



ETF DOOM-SHARKS

WHAT REALLY CAUSED THE MARKET MELTDOWN IN 2018?

“THEY CAUGHT A SHARK, NOT THE SHARK.”

From the movie, Jaws

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INTRODUCTION: WHY THIS PAPER?

1. In late 2015, [Louis Navellier and Ivan Martchev told you how ETFs had reached a tipping point and were a disaster for the market in 2015.](#)
2. In September 2016, [I introduced you to the ETF sharks.](#)
3. In February of 2018, [I told you how the sharks mutated to robo-sharks with lasers on their heads.](#)
4. Today I am telling you that the machines have taken over and are artificially intelligent robo-sharks with lasers and doom weapons. Oh, and I'm completely serious....

It's early 2019 and the shark mutations have been thundering forward for years. You may not know it, but robo-sharks have gobbled up the stock market and are firmly in control. The tail is wagging the dog. Better yet, the ETF-robo-shark tail is wagging the entire market.

2018 stunk for stocks and here's how the media says it went down...

We just witnessed the worst December stock market performance since 1931. This was after a weep-worthy Thanksgiving and a plain-old disgusting October. Many are scratching their heads as to why this massive risk-off landslide took place. The media outlets have their jobs to do: provide explanations when the crowd is starving for answers and thirsty for blood. When fear and panic rip through the system is precisely when the news shines. All eyes are on the headlines so it can't be an "I'll get back to you" type of scenario: the public needs answers fast.

With that in mind, recent headlines focused on what gets clicks and eyeballs. Popular stories for why stocks collapsed are "old news" by now. But "global growth slowdown" suddenly blossomed from idea to concern to full-blown crisis in a few weeks. It exemplifies how fear contagion spreads.

Trump's trade war dragging on makes investors uncomfortable. The very first inklings came in May of 2017, causing a market temper-tantrum. Last fall, many (this writer included) made the informed guess that Trump would pull a trade-resolution-rabbit-out-of-the-hat before the November mid-term elections. It was logical: he was appealing to his base by standing firm and would potentially provide the market with much-needed clarity.

Magic didn't happen, and stocks didn't like it.

December came and clearly no one wanted stocks. The ever-present dip-buyers didn't show up anymore, and down we went, fast and hard. Christmas Eve was far from cheerful for stocks. The market found new lows on higher-than-usual holiday volume. Headlines were all sour and almost everyone was bearish.

Then, January put the nail in the coffin for the non-believers of the global growth slowdown theory. Apple CEO Tim Cook wrote a letter to investors revising revenue guidance down around \$5 billion. He cited an impact of slowdown worse than expected. Sales sagged worse than thought in China. This depressed investors and erased more than half-a-trillion dollars of market value in one day. The news media wants you to think that "investors" didn't like the news and sold stocks recklessly. Of course, 24 hours later a rally began and hasn't looked back since, as of this writing.

But you know all of this: I'm not saying anything new here. The market hates uncertainty which sprouted in the summer, bloomed in the fall, and rotted out in the winter.

This recap is the same stuff that baits you into clicking the headlines on your news feeds. They must keep you reading. When you click the article, you are forced to see an ad or 5, if you're lucky. When advertisers know you're looking, they'll pay news outlets for your views. Subscription fees don't pay the bills, so news needs advertisers. So, take news with a grain of salt: their job is to keep you glued so advertisers can sell you products.

2018 stunk for stocks and here's what I believe really went down...

I think ETFs caused the market's flat-footed faceplant. I've felt it in my bones. But you should know that I am a data-driven guy. A theory is fine but should be provable with supporting data. So, here's what I'm going to do:

- Detail the birth and rise of ETFs as it relates to assets gathered and impact on trading volumes
- Recap from prior papers how ETFs are not as sweet and innocent as they are made out to be
- Discuss the explosion of passive investing in the wake of the financial crisis and why it led to a set up for major market impact
- Lay out my theory on why ETFs are weapons of mass destruction
- Show through proprietary data that a tipping point occurred years back where stocks stopped bossing around ETFs and roles swapped
- Pull back the curtain on how ETFs are really in control of this market

- Show you how ETF trading has an immense impact on the market's stability during calm times and a bigger impact on instability when things get bumpy
- Identify specific pivot points in the market and see when unusual ETF trading can tip us off that market bottoms are near
- Demonstrate how I use data of unusual buying and selling of stocks and ETFs to analyze the market condition and make historically educated guesses about its future direction

I'm highly confident you won't read this anywhere else. What I'll tell you is truly compelling, and you'll see data you've likely never seen before.

Then, on page 28, you'll find a 1-page recap of each of our previous ETF White papers. They serve as a solid backdrop and good context for what I am about to reveal to you.

If you've already read the prior papers, feel free to skip those summaries. If not, you might want to start with those summaries before reading on.

Here we go...

SO, THE THEORY GOES...

Here's my theory: ETFs' massive popularity set them up to take control of the stock market. As I'll show you, the massive assets being forced through narrow exit windows in scary markets prompted an ETF caused disintegration - which I believe we just witnessed.

As the world watched equity markets melt down in late 2018, people wanted reasons. The media offered some canned explanations. But I think they missed the real story: I think ETFs caused the depressing finish to 2018.

ETFs came on the scene in 1993 with SPY. Soon came others, followed by widespread adoption. As investors looked for cheap, liquid alternatives to mutual funds, ETFs offered a great way to be a passive investor. ETF managers became all the rage and the number of available ETFs and assets in them ballooned as years rolled on.

Then something fascinating happened: The Financial Advisor (FA) industry began to focus less on asset management and more on asset gathering. Wealth managers (FA's or brokers) get compensated by assets managed. As ETF products flourished from 2000- RIA's and wire-houses made a concerted push to gather assets, as more assets meant more fees. The stage was set for an explosion of popularity of Exchange Traded Funds. Since the early 2000's, ETFs have benefitted from huge asset growth. Passive investing

became en vogue as “hedge funds were dead.” Market outperformance wasn’t necessarily the main goal anymore - especially in the wake of the 2008 financial crisis. Trying to outperform a bull market like the last 10 years almost seemed like a waste of fees: just slap your money in an ETF, track your benchmark of choice, and call it a day.

Some wealth managers focused on gathering assets and diverting them into passive vehicles- especially those with big incentive fees. Then a curious solution arrived for wealth managers: ETF model management could offer outsourced portfolio management for low fees. Model managers could offer exposure to virtually any strategy an FA could want to invest in, and all the FA had to do was gather the assets and allocate them to the appropriate ETF model strategy. So, many Financial Advisors moved from in-house portfolios to outsourced “model-management.” It was a cheap portfolio management solution. ETF model runners could be paid a percentage of assets in their strategy, and FA’s could focus on growing their book.

ETF model strategies were and are often tactical and rule-based with technical price floors built-in. A stop-loss price based on low volatility means a relatively high price floor. When that gets breached by something like, say, High Frequency Trading (HFT) firms (computers) pushing down prices to scoop up profits, models must sell. The rules say so.

As assets swelled, a tipping point eventually came. Stocks stopped moving ETFs, and it became the other way around. As time passed and more ETFs emerged with more assets flowing into them, we arrived at 2018. The data I see paints a clear picture of the tail now wagging the dog: ETFs are in control.

Fast Forward to Q3 2018

Algorithmic and High Frequency Trading firms (*computers*) began selling in September when China’s sinking equity market led to a weak U.S. market. Selling pushed stocks down and blew out (widened) bid/offer spreads. Keep in mind, in a stable market, spreads are a penny wide or less on liquid stocks. When liquidity vanishes and the order book is lopsided with more sells than buys, spreads can blow out to 3-4 cents or more on less-liquid stocks. That could be a 3 or 4+ standard deviation event skewed to the “profit” side of profit & loss (P&L) for a High Frequency Trader. They make their money on spreads repeatedly throughout the day. I know HFT traders said that tell me they make their money for the year on highly-volatile days. So, many successive volatile days for them means many magnums of Cristal. They want volatility to explode and spreads to blow out. They wait for such highly volatile days.

I should mention that HFT firms have algorithms that parse words in headlines for sentiment and they pay for order flow information. Negative sentiment

coupled with observed weak buying = payday potential. Selling becomes aggressive and eventually pushes through technical sell levels for those ETF model managers. When that happens, watch out!

What does that mean?

In the old days, when I worked on a bank (dealer) trade desk, a client would call me and say – “J - I need a bid on \$250 million of XYZ US midcap equity ETF.” I’d call my trader and get a bid which was based on where s/he could buy from my seller and comfortably hedge by selling the stock components or an approximation- like futures. Fast markets meant spreads widened as risk increased for my trader. Bids went lower to try and maximize a reasonable spread (reward for taking risk). The real idea was try not to lose money.

Inevitably, this human process was replaced by machines running algorithms (algos) as automated-market-makers. They too pay for order flow to see if there are more buyers or sellers. They base their market-making with some input for volatility and buy/sell orderbook pressure. When volatility explodes, bid/offer spreads reflect that. Once they are long from an equity ETF from a model manager sell signal, they too must hedge. They employ algo-based sell programs for components of the correlated ETF. They **must** sell stocks.

Eventually, prices bottom and freak everyone out. Wide-spread optimism morphs into downright pessimism and despair in a few weeks.

Complicating matters, human traders became old-school. The new masters-of-the-universe are quant-finance math PhD’s who program increasingly efficient algorithms which trade on their own. Free from human emotion, machines plumbed the markets hoovering up profits when conditions were favorable and reducing risk when they weren’t. This scenario was a storm cloud on the horizon often thought about, less-often talked about, and hardly ever acted upon.

