

## S&P 500 Weekly Forecast 5/3

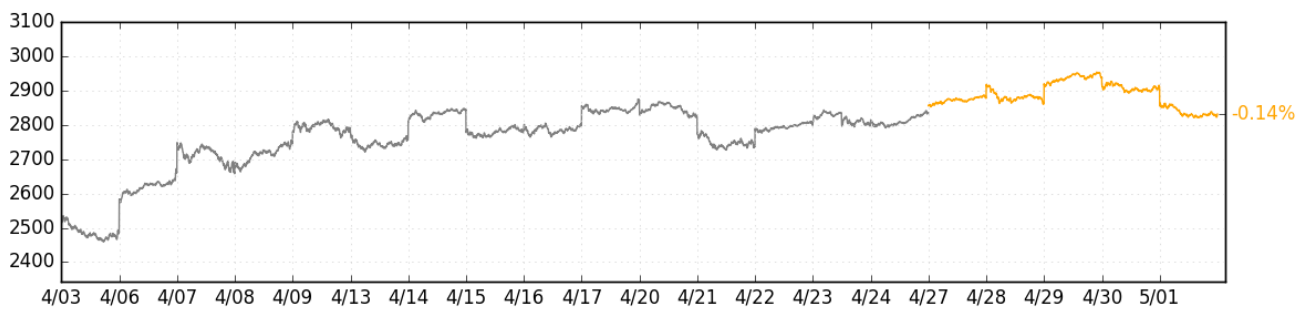
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Hey everyone,

For the last month, we've been saying volatility (with VIX in the 40s) has been much too expensive relative to our forecast, often twice as expensive as it should be, and we've been selling weekly iron flies as a result. Iron flies pay out when the underlying doesn't move much.

This has gone pretty well.



But now that we're in possession of GEX+, we can do more than we were able to do with our forecasts in the past. Specifically, we can pinpoint where gamma and vanna effects will come into play, and that means we can find all sorts of different ways to disagree with the market's volatility estimates. It also means we can do a really good job of gauging *crash risk* -- which is what we've been focusing on for the last couple weeks.

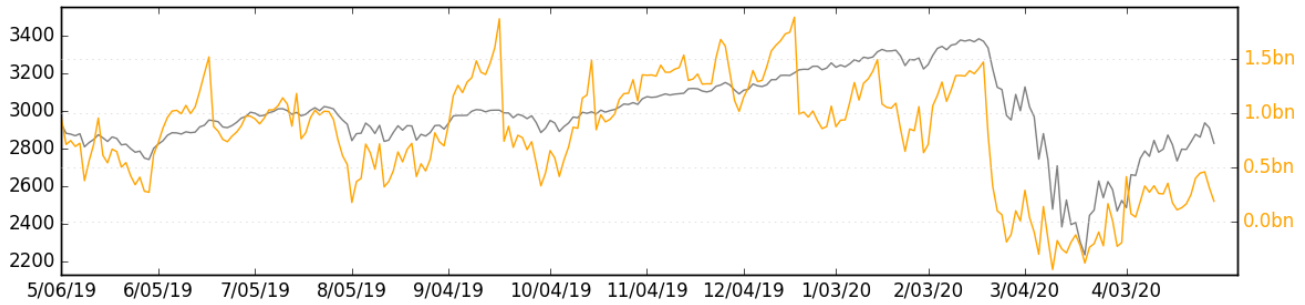
This week, we start taking the next step toward measuring that risk. And it's a perfect time to think about it, because crash risk is ever so slowly beginning to reappear.

1. Looking Backward
2. Looking Forward
3. Looking Askew

### Looking Backward

The past week was, once again, kind enough to align itself with our positioning and expectations. Lots of overnight gaps, tight intraday ranges, and an overall mean-reverting tendency -- such that the week's return was an amusingly tiny -0.14%. This does good things for a position that bets on no weekly movement (\*ahem\*).

