S&P 500 Weekly Forecast 3/28

From: SqueezeMetrics <info@sqzme.co>
To: SqueezeMetrics <info@sqzme.co>
Subject: S&P 500 Weekly Forecast 3/28
Date: Sunday, March 28, 2021 9:03 PM
Size: 711 KB

Hey everyone,

Last weekend, we were talking about triangles. Specifically, we were looking at how the relationship between (a) *the past month* of implied volatility, (b) the *current* implied volatility, and (c) 1-month *realized* volatility can be visualized together as the sides of a triangle. And that if we take this strange leap of faith, then we'll be able to use "Angle C" (the angle that "looks at" realized volatility) as a measure of the relationship between realized volatility (c) and the implied volatilities (a, b).

A couple weeks ago, we said we wanted to start looking at volatility this way because of the "observer effect." Generally, people compare current IVs to past RVs, but ignore past IVs. Since past IVs tell us about the price that people have recently paid (received) to be long (short) volatility, it tells us something about the way people are positioned right now -- and that's something we definitely want to know!

From 3/14:

> Consider an alternative question: "Did people who bought (sold) 30-day volatility 30 days ago win (lose) between then and now?" This question introduces *observers* to the problem set, and considers realized volatility as a factor in whether option prices could actually, in the recent past, be considered "right" or "wrong." *I.e., instead of looking at the volatility cone, it looks at the people who were looking at the volatility cone (observers).* Very meta.

And we found exactly what we were looking for: When "Angle C" is 60 degrees (implying that PIV, IV, and RV are all the same), that's an inflection point for the index -- and it's strongly associated with SPX losses. Furthermore, other angles seem to have visible and persistent effects on SPX returns.

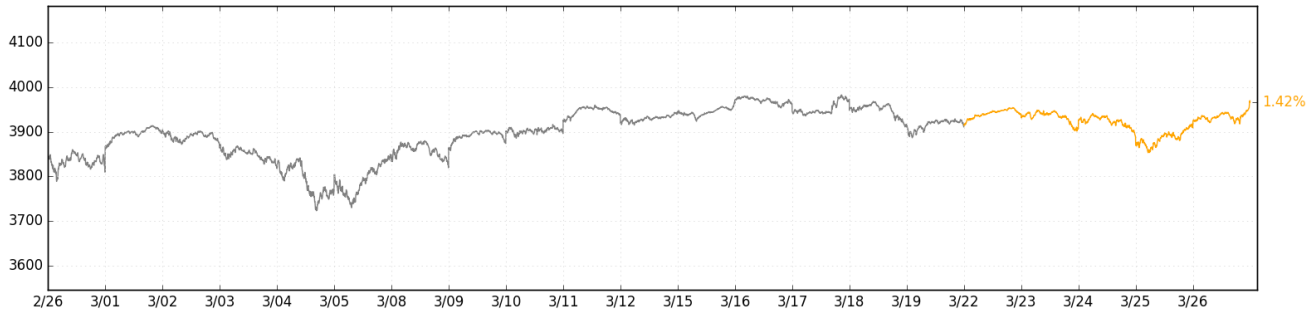
For the past week, we've been searching for some clarity on these concepts, and some further reasoning for why this might work.

Spoiler alert: It hasn't gone very well.

But first...

1. Week -1
2. Week +1
3. The wrong trees

Week -1
Well, our long call position didn't turn out, but our short VIX sure did (again!).



Big intraday moves were a symptom of relatively low GEX+, which opened up the shoulders of the weekly distribution, and made us buy that speculative 3980 Friday SPX call position in the first place.

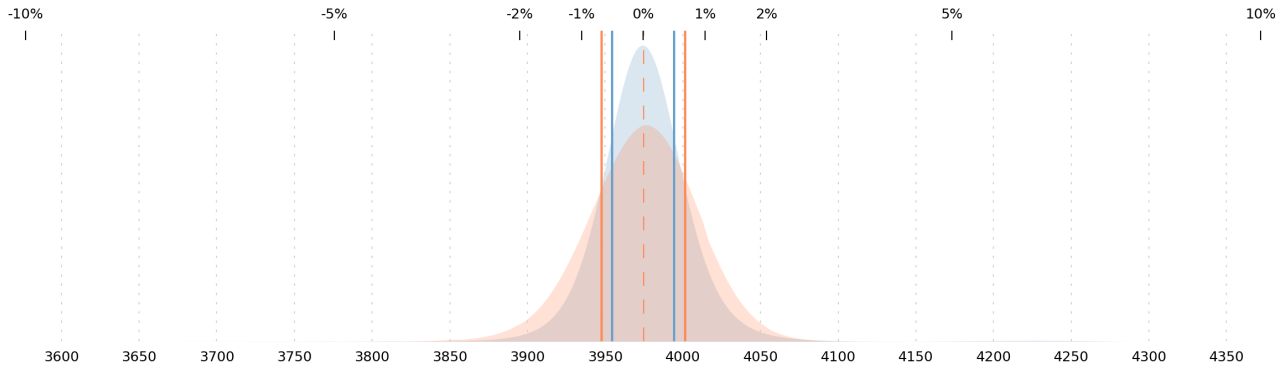
SPX settled at 3975 on Friday, to spite us and our calls.

