

S&P 500 Weekly Forecast 4/25

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Subject: S&P 500 Weekly Forecast 4/25
Date: Sunday, April 25, 2021 8:59 PM
Size: 527 KB

Hey everyone,

A few weeks ago, we postulated that volatility is kind of like a triangle.

In most settings, this is the kind of assertion that would draw scorn. "How is this, um, *remotely* useful?" But as a testament to the peculiarity of the readership of this note, the general response was (unironically), "Hmm, I will grab my protractor."

One reader backtested a homemade "Angle C" against the S&P 500, and found that, when the angle is above its moving average, the index delivers superior risk-adjusted returns. Another reader tested the relationship between daily SPX and VXX returns, demonstrating that the "tension" between the interior angles of the "vol triangle" resembles the week-to-week "tension" between SPX vega and SPX returns. Still another reader wondered about the nature of VIX futures ("a strong resemblance to a forward volatility swap"), and whether they impact the price of volatility (and thus, the shape of the triangle), or merely make a particular exposure more accessible.

In other words, we're not the only ones who think that "*there's something here.*"

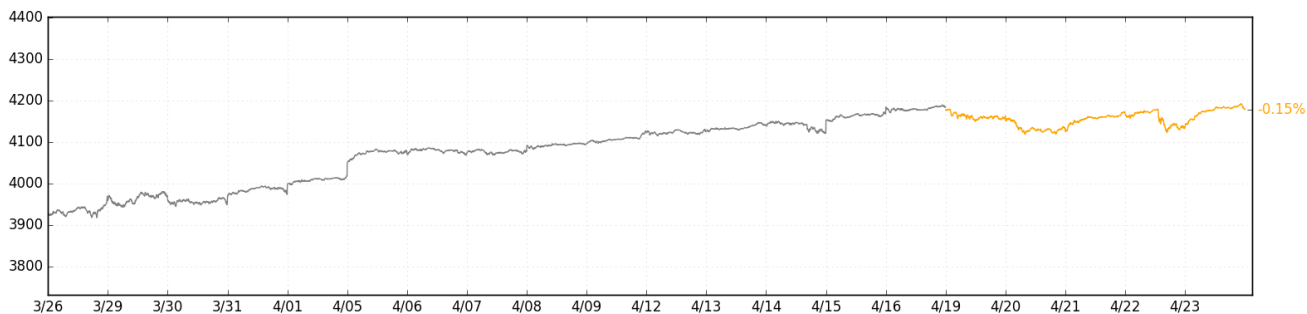
And that leads us to consider the one Angle that we've thus far neglected: "*Angle A.*" We said that we'd try to demonstrate something a bit more "practical" this weekend, so here goes.

But first...

1. Oof
2. Agh
3. Eh?

Oof

When the pain to the ego is sharper than the pain to the bankroll, you at least know you're sizing your positions properly.



It's week #2 of failed low-probability bets for us. We were betting on precisely what happened (-0.15% on the week) *not* happening.

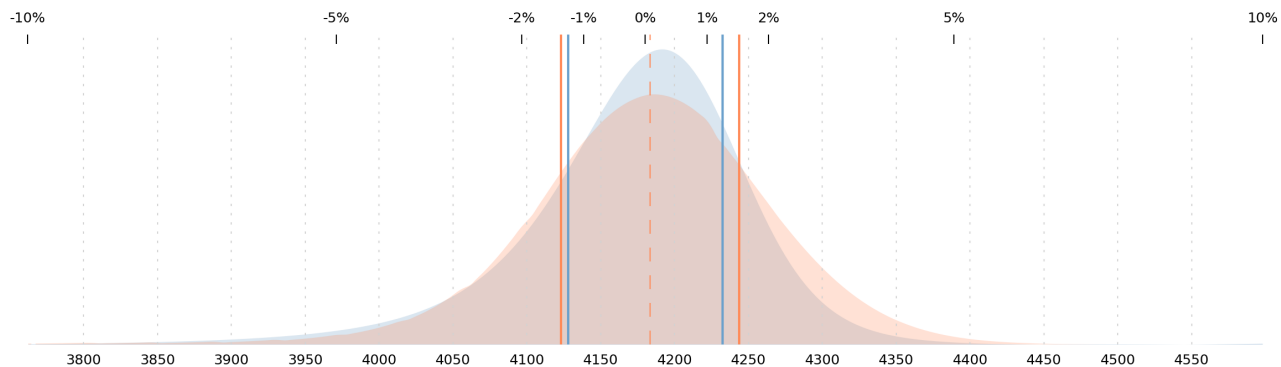
From last weekend:

