

S&P 500 Weekly Forecast 8/15

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Hey everyone,

We finally found it: "*vol tension*" is real.

The simultaneous consideration of rolling returns in an asset's spot price and volatility, normalized and mapped to the same domain [-1.0, 1.0], provides a framework with which we can very successfully analyze the current path in spot and vol returns, and compare it to historical patterns.

You saw this last weekend, in our [dot plots](#), which show that differing combinations of normalized returns on the x- and y-axis yield unique forecasts. E.g., you can see that gold has *poor* returns when the asset has been *flat* while its volatility declines; but has *excellent* returns when the asset is *up* and its volatility declines. The Healthcare sector ETF (XLV) is, for whatever reason, the opposite.

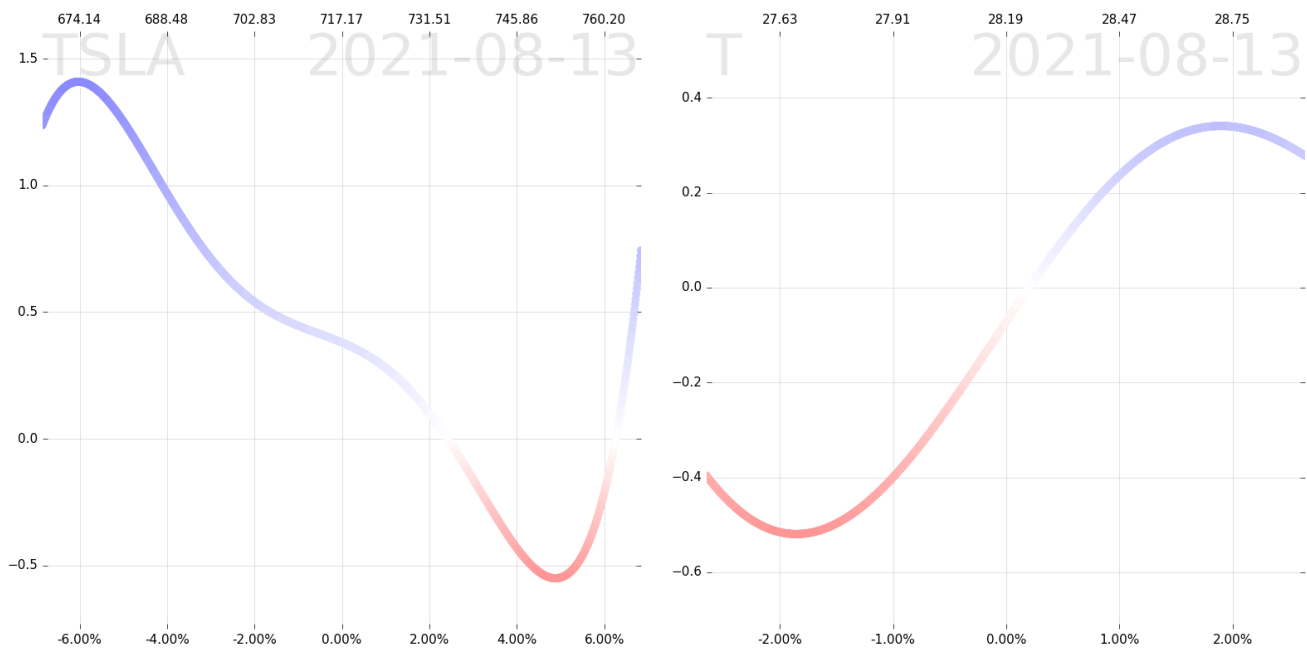
But does this mean that we can rely on the anti-correlation of these signals? *No*, and this is the important part. *Both* GLD and XLV have great returns when price is down but vol is up. They react the same to this particular stimulus, even though they react differently to the others. This tells us that you can't treat any of these signals, or their correlations, as linear: Correlations between assets, their respective volatilities, and expected asset returns *must* be mapped in a three-dimensional space (on the dot plot, the z-axis [color] is the third dimension) to be understood. Hence those dot plots.

But what does this actually mean?

It means we've fixed the zomma curve by adding a third dimension—just like we thought we could. Now, with that 3-D map, we can run a counterfactual analysis of moves in the underlying, and what those moves do to spot and vol PnL, and to their inherent tension with each other. Then we can map that counterfactual future tension to the historical return tendencies of that possible future state. What comes out the other end is just like the zomma curve, except it *actually has return expectations on the y-axis*.

When can you tell a numerical method is working? When, despite its rote consistency, the method shows you something about the dynamic nature of the assets.