As 2018 began, we got our first inklings of what *could* happen. January/February’s correction looks cute compared to December’s swoon, but felt colossal at the time. The sudden drop was a ride on a mad-scientist-designed-roller-coaster. When the dust settled, inverse ETFs bore the blame for the market mess, and bore the shame of blowups. Some funds lost 90% or more of their value in a few days and triggered forced liquidations.¹

But “game-on” came again once the bodies were carried away and the blood was mopped up. We rallied to new highs within months. “Buy the dip” chanted the winners, which was undeniably profitable for years. Only as time wore on, ETFs took up more space, and the overall market traffic flow was being driven more and more by computers.

1 <https://www.fool.com/investing/etf/2018/03/05/the-newest-danger-for-volatility-etfs.aspx>

As the summer brought new highs, FAs heard whispers of growth slowdown. Using a friend as an example: A fellow bull, he would rejoice with me in touting strong economic numbers. Yet we began to diverge as he heard panel speakers wax on about brewing “recessionary forces.” This caused anxiety even though that vision is lean on supporting metrics. Multiply my friend times the many thousands of advisors in the many thousands of branches across America, managing trillions of dollars. With the arrival of late August and early September, came a noticeable slowing of buying. As assets stopped flowing into ETFs, they too stopped flowing into stocks.

As stocks lost their underlying bid, that’s when algo-traders went to work. They thrive on volatility and blown-out spreads. With no bid for stocks, and no confidence left to “buy-the-dip”² the markets started to crack. When technical levels were depressed enough, ETF model-managers hit exit triggers and the dominos came cascading down. October was brutal for funds but when November offered very little relief, December brought liquidations. Record assets flew out of ETFs³, and stocks were sold as hedges by market-makers.

2018 was historically volatile, so what does it mean for the future? Markets have a way of becoming lopsided in terms of *how they trade*. In the roaring 1920s, stocks were speculative instruments that toppled with extreme valuations. Crashes thereafter were analogs to a degree. The 1990’s brought dot.coms with infinite p/e values that eventually imploded. Housing became unsustainable in the leveraged-debt calamity in ’08. All had crowded lopsided views in common.

Today’s main difference is that companies are making money, valuations are not particularly high, the U.S. is prospering, and the economy is expanding. But the price action doesn’t fit the narrative. Maybe a bomb in the system will reveal itself, but my data says this was an ETF technically driven eventuality. Fear of *potential* slowdown took the fire out of the eyes of buyers. The cat’s absence allowed the HFT mice to play and move markets around. Contrasting crashes of the past, the further down prices went, the less investors wanted to buy. Levels slipped below ETF model-manager comfort and the redemption deluge began, but there were only so many places to go.

ETFs remain big culprits in this market turmoil in my view. Model management is a fine concept. The problem comes when hundreds of billions of dollars are in model management and the rules say sell at the same time. *Everyone* must sell. Then dealers who are forced to buy ETFs from their clients are forced to

2 <https://finance.yahoo.com/news/etfs-major-supporter-u-stock-market-stop-buying-191714238--sector.html>

3 <https://www.reuters.com/article/us-investment-mutualfunds-lipper/us-stock-funds-set-for-record-monthly-withdrawals-lipper-idUSKCN1OJ2X7>

sell the constituent stocks as a hedge. When there is no one to buy-the-dip, look out below.

HOW I SEE THE WORLD: UNUSUAL INSTITUTIONAL TRADING

I spent my career trading stocks and options for 14+ years at investment banks like Cantor Fitzgerald and Jefferies. I spent 12 years at the former, including seven years running US equity derivatives and then selling U.S. equity derivatives for the latter for two years. I have traded billions of shares worth hundreds of billions of dollars.

During that time, I handled an immense order that changed the way I see the market forever. After nearly a month of a standing order to buy millions of shares of the same stock, I had helped an activist hedge fund manager acquire a roughly 15% stake in a company. The stock rose nearly 70% in 20 trading days despite terrible fundamentals. It was a major “aha” moment in realizing that unusual institutional trading activity can drive markets.

I wanted to look at this type of unusual trading data every day: if I could know when big players were moving in and out of positions, it might bring an edge. But this data wasn’t available anywhere. So, I ran an algorithm to identify when likely unusual institutional trading was happening. I run my models every day to try and find out where the big money is moving. The model gives me “signals” of unusual buying and selling.

While there is more to it, the easiest way to think about an unusual buying or selling signal is when a stock trades above or below a price range on above average volume and volatility.

Of about 5,500 stocks that I look at daily, only about 1,400 can be traded by institutions without major impact on price. Out of those, I’ll usually get about 100 signals: roughly 61 unusual buys and 46 unusual sells on average. I take note when there is a deviation from this usual count. I sit up and pay close attention when there is a deviation for a sustained period, as you’ll see later.

I’ll show you some unique data in this paper as it shows how unusual institutional trading of stocks can hint at future market conditions. It will also show that ETFs have grown to impact overall stock trading and sometimes completely dictate action.

In short, understanding how unusual institutional trading affects markets will help explain how ETFs rule the roost now.

To begin, we must look at the evolution of stock trading. I’ll spare you the mainstream history of the markets. Instead I’ll focus on the data I collect,

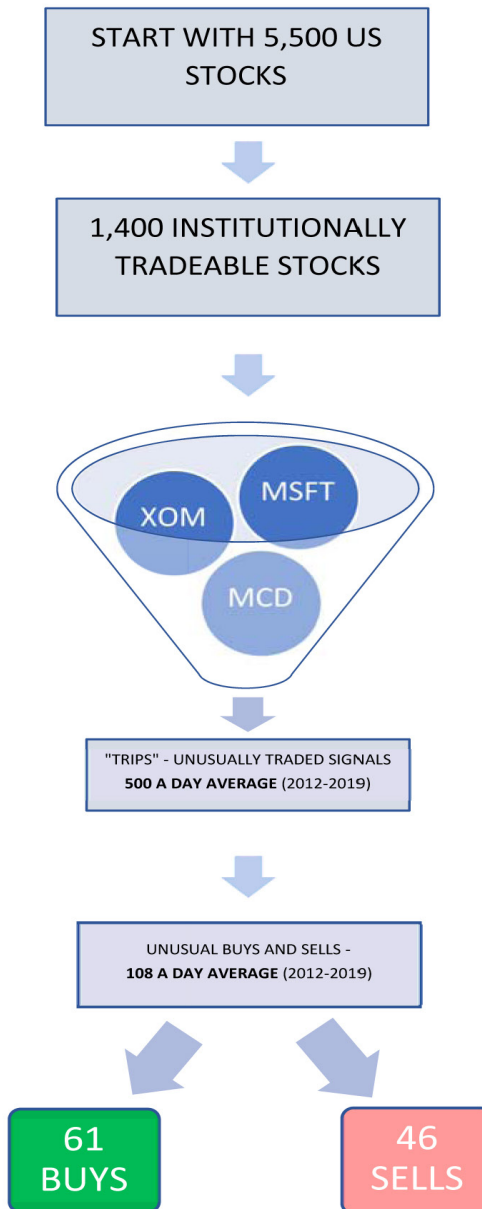
offering you a different view. To boil my entire career of analysis down to five words: I care about unusual trading. That's really the gist of all my algorithms, big data, huge spreadsheets, and database queries of all this stuff I collect.

I care about unusual trading.

So, let's look at stocks over the past 30 years to get a context of their trading history. When we look for unusual trading activity, we must establish a normal baseline for comparison. Every day, an algorithm in my model looks for stocks that trade above their average volume and volatility. I use several time periods and metrics woven together, but what I come up with every day are several stocks that trade in an unusual way. I call them "trips" because they "trip my model." From there, I look for unusual buying or selling: a violation of price ranges high or low over various periods of time on these unusually traded stocks.

The process looks like this funnel on the following page.

The process looks like this funnel:



(Navellier & Associates owns AAPL in managed accounts and in our sub-advised mutual fund but does not own XOM, MSFT or MCD. Jason Bodner does not own AAPL, XOM, MSFT or MCD in a personal account.)

So, what does this mean? Out of 5,500 possible stocks each day, only 1,400 can absorb big institutional orders without major impact. Out of those 1,400, 500 stocks look to be trading in an unusual way each day- *on above average volume and volatility*. So, on any given day, we can expect 9% of all 5,500 stocks (36% of 1,400 institutionally tradeable stocks) to act weird. And by “act weird,” I mean I suspect there is some institutional sized trading going on.

To boil it down further, it's rare! Less than 2% of all stocks are unusual buys or sells. In fact, the average for the last five years says 1% of all stocks every day are bought in an unusual way, and less than 1% are sold in an unusual way. Looking at these unusual buys and sells is how I try to identify the strongest and weakest stocks being traded by institutions.

Now it's important to know that the average number of "trips" (unusually traded signals) each day has been climbing steadily for the past 30 years. It makes sense as more stocks have appeared, and more volume trades each successive year as things get more automated. Day-trading, computerized trading, and big hedge funds are all increasing the activity of overall stock volumes each year. But as you'll soon find out, that all might pale in comparison to the effect of ETFs.

