



Stop fighting volatility, learn how to *do something about it*



Investing in **Volatility** and the **VIX**

(Updated May 2018)

Everything you need to know about the VIX



It's February 1st, 2018. Stocks have just given investors a 6% return in the month gone by, after posting 21% in 2017, after averaging about 15% per year in the 8 years before that. It seems like all systems go - business as usual - with a benign VIX reading of 13.50 showing markets expecting annualized volatility over the next 30 days of just 13.5%.

It's February 5th, 2018. Out of the blue, the financial market's so-called fear gauge, the VIX, spikes more than 100%, going above 30 for the first time since 2011! Left in the VIX's wake: more than \$4 Billion or so in assets invested in exchanged traded products that tracked the VIX,

with the majority of that on the short (read: wrong) side of the move; a near Billion dollar mutual fund selling volatility via options forced to close, allegations of market manipulation in VIX futures, and a stunned market which is now wondering after seeing the Dow drop 1,000+ points whether the fear index reflects moves in the stock market, or whether the stock market is now reflecting moves in the VIX.

With all this happening in the not too distant past, it may seem there are more questions than answers. What exactly is the VIX Index? How does the investment community use it? What is it based on? How did it become something people invest in? Are there VIX and volatility investments out there that are a suitable option?

All questions we hope to answer in this report meant to give you the basics of the VIX and followed by an in-depth explanation of what happened in Feb 2018 and if we could see something like that again.

What is the VIX?

It's hard to imagine now, but we didn't used to see the VIX quoted in the Wall Street Journal, CNBC ticker, and Bloomberg terminals like we do these days. It's been 20 years in the making, and it's now common to hear reports of the VIX at multi-year lows on the news and hear investment managers speak about volatility regimes with the VIX above/below 20, for example. Yes, the VIX has cemented itself as the defacto volatility gauge just as the Dow (or S&P) is the defacto stock market gauge.

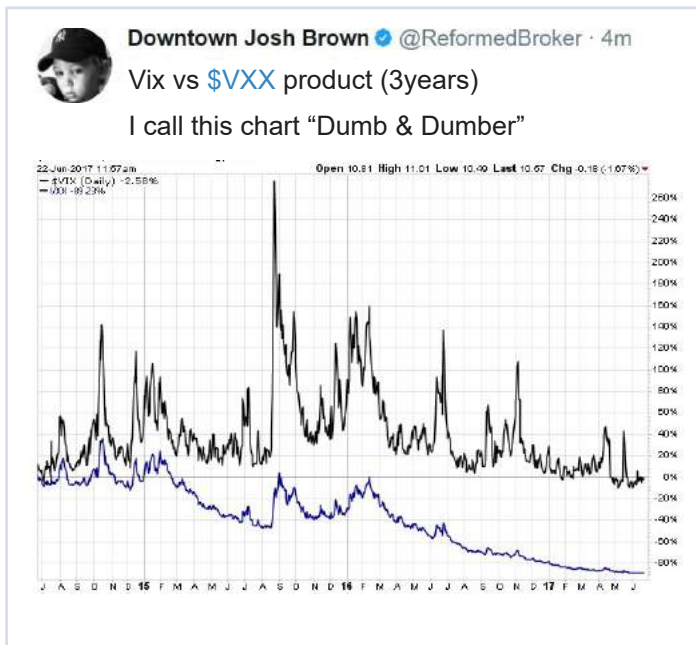


What's of infinitely more interest to investors, however, is how the VIX has become something much more than just an index. There are now VIX Futures and Options on VIX Futures, and a whole host of exchange traded products attempting to track the VIX to the upside, downside, levered, long dates, and more. And last, but not least, hedge funds, quants, and algorithms that now use the structure of the VIX to find returns with or without the fear and volatility typically associated with the VIX.

Nobody ever accused the financial industry of lacking innovation (even if it is often tainted with a negative connotation and called financial engineering), and VIX products and ways of producing structural alpha out of those products are just the latest example of this. It's a world with incredible opportunity, but also a world pitfalled with danger. Just take a look at the VIX chart with the VXX tracking ETF overlaid onto it, in what blogger The Reformed Broker titles "Dumb and Dumber." The VIX is roughly where it started, while the VXX is down more than -80%.

So before tackling the VIX and the dozens of ways to get exposure – let's dig into how the VIX actually works and learn a little bit more on how the products using and tracking it are designed, so your tagline can be upgraded to 'Smart and Smarter' (which come to think of it would have been a better Dumb and Dumber sequel – where they take some intelligence potion or something).