E.g., take a look at these tension curves.



You probably already have it in your mind that TSLA is a stock for which volatility is a driver of returns, and you would expect an increase in volatility—especially to the upside—to be associated with excess returns, historically. Yet, if you look at the leftmost plot above, you'll see that a 4–5% spike in TSLA stock on Monday would actually be associated with negative 1-month returns (-0.5 MAD).

Similarly, you likely think of T as a blue-chip bastion of dip-buying. A cash-secured put-selling paradise! Widows and orphans, right? And yet—if T were to fall 1.50% on Monday, that would be associated with further declines in the stock—downside momentum.

Why is this the case for T and TSLA? Simply because of the *current* positioning w/r/t spot and vol. A few days from now, these curves will look very different—because the realized covariance between the price and the volatility of the assets will be very different. If T falls enough, it will become a strong dip-buy candidate, as you'd expect, but it's not even close to that *yet*. Similarly, if TSLA's price and volatility continue to increase, against the odds, it will eventually have a lot of upside convexity (and you actually see the start of it toward the right of the plot above).

We think this all sounds very cool. *Very* cool. *But* we began this note with the sweeping claim that "vol tension is real." And we wouldn't say that if we hadn't at least a *bit* more solid ground to stand on.

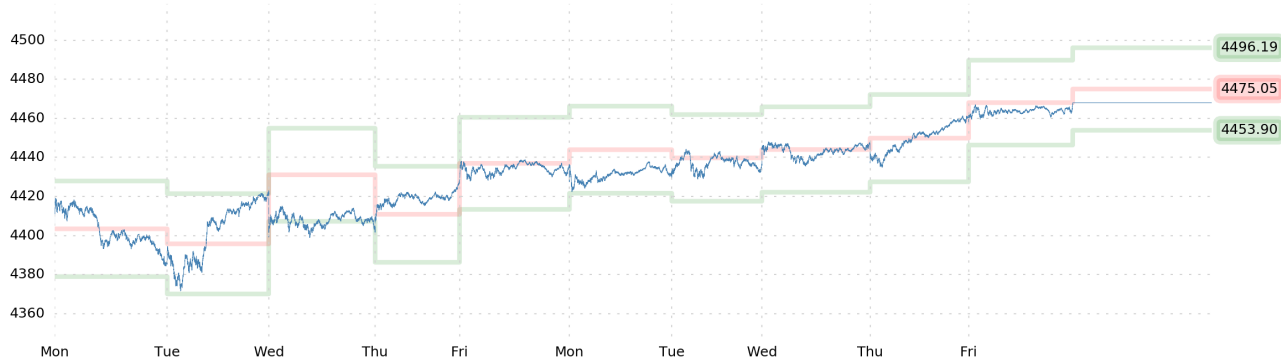
So, below the fold, let's talk about carrying out an extremely boring test.

1. Other things
2. Blah Blah Blah
3. TENSION

Other things

Boring week, but it went very well with our forecast—which thought that VXX would keep doing down, but that it wasn't worth shorting SPX anymore.

Lots of time at the Mid band, with very low volatility.

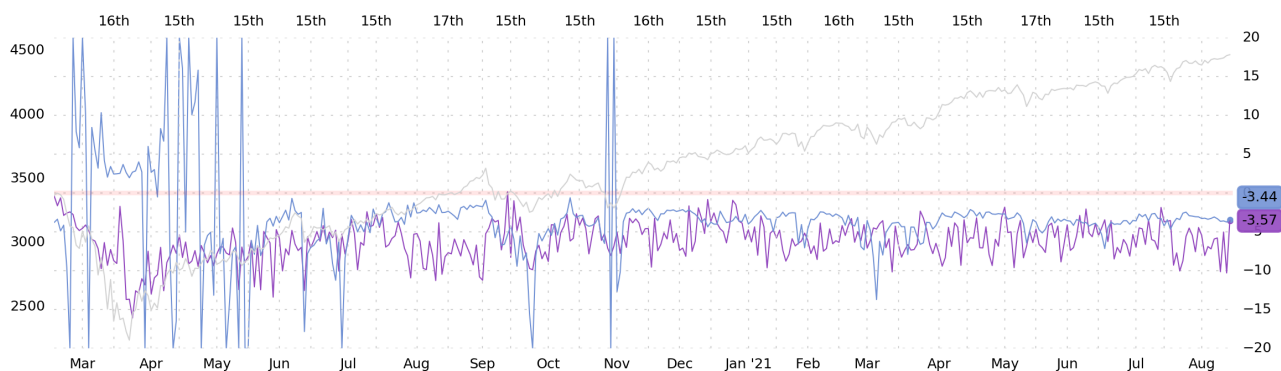


GEX+ high as it's been since February 2020. Hence that low vol.

