Title: A Tale of Two Tickers: Cross-Comparing Volumetric Information-Volatility (VIV) to Glean Insights Into Liquidity and Volatility
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Grossly-Terse TL;DR \- This exciting period is exposing how liquidity in ETFs is tested through a bear-market. I did a comparison between ETFs and individual securities and found more ways to show just how exciting 2022 has been so far.

This is going to be another long one, folks, and there's no way around that. I'm sorry. I'm so, so very sorry... NOT! This stuff is cool!

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1 - Intro

Well well well, was last week a doozy or what! The market took another big leg down after JPow announced a 75-point rate hike at the latest FOMC meeting. This is probably because while this may seem like a pretty big change, it really is still nowhere near sufficient to catch up to, let alone get ahead of inflation. I think that this leg down was because the market realized that the Fed is admitting that there will be no "soft landing" and is now pricing in a mild recession as a near-certainty. While there are still talking heads out there calling bottoms for the market and peaks for inflation, it's all uninformed nonsense. **Every crash needs a fear-catalyst, and every bear-market needs a certainty-catalyst to bounce back**. We have seen no fear-catalyst yet, so it will likely be a slow-bleed. Unless there is a certainty-catalyst such as consecutive falling CPI prints for the right reasons, the bear-market will persist.

Alright, now that we got the doom and gloom out of the way, I wanted to go over a more in-depth analysis that I did in comparing the behavior of ETFs and securities between each other, as well as amongst themselves.

2 - Yucky Math

If math isn't your thing, then you can just skip this next section. BUT, if you're going to do this, just know that there are two indicators that I will be referring to: **the green one is VIV** (Volumetric Information Volatility), while **the blue one is the greek letter Upsilon or "U"**(Of course I fucking used **UP**silon!).

To better understand how ETF's are used as liquidity (and therefore volatility mitigation) tools in the secondary market, I created a new indicator, which is a function of the old indicator computed on two separate securities. If we assume that two securities, A and B, are being compared, then the indicator's formula would be:

[Ew, math.](https://preview.redd.it/byz5ssraet691.png?width=247&format;=png&auto;=webp&s;=8b9bc07ced0e077b7d653094fc5429652e0111f8)

Before moving on, I also wanted to explain some significant values for the indicator. **If Upsilon is positive, it means that the volumetric information-volatility (VIV) of security A is less than the VIV of security B**. Thus, it is only reasonable (and correct) to assume that **a negative Upsilon value indicates that the VIV of security B is higher than the VIV of security A**.

Okay, now that the math is out of the way, it's time to move on to the pretty pictures!

3 - Examining Upsilon Across Redundant ETFs

What I mean by "redundant" ETFs is ETFs that reflect the same index. Of course, the most obvious choice was comparing SPX to SPY. These are both ETFs for the S&P; 500.

[U\(SPX,SPY\), 1-day candles](https://preview.redd.it/08azvvvwus691.png?width=1815&format;=png&auto;=webp&s;=c274f88b2827c3fed67bc39349377d606c49f0c5)

First thing of note is that the indicator is less than zero, which means that the VIV for SPX is higher than the VIV for SPY. The next thing to note is a cyclical-looking nature to the indicator. During drawbacks in the market, the VIV of SPY increases more rapidly than that of SPX, which results in the upward jumps in U. **The upward climb in U over the past year and a half indicates to me that at the very least, some kind of liquidity issue has been brewing in the S&P; stocks that has required authorized participants (APs) to lean more heavily SPY to get liquidity in the underlying securities that they're trading.**

If I had money, I'd be willing to bet that recently, this is mostly share-creation to stabilize bid/ask spreads during periods of heavy selling. Being able to buy shares of the underlying securities of an ETF, then turn around and redeem those shares for shares of the ETF that you can then sell can be quite the profitable arbitrage play, and it also helps to stabilize the secondary market. This also works inversely - when there is heavy buying on an underlying security, the arbiter can go purchase a bunch of ETF shares and break them up into shares of the underlying securities in the secondary market, then go and sell those shares to those buyers. Later on, they can go buy those shares back at a lower price and redeem those ETF shares before selling them in the primary market, likely also at a profit.

4 - Examining Upsilon Across Sector-ETFs

For this section, I'm going to go over the charts in ascending order from least to most interesting-looking.

Since SPY is all the rage for traders these days, I figured that it would be an awesome baseline liquidity-engine to compare other ETFs to. I'm going to be showing long-term charts for these indicators, but my focus will mostly be on what's going on currently. The markets seem to be undergoing a fundamental shift in liquidity that is different from anything I've seen going all the way back to 2008. While the following charts won't reflect this for all ETFs **yet**, it is my belief that this liquidity problem will slowly begin to leak through the market as the stench of recession touches more and more companies.