On Friday, at the close, we reduced our short April VIX position to "small" once again. We were in and out of that all week, which was the primary driver of our PnL (recall that we felt comfortable acquiring a large short VIX position because both VGR and NPD were amenable, and because we believe that outsized intraday moves were a symptom of relatively low GEX+, but nothing more nefarious than that).

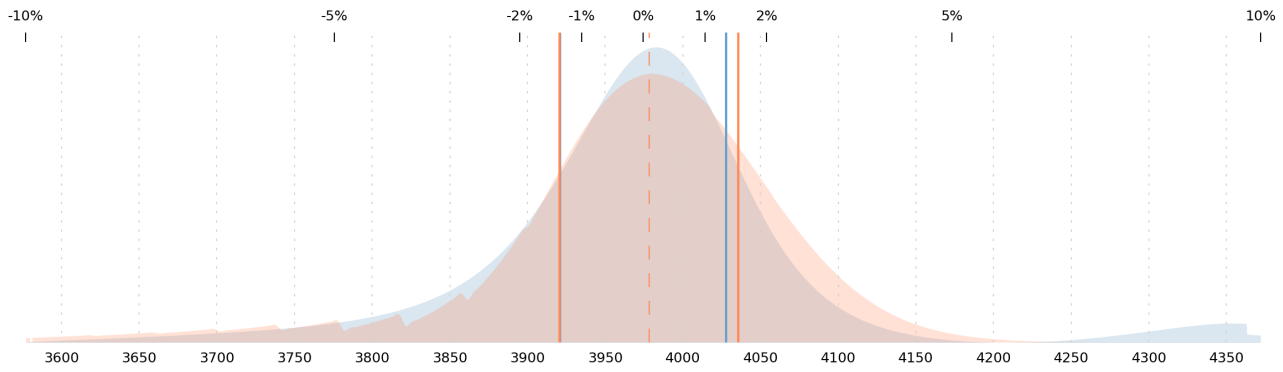
So, a bit frustrating, on account of the Friday settle, but still a winner overall!

Week +1

Oddly, it's a remarkably similar setup. Here are the 1-day probability densities, to give you an idea.

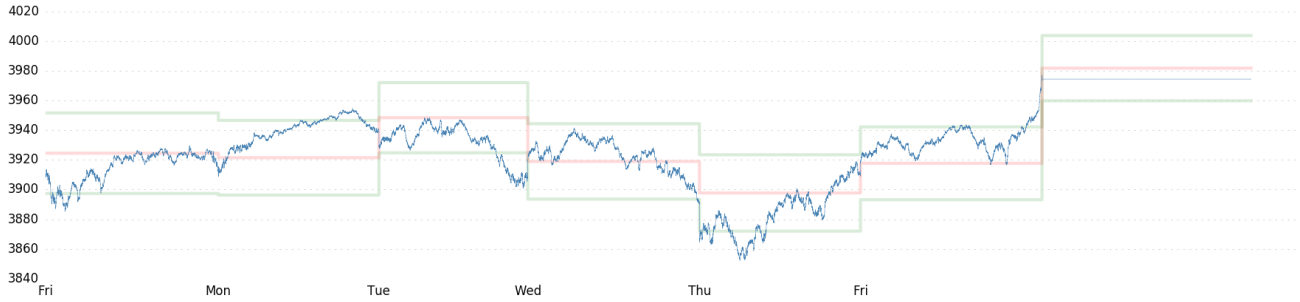


According to GEX+, 1-day IVs are way too low. GEX+ expects that the likelihood of a 1.00% to 1.50% move is quite a bit higher than SPX IVs imply. The weekly distribution, similarly, suggests that options are fairly priced or cheap (again), with the 2.00% to 3.00% gain underrepresented.