Fig. 1: Dumb & Dumber



The History of the VIX

It's been nearly a quarter of a century since the CBOE launched the VIX. Like most inventions, the VIX was created out of necessity. As the Wall Street Journal puts it [in this article](#):

The VIX was conceived after the Black Monday crash in 1987... The measure used stock-market bets, known as options, to gauge expectations for the speed and severity of market moves, or what traders call volatility. Options prices rise and fall based on the perceived odds of a payoff... [and]...options prices fluctuate constantly as traders react to news and reassess their risks. Those prices feed into the VIX.

Armed with all of this data of the option prices and their reactions to news, the largest options exchange – the Chicago Board Options Exchange – launched the VIX as an index in 1993. But there it stayed as just a way to gauge market sentiment for nearly 20 years, until Mark Cuban (yeah, that Mark Cuban...we weren't expecting him to be part of this story either) entered the picture in 2002.

... newly minted billionaire Mark Cuban called Goldman Sachs Group Inc. looking for a way to protect his fortune from a crash. Because the VIX typically rises when stocks fall, he wanted to use it as insurance. But there was no way to trade it.

Devesh Shah, the Goldman trader who fielded the call, says he instead offered him an arcane derivative called a "variance swap," but Mr. Cuban wasn't interested.

Goldman Sachs is many things, but one thing it seems to do well is realize that a billionaire wanting something is probably a good place to start when thinking of new products, and sure enough...

Lamenting the lost opportunity, Mr. Shah met up with Sandy Rattray, a Goldman colleague and erstwhile indexing buff with a knack for packaging investment products. What if, the pair speculated, they could tap the VIX brand and reformulate the index based on their esoteric swaps?

Shah and Rattray ran with the idea, coming up with a reformulated version of the VIX which could better be productized, and "handed it over" (that's all we can find on the deal, but surely they sold it for something...

we hope) to the CBOE, who eventually launched VIX Futures in 2004, followed by VIX options in 2006. As an aside, Mr. Shah is now the CIO of Man Group, who knows a thing or two about futures markets via their purchase of AHL ([see our History of Managed Futures for more on that](#)).

So what does a VIX of 10 mean?

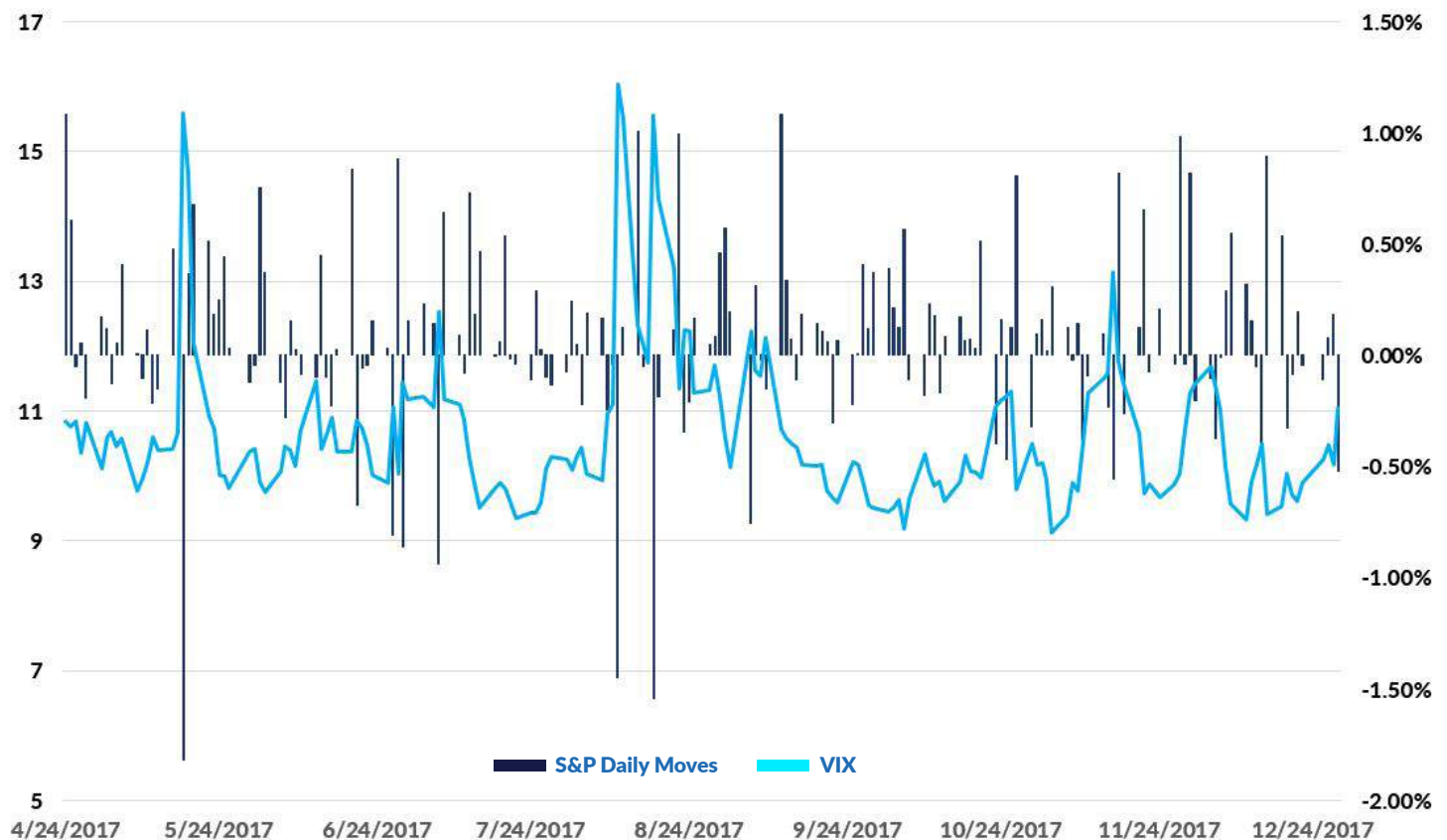
We all see the numbers now pretty frequently, but it's rare to find many people who actually understand how its calculated and what the VIX value really means. To understand how it's calculated, think about it like a real time reading of prices for insurance on the US stock market, as represented by options on the S&P 500 which go up and down based on expectations of market price movement. If it were car insurance, imagine it like insurance re-priced in real time, with premiums going up when you get in the car, go faster,