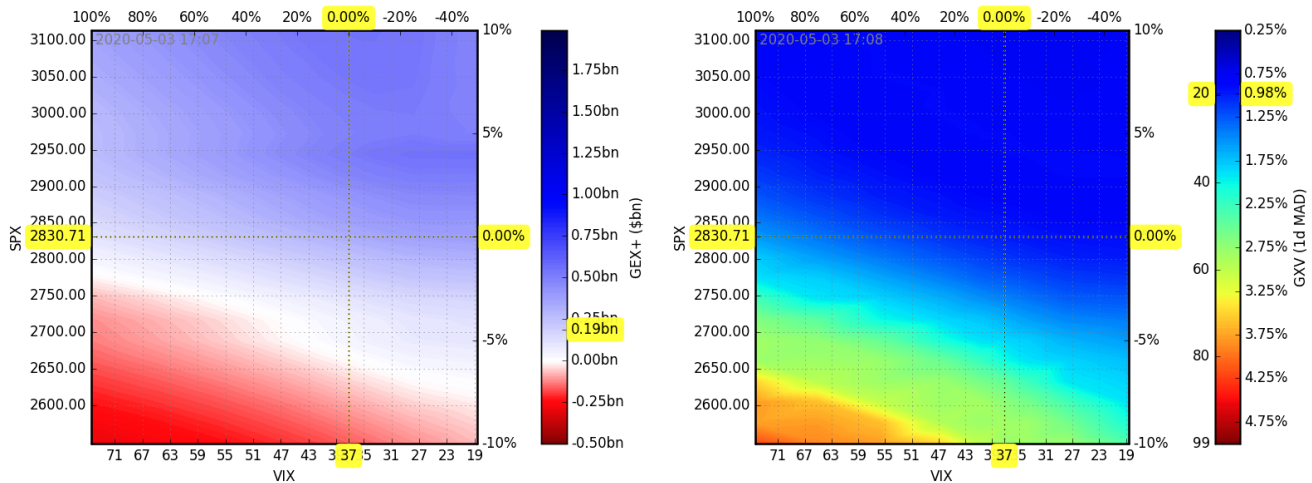
Over the week, VIX is up, SPX is down, puts have been net bought, calls have been net sold, and three expirations have taken place. All told, that leaves GEX+ a bit lower than at the same time last weekend: \$119mm.



**Looking Forward**

This level of GEX corresponds to an average daily move of 0.98%. In volatility terms, that's around 20 vol. Meanwhile, VIX is around 37, suggesting that volatility is still rather overpriced. Which is what we've been saying for a while now, and which probably doesn't surprise you.

But there's a slight difference between *this* "volatility is overpriced" and the "volatility is overpriced" you've been hearing from us nearly every day for the past month, and that difference has a lot to do with how much red you're now seeing in the heatmaps below.



For a number of days this week, there wasn't even a hint of orange in the GXV plot. We thus concluded that volatility couldn't even rise above 60 in a nasty scenario, giving us a large margin of safety and making us comfortable saying "there is no crash risk."

That's changed. There's some crash risk now -- but let's just say it's not enough to warrant changing your positioning (more on this in a second). And although it's probably too much to ask for iron flies to perform so perfectly *four* weeks in a row, we still think it's the best position out there, and we'll be opening more of 'em in the morning.

Now about the reemergence of crash risk...

**Looking Askew**

So, those heatmaps are pretty neat, right? There's a lot of data there. Now that we know so much more about option positioning and vanna, it's possible to visualize this stuff on a high level. And that's nice, but a "high level" is exactly what we *don't* need when we need to plan a trade. So let's start to drill down.