As mentioned above, the current average number of daily trips (unusually traded signals) is ~500. The 29-year daily average is 235, but in recent years, the average is much higher. In fact, the last 14 years averaged more than 4x the unusual trading activity of the prior 15 years- **important as this coincides with the rise of the popularity of ETFs**. To show you how skewed the number of unusually traded stocks are towards recent events, look at this table:

AVERAGE DAILY RETURNS-US STOCKS			
PERIOD	TRIPS	BUYS	SELLS
1990-2005	95	29	17
2005-2019	429	63	49

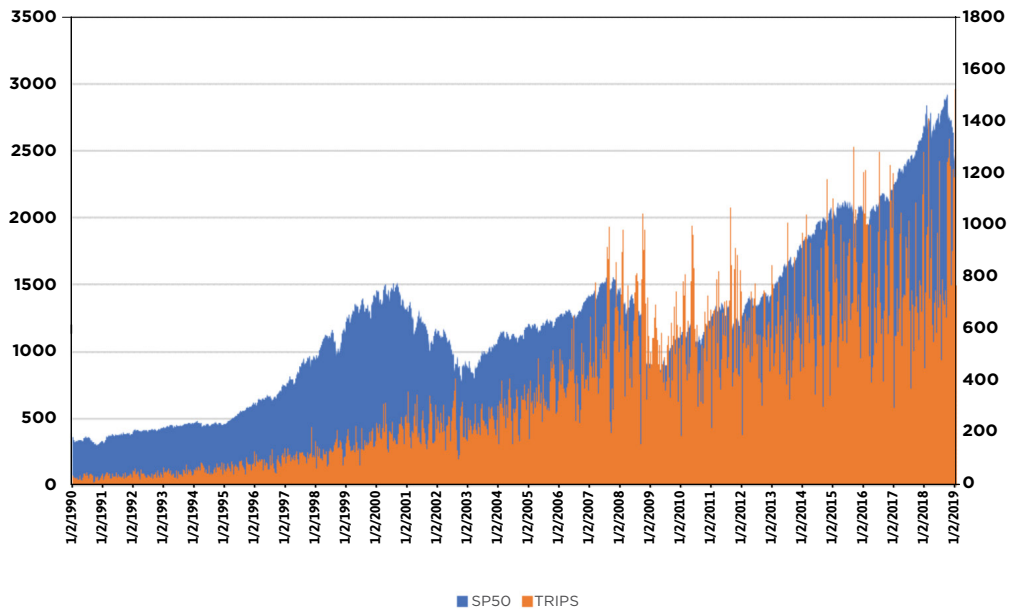
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That trend is continuing. In fact, the last five-years show us an average of 500 unusual trading signals per day is the norm (That means that roughly 35% of institutionally tradable stocks trade on larger than average volume).

Next is a 29-year chart of the S&P 500 price overlaid with the number of unusually traded signals each day. You can see unusual trading activity is growing steadily. What could be responsible for such a sustained rise? Notice how things started picking up in the late 90's and 2000's:

4 Mapsignals.com

S&P 500 VS. TRIPS



5

Below is another 29-year chart of the S&P 500 in which days of trips (unusual trading signals) were twice the daily average or more noted in red. What you will notice, is that extreme selling days typically yield a lot of trips and are occurring more frequently in recent years. This is logical, but here's the eye-popper: **Extreme trips and lows tend to also coincide with big ETF signal days**, which you'll soon see.

S&P 500 - TRIPS > 2X AVERAGE



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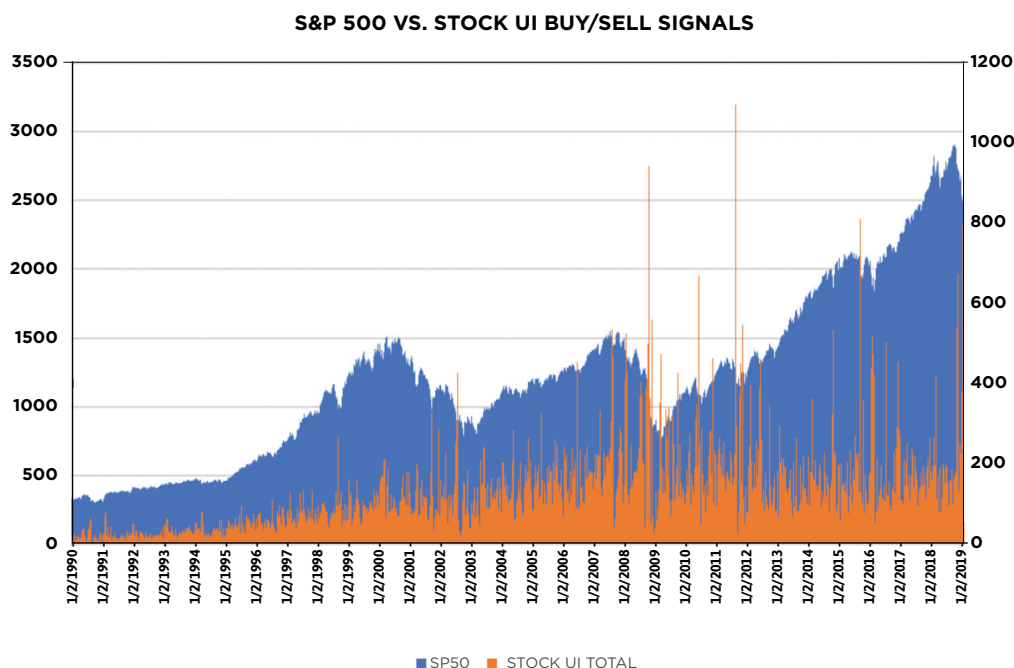
5 Mapsignals.com

6 Mapsignals.com

Trips are important, because they can indicate when massive trading is happening either up or down in tandem. For instance, during the extreme selling in October and December of 2018, we found many days where 1,200 out of 1,400 institutionally tradeable stocks - or 85% per day had exceeded unusual volume characteristics. We even had several days where 100% or more of our 1,400 institutionally tradeable universe tripped my abnormal volume and volatility ranges. That meant that 100% of my institutionally tradeable universe was getting sold hard. This is where I think ETFs come into play...

Don't confuse trips with actual buy and sell signals I talked about. Trips just mean a stock is trading unusually- to get a buy or sell signal it must also break above or below a recent technical high or low. So, what are trips telling us?

Remember the funnel diagram? The chart of trips tells us how many stocks were traded unusually (just below the funnel). Next come the unusual buy and sell signals. Now, these also increased over the years but less defined than trips. Those big spikes interest me, as you will find they line up with big ETF activity. More later, but for now know that with the passage of time, more unusual trading happened giving rise to more unusual buy and sell signals:



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Here's an example of why they matter: December 2018 was abysmal. On 12/23/2018, I had posted this table in an article:

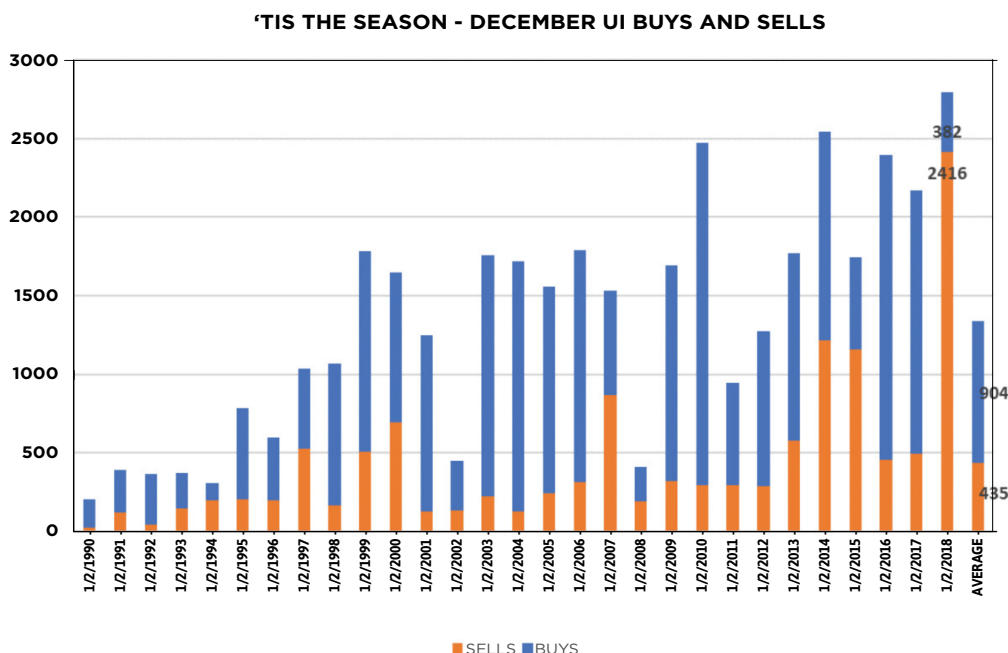
7 Mapsignals

1-week, MTD, and YTD performance for the major indices were as follows:

INDEX	1 WEEK	MTD	YTD
DJIA	-6.9%	-12.1%	-9.2%
SP 500	-7.1%	-12.5%	-9.6%
NASDAQ COMP	-8.4%	-13.6%	-8.3%
RUSSELL 2000	-8.4%	-15.7%	-15.9%

8

Just so you can understand how powerful unusual selling signals can be, below is a chart of all prior Decembers since 1990. During the worst December in decades, you see an unprecedented amount of unusual sell signals this past December 2018- more than 5x the 29-year average!