when it's raining, and so on, and going down when you pull into the garage, are asleep at night, and so forth.

But with the VIX, this isn't long term insurance – the options prices that feed into the VIX calculations are only designed to be looking 30 days out. And to make it more confusing, the 30-day look is then annualized to arrive at the VIX number, which represents the annualized implied volatility of the S&P 500 stock index (over the next 30 days).

Doing some math, we can then surmise what that means for daily or weekly implied volatility. For example, when the VIX is around 10, it implies that traders believe the S&P 500 will have about 10% annualized volatility over the next 30 days, which equates to a monthly vol of 2.7% and daily vol of 0.63%. [Here's a good explainer if you want to dig into the math some more.](#)

Fig. 2: S&P 500 Daily Moves vs VIX



Source: Yahoo Finance

How does that match up with what really happens in the stock market? Pretty well, it turns out. Just check out the chart Fig. 2 on the previous page, of the VIX overlaid with the daily percentage moves in the S&P 500, where we can see the VIX holding mostly steady between 9 and 11 for most of 2017 as the S&P had barely any moves worse than -1% and averaged right around 0.29% positive or negative each day.

BRING ON the volume

We're not sure if anyone at the CBOE would have imagined the runaway success VIX futures and options when it first launched, when the contract mostly languished unknown and unloved by investors and traders.

But then along came the biggest financial crisis since the Great Depression, sending the VIX screaming higher, reaching a peak in the 80s during the 2008-2009 financial crisis (representing the expectation of monthly moves of more than 23% in the S&P), when markets were moving more than 5% a day and 20% monthly moves seemed like a realistic possibility.

That spike in volatility led to more Cuban-like interest in protection, which led to some more financial product engineering/innovation/development in the form of Barclays PLC launching the first exchange traded VIX product in 2009. The flood gates had been opened, and the new era of VIX as not just an index, but as a product was born.

There are now about about 20 VIX related products on the market with assets, including two on European VIX (or VStoxx) with assets of **more than \$2.76 Billion**.

Fig. 3: VIX Related Products

VelocityShares

- EVIX** = 1X Long VSTOXX ETN
- EXIV** = 1X Daily Inverse VSTOXX Futures ETN
- TVIX** = Daily 2x VIX Short-Term ETN
- TVIZ** = Daily 2x VIX Medium-Term ETN
- VIIX** = VIX Short-Term ETN
- VIIZ** = VIX Medium-Term ETN
- XIV** = Inverse VIX Short-Term ETN
- ZIV** = Inverse VIX Medium-Term ETN

Fig. 3: Vix Related Products Continued

iPath

- IVOP** = Inverse VIX Short-Term ETN II
- VXX** = S&P 500 VIX Short-Term ETN
- VXZ** = S&P 500 VIX Mid-Term ETN
- XVZ** = S&P 500 Dynamic VIX ETN
- XXV** = Inverse S&P 500 VIX Short-Term ETN

ProShares

- SVXY** = Short VIX Short-Term ETF
- UVXY** = Ultra VIX Short-Term ETF
- VIXM** = VIX Mid-Term ETF
- VIXY** = VIX Short-Term ETF

