



THE EVOLUTION AND MUTATION OF ETF SHARKS SINCE OCTOBER 2016

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*"You know, I have one simple request. And that is to have sharks
with frickin' laser beams attached to their heads!"*

~ Dr. Evil from Austin Powers

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In October of 2016 I wrote about the state of the ETF industry and its main players in [this white paper](#). While that paper was very relevant at the time, a lot has happened since then. Therefore, it makes sense to revisit the topic of ETFs and how, I believe, misperceptions of the market can harm the every-day investor. If you don't have the time to read the prior white paper, allow me to summarize it for you briefly here:

- ETFs can be more expensive to trade than stocks and don't always trade near their Net Asset Value (NAV).
- ETF managers consistently have issues executing trades without significant impact.
- Many popular ETFs, known for their low volatility, have traded at up to a 35% intraday discount during market extremes.
- Robo-advisors halted trading after Brexit due to excess volatility, possibly caused by exaggerated spreads.
- The explosion of high-frequency traders and how they exploit ETF inconsistencies have also impacted ETF trading.

We discussed the kinds of ETFs out there, spreads, NAV calculation, discounts and premiums vs NAV, fees, market-makers, pricing abuses, intraday volatility, robo-advisors, and High Frequency Traders. It's a lot, but it serves as a great primer for those of you who wish to know more about ETFs in general and it also serves as a very helpful background for this current paper.

The problems began when ETFs went from virtual obscurity and skyrocketed in popularity to become some of the most liquid and frequently-traded securities on the planet in very short order. That brought about a very fast commoditization schedule. By that, I mean that when products are obscure, there is opacity and therefore margins can be quite high. Think about how expensive it used to be to trade stocks in the 1980's! As the products become more mainstream and competition entered the market to grab their piece of the pie, margins begin to erode, until we are left with a few big players fighting over the crumbs. The commoditization of products means that final users have more and more choices of outlets to go through at ever-cheaper prices. The most liquid ETFs have become staple products of the equity trading world. Unless there is severe market volatility, the spreads are very small. So, to earn meaningful profits making markets on spread, a participant needs to do huge volume, very reliably, and very quickly. Machines typically fit this profile and this "Shark 2.0" paper serves to update you on the evolution of ETF trading since October of 2016.

But first, here's the problem with investigating an industry shift to machines and algorithms: The players are very good at keeping quiet. They are good at being unhelpful in disclosing key information. They also tend to be machines. So, for this paper I surveyed several human experts in the field of ETFs. I asked many questions and got many helpful answers. My aim here is to tell you the good news and bad news about ETFs and how you the investor can ultimately avoid many pitfalls that you may not even know how to look for.

Here's the deal: if the ETF market used to be shark-infested waters, now the sharks have met their match. They have been gobbled up by robot sharks, which are smaller, nimbler, more efficient, and ultimately too much of a match for the original sharks.

Enter the age of the robo-sharks, with lasers on their heads.

CONVERSATIONS WITH THREE MARKET VETERANS ABOUT THE NEW ETF SHARKS

I asked three very experienced professionals about their view on different aspects of the ETF industry in the past, present and future. Two remain anonymous and the third you know well.

Our first source is an ETF industry veteran with years of experience. His first role was in Capital Markets at a prominent ETF issuer. He gave Financial Advisors and Institutional Investors guidance on efficiently accessing ETFs. He basically helped a manager trade ETFs more easily, whether it be through their own trading platform or finding market makers. From there, he moved to a bulge-bracket market maker of ETFs; interfacing between the client and the trader, making block trade two-way markets of big size for ETFs. He is currently at a very large asset manager as consulting portfolio manager on navigating ETFs. We will call him Ben.