9

As you will see, this coincides with record ETF outflows in December. On December 14th, *only halfway through the month and before lows were established*, Lipper estimated that week to be the largest outflow week since they started tracking¹⁰. **Your main takeaway here is that from the '90's stock trading increased. So did unusually large volume trading. I believe the rise of popularity of ETFs really helped amplify unusual trading of stocks and caused market dislocations.**

8 Factset

9 Mapsignals

10 <https://www.marketwatch.com/story/investors-flee-us-stock-funds-at-record-pace-lipper-2018-12-14>

RISE OF ETFS

The stock market used to just be the stock market. In the early 1990s, stock trading was relatively unchanged since the go-go 20's when it caught the attention of the world. Along the way there were improvements, but trades happened by calling brokers who wrote paper tickets which were collected, shuttled and so forth on down the line to the exchange floor where hand signals and loud shouting by the tallest brokers ruled the world. But with the widespread adoption of computers from the late 80's through the end of the 90's the landscape shifted immensely. Stocks used to trade in fractions of a dollar and commissions used to be sky-high. But when computers came to town, pricing went to pennies and commissions came crashing to earth. An entire industry of brokerage was left feeling like the end had come. If they only knew then that commissions would eventually become fractions of a penny!

The late 90's then brought day-traders. Volumes started surging intra-day. More and more stocks were being traded more and more frequently. This market was still ruled by stocks, but computers were just starting to gobble up the trading of stocks. Brokers now had computers and order management systems.

Mutual funds were still popular in the 80's, but in the early nineties an alternative idea showed up. Enter the first ETF: State Street Global Investors released the S&P 500 Trust ETF ¹¹(called the SPDR or "spider" for short) on January 22, 1993. It offered a simple, accessible way to trade the S&P 500 index. By buying ETF shares that track the index, investors didn't need to worry about index futures contracts or messily trying to recreate a basket of 500 stocks. It was a wonderful passive investing option to track an index with no fees. ETFs sound too good to be true, but according to some, they have their flaws¹². Despite the perception of no fees, ETFs can trade at steep premiums and discounts to NAV, can fail to accurately track their benchmark¹³, are subject to some wicked volatility, and leveraged ETFs have taken out the market already once in the past twelve months. In February 2018, where some inverse leveraged volatility ETFs and ETNs, dubbed exchange traded products (ETPs) registered 80-90% declines in a single after-hours session¹⁴.

This is a good place to explain the difference between an ETF and an ETN. An exchange traded product (ETP) is an umbrella term for exchange traded funds (ETFs) and exchange traded notes (ETNs). While ETNs and ETFs may look similar in the way that they are passive investing products that track indexes

11 <https://www.investopedia.com/terms/s/spiders.asp>

12 https://www.investopedia.com/articles/mutualfund/07/etf_downside.asp

13 <https://blogs.cfainstitute.org/investor/2018/01/18/how-to-see-the-hidden-risks-of-etfs/>

14 <https://www.cnbc.com/2018/02/06/the-obscure-volatility-security-thats-become-the-focus-of-this-sell-off-is-halted-after-an-80-percent-plunge.html>

and provide intraday liquidity to investors, they are fundamentally different. An exchange traded note is a liability of the issuer and is technically debt that is designed to track an index. It is much more of a black box than an exchange-traded fund, which is technically a trust full of assets, whether they are stocks, bonds or even derivatives like futures contracts.

In many cases, ETNs tend to use more derivatives to make what is, in essence, unsecured debt track their index of choice, while ETFs may or may not use derivatives, like futures. To make matters worse, there are leveraged ETPs where the tracking error and bid-ask spread issues tend to be magnified simply due to the leverage factor. The need for ETNs arises from the desire of the issuer to corner the arbitrage market (as there is typically one arbitrageur in the face of the issuer) and as such make more money that way, where with ETFs there are multiple arbitrageurs and therefore the ability to profit from discrepancies between the NAV and the market price of the ETF is typically smaller.

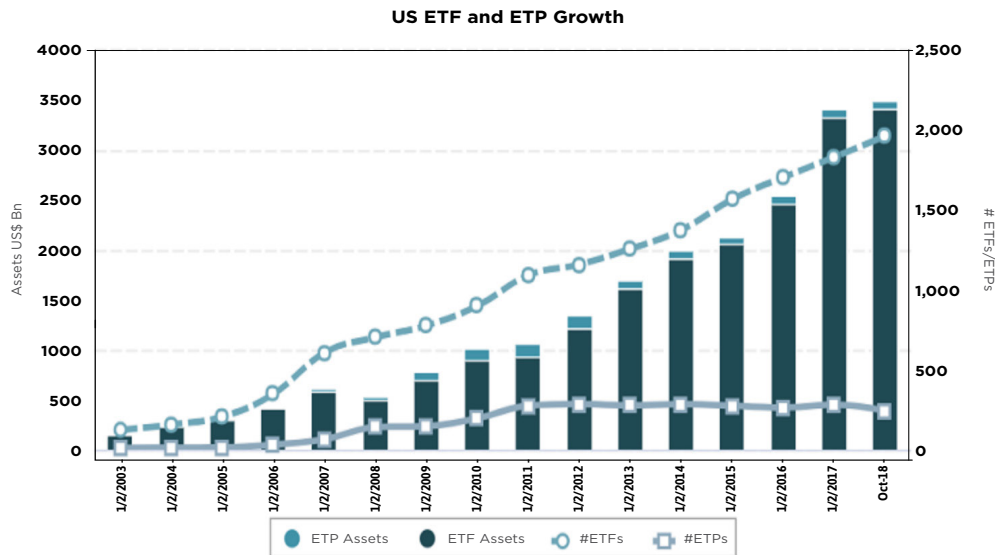
While I think it is highly unlikely for policy makers to let another systemically important firm like Lehman Brothers fail its bankruptcy does illustrate the fundamental flaws of ETNs (read: unsecured debt). All of Lehman's ETNs went to zero as there was no buyer to be found for its ETN business in the middle of the 2008 Wall Street crash¹⁵.

From that one single SPY ETF sprouted a monstrous industry. 2003 marked the first year where ETF net inflows exceeded those of mutual funds. According the ETFDB.com there are currently 2,241 listed ETFs. That's astonishing. Some think there are just too many and some are too niche¹⁶. Regardless, numbers are growing.

I am willing to bet, a great number of people's 401k's have some exposure to ETFs. When the average American employee logs into his or her retirement account, the pull-down investment election menu is almost certainly littered with ETFs- NOT single stocks. The ETF doomsday clock was set in motion long ago as assets kept flowing in. ETFs were the perfect vehicle to eventually take over the popularity of stocks and mutual funds.

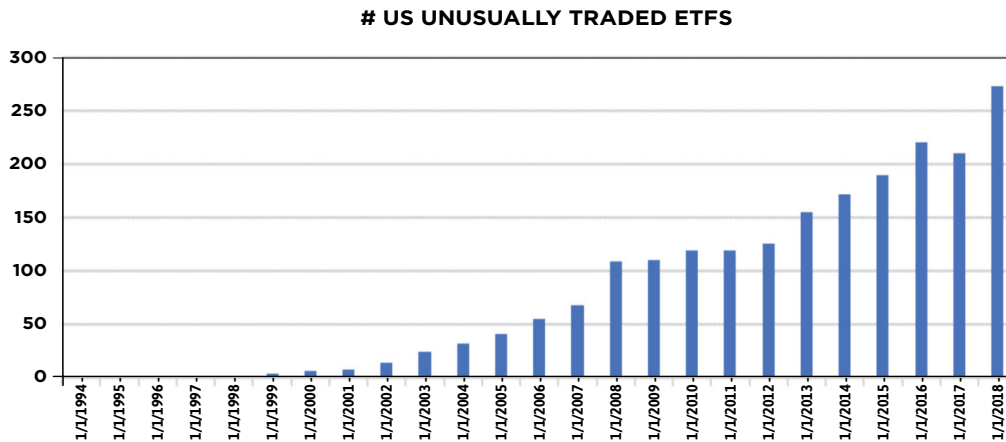
15 <https://www.etf.com/sections/features-and-news/lehman-bros-etn-fallout?nopaging=1>

16 <https://www.fool.com/investing/etf/2018/01/08/are-there-too-many-etfs-paid-post.aspx>



17

As the number of ETFs and the assets in them swelled, the number of ETFs making unusual trading signals climbed as well. This next chart shows that out of all available ETFs at the time - how many ETF tickers had at least one signal each year. For example, in 2008, 109 ETF tickers made an unusual trading signal at least once during the year out of the slightly more than 1,000 available at the time from the chart above, or about 11%. There is also a monster-sized ETF graveyard (those that never get big assets).