REX

- VMAX** = VolMAXX Long VIX Weekly ETF
- VMIN** = VolMAXX Short VIX Weekly ETF

PowerShares

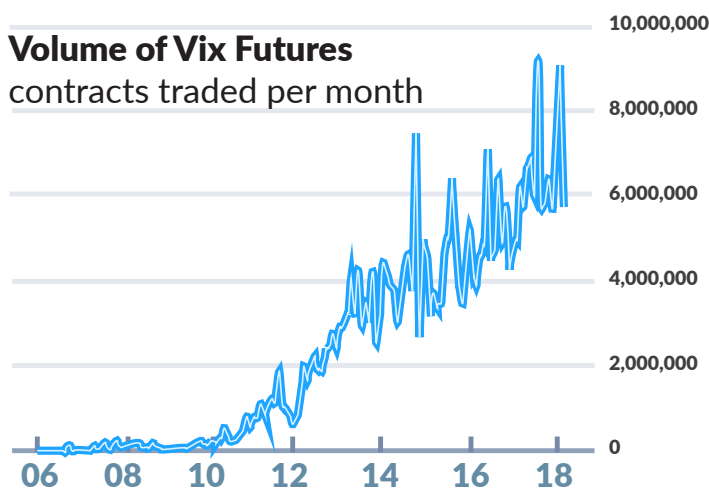
- PHDG** = S&P 500 Downside Hedged

VEQTORTM

- VQT** = Index ETN

The interest in these products keeps the folks at the CBOE smiling from ear to ear when they lay their option filled heads on their pillows at night, with the products use of the VIX futures having led to one of the best futures contract success stories since the e-mini S&P.

Fig. 4: The Relentless Rise of Volatility Trading



Source: Cboe

How to trade the VIX?

With all of these choices, including options, futures, ETFs, inverse ETFs, ETNs, options on futures, and more allowing investors to establish a position on what happens to the VIX; how do investors wisely go about getting the exact exposure they want? That calls for two types of explanation:

1. The simplistic, humorous, 'How to Trade the VIX' infographic (Fig. 5 to your right)

2. The more serious, technical explanation of "VIX ETPs/ETFs below:

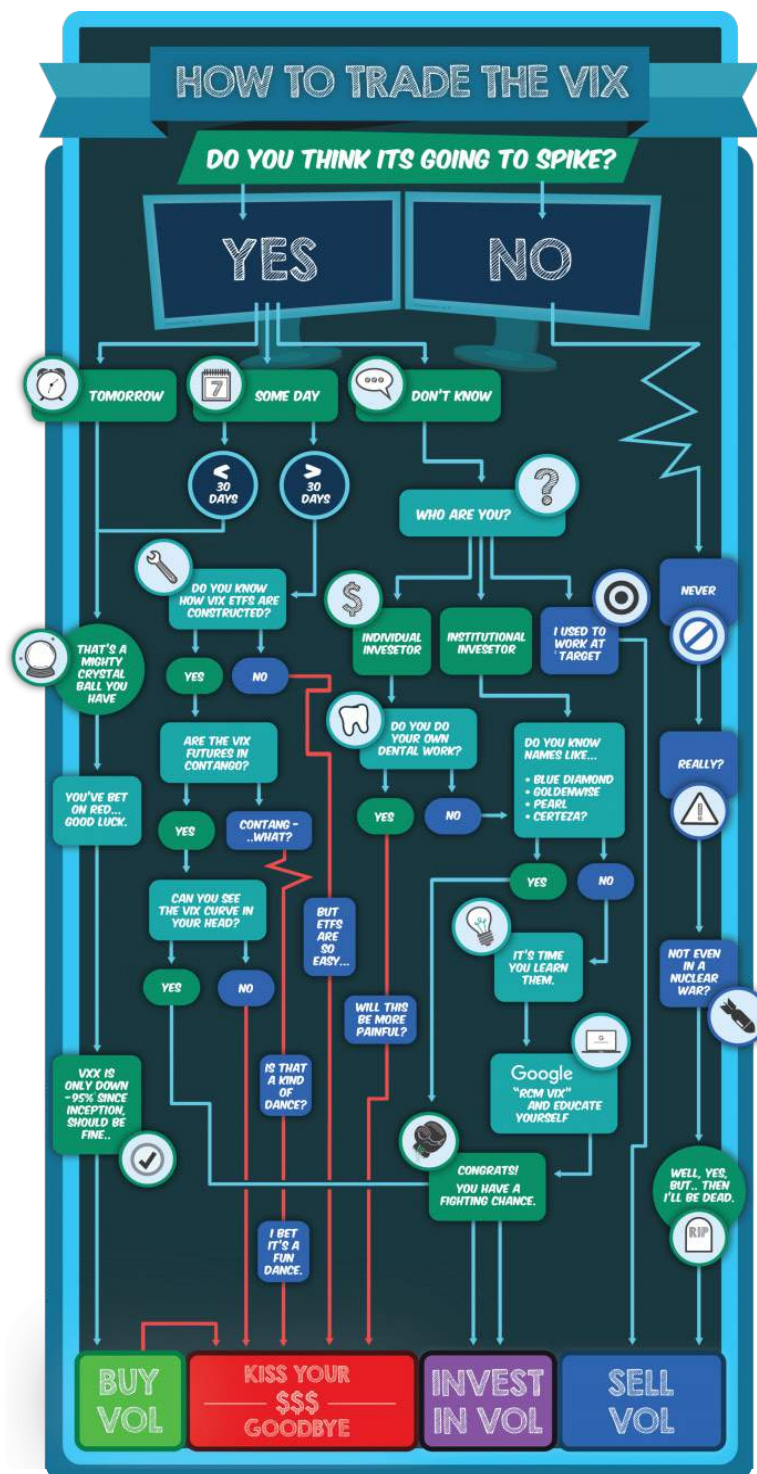
Of course, not everyone has that handy infographic to fall back on, and without a guide – billions of dollars flowed into VIX related exchange traded products (read: ETFs and ETNs). At first, most of this money was using the long VIX products designed to make money when VIX prices rose. After all, what's not to like about a low-cost ETF you can turn on/off to protect against volatility spikes. It's just the sort of thing Mark Cuban desired. Well, turns out there was a lot not to like about it. For one, the structure of these things, being a security (an ETF) which owns a derivative (VIX futures) of an index (VIX) calculated off of prices of derivatives (S&P 500 options) of a stock index (the S&P 500) is a sort of derivative on steroids – a quadrivariate, if you will, - with enough twists and turns to make your head spin. As [one recent Barron's article put it bluntly](#):