So yeah, we're going to buy some more OTM SPX calls for Friday. Tiny position, highly convex. Thinking 4050 strike.

E-minis looking a bit rough right now (-0.50%), but that's no surprise, given the crazy Friday EOD ramp. As usual, we'd expect some support around the SuMo Support band in the morning.



New SuMo bands for Monday are 3959.18, 3982.22, 4005.27.

The wrong trees

First thing we did this week was test our "vol triangle," but with *VIX instead of ATM IVs*. Conventional wisdom tells us that VIX has a pretty strong relationship with 30-day ATM IVs, so why not just make this process easier on ourselves and use a totally standard, well-known volatility computation?

Abject failure. The signal that we identified previously in "Angle C" completely disappeared when using VIX for the PIV and IV legs of the triangle. This is interesting, because it suggests that the difference between ATM volatility and VIX (with its broader *variance*-based computation) is an important part of what makes the "volatility triangle" meaningful. In other words, this is about *volatility*, not variance, and we can't casually substitute a variance-based index value.

This is interesting, because it suggests that what makes Angle C meaningful is the way traders manage the ever-tenuous relationship between S&P 500 implied volatility and S&P 500 realized volatility. And this, again, brings us back to a point we made a couple weeks ago.

From 3/7:

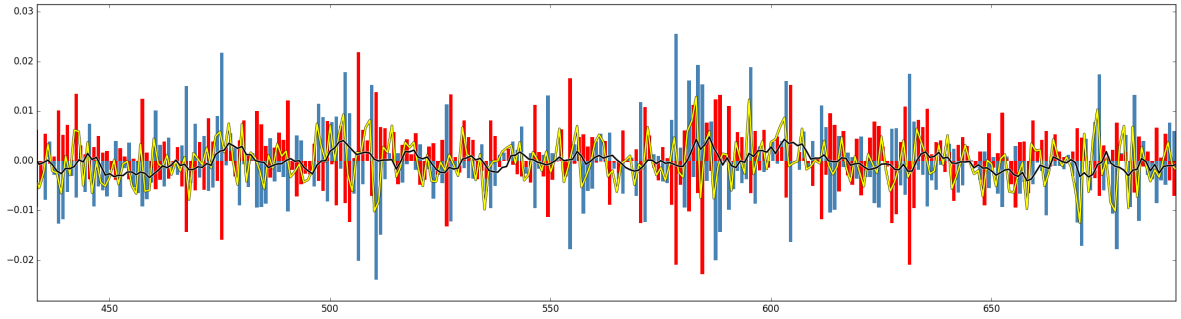
> So if we were to declare that, in the case of the S&P 500, there is a mechanism that *actually* draws RV and IV together in a big way, you'd find that interesting. That mechanism is VIX futures.

Because traders use VIX futures (and options) as a way to get exposure to S&P 500 volatility, they expect

VIX futures to provide nearly a 1:1 hedge relationship to SPX realized volatility -- and whenever this relationship gets stretched, we should expect that traders will need to make routine adjustments of some kind.

Normalizing this data to test it, though, is non-trivial. We need a constant-maturity VIX futures exposure, but we also need to normalize *that* exposure to the level of VIX (vega-weighted), and *then* we need to find a constant (hedge ratio) that best relates daily VIX futures' percentage moves to daily SPX percentage moves -- to make them comparable.