The right tail and the left shoulder -- where you see orange poking up above blue -- remain "underrepresented" by market IVs, and that's where we want to bet on things moving toward. We specifically want to be betting *against* a 0% return this week (where blue rises above orange) -- i.e., there ought to be some movement. As such, we want to be betting on either a 2.00% loss or that crazy 3.00% gain for the week.

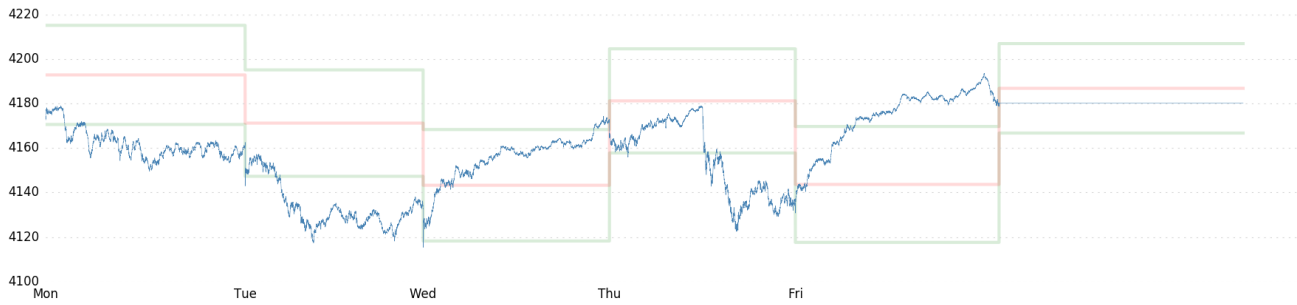
And that's all we have to say. *Oof.*

Agh

And to make matters worse, the market continues to goad us into the same positions.



A long Friday-expiring call struck OTM around 4250 to 4300 appears to be "optimal" according to where all the gamma lines up, relative to market IVs. We already own the 4300 calls (tiny position, of course). We have no other position, and will take no other position, except to casually scalp some SuMo bands.



SuMo for Monday:

4164.28	4188.12	4211.95
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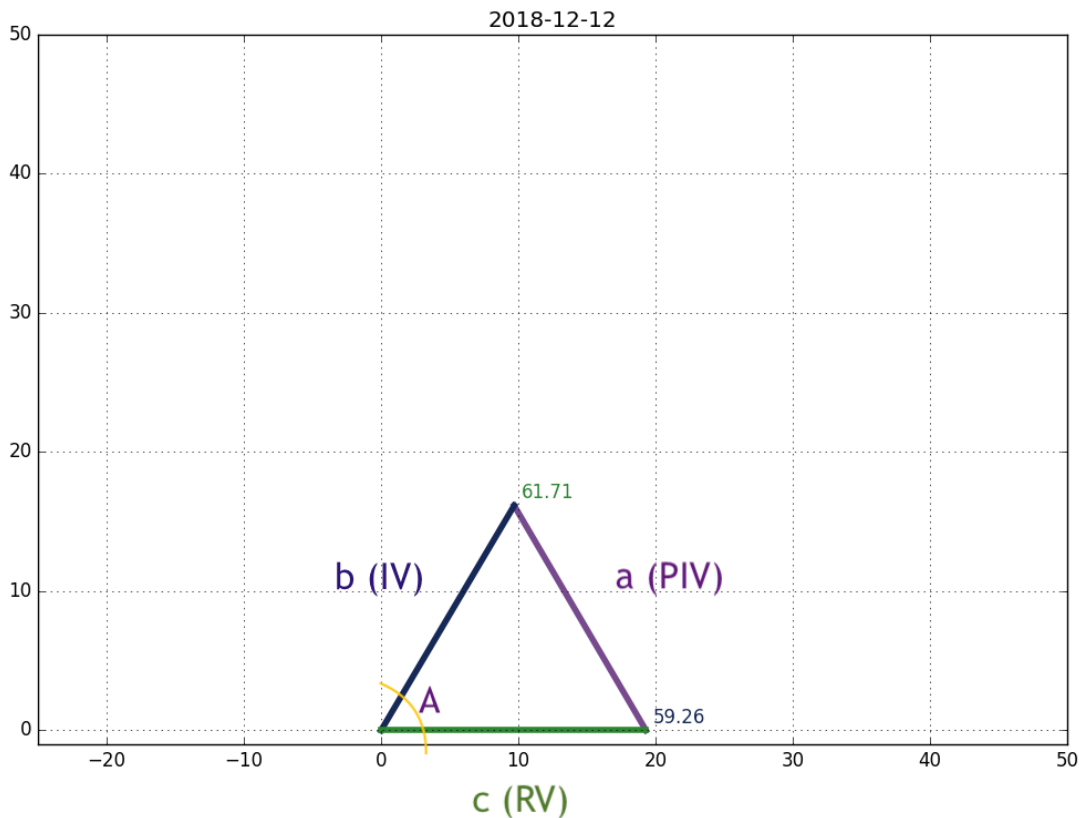
The only other thing worth mentioning is that the customer vanna-gamma ratio (VGR) remains in the shallow negatives (-2.48). That means that folks are sensitive to shifts in volatility, and that VIX will have a tough time falling further. What does this tell us? Well, at the moment, it just adds a bit of conviction that being long those fixed-risk calls is the way to go. Spot-up, vol-up is quite possible. And if we finally get a leg down and VIX back to 20, we'll be happy to sell May VIX!