XLF

[U\(XLF,SPY\), 1-day candles](https://preview.redd.it/jyz2fk8zus691.png?width=1816&format;=png&auto;=webp&s;=9fd90bc8bc3d960c9e7cf14db6f4f36fd845f1a0)

When XLF starts going strongly negative, it's time to call mom. I think that some very rich and powerful informed investors started smelling a credit bubble forming about six or seven years ago. The decrease in U shows that XLF went from enjoying a lower VIV than SPY to now teetering on the edge of losing that luxury. The last significant drop well-below zero for U(XLF,SPY) you ask? Oh, just a little thing we call the 2008 Great Financial Crisis (GFC).

IWM

[U\(IWM,SPY\), 1-day candles](https://preview.redd.it/hc5nikd3vs691.png?width=1817&format;=png&auto;=webp&s;=36423f75fb0736e5794be67513d77a1bfd895410)

From the looks of it, IWM is enjoying a brief respite from a mostly information-volatile period. Much like the March 2020 crash, however, I feel like this is just the "calm before the storm" and is thus unlikely to last. Smaller companies were not immune to the temptation of free debt, and are as likely to experience growth-crises as the larger ones.

HDV

[U\(HDV,SPY\), 1-day candles](https://preview.redd.it/ndimavx5vs691.png?width=1815&format;=png&auto;=webp&s;=bf240a67d7cf5a97d69fccf5e1cdd95b9d65a922)

HDV is a core high-dividend ETF. Since the beginning of 2022, it looks like VIV has begin picking up rapidly in relation to SPY. I think that arbiters are making plays on the underlying securities as either their margins evaporate or their value is proven.

XHB

[U\(XHB, SPY\), 1-day candles](https://preview.redd.it/ryz0klq7vs691.png?width=1817&format;=png&auto;=webp&s;=4d8dd3ffd1caa558de6cfd7226d8cdcb64930625)

This ETF looks a lot like HDV. A lot of arbitrage is probably happening on this ETF now for obvious reasons (housing market is fuk).

QQQ

[U\(QQQ, SPY\), 1-day candles](https://preview.redd.it/nazyoz0avs691.png?width=1817&format;=png&auto;=webp&s;=ff8b70a008fa128822023a1701d890cb8aa10243)

Now we are getting into the fun stuff. Much like XLF, here was a marked drop in U about 5 or 6 years ago. Ever since the beginning of 2022, this ETF has been on a crash-course for negative territory.

XRT

[U\(XRT, SPY\), 1-day candles](https://preview.redd.it/bd66k86cvs691.png?width=1819&format;=png&auto;=webp&s;=1251cd7c52a3df822852f5648f4dd5fea2476d87)

Because of the ease with which XRT can be shorted, it is really easy to create shares without producing volatility on the ETF; it looks like that is starting to come to an end. This may have an amplifying effect on the price action of GME and other meme stocks during periods of low liquidity such as ETF rebalancing and OPEX.

[U\(XRT, SPY\), 4-hour candles](https://preview.redd.it/mc0pwlldvs691.png?width=1819&format;=png&auto;=webp&s;=c2440697d7611a240e1f7ad601f34bf46040ce5e)

To look closer at the effect that the January Sneeze had on XRT, I moved into an intraday timeframe. As can be seen, the Sneeze took its toll on what was otherwise a fairly "stable" ETF. Interestingly enough, this timeframe suggests that XRT has entered into a period of instability not seen since then. With the ETF being on Reg SHO through the rebalancing period, it will be interesting to see what happens to this chart through this week as last week's OPEX obligations are covered.

5 - Examining Upsilon Between Individual Stocks and ETFs that Contain Them

5.1 - CAT as a Base-Case

Now that we've looked at ETFs, let's look at individual securities and their relations to ETF VIV. I chose Caterpillar (ticker CAT) and the DIA ETF to show how Upsilon exposes the difference in behavior between an ETF and its underlying security.

The following are the original VIV indicator (epsilon) for CAT and DIA:

[CAT VIV, 1-day candles](https://preview.redd.it/00vylb59ts691.png?width=1819&format;=png&auto;=webp&s;=437dd590a10e9d70e0cf17819ff7b7593f1ce8d3)

[DIA VIV, 1-day candles](https://preview.redd.it/lh90bitdts691.png?width=1817&format;=png&auto;=webp&s;=615e0db6fcde0cdf43d1fd161fee41103ea5a429)

This is a chart of U(CAT,DIA):

[U\(CAT,DIA\), 1-day candles](https://preview.redd.it/vtsx3vpgts691.png?width=1815&format;=png&auto;=webp&s;=cce406c71183ce09a6c5726e078bfb69edbeaa05)

What this chart tells me is that DIA became more unstable than CAT in November, 2021 and it has remained that way since. While it would be nice to put BUY and SELL signals on this indicator, I think that it would limit the amount of creativity one could put into their strategies surrounding it. The market is fundamentally changing, so traders must be agile in their thinking about past performance and future forecasts if they want to find success in this bear-market.