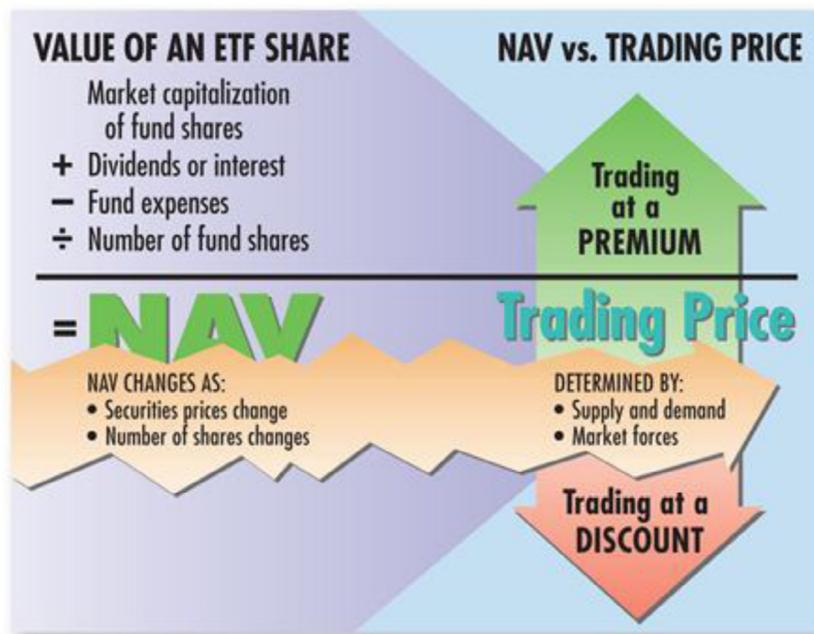
(This interview was conducted January 30th, 2018 - right after the near-term market top!)

Jason: *"Speak to me about the subject of premiums and discounts on ETFs."*

Ben: I'd like to begin by saying that NAV is typically not tradeable. There is a regulatory requirement that ETFs report their net asset value. The one thing about NAV is that there are nuances in how specific types of ETFs calculate their NAV and they are not all the same. The problem with perceived premiums and discounts is that the data may not always reflect current information, so comparing an ETF's market price to NAV may be comparing apples and oranges. There are nuances in how specific types of ETFs calculate their NAV and they're not all the same

For instance, US-listed ETFs that happen to hold international companies will have stale data when the US market is open, and the local market is closed. This is simply due to time differences. Things get even more distorted the farther away you get, like in Asia or India, where NAV is based on the closing prices of the local exchanges. The NAV during US hours for Asia or India – where the local stock values are not being calculated – is based on the closing prices of the exchange. The actual market price will often be compared to an NAV which is actually hours old.

The next issue with NAV is how it is calculated. The method depends on the type of ETF. A bond ETF based on an underlying basket of bonds may be priced based on the bid of those bonds as opposed to mid-market. In the case of more volatile underlying securities, like high yield bonds, not every bond trades every day. The liquidity of the underlying bonds greatly impacts the NAV.



Source: The Ins and Outs of ETFs

Jason: Talk about market shocks, such as August 24th 2014 when DVY traded at a 35% discount.



Source: FactSet

Ben: You bring up DVY, which is an interesting case. Many of the DVY underlying stocks were not yet open for trading yet that morning. You may wonder why the ETF was trading when the stocks weren't. The answer is that exchange rules that apply to stocks don't necessarily apply to the ETFs. The DVY ETF was open while the stocks weren't. It's worth mentioning that stocks are also sometimes independent from the underlying basket. Retail investors may have accessed their account by placing stop-loss orders before the market opened. This could have caused a distortion in a more "normal" discount range. Cases where there is an exchange glitch or stocks are halted are rare, though. Don't forget that futures were limit down as well. We view this event as rare, but it can happen. It is less likely, because exchanges have updated their rules in order to protect investors from a repeat of events like this.

Jason: *Speak to me about ETFs with illiquid underlying securities and how that contributes to exaggerated premiums and discounts. Let's use MJX as an example. Recently I saw MJX trading at a steep premium to NAV.*

Ben: This is a good example because it is a US-listed ETF with non-US listed securities. In general, there is typically more global access to US markets than the local underlying stocks. The volume of the ETF usually exceeds the volumes of the Canadian stocks. Ultimately, price discovery of the market dictates the true value of the underlying security. In general, one could expect investors to go to where there is the most liquidity and highest volume. This

tends to be more reliable as opposed to lower liquidity of the components of the underlying basket of stocks.