Can you trade the fear gauge that everyone quotes? If you answered yes, study the VIX and come back next year. If you know the fear gauge is a tracking index, onward to the next level. How are VIX options priced? If you answered VIX futures, you know more about the VIX than most. Still, if you cannot see the VIX futures curve in your head, burning \$100 bills is probably more profitable than trading them.

That part about the futures curve might be the most important, however, because there was a massive roll cost associated with the ETFs structure of providing access to front month futures prices – which must

be sold and reestablished in the new 'front month' contract each month. That becomes a problem when the futures curve is in what's called [contango](#).

Fig. 5: How To Trade the Vix Infographic



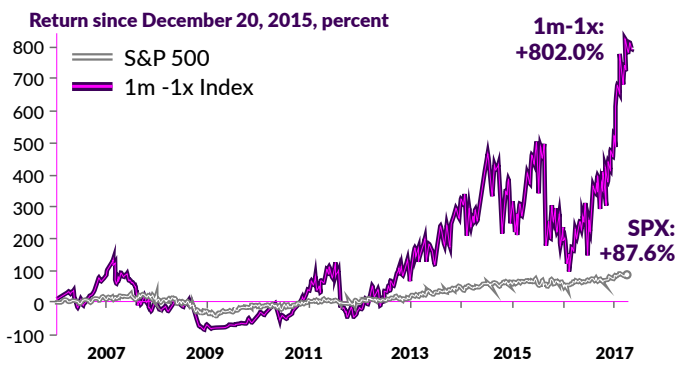
Simply, contango is when the front month contract is priced lower than the later dated contracts (ie. April's Crude Oil contract may be priced lower than June or July's). This is an inherent issue for commodity ETFs, because they only make money when commodity prices rise. Most of these commodity ETFs find their commodity exposure from the front month futures contract. This means when the front month is rolled into the next month, the etf is essentially selling the front month contract, and buying the further out contract at a higher price. This is what people in the futures business call a roll. Being long in a futures market that is in contango is what would be described as a negative roll yield, potentially creating mismatches between the commodity's actual performance, and what you get in the ETF. Sometimes, the difference between the ETF performance and the market it's based in can be in the double digits!