Still short some VIX stuff.

Blah Blah Blah

The only maybe-interesting development right now is that NPD took a break from abject put-buying and threw a neutral-to-bearish print in the mix.



We'll wait for confirmation on whether we get some more near-zero NPDs. It's not bearish yet.

The only other thing is that this is Gamma Week! So we're expecting GEX+ to stay high until Friday. It's been the trend, however, for folks to frontrun the OpEx recently. That's worth considering, perhaps by Wednesday.

But we'll provide some updates on this as the expiration draws nearer, including an idea of just how much gamma is going to disappear.

Moving on...

TENSION!

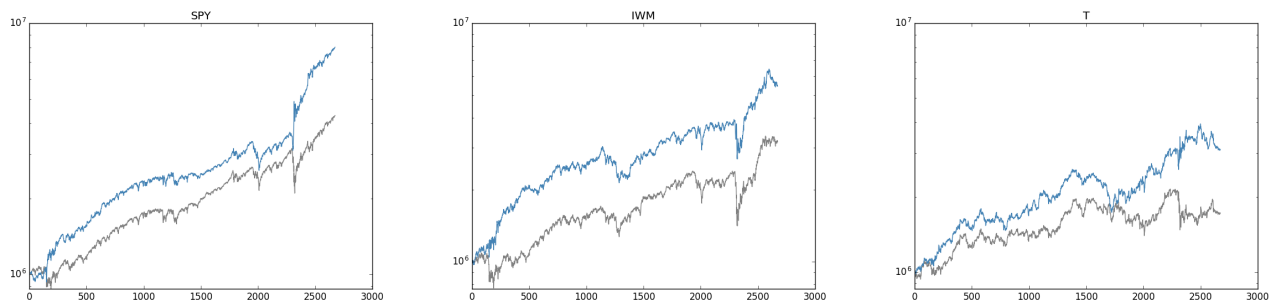
So here's the idea: Re-create the 3-D map of vol tension for every day in a stock's history, so as to avoid look-ahead bias. Use that map to determine whether the current tension is bullish or bearish. If it's bullish, be long with the whole portfolio. If it's bearish, be short. No frills! It's a stupid binary system. No leverage, no vol adjustment, no partial sizing, no anything!

Recall that (as with the zomma curve), we have *foreknowledge* of the z-axis / color / expected return because of our counterfactual analysis, and we know, based merely on the closing price, whether the next day is going to be bullish or bearish for the stock. So we have eliminated all potential look-ahead. It is a simple event-driven backtest.

In this arena, a "win" (especially in the indices!) is if the PnL is simply a tad *smoother* than buy-and-hold. We would not expect the ending capital of a long/short strategy on a single stock to be higher than the buy-and-hold, since no leverage is being applied.

And yet...

Blue is vol tension, gray is buy-and-hold.



We started with SPY. The system went short plenty of times, but it went short at a few crucial moments, for which it was rewarded... which is what drives the outperformance. That's impressive on its own, but SPY is characteristic of a carry trade, and perhaps it'd be better to look at something that doesn't have an "all-or-nothing" volatility profile. After all, we want something that delivers value more than a couple times a decade.