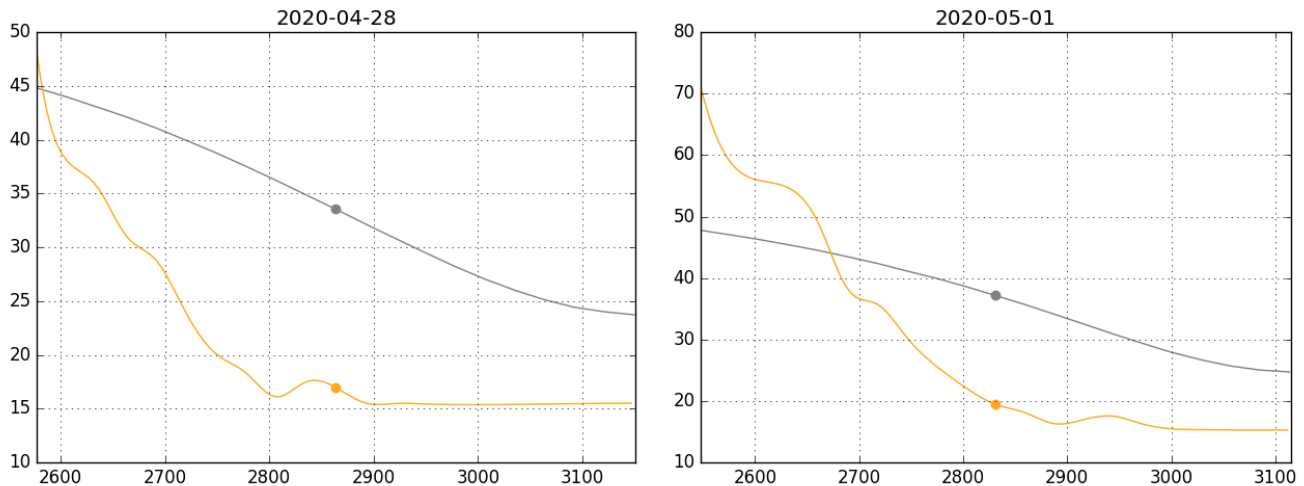
The first thing we need to do is take a guess at SPX-VIX covariance. We can do this by partially reverse-engineering the VIX formula by interpolating an SPX skew using the same expirations and weights as the

formula -- a 30-calendar-day SPX IV skew. This skew tells us about SPX-to-ATM-volatility covariance, and since VIX has a meaningful relationship to ATM volatility, we can use this skew as a guide to how the market "believes" VIX will change with the S&P 500. This relationship is the *gray* line in the charts below.

The *orange* line in the plots below is the relationship between SPX and *our* vol forecast (GXV).

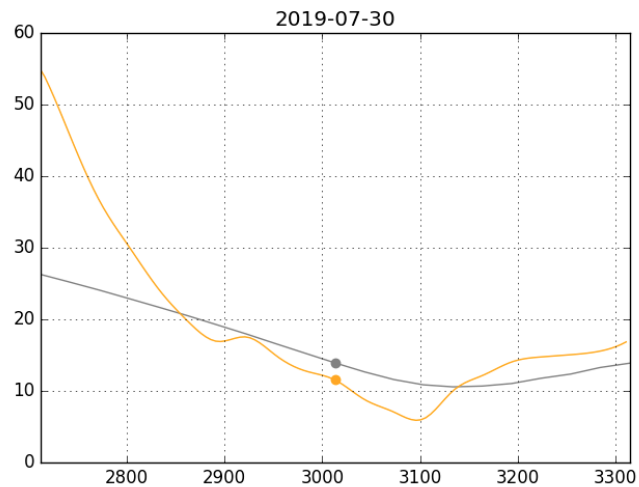
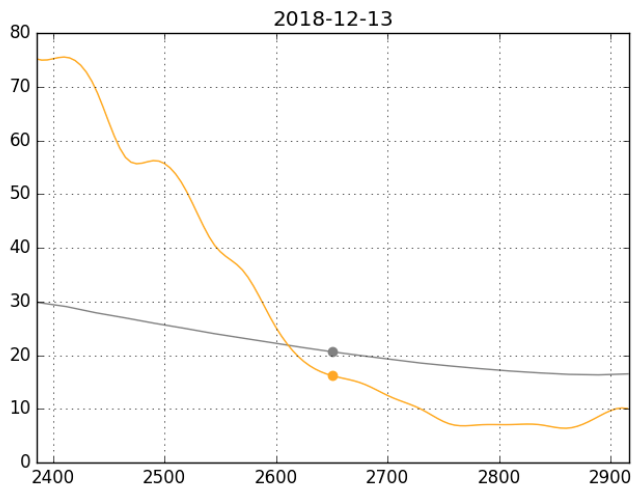
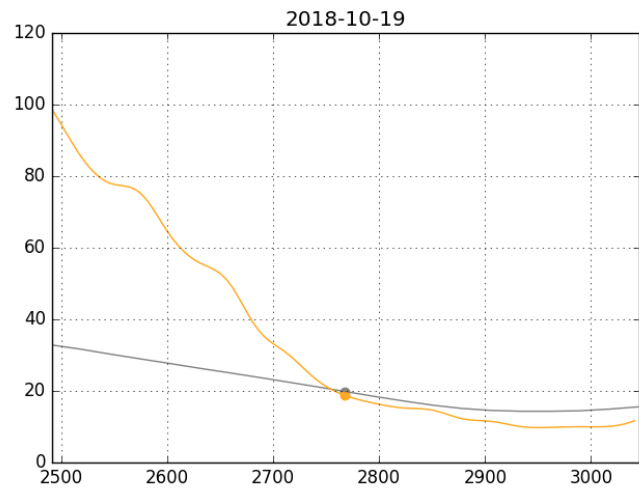
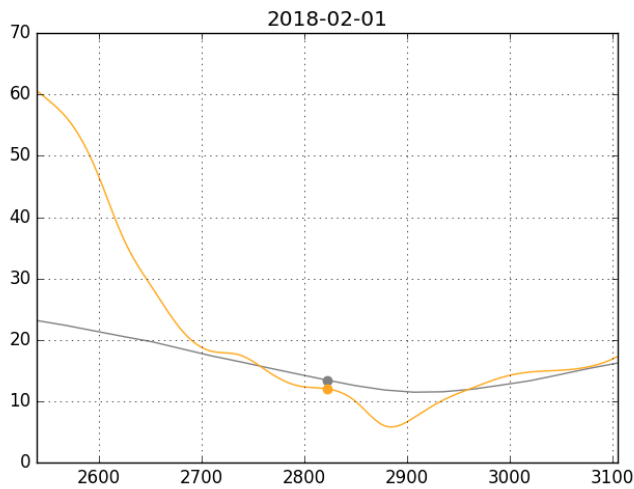
So, to narrate some of the first (left) plot below, "Right now, VIX is 34 and GXV is 17. But if SPX were to fall to 2700, VIX would be 41 and GXV would be 27. All of this is super safe."