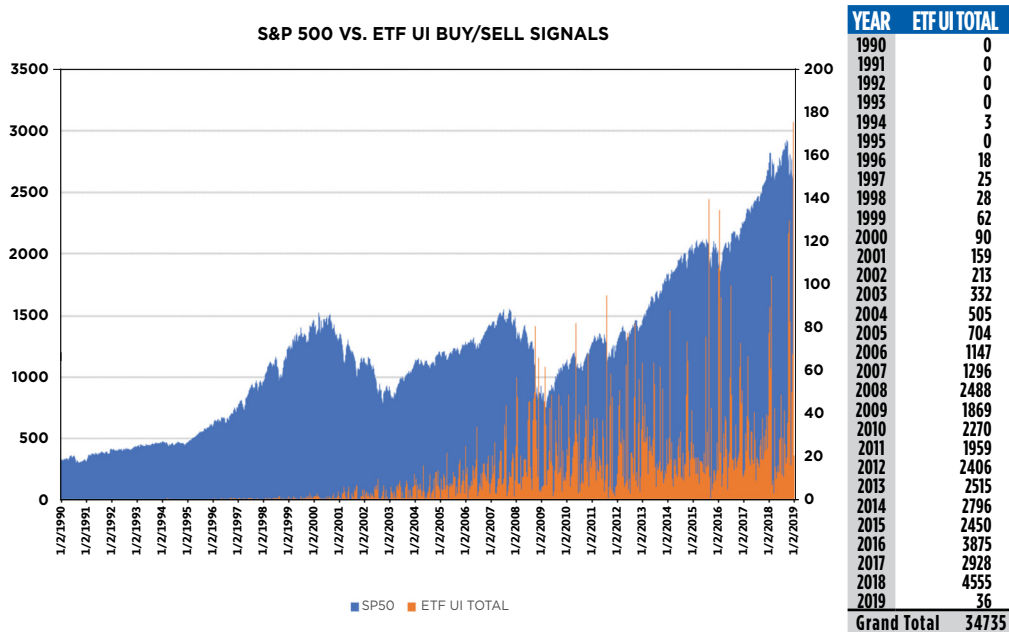


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17 etfdb.com

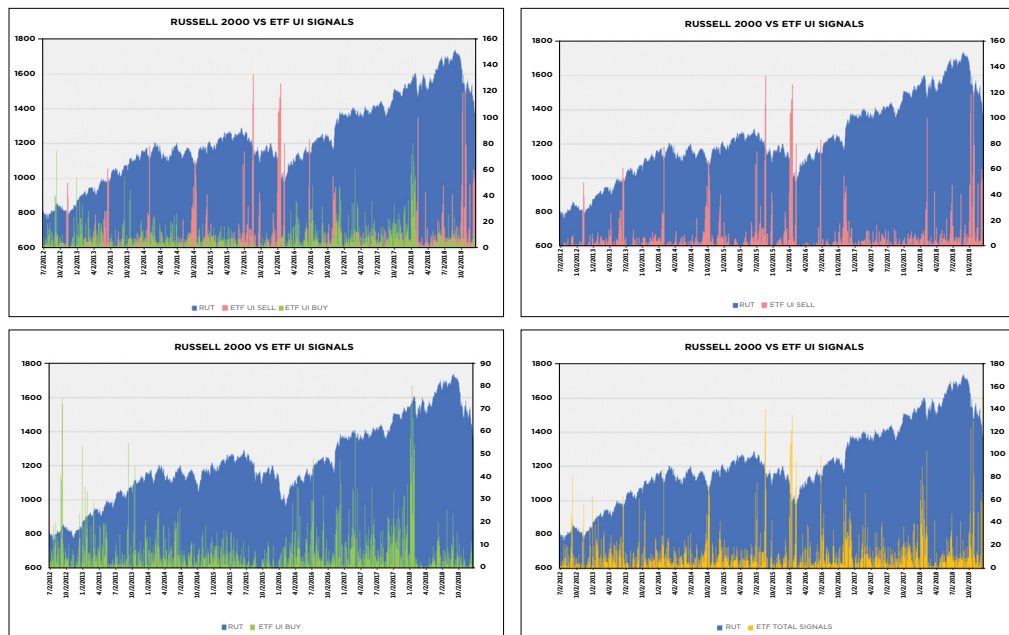
18 mapsignals.com

Next up, we see a 29-year S&P 500 chart displayed with the daily total of unusual ETF buy and sell signals. Again, notice the growth over the years. Note that the spikes tend to coincide with dips in the market- more on this later. The table on the right shows you the total number of unusual ETF signals each year. Again, observe the clear uptrends:



19

Let's look at the correlation of big ETF signals and market valleys in the last 5-years during which I believe ETFs took control and started causing major market dislocations. For this study, I compared to the Russell 2000 Index. One thing should jump off the page. Unusual ETF sell signals spike at market lows. Buy signals correlate to peaks less, but the sells track the valleys notably.

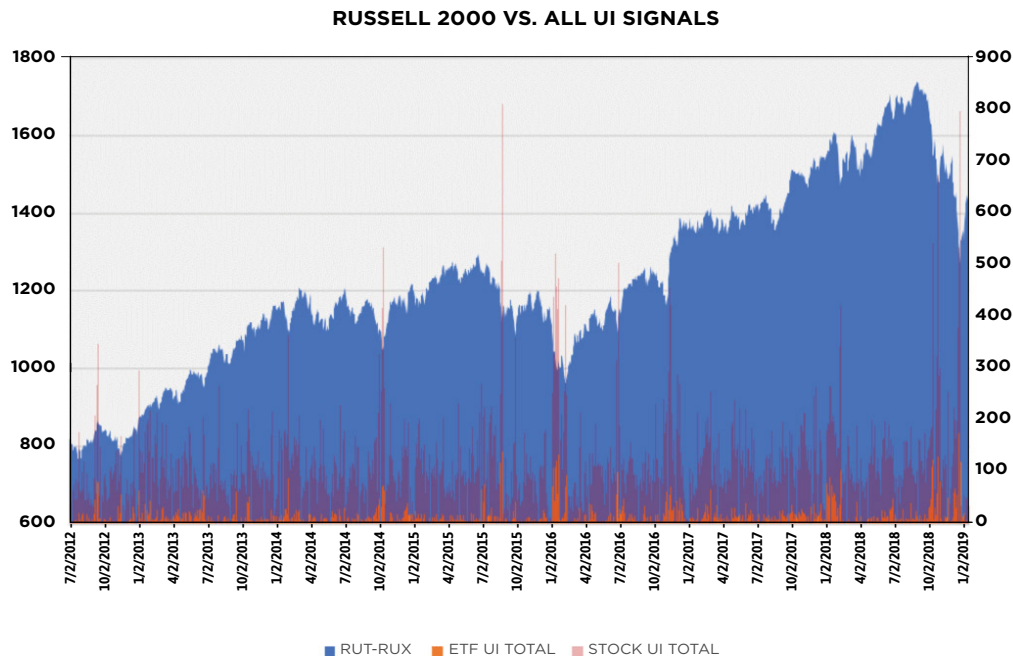


19 Mapsignals

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This suggests that when the market feels pain, unusually large ETF selling is a primary factor. Since 2012, in most instances in which markets move down sharply, unusual ETF selling spikes. This is crucial because the next chart overlays the same unusual ETF selling with unusual stock selling. The picture should snap into focus now. **When unusual ETF selling spikes at market valleys, unusual stock selling skyrockets.**



20

But how do ETFs cause the stock selling?

Now we know unusual stock and ETF trading has been on the rise for decades. But how might the rise of the popularity of ETFs have impacted the market?

The normal idea is when a single stock's volatility impacts an ETF, like when the SPDR Communications Services sector ETF dropped 3.8% in one day due to its heavy concentration of Facebook ²¹(FB), which reported poor earnings. But think about this: *One stock can be present in many ETFs*. For example, according to ETF.com, FB is present in 188 ETFs totaling nearly 200 million shares as of this writing²²! A redemption of even a few ETFs on the same day could cause major stock disruption. Imagine hundreds of ETFs on the same day getting sold in huge volume, as seen by the orange spikes above. This data suggests it amplifies volatility in a big way. Now, when markets are down and

²⁰ Mapsignals.com

²¹ <https://www.bloomberg.com/news/articles/2018-07-26/here-s-how-etfs-with-biggest-face-book-exposure-traded-today>

²² <https://www.etf.com/stock/FB>

uncertainty is high, ETF spreads tend to blow-out. Add that phenomenon – and it further widens already agitated stock bid/offer spreads on ugly days.

It all starts falling into place. **I postulate that ETFs are now the tail that wags the dog. That is, ETFs through massive asset gathering and allocation became the drivers of market direction – especially under periods of uncertainty and risk-off.** This lends even more weight to my notion that the second half of 2018's selloff began with uncertainty over rates, trade, and global growth-slowdown. This took buying pressure out which invited HFT to profit off thin liquidity and high volatility. The pressure of those conditions eventually led to ETF model managers hitting sell-stops. Forced selling of hundreds of ETFs caused a massive dislocation in the market over thousands of stocks.

Now, I'm not the first to cry foul on ETFs²³, but it's clear to me, that ETF passive management (tracking a benchmark), by gobbling up retail assets for decades, has reached a major tipping point. When Financial Advisors who spent a decade-and-a-half gathering assets and pushing them into passive management vehicles (ETFs) heard their model-managers say to hit the sell button, the FAs all rushed for the exits at the same time. That pressure caused forced institutional selling elsewhere. This inevitably spread to mom and pop. It was a "Backdraft" event in which buying liquidity got sucked out of the market. The explosive force of HFT shorting and low liquidity amplified into forced selling which became a horrifically toxic end-of-year for the market and most portfolio managers everywhere.