5.2 - Comparing Underlying Securities of XRT to XRT

Because XRT has been historically over-shorted, I wanted to take a look at how companies with varying fundamentals compared to the ETF with respect to their VIV.

TGT

[U\(TGT,XRT\), 1-day candles](https://preview.redd.it/i6n03yaczs691.png?width=1817&format;=png&auto;=webp&s;=131a9a448a65e902e3716b6ebe159623549776d5)

[U\(TGT,XRT\), 4-hour candles](https://preview.redd.it/5zj06ixl1t691.png?width=1817&format;=png&auto;=webp&s;=9bb55321ae26d719903a18d420ba0081d6560f96)

TGT has decent fundamentals and will resist the recession better than a NASDAQ stock. Much like CAT, it's no surprise that TGT is less volatile than XRT (U is greater than zero). Stocks like DG and WMT with solid fundamentals and steady revenue have charts which look similar to this one.

For the "meme" stocks, I'm going to show their charts, then explain what's going on. In another post I'll go over inter-security VIV comparisons, but I've reached the image-limit, so this will be the last analytical section of this post:

BBBY

[U\(BBBY,XRT\), 1-day candles](https://preview.redd.it/i16r7dlu0t691.png?width=1817&format;=png&auto;=webp&s;=9eee312c7463cb3b24757a16f7d1009ca823edfa)

[U\(BBBY,XRT\), 4-hour candles](https://preview.redd.it/nftfo4ph1t691.png?width=1819&format;=png&auto;=webp&s;=e2fdb4829cc011b1fde81a13c1d67e4ec5def4f3)

AMC

[U\(AMC,XRT\), 1-day candles](https://preview.redd.it/skiebmc14t691.png?width=1815&format;=png&auto;=webp&s;=d20b58d9c9d2d6d4216f9cef6a0a57fccd488282)

[U\(AMC,XRT\), 4-hour candles](https://preview.redd.it/8txgb4g44t691.png?width=1819&format;=png&auto;=webp&s;=3c7e8d64f87d933aafaab672c9fa13b1d72604e9)

GME

[U\(GME,XRT\), 1-day candles](https://preview.redd.it/fonp9f0n2t691.png?width=1817&format;=png&auto;=webp&s;=ad5d5f400b65ece97b99b5070400c0c715280dce)

[U\(GME,XRT\), 4-hour candles](https://preview.redd.it/j1wem15x2t691.png?width=1815&format;=png&auto;=webp&s;=366fd65837c6705fdac32a1aa11240c220f75941)

I picked BBBY, AMC, and GME to show three different cases: Unimpressive fundamentals and low-hype (BBBY), a complete and total scam of a stock driven purely by hype (AMC), and okay fundamentals and high-hype (GME).

Based on these charts, it's easy to see that there seems to be some significance to Upsilon crossing below zero. To investigate this further, I tried to find other "conventional" securities where Upsilon crossed zero. **Of the top-ten holdings in XRT's portfolio, GME is the only ticker where Upsilon dropped below zero on the four-hour candles in the entire history of the tickers on TradingView.** In fact, this occurrence on tickers is exceedingly rare across other ETFs and their top holdings as well. So far, I've found three stock tickers where this happens: AMC, NOK, and GME, and I've checked dozens of securities contained in various ETFs.

Perhaps this crossover is some sort of inflection point where the liquidity of a stock exceeds the liquidity of the containing ETF, but there's no way to be sure without historical primary-market (etf creation/redemption) data on XRT and other ETFs to overlay with Upsilon charts and compare to NAV.

6 - Conclusion

I think that arbitrage traders are the ones that are going to be raking in the most dough during this bear-market. The profitability of providing liquidity to the secondary market through ETF creation/redemption during periods of volatility extends well-beyond XRT, and is something that Upsilon **might** be exposing on QQQ, HDV, and XHB.

Extending this to XRT, what might be happening that's causing problems for the parties involved with these volatility-cycles is that arbitrage-players are indeed starting to move into the space, and it's creating a bottleneck for the amount of creation/redemption that can happen on the ETF.

Oh yeah, and hedgies r fuk.

\- DORK out