The same type of thing happens in High Yield ETFs. The volume of the High Yield ETF eclipses the volume of the bonds underlying. So, for this reason the ETF is usually the “go-to” barometer for what the real market is.

A word of caution: I think it’s wrong to assume that the underlying basket is a better barometer for market value when liquidity can be a real factor. To give an opposite sort of example, look at US large cap stocks. The liquidity in the futures contract is five to 10 times larger than that of the S&P 500 ETF and this is one of the most liquid ETFs out there.

Jason: *It’s also what attracts the mainstream media headlines. ETFs are still a popular story in the press, whereas futures are not.*

Ben: That’s right. It’s all about getting clicks. It is easier to talk about the impact of ETFs on the markets as opposed to futures impact on the market.

Jason: *Speak to me about how you see the evolution of the ETF product from an institutional seat. My view is that from 2008 to 2010, the ETF was a young product, institutionally speaking. There were very few block traders. As institutions began to trade the product, the few block traders enjoyed big spreads with nice money to be made. As time went on and traders and sales people began to move around Wall Street desks, new ETF desks were started, and more participants came into the fray as ETF popularity increased. The eventual commoditization cycle of the product worked its way through as more managers traded ETFs with more Wall Street desks. Spreads came under pressure through competition. In the end some desks would price at a loss to win market share, which was the signal of the end of that cycle. Business can’t be done at a loss forever so competition dies out, but spreads are still thin. Then in comes technology, which can be employed to do everything faster, better, cheaper and more efficiently.*

Ben: I think you recounted that right. Big banks take a longer time to develop technology. They invariably are slower than smaller firms, who can do more with less people. Liquidity firms with a focus on technology began to automate the process for pricing block-sized trades on ETFs. There is still interaction with the client, but how the sell-side delivers a price and makes a market is becoming increasingly automated. It wasn’t long ago that a buy-side trader at a fund would call up a trading desk and say, “where is your two-way market on XYZ ETF?” The sales trader relayed this to the trader who assessed risk and made a market based on where he or she thought they could hedge it safely. This market was relayed to the sales trader who relayed it to the client

(buyside trader). The buyside client would also usually be required to try several different desks to get the best price. Maybe he/she would call five desks for the same price and trade with the best one. This whole process could take minutes. Now software allows buyside traders to interface with the market in an automated way. No phone is necessary. They pull up a window on their computer, type in the ticker and size and interface with multiple desks simultaneously and automatically. These desks all have a vast number of tools to price quickly and effectively within seconds or less. That means the sell-side desks with no automation can't compete. They are simply too slow. By the time a client picks up the phone to call only one desk and is waiting for price, he could have traded and received a confirmation while having interacted with the whole market. Computers are obviously faster, more reliable and much more accurate.

As the market becomes more crowded, new players will trade at losses to gain market share. The competitive environment means tiny spreads with no need for an actual relationship. Buyside traders used to want to trade with Goldman, Morgan Stanley, Jefferies, and Deutsche Bank. There was a relationship between those desks and their clients. But now buyside firms are facing more compliance pressure to ensure best execution. The best brand name has become secondary to the best price. It is simply easier for smaller firms to compete if they have a better pricing advantage. Technology and competition are continuing to drive down cost.

Firms like Citadel and Jane Street are heavily active in the algo-market, making space for ETFs. They are significant liquidity providers off-exchange, which is different from being a listed market maker posting liquidity on the screens, which they also do!

Jason: *Speak to me about the dangers of automated market making in times of market stress.*

Ben: When there is a market shock or liquidity event, flash crashes are far more likely now with more HFT and algo market participants around the world. The pricing may be automated, but there is still no trade unless a human trader gives the order. There is still some human interaction when trading big blocks. There is still a substantial human element to off-exchange block trading.