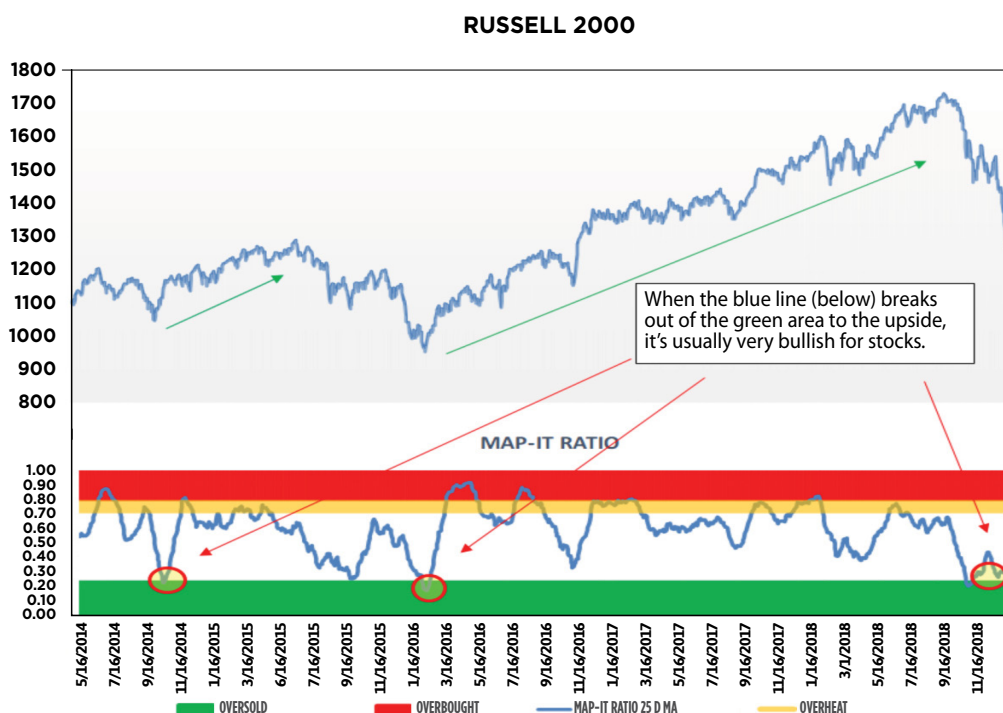
This is what happened this past fall. I feel that ETFs were the culprits. ETFs move stocks now, not vice-versa. I'll say it again clearly here: ***I believe 2018's horrendous finish was caused by fear vaporizing buying and as soon as it got too uncomfortable for retail managers, ETFs caused the monstrous cascade of selling.***

Life After ETF Cyclones

If we now know extreme ETF selling disrupts the entire stock market, what can we glean from that to project future market returns when it happens?

First let's look at when the ratio of unusual selling to buying tilts heavily towards selling:

²³ <https://www.marketwatch.com/story/fears-grow-that-popularity-of-etfs-is-a-ticking-time-bomb-2017-11-16>



24

The chart above plots the MAP-IT ratio vs. the Russell 2000 Index. For a quick recap: it calculates a 25-day moving-average ratio of unusual buy signals over unusual sell signals in US stocks. A ratio above 50% suggests buyers are in control. The average ratio is 63% over sixteen hundred+ trading days (since July 2012).

This makes sense if you think about it... an average signal count skewed above 50 jives with an up-trending market which we've certainly seen since I started collecting data in July 2012. Just look at IWM – the Russell 2000 ETF, up approximately +90% during that time. More buying than selling on individual stocks means upward pressure: we expect higher market prices.

When the ratio heads negative, we would expect lower market prices, at least short-term (see chart above). As you can see, when the ratio plummets below 25%, it suggests a deeply oversold market. We tend to see strong positive returns afterwards:

Russell 2000 forward weekly returns after oversold MAP-IT Ratio since 2012

OVERSOLD DAY	DATE	MAP-IT RATIO	YEAR	1W	2W	3W	4W	5W	6W	7W	8W
1 Wednesday	10/15/2014	24.2%	2014	2.3%	6.9%	8.8%	10.6%	7.9%	11.0%	9.4%	8.8%
2 Thursday	9/24/2015	24.6%	2015	-3.5%	2.3%	2.2%	1.5%	2.5%	4.7%	1.5%	2.6%
3 Tuesday	2/2/2016	23.5%	2016	-4.5%	0.2%	1.3%	5.6%	6.3%	6.5%	6.6%	10.4%
4 Friday	10/26/2018	24.7%	2018	4.4%	4.5%	3.0%	0.3%	3.5%	-2.4%	-4.7%	-12.7%
5 Monday	12/24/2018	25.0%	2018	6.4%	11.8%	12.2%	12.1%	?	?	?	?

25

Takeaway: When the market tanks, unusual ETF selling spikes. I believe this causes an even larger spike in unusual stock selling (not vice-versa). And notice that those extreme sell periods often coincide with an oversold market (25%) which pops shortly thereafter?

But what happens when sellers take the wheel for a long time? Below is a table of the 17 periods, including currently (January 2019), when the MAP-IT ratio stayed below 50% for 40 or more trading days since 1990. The performance table below calculates the forward returns of the Russell 2000 once the ratio breaks above 50% after a prolonged period of selling (the point when buying becomes greater than selling). Draw your attention to the **bold** entries. For instance, the longest consecutive-day period of a ratio below 50%, was 128 days: June 24th to December 30th of 2008 with the highest total number of unusual sells in stocks, unsurprisingly so - given the state of the '08 market. The highest average daily unusual sell count, more surprisingly, came from December 10th, 2015 to February 29th, 2016. It was a relatively short period of 53 days with a ton of sell signals.

STARTDATE	ENDDATE	DURATION	UI	LIBUY	UI	USELL	1 MO	2 MO	3 MO	4 MO	5 MO	6 MO	7 MO	8 MO	9 MO	10 MO	11 MO	12 MO
		TODAYS	BMS	AVG	SELS	AVG												
8/7/1990	11/13/1990	70	153	2	-550	-8	2.0%	-2.5%	13.7%	16.6%	18.7%	16.0%	19.3%	18.7%	21.7%	19.7%	20.6%	24.0%
3/11/1994	5/25/1994	44	295	7	-765	-17	-3.1%	-0.8%	3.7%	0.8%	1.2%	-1.0%	0.6%	2.5%	6.8%	9.6%	12.2%	15.7%
8/4/1998	10/22/1998	57	752	13	-2716	-48	11.0%	14.7%	14.4%	18.7%	17.9%	26.7%	24.2%	24.5%	26.7%	27.0%	19.6%	21.6%
8/10/1999	11/1/1999	55	1690	31	-2037	-37	4.5%	9.0%	4.6%	2.5%	11.2%	7.3%	9.6%	7.9%	6.7%	12.8%	6.6%	5.5%
7/10/2001	10/26/2001	74	1540	21	-4200	-57	4.1%	4.8%	2.6%	0.5%	3.6%	-2.6%	-1.9%	-10.3%	-22.8%	-15.4%	-25.1%	-18.7%
6/5/2002	10/29/2002	103	1122	11	-6577	-64	5.1%	-1.3%	-5.2%	-5.6%	-3.1%	2.9%	8.2%	9.4%	10.9%	13.2%	11.8%	17.7%
2/3/2003	4/1/2003	41	740	19	-1794	-44	5.6%	9.8%	12.8%	11.3%	16.0%	15.8%	19.3%	21.1%	25.8%	28.9%	30.4%	28.5%
5/24/2006	8/17/2006	60	1984	33	-4423	-74	1.4%	4.9%	7.6%	9.2%	9.5%	11.8%	6.5%	13.1%	16.9%	17.6%	18.7%	11.0%
11/15/2007	4/8/2008	98	3600	37	-9538	-97	2.5%	0.5%	-8.1%	-4.3%	-9.6%	-32.8%	-31.3%	-34.4%	-34.3%	-35.8%	-50.1%	-39.1%
6/24/2008	12/30/2008	128	2657	22	-16483	-129	-6.6%	-18.6%	-11.7%	-3.4%	1.8%	1.8%	9.3%	13.0%	17.0%	14.7%	21.3%	24.7%
5/24/2010	7/30/2010	48	1064	22	-3101	-65	-4.7%	3.6%	7.4%	7.2%	14.2%	16.8%	20.5%	20.4%	23.8%	22.1%	19.9%	17.3%
8/3/2011	10/21/2011	54	800	15	-5683	-105	-4.1%	1.3%	6.2%	9.6%	12.5%	11.3%	6.3%	7.8%	10.0%	14.2%	17.9%	15.7%
5/7/2012	7/5/2012	42	1250	30	-3992	-95	2.9%	5.7%	7.8%	5.4%	4.4%	8.3%	11.6%	13.8%	14.7%	19.4%	19.8%	20.5%
7/1/2015	10/27/2015	83	2963	36	-8676	-105	0.0%	-1.6%	-9.4%	-5.8%	-2.5%	-0.7%	0.4%	-2.6%	3.8%	3.8%	3.9%	2.0%
12/10/2015	2/29/2016	53	1413	27	-8265	-156	4.8%	4.4%	6.1%	6.3%	9.7%	9.7%	9.6%	6.7%	10.8%	13.2%	15.2%	19.5%
2/27/2018	5/8/2018	45	1843	41	-2403	-53	3.0%	3.2%	5.8%	6.4%	6.8%	3.1%	-2.4%	-5.5%	?	?	?	?
10/5/2018	1/7/2019	62	1473	24	-8928	-144	?	?	?	?	?	?	?	?	?	?	?	?
AVERAGE							1.7%	2.3%	3.6%	4.7%	7.0%	5.9%	6.9%	6.6%	9.2%	11.0%	9.5%	11.1%
% OF TIMES POSITIVE							68.8%	68.8%	75.0%	75.0%	81.3%	75.0%	81.3%	75.0%	81.3%	81.3%	81.3%	81.3%