Seeing this huge roll cost and time decay inherent in the structure of the futures market and resulting ETF products, the good folks at the ETF shops did what ETF folk do – they created products which did the exact opposite, rolling out inverse VIX based ETFs which would rise in price as volatility fell (or even as it remained at the same levels due to that roll cost, which the inverse ETFs would now be earning and calling a roll yield). The benefit of this strategy, selling front month VIX futures, was laid clear for all to see in The prices of the inverse VIX products; two of the most popular XIV, and SVXY both went from 20 - 130 in 24 months (2016-2017) – and in this handy inverse VIX index put out by Goldman Sachs research, showing a gain of about 700% since the beginning of 2016! [See Fig. 6.](#)

Of course, with one side – the short side - of the VIX trade having performed so much better on the nearly \$4 billion in investor bets on volatility, it was only natural for more and more players to enter the volatility trade on the short side, leading perhaps to a self fulfilling volatility dampening profile. As JPM's quant Marko Kolanovic put it [via ZeroHedge.](#)

Shorting volatility is a multi-year alpha generating strategy utilized by the largest pension funds, asset allocators, asset managers and hedge funds alike that has

Fig. 6: Performance of the Inverse-levered Futures Index

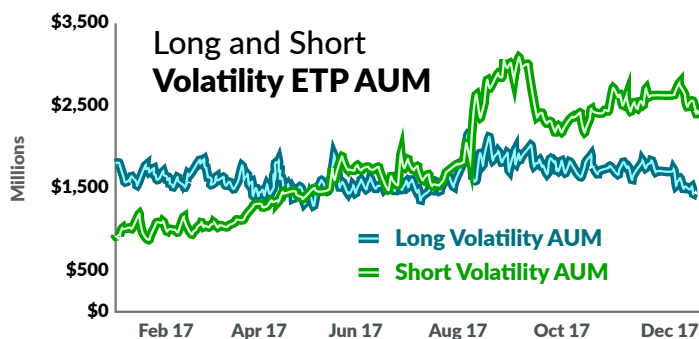


Source: S&P Dow Jones Indices, Goldman Sachs Global Investment Research

profited from selling into short-term vol spikes (similar to 'buying the dip'). It will be continue being done until it ceases working; it remains a +++ performance driver for now.

Said another way, the short volatility trade became something of a wealth transfer mechanism between the cautious/fearful and the observant/risk acceptors, with Goldman estimating that the the *S&P 500 VIX Short-Term Futures Daily Inverse Index which tracks the return of being short a one-month VIX future was up 4364% from March 9, 2009 through 1Q 2017.* With returns like that, it's no surprise that 2017 saw assets on the short side of the trade eclipse those on the long side. The insurance sellers now outnumbered the insurance buyers.

Fig. 7: Long and Short VOL ETP AUM



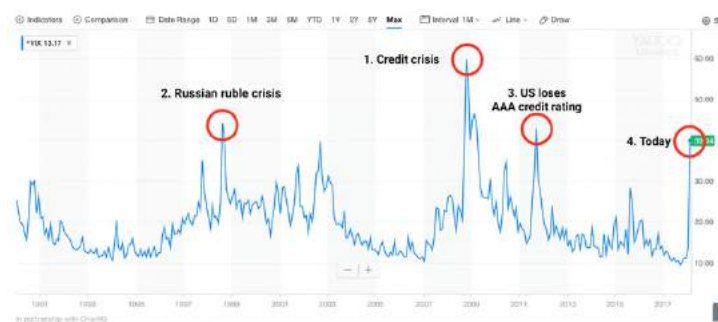
Source: TCW FactSet

Of course, it's never that easy....

Volatility Comes Knocking

Surprising everyone, and somehow at the same time
- no one – volatility awoke from its long slumber on February 5th, 2018.

Fig. 8: CBOE Volatility Index



Source: Cboe

- The Dow lost **-1,175** points, or **-4.6%** (after going about **14 months** without a **-3%** decline)
- The VIX rose 116%, from **13** to **37** (its largest daily move ever)

Suddenly, the short volatility trade Goldman had been trumpeting and seemingly everyone had been piling into per the billions in short VIX ETFs, had reversed course in a massive, drastic way. If selling volatility is picking up pennies in front of a freight train, there were suddenly Billions of dollars left exposed on the tracks as a massive train came barreling down on investors. But here's where things get interesting, because this wasn't just a run of the mill 1,000 point decline in the market. No, the bulk of this move happened in the last hour of trading, with losses in Dow terms going from -800 points to -1597 points at the lows - nearly doubling after 3pm EST.

Why the late day move? Turns out the late day increase in selling pressure, was due in large part to our friends the volatility sellers – and specifically the two largest inverse VIX products, XIV and SVXY, who had massive amounts of short VIX futures they had to buy back to: 1. meet margin calls and 2. rebalance the fund to track that day's move in the VIX index.

Here's blogger Kid Dynamite on how this all works, via [Bloomberg](#):

So XIV has \$ 1.5B notional short VIX futures, and an NAV of \$ 1.5B (\$ 100/share). Now let's make up some numbers: Imagine what happens when the short VIX futures go up 40%. XIV now has \$ 2.1B in short futures exposure, and and NAV of only \$ 900MM (because it has lost \$ 600MM on the short futures position). So what does the XIV manager have to do? He goes out and buys VIX futures to reduce his exposure and get it back in line with the NAV.