Jason: *Speak to me about the future of the ETF industry in your eyes.*

Ben: The world of actively-managed strategies is desperately trying to figure out a way to offer managed products in an ETF. There are certain structural advantages of an ETF format in terms of tax and cost over say a mutual fund. I am optimistic that active managers will deliver through ETFs. I also see big

opportunity in Europe. There are big changes there with more exchange transparency. Maybe most significantly, I feel that fixed-income ETFs are ripe for huge growth. Fixed Income is still a small community, too small in my opinion. ETFs offer a better-packaged solution to a bond portfolio, as opposed to a mutual fund. I foresee the costs continuing to drive lower and lower. Eventually the cost of an ETF will be the cost to run it.

Jason: *Then where do traders make money in ETFs if there is no more spread or edge? Rebalance days and issuer incentives are still part of the industry.*

Ben: Yes, that's right. Where to make money in ETFs is a fun question to think about as the industry evolves. I think the pendulum is swinging to everyone loving cheap and passive ETFs, like the S&P 500. Sentiment is good as the market is going up and so are 401k's. They think "why think about it? I'll just buy the SPY for a 3 bps (0.03%) fee and watch it go up!" This seismic shift to passive management will give way to opportunity for actively managed ETFs.

The line between active and passive is becoming increasingly blurred. Look at Vanguard, the name most associated with index investing. Last year saw Vanguard having the highest inflows of any active manager. In addition to opportunities for actively-managed ETFs. I think there's also opportunity for smart beta. Smart beta strategies try to give a better risk/reward than traditional market cap-weighted indices. They do this by using different weighting schemes based on things like volatility or dividends, for example.

In the future, I see more participants, lower volatility, higher liquidity, lower cost and more products. When a correction comes, active managers will be able to deliver the message of value. Passive is king now because of the market condition. We are in a period leading up to a correction where investors discount the value of financial and investment advice. I don't know where we are in the cycle, but I know we are closer to a peak than a trough...*

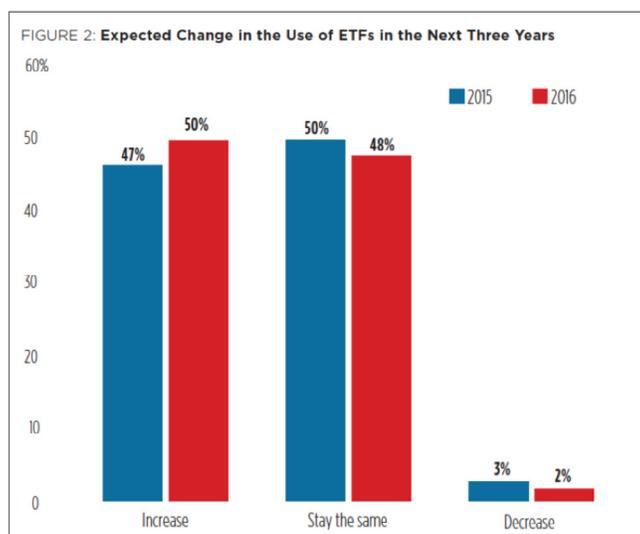
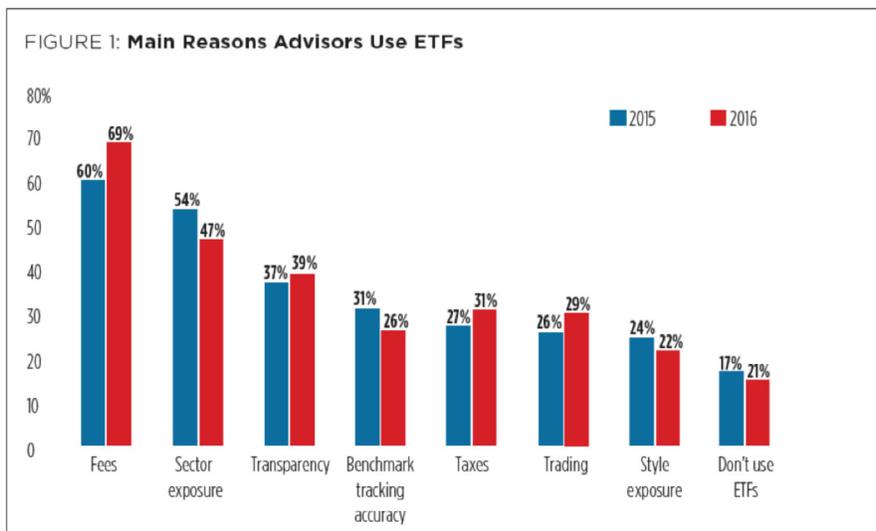
**Reminder: This interview was conducted January 30th, 2018 - right after the market peak.*

