look attractive. However, evaluating asymmetrical strategies via the Sharpe ratio does make no sense at all – it is as if the risk of selling fire protection insurance could be gauged by estimating the volatility of insurance premium receipts.

3. The alignment of interests consistently implemented – two examples

RP Crest's business and governance models are an attempt to reinvent the concept of personally liable managers in a modern form. RP Crest only manages the mutual fund RP Gamma and refuses to diversify into other products. The company thus has linked its fate with that of the fund. High base salaries and bonuses were done away with. Instead, the company's annual profits are divided equally between employees and shareholders. However, both personnel and active shareholders must invest 30% to 50% of such profit participation into the RP Gamma fund for 3 to 10 years with a minimum leverage of two. Consequently, they are over-proportionately exposed to the same risks as the fund investors – a construction which creates a true alignment of interests.

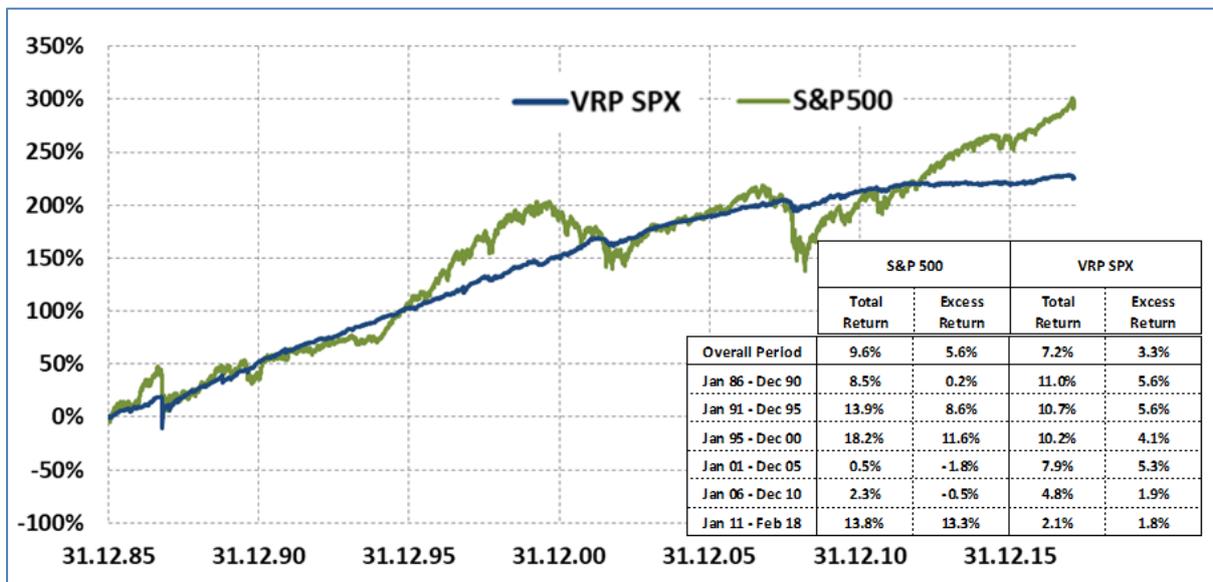
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The managers of *Velocity Shares* (manager of XIV) on the other hand, were sitting at both ends of the same trade as they were simultaneously managing both short and long VIX ETNs. We do not know if they are co-investing in their products, but suspect they are not.

It is amazing however, how naively investors invest into short volatility products from “transaction-oriented” providers such as Velocity Shares or investment banks. Customer A receives a short exposure and Customer B a long exposure, ideally just inversely structured. This business model may be justifiable for “Delta 1” concepts in stocks and bonds, but certainly not when dealing with asymmetric risks.

4. Properly dosed, volatility risk premiums (VRPs) are very attractive

Why short-volatility structures so frequently trigger crises is effectively shown in the following chart by the performance of the volatility risk premium of the S&P 500 (“VRP SPX”, net of transaction costs, from Jan 86 to Feb 18, extended via S&P 100 data into earlier periods). VRP SPX is the performance of a monthly rolled short position of a one-month, at-the-money straddle on the S&P 500 Index, while delta-hedging the net delta of the options portfolio on a daily basis.



The extremely stable performance is virtually crying out for a leveraged implementation. XIV was not in and of itself a bad product – it was just ridiculously aggressively structured. XIV’s risk exposure was inversely proportional to the level of the VIX and changed dynamically. With VIX-Futures trading at 10, a daily increase to 20 (a 100% increase) was sufficient to lead to a total loss. This risk exposure corresponds to roughly 40 times (!) the risk exposure of the VRP SPX as shown in the chart. At a VIX level of 50, XIV’s risk exposure decreases to approximately 8 times the risk exposure of VRP SPX. Starting from the level of 50, a daily increase to 100 in the VIX would again be sufficient to trigger a total loss. This would have been the case in October of 1987, when implied volatilities in the S&P 100 increased from 25 to 165 over the course of just two days.