Herein lies the rub... As the XIV manager goes out and buys VIX futures, in massive size, in an illiquid volatility market, he drives the price up...which drives the NAV down... which requires him to buy more VIX futures... Rinse, repeat. This is why we saw VIX futures spike late in the day on Monday, and especially into the 4:15pm ET benchmark



And here's where a bad day became a very bad day for XIV, in particular.... because there was an artificial line in the sand that drew traders to it like a moth to a flame.

We're talking about the -80% 'knock out' level created by XIV issuer Credit Suisse in the fund's prospectus ([read more about that here](#)) which said if the fund was less than 20% of its previous day's

value, Credit Suisse would terminate the product to insure they didn't lose more money than was invested in the product.

Meaning, the closer XIV got to being down -80%, fund wouldn't just have to buy more futures – it would need to buy all of its positions back, meaning other traders were all of a sudden clued into the fact that there was a very large buy order waiting in VIX futures if prices just went a bit further up, creating a massive short squeeze that essentially drove the VIX to exactly the spot it needed to be in order to pierce the -80% level for the ETF.

When the dust settled, \$1.7 Billion invested in XIV was essentially wiped out, and the question of when will the short volatility trade become too crowded was answered. Between 3 and 7pm on February 5th.

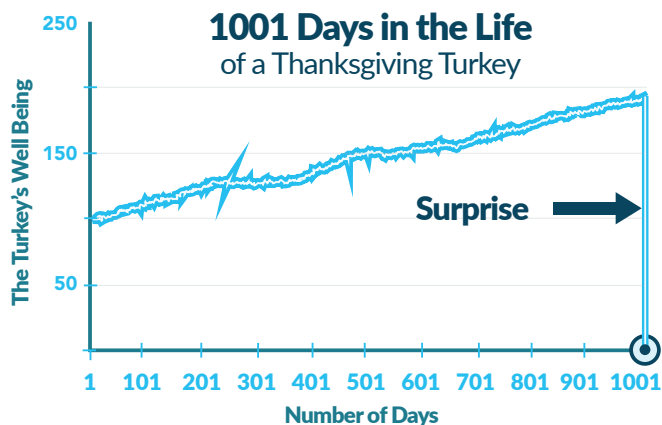
Fig. 9: Credit Suisse's inverse VIX ETF - XIV



Source: Barchart.com

We couldn't help but be reminded of the lovely chart of the life of the Thanksgiving turkey (Fig 10.) from Nassim Taleb's wonderful book, *The Black Swan*, when looking at the XIV graph. The reason for this profile is that inverse VIX products make a living by risking a small probability of losing a very large amount to generate a high probability of making a very small amount time and again. They are literally betting nearly everything against exactly what happened on Feb. 5th. Problem is, when you go through a period of next to no volatility, this risk gets masked. It should statistically show up as a high Kurtosis and Negative

Fig. 10: XIV Comparison Life of a Thanksgiving Turkey



Skew, but can only do so after a few spikes and large losses happen. Until that point, the losses are hidden from view. Just so happens all of these inverse products were launched and operated in an environment largely devoid of any such spikes which would have/could have informed investors.

Problem is – the other side of the trade was terribly bad (right up until Feb 5th) too, with a steady diet of lower lows year after year. What's an investor to do?

Finding a Pearl in the Volatility Oyster

So how do you capture the natural decay in volatility pricing that led to that nice upward sloping performance curve in the inverse VIX products (the first 1000 days of the Turkey's life, so to speak), while protecting against those nasty spikes which can wipe away everything you've gained up to that point? ***How do you navigate the three phases of volatility: Drops, Sideways, and Spikes?***

Well, none of the currently available ETFs and ETNs are up to that challenge; with each designed to perform during one or two of those phases, but not all three. No, to perform in all three, you would need to be able to deftly move between products, sometimes being long volatility, and sometimes short. But how do you do that?

Pearl Capital

One private fund manager we monitor is as close to figuring this problem out as we've seen. Their name is Pearl Capital, and their Hedged VIX program is designed to do just this – dynamically moving between the three volatility environments of spikes, drops, and sideways movement. So how did they do in Feb 2018 when the spike finally came? Glad you asked – they were up +19% after correctly being long volatility heading into the Feb 5th vs Feb 6th spike.

But history has shown Pearl doesn't need a big spike to make profits. They've shown an ability to turn a profit in all three volatility environments (spiking, dropping, and moving sideways). Just look at Pearl's annualized performance across each of those three VIX environments, and you can see there is more going on here than just a simple short or long vol trade. It's dynamically adjusting to each environment, all while keeping the maximum month end drawdown less than -4% (past performance is not necessarily indicative of future results).