Next up, I interviewed a Wall Street veteran who ran an ETF trading desk from a major Wall Street bank. With over a decade in ETF experience, he handled some of the largest ETF order flow and interfaced with the biggest payers in the business. Let's call him Simon.

Jason: *When I think about the ETF industry today, I think about the domination of the big Wall Street dealer desks diminishing. I feel like they are no longer the sole voice in market-making and are essentially fighting over the crumbs as they chase diminishing spreads to zero. The automated market makers have now taken over for a just a few basis points of edge. Can you speak to your view of the evolution of the industry?*

Simon: I've always felt that the entire ETF business is built around fees -- fees on fees on fees. I'll give you an example. There is a lack of stock splits now. If I am an average retail investor, affording multiple shares of a \$1,300 stock like Amazon is a problem. How do I get exposure? I buy an ETF that holds Amazon! I can have exposure through an ETF simply because of the lower ETF share price. This is fascinating to me as it never happened before, an ETF as a share substitute, based around fees. Historically, stock splits have been there to make stocks more affordable to the average investor. But since ETFs were designed as a retail product, the companies don't need to split. It can be viewed as tax on people that want to invest. The ETF industry now pitches diversification and passive management in an effort to collect more fees. Vanguard is to ETFs what Amazon is to retail.

But what led us here specifically in terms of the dealers? The rise of the Registered Investment Advisor naturally gave rise to ETF issuers focusing on them as clients. There were massive marketing efforts to the RIA community about how diversification is the best for their clients. Because of how RIAs clear and settle, the middlemen created a big business. This paved the way for an explosion to create new products for RIAs. The issuers who issued ETFs needed them to be seeded with a base amount of assets, usually \$2.5 million or more. Those seeds came from the market makers. The eating was good till about 2010, at which point more ETF desks got involved, wanting to face the RIA clients. Competition ramped up and desks clamored for business. In 2012-2013, "dark" market makers faced clients and spreads came way down. "Dark" just means that they posted liquidity in blind matching systems out of view of the public. Citadel, Jane Street, Susquehanna, etc. all face clients electronically now. The cycle continued as bloated Wall Street desks got slashed in terms of headcount and spreads raced to zero. Automation rules ETF trading today for way less than a penny per share.



Source: Wealth Management RIA Trend Report

Jason: Can you speak to premium/discount distortions during times of market shock?

Simon: When volatility spikes, automated market making businesses will instantly realize that volatility is picking up. Their algorithms will detect that shares trade outside their usual ranges. They will widen their bids and offers in an attempt to capture wider spreads to make more money. In times of stress, investors use market orders instead of limit orders because fear is amplified. They want out right now! Market makers know this and will take advantage of the fear to make money. They will always try to capitalize on bad trading.

There are just so many ETF products out there and so many indices. In fact, there are thousands of ETFs. Last time I looked, 75% or more of all listed ETFs have low assets. Due to that, spreads can be very wide, and trading can make

a very large impact on an investor's potential return. In most cases it behooves investor to deal with ETFs that are liquid with substantial assets, maybe \$500 million, and those that typically trade relatively near their NAV. By that I mean, there should be enough assets in it to gauge interest from market makers. It is better for investors to trade ETFs attractive to professionals as well as retail customers.