In the meantime, we look forward to another week just like the last one. *Agh.*

Eh?

Ok, it's time to talk about Angle A.

Let's bring in a picture for reference. Recall that it's from [this](#) animation. We just added some extra labels for clarity.



"Angle A" -- the angle that "looks at" the *past implied volatility* (PIV) side of the triangle -- is the one angle we've neglected over the past few weeks. And that's a bit odd, isn't it? Because "past implied volatility" is really where this whole "triangle" thing began.

See, most folks are just looking at the spread, or the ratio, between realized volatility (RV) and *current* implied volatility (IV). I.e., looking backward and looking forward -- but not looking at the true relationship between the two. "Past implied volatility" was the element that we thought would draw those together -- the much-needed context (or "the observer") for the other two elements -- and evaluating this *third* element was the reason we ever had to think in terms of triangles in the first place (Law of Cosines, etc.). So, Angle A is really our "contribution" here.

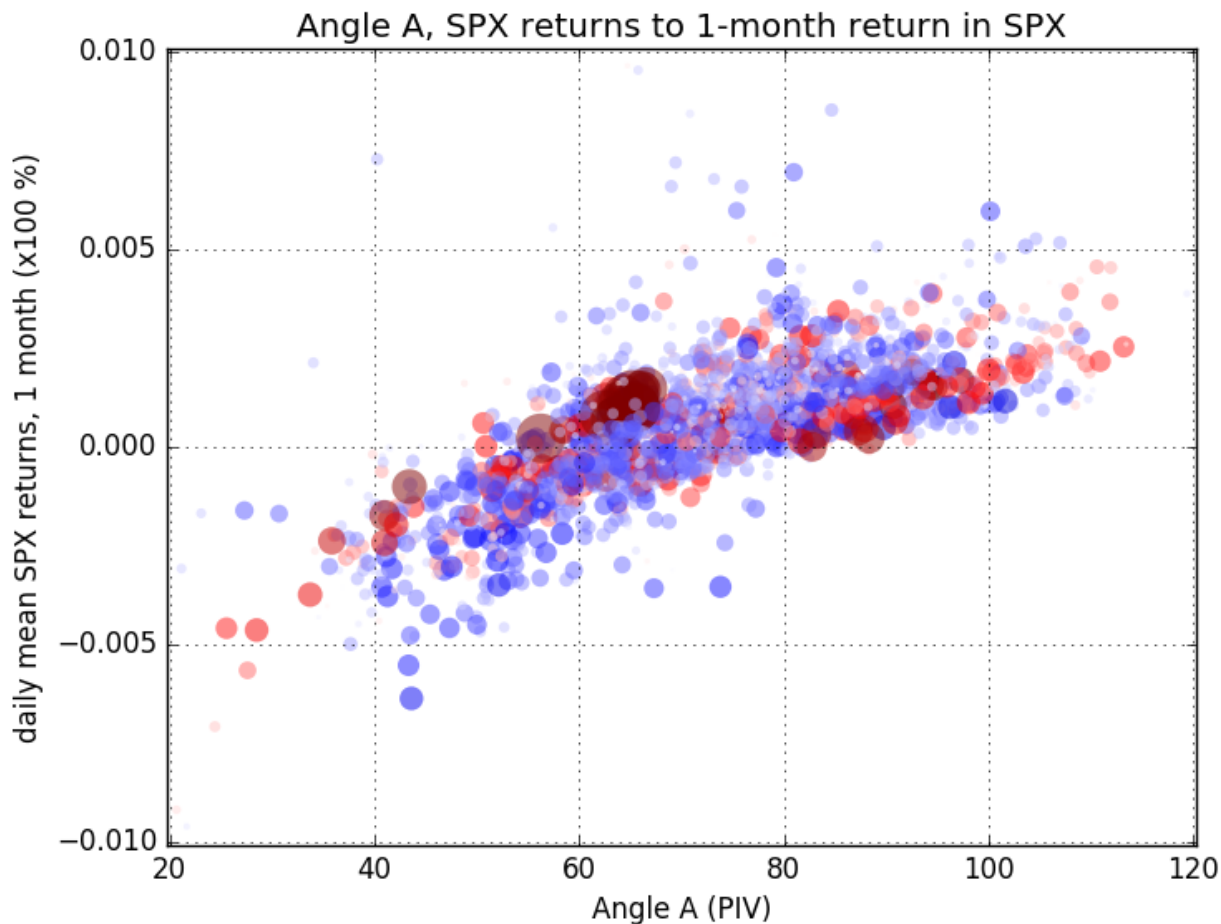
Perhaps we've saved the best angle for last!

But, before we dive into generating a chart of some kind, consider what Angle A *means*. If Angle A is *high*, that means that past implied volatility (PIV) is high relative to current IV and RV. This would happen only when IV has fallen recently, and when RVs are low. If Angle A is *low*, that means that PIV is low relative to IV and/or RV. This would be consistent with a recent increase in S&P 500 volatility -- either an increase in IVs, an increase in RVs, or an increase in both.