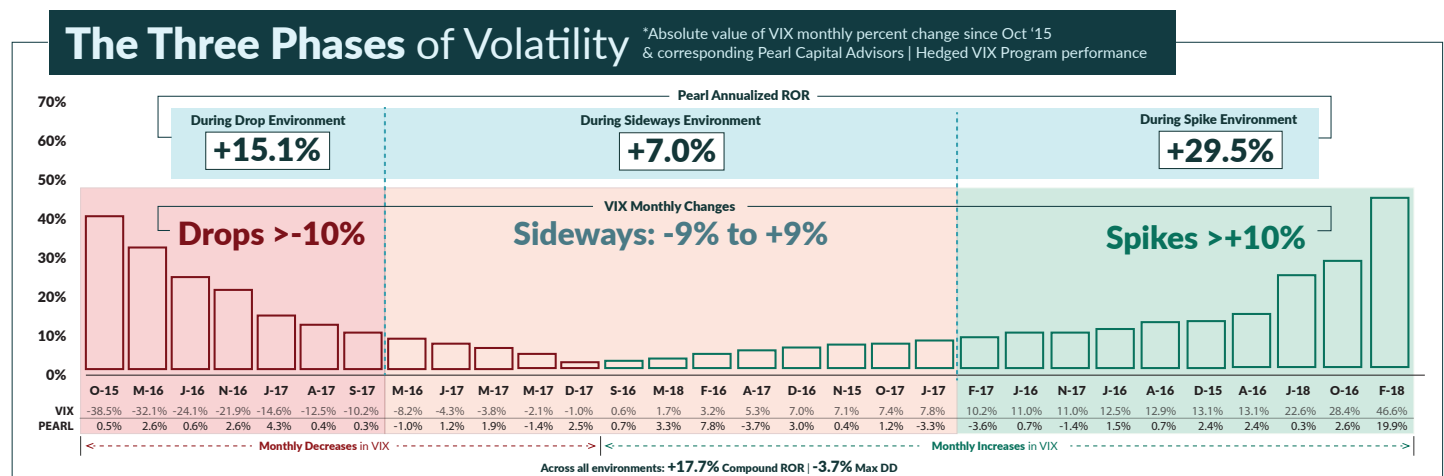
How are they doing it? Well, it helps to understand where they came from, first. Pearl is led by a team with 20+ year of experience, that currently runs the alternative investment arm for a family office – where the job includes manager research and selection, risk-based portfolio construction, and position level risk management.



Tasked with a project to find alternative investment strategies that were complementary to the existing family office portfolio in providing both all-weather performance and tail-risk protection, Pearl found that no product fit the desired parameters, with most possible choices highly directional and possessing a short volatility profile.

Without a third-party product to utilize, the investment team decided to build their own product to meet the all-weather/tail risk protecting mandate. The result of their efforts was a hedged VIX investment product that seeks to benefit from both “risk-on | risk-off” environments and derives its potential returns from structural, persistent, and behavioral inefficiencies.

Fig. 11: Pearl Capital in the 3 Phases of Volatility



The resulting strategy is today's Pearl Capital Hedged VIX program, which seeks to exploit these inefficiencies with the objective to hedge out systematic factors, market risk, and directional bias.

Here's some further program highlights on Pearl Capital:

PROGRAM HIGHLIGHTS:

(past performance is not necessarily indicative of future results)

- Not Short Vol, but Relative Value - dynamically adjusts to different vol regimes
- Skin in the Game - Pearl Capital has their own money invested in the program
- Limited Remaining Capacity - ~\$100 million remaining.
- Winning Months - 77% winning months since inception
- 30 month track record

Conclusion

Despite the very real dangers of VIX trading, as seen in the long volatility products losing the bulk of their value over several years, and the inverse volatility products losing the bulk of their value over a few days, it seems the VIX trading genie has been let out of the bottle, so to speak, and there'll be no putting back the dozens of ETFs and ETNs giving exposure to volatility one way or the other.

But while many are looking at VIX products with the simplistic type of decision tree outlined in [our infographic](#) (do you think it's going to spike? When?), there are professional hedge fund managers out there who look at the VIX in an entirely different way.

They see it as a product with inefficiencies to be captured, as a hedgeable trade on market structure; to both produce income during normal times and capture gains from the panic associated with market crashes, whether those be short-lived or longer term.

Call our team at **855-726-0060** to learn more about how these managers are approaching the market and how they may fit into your portfolio.

RCM Alternatives

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3.1 \$ BILLIONS UTILIZING FIRM*	15 YEARS OF EXPERIENCE	55 FUNDS ALLOCATED TO	53 COUNTRIES WITH CLIENTS
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*As of August 30, 2017

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