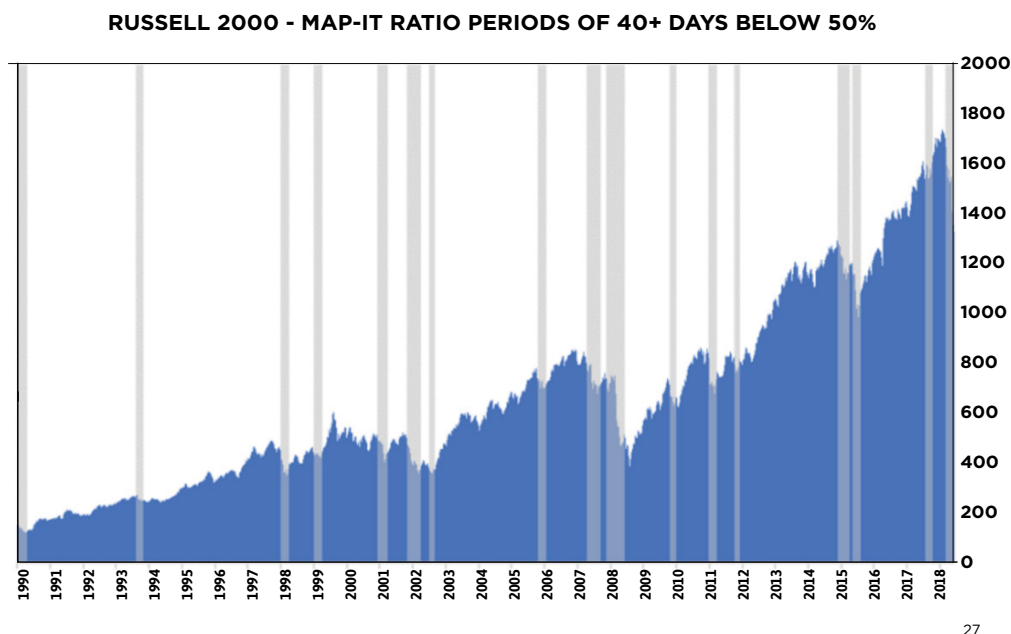
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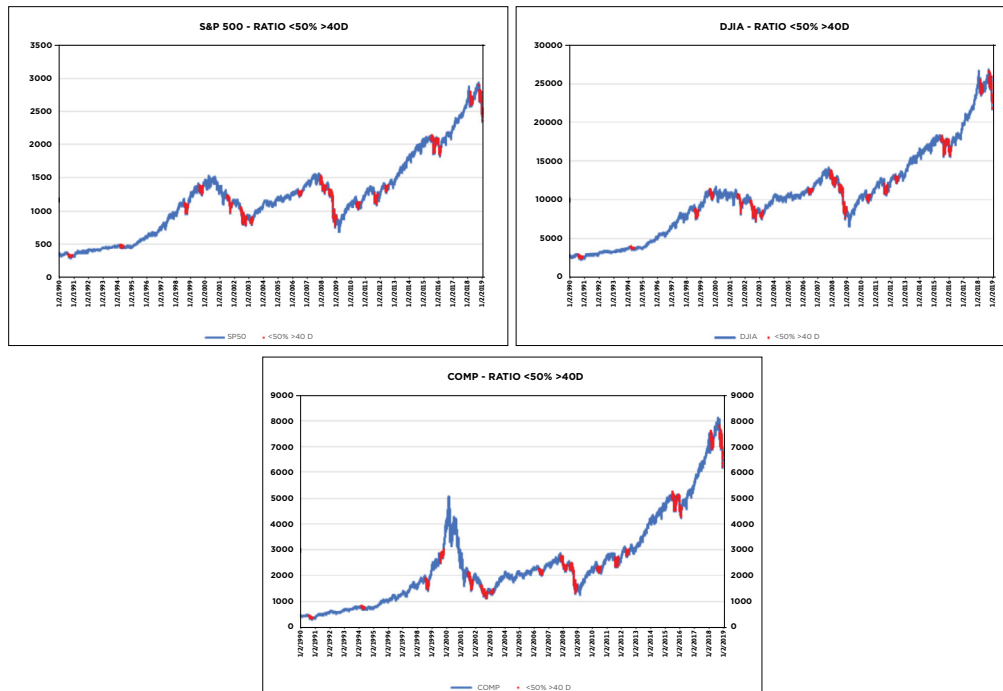
26 Mapsignals.com

The bottom line here is that no matter which way you look at the data, it bodes well for forward returns once our ratio crosses back above 50% after a sustained depressed stretch. All periods from 1-12 months out have a very high likelihood of positive return for the Russell 2000. Significant double-digit returns kick-in from 4 months onward.

This table supports the hunch that ETFs are the “tail that wags the dog,” when you also look back at the unusual ETF signals chart on page 16. We know that ETFs have an ever-growing effect on the market movements. The chart below plots the periods of prolonged ratio below 50% in gray bars vs. the Russell 2000 Index:



Below shows the same 16 periods overlaid via the S&P 500, DJIA, & NASDAQ Composite indexes. The red plots denote prolonged times of a ratio below 50%:



28

If we look at the days returning the largest ETF signals and isolate days of at least 100 unusual stock sells, we see very strong forward performance. Why? Well, we believe that the most liquid ETFs can reach maximum capacity when it comes to selling (a risk-off environment). That means, there are only so many liquid ETFs available to trade when people rush for the exits. And because 1 stock can be in 100+ ETFs, when model-managers all say “sell” at the same time, it’s like forcing a watermelon through a keyhole- there’s simply nowhere to go. Stocks must absorb all this selling pressure which breaks open the floodgates of volatility.

This next table looks at the days with the most ETF signals AND days with at least 100 UI sells in stocks. Notice the strong forward return profile:

DAY	DATE	1WEEK	2WEEK	3WEEK	4WEEK	ETFRATIO	ETFSTOCK
Thursday	6/20/2013	1.95%	3.16%	7.55%	9.32%	31.2%	23.8%
Monday	2/3/2014	2.20%	4.98%	7.23%	7.58%	24.2%	19.5%
Friday	10/10/2014	2.62%	6.04%	11.29%	11.43%	17.5%	14.9%
Monday	10/13/2014	4.24%	6.41%	11.54%	12.43%	13.9%	12.2%
Wednesday	10/15/2014	2.20%	6.85%	8.85%	10.60%	29.1%	22.6%
Monday	6/29/2015	-0.01%	1.44%	1.07%	-2.57%	24.8%	19.9%
Wednesday	7/8/2015	2.93%	2.43%	-0.04%	0.29%	33.6%	25.2%
Thursday	8/20/2015	-1.63%	-2.29%	-1.50%	0.82%	28.7%	22.3%
Friday	8/21/2015	0.51%	-1.88%	0.13%	0.60%	23.4%	18.9%
Monday	8/24/2015	4.22%	2.11%	3.72%	4.50%	17.2%	14.7%
Tuesday	8/25/2015	2.01%	5.25%	5.70%	3.71%	12.3%	11.0%
Wednesday	1/6/2016	-7.54%	-8.65%	-8.16%	-7.52%	28.5%	22.2%
Thursday	1/7/2016	3.69%	-6.36%	-5.66%	-4.61%	24.6%	19.7%
Friday	1/8/2016	-3.34%	-4.50%	-3.99%	-3.31%	25.5%	20.3%
Wednesday	1/13/2016	-1.20%	-0.67%	0.30%	-4.53%	21.3%	17.5%
Friday	1/15/2016	1.25%	2.84%	-2.08%	-3.53%	26.6%	21.0%
Wednesday	1/20/2016	0.53%	1.24%	-3.38%	1.26%	28.4%	22.1%
Monday	2/8/2016	0.17%	5.33%	8.83%	10.19%	17.0%	14.5%
Thursday	2/11/2016	5.44%	8.18%	13.64%	14.15%	37.8%	27.4%
Monday	6/27/2016	6.16%	9.29%	10.92%	11.21%	19.8%	16.5%
Wednesday	11/2/2016	6.04%	12.10%	15.64%	13.89%	28.6%	22.2%
Monday	11/14/2016	1.90%	2.46%	3.10%	5.96%	17.3%	14.8%
Thursday	2/8/2018	5.06%	4.51%	3.10%	7.55%	24.7%	19.8%
Wednesday	10/10/2018	0.89%	-6.78%	-4.17%	0.54%	25.3%	20.2%
Thursday	10/11/2018	0.93%	2.90%	-0.05%	2.23%	22.9%	18.6%
Wednesday	10/24/2018	2.80%	7.85%	2.40%	1.43%	19.3%	16.2%
Monday	10/29/2018	4.92%	2.97%	1.49%	2.14%	27.6%	21.6%
Monday	12/10/2018	-4.4%	-12.6%	-7.2%	-1.0%	33.7%	25.2%
Wednesday	12/19/2018	0.4%	0.4%	9.0%	7.4%	61.1%	37.9%

29

This table is a subset of the table above looking at the ETF to Stock ratio of below 20%. That means, that selling in ETFs reached max capacity and stock signals exploded. When this happens, it bodes especially well for forward returns. It's a flush out, and ETF liquidations, triggering huge stock selling, become like a forest wildfire: the destruction paves the way for new life.