That first plot is from this past Tuesday, which was a remarkably safe day from the perspective of crash risk. The one to the right is from Friday at the close, which is the one that we care about right now.



Do you see what we mean by crash risk slowly coming back? If the S&P 500 were to fall to around 2600 in the right plot, VIX would move to around 47 and GXV would be 56 -- *higher* than VIX. So that area where the orange line is higher than the gray line? That's where crash risk lives.

But before you get to thinking that buying 2600-strike puts is a good idea (it's a bad idea), take a look at what *real* crash risk looks like. Each of these plots below is from immediately before a really significant recent dip in the market. Soak up the beauty.



Note how, in each case, (1) our volatility forecast is set to be *two or three times* what VIX expects to be in the event of a big dip, and (2) there's no "buffer" or "crumple zone." In other words, the orange line is almost entirely *at or above* the gray line if SPX falls, and that means there's nothing to stop SPX from falling -- and then accelerating. In these situations, puts are *super* underpriced.

*Nerd note: Ok, so you know how we had those vertical skew plots at the bottom of the daily GEX 1.0 PDF document? Those skews are built on the historical distribution of returns associated with a given GEX value. This is great, because it tells us a lot about what ATM volatility is likely to be, but it has a much harder time understanding what happens in the tails, because in order to know what happens in the tails, you have to compute GEX in the tails, and in order to compute GEX in the tails, you need to have a really robust way of measuring GEX (i.e., GEX+). But once you can do that, you can compute skews the way we just did up there, because now we know what GEX (and GXV) will be when spot and vol move in all sorts of different ways, and we can build up our skew from that, in a very organic way. But now where this gets really exciting is when we assert that we can build a probability density (or probability mass, really) function from these skews, and compare those densities to each other, and find out a Kelly-optimal strike and size for an SPX put. Meaning, there is a perfectly sensible, dispassionate, and scientific way to turn that heatmap data into these skews, to turn these skews into probability densities, and then to turn those probability densities into objectively optimal positions. The way we see it right now, this is the "last step" of converting that heatmap data into something actionable. That's what we're working toward.*

Now look back at the Friday plot. It really has no resemblance to these risky skews, right? In the worst case scenario, GXV is around 70 and VIX is around 50. That's not even interesting compared to these historical examples. For crash risk, you want a market that's *way* offside, and that's definitely not this market right

now.

What this market *is* is more crazy overnight gaps, more relatively boring intradays (0.98% average), and more people pricing volatility way too high.

When that changes, we'll let you know.

In the meantime, enjoy the week!

The SqueezeMetrics Team

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