Another example: in Fixed Income ETFs, there are times when natural bid offer spreads are away from the true NAV. It can disadvantage an investor looking at an ETF by share price alone. An investor might be thinking of an ETF as a stock and not as the true value of the underlying assets and where it is marked relative to them. This type of dislocation is more common in Frontier markets or less developed markets. Supply and demand within the underlying stocks of those ETFs can cause values to move significantly away from their NAV simply due to supply/demand mechanics of the underlying stocks relative to the ETF.

Naturally this distortion of NAV is less common in liquid ETFs, but it certainly does happen. Sometimes there are systemic issues like when stocks get halted or there is an exchange malfunction. These are rare events as typically US stocks are very liquid. I would characterize these more as "freak events" for domestic liquid ETF products.

Jason: *Can you speak about an ETF like MJX which recently experienced a massive NAV dislocation with no particular market shock event?*

Last Price 37.71	Day Change ↑ 2.06 5.76%	NAV 35.17	Open Price 36.59	Day Range 36.27-38.37
As of 01/03/2018 14:39:37 EST USD		USD		
Intraday Indicative Value 28.74	Day Change ↓ -0.33 -1.14%	Prem/Discount 24.06%	Volume 116813	Avg Vol 4,473
As of 12/29/2017 17:00:00 EST USD				
Morningstar Premium Analyst Report MJX				

Source: Morningstar

Simon: In a case like MJX, the Marijuana ETF, the underlying basket of stocks are smaller, illiquid Canadian-listed equities. The ETF is more liquid than the stocks, I believe, so this would fall under the first category, where NAVs drift from the underlying from supply/demand issues. Naturally, market makers are experts in their products, so they will use this to their advantage to widen bid and offer spreads. Remember, the wider the spread that they can potentially trade at, versus what they believe it is worth, this represents their margin. Their

interest is to keep the spread as wide as they can without pricing themselves out of a trade, unless of course they don't want it.

After interviewing Simon, I concluded that the rise of the automated traders will help the liquidity and efficiency of markets, especially in periods of low volatility. But when a market reaction occurs, I think this market dislocation will happen at a much faster pace than years prior. These new automated market makers provide liquidity and they can react instantaneously, so amplified flash-crash-type events may become more frequent. I would expect this to come with higher volatility due to the immediacy of the algorithmic reactions. I think this is easier to occur when everything is run by algos. The fact that there are robo-advisors also complicate issues. The best route is ultimately still having a human at the helm – and an experienced one at that. An informed manager will be proactive in environments that are disadvantageous to retail community and can use his knowledge of market mechanics to his investors advantage.

Next, I interviewed Louis Navellier, Chairman of Navellier & Associates, a \$1 billion money manager across several asset classes.

Jason: *Can you speak about some of the snakes in the grass you encounter as an ETF manager?*

Louis: As an ETF portfolio manager, when being on big platforms like the major wire-houses, you are forced to trade through their order pipes or model management platforms. That means your trade execution must take place through their dedicated systems. Unfortunately, that doesn't mean it's great execution. In fact, most of the time it's quite the opposite. This translates to a real drag on performance. In the investment management world, this is called "execution risk." For this reason, we pulled out of a major wire house that used their own trading system, and we pulled out of multiple model management platforms due to the fact that their trade execution was horrific. Especially in the model management programs, we felt that we were being taken advantage of since it was very unclear when they would execute their respective orders. . In some cases, performance on my model management accounts, that were traded on these trading platforms were actually behind my own GIPS composites, which again, is truly horrific. I feel our clients are much better off being able to have my expert traders trading their accounts rather than rely on unscrupulous model management programs or trading pipes that have problematic execution.