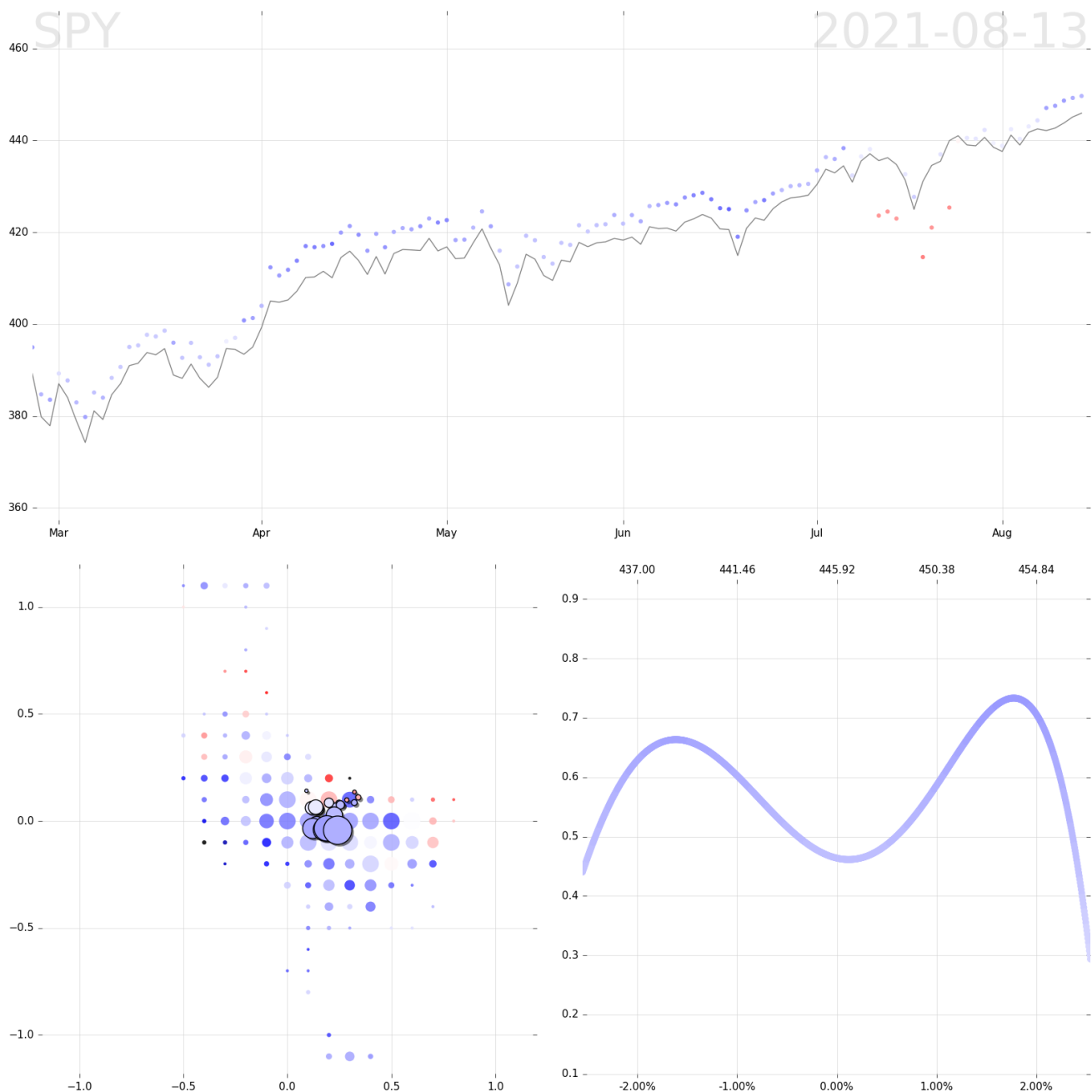
So we looked at IWM, but the story is mostly the same. Remarkably, with data only coming from IWM itself, the model "sees" some useful stuff here as well, and outperforms at a few crucial moments (including a much shallower DD in March '20). But it's still not quite dramatic enough. We want to see the blue and gray lines wiggling more independently, if possible.

So we thought, why not try T? And this one's interesting, because you see in sharp relief the disagreements between the model and the subsequent price-action, which occur more frequently (T doesn't have the characteristics of a carry trade). Sometimes it wins, sometimes it loses, but it clearly comes out ahead. Which is, actually, pretty crazy.

(We didn't try any others because it takes a looong time to generate.)

This is the first time in a while we've run a test and seen something as good as, or better, than what we were hoping to see.

And now we want to leave you with one last thought. Here's a little panel of SPY, with recent signals (dots above, below price), with today's dot plot, and with today's curve.



We want you to look closely at the curve in the bottom-right. The SPY curve often looks like this.

Does it remind you of anything? If price stays the same, that's pretty neutral. If it goes up quite a bit, that's bullish. If it goes down quite a bit, that's bullish, too. The middle, where things remain unchanged, is what's most bearish.

What other indicator do you know if that looks like that? Bearish at Mid...

That's right. SuMo bands.

Are SuMo bands actually an artifact of vol tension?

Well that would make an awful lot of sense, wouldn't it?

(The code to spit out those backtest charts is [here](#), and the input data are here: [SPY](#), [IWM](#), [T](#). Download them all into the same directory and edit "symbol" in the script. Try changing up the parameters, apply leverage, ditch the short-selling, add some sizing constraints... whatever. Or try doing an index correlation trade with the data! We're only scratching the surface here—we'll be able to do a lot more with the curves. Lots of work to do!)

Enjoy the week!

The SqueezeMetrics Team