DAY	DATE	1WEEK	2WEEK	3WEEK	4WEEK	ETFRATIO	ETFSTOCK
Monday	2/3/2014	2.20%	4.98%	7.23%	7.58%	24.2%	19.5%
Friday	10/10/2014	2.62%	6.04%	11.29%	11.43%	17.5%	14.9%
Monday	10/13/2014	4.24%	6.41%	11.54%	12.43%	13.9%	12.2%
Monday	6/29/2015	-0.01%	1.44%	1.07%	-2.57%	24.8%	19.9%
Friday	8/21/2015	0.51%	-1.88%	0.13%	0.60%	23.4%	18.9%
Monday	8/24/2015	4.22%	2.11%	3.72%	4.50%	17.2%	14.7%
Tuesday	8/25/2015	2.01%	5.25%	5.70%	3.71%	12.3%	11.0%
Thursday	1/7/2016	3.69%	-6.36%	-5.66%	-4.61%	24.6%	19.7%
Wednesday	1/13/2016	-1.20%	-0.67%	0.30%	-4.53%	21.3%	17.5%
Monday	2/8/2016	0.17%	5.33%	8.83%	10.19%	17.0%	14.5%
Monday	6/27/2016	6.16%	9.29%	10.92%	11.21%	19.8%	16.5%
Monday	11/14/2016	1.90%	2.46%	3.10%	5.96%	17.3%	14.8%
Thursday	2/8/2018	5.06%	4.51%	3.10%	7.55%	24.7%	19.8%
Thursday	10/11/2018	0.93%	2.90%	-0.05%	2.23%	22.9%	18.6%
Wednesday	10/24/2018	2.80%	7.85%	2.40%	1.43%	19.3%	16.2%

Bringing it home

So, there you have it. I gave you so much data that it risks being overwhelming, but here is the summary: Stocks became increasingly popular to trade the past three decades. As volumes increased, unusual trading activity became more apparent. Extreme readings coincided with index peaks and troughs. This simply indicated massive buying or selling.

In 1993, the first ETF arrived. From there, we fast-forward to 2019 with over 2,000 ETFs containing over \$5 trillion of assets. Just like unusual stock trading, I also monitored the same for ETFs. What we found was since the 2000's, ETFs followed a similar path to stocks: more signals and more unusual trading. The ETF trend was much faster, and a tipping point was reached. We believe that ETFs now control the markets. We provided many studies to illustrate this hypothesis. You saw how huge ETF selling coincided with mega-selling days in stocks. With only so many ETFs to jam thousands of stocks into, when ETF managers decide it's time to get out, they notify the FA community who all start to sell. This becomes like forcing a watermelon through a keyhole. It gets messy and fast.

Then we finally look at forward market returns after oversold conditions. The many studies show that when markets go heavily lopsided in favor of selling, positive prices are usually not far away. More importantly, we show how this type of action correlates to huge ETF selling. In fact, we show how ETF selling can amplify selling of stocks in the market, spiking volatility and sales of antacid.

The sharks of High Frequency have evolved into a terrifying wolf dressed in sheep's clothing. ETFs have mopped up massive assets, deployed into only a few hundred unusually traded ETFs. When everyone wants out, it causes serious problems. But the sharks don't care. They are now robot-sharks-with-laser-guidance-missile-systems on their heads. They just came to eat you for lunch, and they will come again.

Only now you know what to look for. You now have a hope of spotting mutated sharks circling. So, the next time the market suddenly slides and you're hanging on the words of CNBC offering up some story to keep you engaged, think of the market and its mechanics. Follow the money and you find ETFs

have soaked up 5 trillion bucks. You better believe that when there's even a slight repositioning, it's going to make some big wake. Wake can be fine and even fun. You just have to learn how to swim with sharks...



A Sharks Field Guide: A Summary of Three Previous White Papers on ETF Sharks

(Click to link for actual White Paper)

#1: Published Q3 2015: [ETFs: A SECOND-PART-OF-THE-CHESSBOARD PROBLEM](#)

We think ETFs have reached a tipping-point. The August 24, 2015 flash crash was caused by high-frequency trading (HFT) used in ETF market-making reminiscent of the Flash Crash in 2010. ETFs are great to gain exposure to a specific index, sector, or asset class. Leveraged HFT trading of ETFs could do more damage than good when things get bumpy. Despite being pitched as offering a window into market liquidity for close to NAV, some ETFs can be highly illiquid, with double-digit percentage discounts or premiums to NAV. Rapid growth caused ETF assets to top an estimated \$2 trillion as of 2015. 73% of global ETF assets at the end of 2014 were in the US. Markets are vulnerable to flash crashes as HFT is about 50% of trading volumes at any given time. This with leverage and HFT driven ETF arbitrage is increasing risk in US markets for major dislocations.

A paper published on July 26, 2015 by members of the Arison School of Business in Israel, Stanford University's business school, and UCLA's business school shows that ETFs' popularity increases some stock trading costs and leads to less analyst coverage. It also shows that some stocks lag in reaction to news and diversification to reduce risk is harder because of ETFs.

Fundamentals don't drive ETF pricing anymore, HFT and arbitrage do. ETFs affect the components. For example, when a major component of an ETF has a problem, the selling pressure in that ETF affects other stocks without that same problem. Deep discounts on ETFs were exposed on August 24th 2015. ETFs with billions of dollars in assets gapped down over 30%, while the underlying stocks did not fall anywhere near that much. Pricing stocks was difficult in that volatile moment, but investors were "picked off" by the specialists that make markets in ETFs.

Investors that think ETFs have no management fees must understand that ETFs can trade at substantial premiums or discounts to the underlying securities in the ETF. Investors should also know that ETFs are historically more expensive to trade than individual stocks, according to Arinson research.

#2: Published Q3 2016: SHARKS, HIGH FREQUENCY, & ETFS

ETFs can be more expensive to trade than stocks and don't always trade near their Net Asset Value (NAV). At any given moment, the basket of assets has a net asset value, and ETFs typically trade at either a premium or a discount to that NAV. This comes from the difference between an index value and the value of its underlying constituents. The concept of premium/discount drives much liquidity behind ETFs and the creation/redemption process. ETF execution is increasingly flawed due to wider premiums/discounts. This means that ETFs can indeed be more expensive to trade than stocks, with fees and slippage imbedded in the bid/offer spreads and the premium/ discount to NAV. These phenomena are at the heart of why trading ETFs can be more complicated than the simple broad-exposure instruments they are made out to be.

"Market Makers" stand to gain significantly if they can anticipate the direction of potential large order flows. Multi-billion-dollar ETF managers with predictable rebalances got picked off by Wall-Street market makers. The entire market could be moved by market makers exerting buy or sell pressure in anticipation of a large order. This was only the beginning of market distortions due to the ETF trading community.

Days of extreme market volatility (flash crashes) caused major discounts on liquid ETFs. At one point on August 24th 2015, 1000+ stocks were halted from trading, yet many ETFs with those same stocks as underlying constituents kept right on trading. Specialists stood to make a lot of money. Some ETFs that traded straight down at a deep discount to the last posted prices of their constituents' ETFs that normally exhibit very low volatility had immense intraday swings. DVY, the iShares Select Dividend ETF had a 35% intraday range.

A \$4.8 billion-dollar ETF asset manager halted their robo-trading without telling their clients. It caused a big flap but shows the increasing control of computerized trading. HFT firms increasingly control more and more volume of stocks and ETFs. If an extreme market move occurs and a tipping point is reached, excessive volatility rears its ugly head, and flash crashes can occur for precisely this reason.

Trading ETFs alone can invite sharks to the solitary trader. Using an informed manager can mean the difference between wading fearfully in the ocean or confidently swimming with sharks.

#3: Published Q1 2018: THE EVOLUTION AND MUTATION OF ETF SHARKS SINCE OCTOBER 2016

Problems began when ETFs rapidly went from obscure to the most liquid traded securities on the planet. That brought about a very fast commoditization schedule: competition went up, margins went down. The most liquid ETFs are staples. Unless there is severe market volatility, spreads are small. So, to earn meaningful profits making markets on spread, a participant needs to do huge volume, very reliably and quickly, and likely using leverage. Machines typically fit this profile.

In this report, I chat with three industry experts about the ETF marketplace:

Chat 1, Ben: An ETF's NAV isn't typically tradeable. Different ETFs calculate NAV differently. For instance, U.S. ETFs with international companies may have stale price data when those countries are closed for trading. Things get even more distorted the farther away you get, like in Asia or India. NAVs can also be different for different types of ETFs. Bond ETFs are calculated on the bid of the binds not mid-market. The liquidity of the underlying bonds also greatly impacts the NAV. You may wonder why DVY was trading when the stocks weren't ON August 24th, 2015. The answer is that exchange rules that apply to stocks don't necessarily apply to the ETFs. It's wrong to assume that the underlying basket is a better barometer for market value when liquidity can be a real factor. From 2008 to 2010, the ETF was a young product, with few block traders who enjoyed big spreads. More participants came as ETF popularity increased. Spreads came under pressure through competition. Technology then came doing everything faster, better, cheaper, and more efficiently. 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 seismic shift to passive management will give way to opportunity for actively managed ETFs.

Chat 2, Simon: The ETF industry is built around fees. A retail investor buying shares of a \$1,300 stock like Amazon is a problem. How do I get exposure? I buy an ETF that holds Amazon! It's a cheaper share price to get exposure. The rise of RIAs helped to popularize ETFs. They had the distribution, so issuers rushed to create new products for them. Automation rules ETF trading today. When volatility spikes, automated market makers will widen their bids and offers in order to make more money. ETFs with low assets can mean spreads can be very wide, making a very large impact on an investor's potential return. ETFs can be more liquid than their underlying stocks causing distortions of NAV. Automated traders help with periods of low volatility but amplify high volatility.

Chat 3, Louis Navellier: An ETF portfolio manager on a big platform is forced through wire house execution pipes. This means bad execution at times. Bad execution means a drag on performance. Most of the time algo traders are good for the market: liquidity is better, there are more products, and more participants. The bad news is that we haven't really seen a major stress test 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.

The market went into tailspin mode shortly after that 2018 paper was published. Inverse ETFs caused a market meltdown; no one knew why until the dust settled...

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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