Structurally speaking the VRP SPX differs greatly from short VIX strategies in terms of the risk management. While the VRP SPX is a so called short Gamma strategy, i.e. its source of income is the

spread between implied and realised volatility, short VIX strategies are pure Vega plays and their income source is the roll yield of VIX futures. The events in February demonstrated once more that VIX futures are very susceptible to short squeezes: during aggressive VIX spikes hedging a short VIX Futures position might become an impossibility. This risk is substantially lower in a delta hedged short option position (VRP): during large market sell offs, the options eventually converge to a pure delta position, with zero vega risk left. The delta can be hedged by selling futures on the underlying instrument for which natural buyers typically exist.

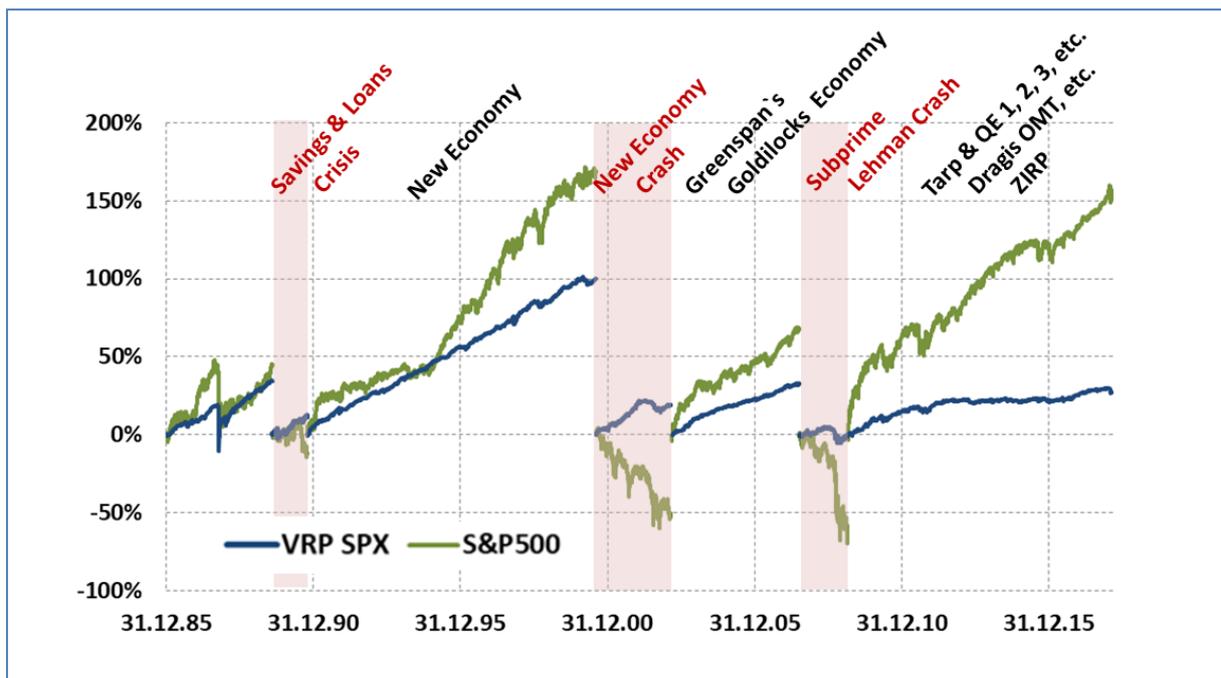
The fact that the performance of VRP SPX is positive should not come as a surprise. Those who sell options are effectively providing insurance protection in the equity market and are remunerated for bearing most of the downside risk. But why is VRP SPX so stable?

5. The stability of the volatility risk premium

The VRP's relative stability is best explained by analysing the causes for the instability of equity markets. Next to the level of companies' profits, there are two decisive factors for the valuation level of the stock market:

1. Changes in the level of uncertainty
2. Changes in the effective money supply underlying an economy

We estimate that around 90% of the fluctuation of the value of assets is to be attributed to changes in the money supply. The level of uncertainty is of secondary order; it only triggers changes in the trend of the money supply by affecting the markets' risk aversion and by that the economies' willingness to take on leverage. The level of leverage is the most important driver of the money supply. This is effectively shown in the following image, where we reset the S&P 500 and the VRP SPX at the beginning of each new money supply cycle.



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Longer-term money-contraction phases are highlighted in pink. These are “de-leveraging” phases, which are usually triggered by a shock event, causing a revaluation of credit risks and a prolonged downturn in the stock market.

The VRP evades the stock market ups and downs induced by the money cycle because it does not absorb any liquidity. Anyone taking on equity risk by means of VRP is not providing capital to the markets and thus is not investing in an asset whose valuation is based on the sum of the present value of uncertain revenue streams discounted at uncertain interest rates. VRP investors are much less exposed to the risk of rising or falling discount factors. They are only, for the short duration of the option life, exposed to the difference between implied volatility versus realised volatility. This involves significantly smaller estimation errors than the valuation of a share. This is where the VRP’s stability comes from.

Volatility risk premiums remain - now more than ever - the most attractive way to participate in capital markets’ risk premiums. That is the reason why we remain dedicated to and focussed on managing this one subject matter in our only fund: the RP Gamma.

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Matthias van Randenborgh, CIO

RP Crest GmbH
Landsbergerstr 110
80339 München

+49 89 552 996 210
mvr@rpcrest.com