Jason: *What are your thoughts about the new proliferation of algorithmic and automated trading?*

Louis: I view it as a good news/bad news situation. The good news is that

in reality, 99% of the time it's good for the market and everything functions the way it should. Liquidity is better, there are more products, and more participants. The bad news is that we haven't really seen a major stress test. We don't know what will happen in rough markets. If you trust machines to handle your order flow, when things get bumpy you don't have a human who can sit and wait and watch volume and work the order. The other bad news about algorithmic trading is that if humans could game the system and front-run orders, what could quant-based algorithms do? They can do it faster, better, and way more efficiently than any human ever could. That's just a fact.

Citadel and other algorithmic firms may be taking over the world from a liquidity standpoint, but I see the bottom line as this: Having a professional seasoned manager at the helm is precisely what you want when waters become rough. I won't be trying to push a watermelon through a keyhole just because a machine is telling me to. I know how to assess market conditions and trade appropriately for them. I won't allow my clients to get picked off by the games in the fast-market world. August 24th of 2015 was a perfect example. We had humans trading our orders and we weren't affected significantly. Also, the day after Brexit we had the foresight to exit our Treasury positions. This is when you want an experienced professional managing your money.

Summing up all three of these interviews, I find a lot of common themes:

- ETFs offer a great way to access exposure to multiple markets and products.
- ETFs have complicated dynamics that when exploited may disadvantage the individual investor
- The ETF landscape is increasingly dominated by automated trading done by machines.
- Liquidity should continue to improve with more participants.
- We simply do not know what the impact of more machine participation will do to potentially distort markets in times of stress.
- Employing a knowledgeable and experienced manager to guide investors through the ETF investing landscape is still the best way to invest in ETFs.

UPDATE IN LATE FEBRUARY, 2018

After I compiled these three interviews at the end of January, I wrote the report as the markets went into a two-week tailspin. The equity markets proceeded to sell-off more than 10% after I wrote my first draft, but that only

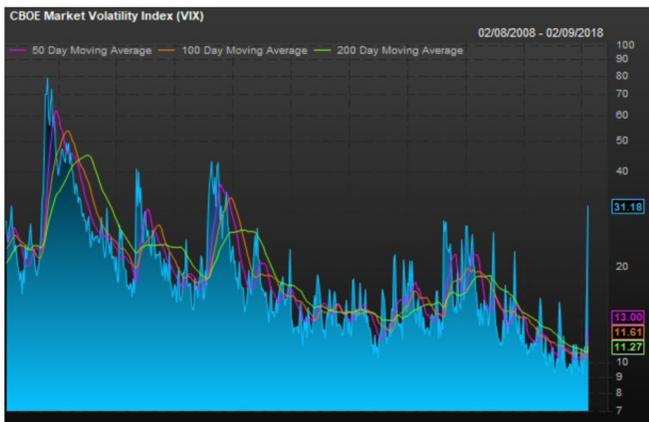
serves to underline the fifth point on the list above:

- We simply do not know what the impact of more machine participation will do to potential further distort markets in times of stress.

After the correction in early February, I think now we have some valuable extra data.

“Short Vol Positioning” received much of the blame for the selloff, but I think the algorithmic traders exaggerated the start of the slide, which pushed everything off a cliff.

Let me explain my view: A lot of hedge funds and even some mutual funds have had positions that were sold to them as insurance against a downdraft. Volatility is the measure of an asset’s expected or historic price movement over time. The more movement away from the historic levels- the more change in volatility. It’s no secret that the market has had historically low volatility for quite some time during the massive run-up. So, selling volatility to buy it back lower has been the trade-du-jour for a while. Here’s the thing: Shorting volatility is not insurance; it’s more risk! It is really squeezing extra basis points of return trying to keep pace with a super-strong stock market. It’s a lot like selling low delta (probability) puts on a long stock portfolio. Investors happily buy stocks going up and sell volatility to earn premium to try to keep pace with the market or outperform. The first real sign of selling came and the algos pounced on sending stocks lower. Volatility exploded upward, but way more than normal. Why?