Now, where this gets interesting: *What that means* is that we should expect recent S&P 500 returns to be associated (positive correlation) with Angle A. When Angle A is high, recent index returns should be high; and when Angle A is low, recent index returns should be low. This is just a way of saying that, if the index fell, either long IV or long RV (or both) should have won some; and if the index rose, either short IV or short RV (or both) should have won some. There's an inherent link between these things, and while they cannot move

proportionally all the time, they certainly cannot *continue* to drift from each other forever ("vol is mean-reverting" etc.). No strategy can *always* win, and no strategy can *always* lose. So when does the rubber band finally pull it all back together?

Well, here's a visual of it.



This is Angle A (x) against 1-month average daily S&P 500 returns (y). In the scatter plot are coordinates representing days from 2012 to present, and in red and blue colors are subsequent 1-month S&P 500 returns. The bigger and bluer a dot, the bigger the gain. The bigger and redder a dot, the bigger the loss.

You ought to notice, first of all, a cluster of red where Angle A is low (20–70 deg, where 'vol' is high) but SPX is itself relatively high. Our interpretation of this is that "SPX is too high relative to high vol," or "long SPX has won too much relative to short vol." Second, you'll note a cluster of red where Angle A is high (80–120 deg, where 'vol' is low) but SPX is itself relatively low. In the same vein, this would be where "vol is too low relative to low SPX," or "long vol hasn't won enough relative to short SPX." And... everywhere else on the map is pretty darn bullish by comparison.

At a glance, this seems to tell us an awful lot about the relationship between spot and vol. Indeed, this may be the single most useful mapping of spot-vol covariance we've ever seen.

This seems compelling.

Hold on to your protractors.

The SqueezeMetrics Team