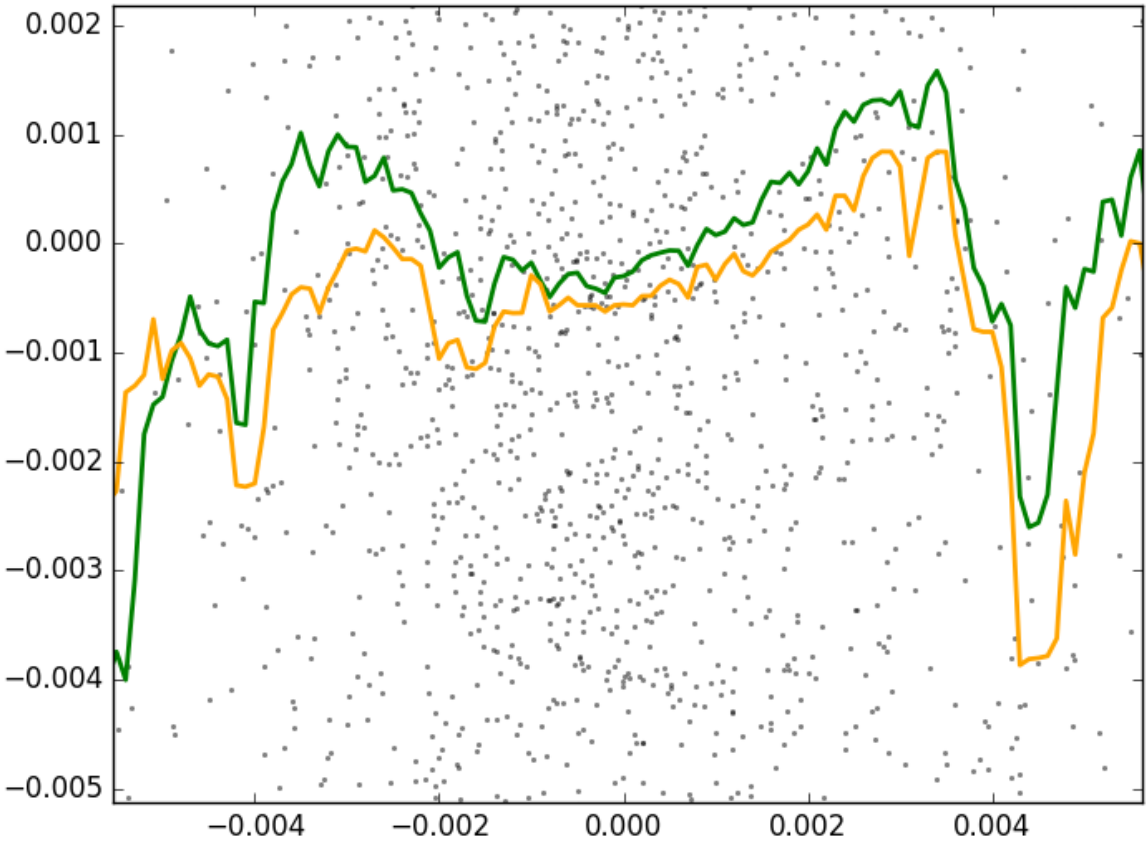
It's natural to choose the UVXY ETF, which has uninterrupted, constant-maturity VIX futures exposure PnL data since 2011, but this introduces the need to adjust for the leverage decrease (2.0x to 1.5x) in 2018 -- another thing to normalize! So this is a pain to set up, but once you do all of it, you get a chart that looks like this:



Red is the daily return from normalized, constant-maturity VIX futures. Blue is the daily return from SPX. The x-axis is in percent (0.02 = 2.00% gain), and the y-axis is time, in days. The yellow line tracks the daily imbalance between SPX and VIX futures. When it's above zero, that means that Long SPX, Long VIX is "winning." When it's below zero, that means that Short SPX, short VIX is "winning." The black line is a 5-day moving average of the yellow line, so we can see the cumulative "imbalance" evolving between SPX and VIX futures.

The imbalance is almost always small. It oscillates mostly between -0.50% and +0.50%, and it always reverts. At a glance, you might think that it lends itself to a mean-reversion strategy of some sort: "If the imbalance is +0.25%, that means that Long SPX, Long VIX (long vol) has outperformed and is due for a reversion, so go Short SPX, Short VIX (short vol)." Sounds appealing!

But when we test that thesis, it doesn't hold up. Indeed, as is almost always the case, the truth is the *opposite*.



On the x-axis is the cumulative (5-day) imbalance. On the y-axis is the following day's imbalance, in the same units. So a +0.25% imbalance can be seen just to the right of 0.002 on the x-axis. Since the green and orange lines are the mean and median (respectively), we see that a 0.0025 imbalance is associated with a mean next-day imbalance of 0.001 (+0.10%). Positive imbalance begets positive imbalance.

In other words, when long vol (Long SPX, Long VIX) outperforms, it tends to *keep* outperforming the next day, and by a substantial amount!

But then, if the imbalance gets to be even wider (say, 0.50% [0.005]), the trade suddenly breaks (the green and orange lines take a sharp dip), and Short SPX, Short VIX wins.

Is the difference between +0.25% and +0.50% on this chart similar to the difference between a 50-degree Angle C (bullish for SPX) and a 60-degree Angle C (bearish for SPX)? When Long SPX, Long VIX is outperforming, is that because SPX is ramping and VIX isn't falling? And if that's the case, is that a case of RVs rising relative to IVs (and thus, Angle C broadening to 60)? *Gahhhh.*

There's some Magick in here. We can feel it. But we still can't quite figure it out.

Enjoy the week!

The SqueezeMetrics Team