Source: FactSet

Shorting VXX was a great trade for nine years (chart, above right) while selling VIX has been fruitful for a few years. When volatility is not just a measure of price action, but actually is traded like an asset itself, shorts need to cover when it goes the wrong way against them. They buy back these shorted

products like VIX (+175%, February 1-3) and sell their long inverse products like XIV (-96% February 1-8). On a 3%-4% pullback from equity market highs, the VIX should not have exploded to 50 (intraday, February 6), but it did. This was due to a few factors, including:

- Short-covering
- Selling pressure on stocks and indexes
- Big Banks (dealers) know this wrong-way positioning of the street and skew markets to make more money, further amplifying the dislocations and the need to cover exposure.
- Margin calls require raising cash by selling liquid securities = stocks.

I initially thought that even the most aggressive estimates put assets in these funds and vehicles at \$50 billion – but the market cap on the S&P 500 was nearly \$8 trillion. What effect could it really have? Then I remembered that as of December the top 5 stocks in mkt cap accounted for over 12% of the weight of the S&P (according to [this December 25, 2017 Seeking alpha article.](#))

That's right: FB, BRK.B, AMZN, AAPL and MSFT account for 12.3 % of the S&P 500 by market weight. As liquidation requirements to raise cash put pressure on the major stocks, it pressured the index itself. The other indexes started cascading down followed by global indexes. Our market had a cold and the world caught the flu.

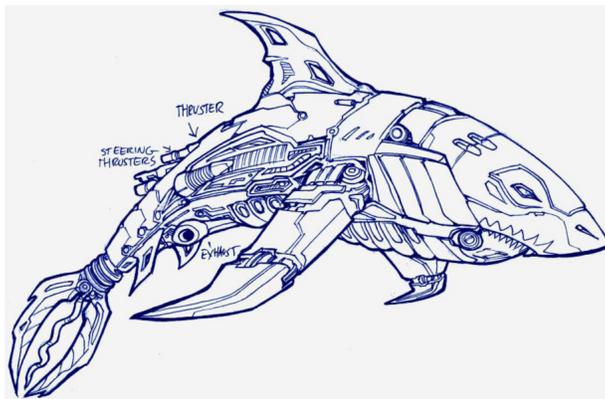
(Please note: Jason Bodner does not currently hold a position in FB, BRK.B, AMZN, AAPL and MSFT. Navellier & Associates does currently own a position in FB, BRK.B, AMZN, AAPL and MSFT for client portfolios).

I believe these products were not protective but a manifestation of greed – trying to keep pace with a heated equity market, itself partly fueled by this type of cycle of buying stock and selling volatility. The result was just like a gun going off in a movie theater: No one expects it and pandemonium hit as everyone rushed for the exits.

So here we have new data, on top of the flash crashes of May 6, 2010 and August 24, 2015. What we can begin to piece together is that when machines are in charge, moves can become extremely exaggerated and accelerated. This is a prime environment for liquidity providers to take advantage of investors. In plain English, fast markets are when investors get picked off.

The truth is that the sharks were always there – dating back to when markets began. They have just been evolving over time. The human ETF sharks have now been gobbled up and replaced by robotic sharks with lasers on their heads. When they have a feeding frenzy it can get scary and worrisome. Not everyone knows what to look for or how they behave. The key is having a cool head or at least having an investment manager with a cool experienced head.

After all, it took a human to come up with robot sharks with lasers on their heads in the first place...



Beware the automated sharks out there!

IMPORTANT DISCLOSURES

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- ETF shares may trade above or below their net asset value;
- An active trading market for an ETF's shares may not develop or be maintained;
- The value of an ETF may be more volatile than the underlying portfolio of securities the ETF is designed to track;
- The cost of owning shares of the ETF may exceed those a client would incur by directly investing in the underlying securities; and
- Trading of an ETF's shares may be halted if the listing exchange's officials deem it appropriate, the shares are delisted from the exchange, or the activation of market-wide "circuit breakers" (which are tied to large decreases in stock prices) halts stock trading generally.

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