S&P 500 Weekly Forecast 2/28

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Hey guys,

Last weekend, we exhorted the reader to be patient, and calm, and to be very suspicious of pretty things.

> See, the problem with just declaring that hedging bands are real and useful is that *it's an appealing idea*. Finding some truth, some alpha, in an ugly idea is much more compelling, because it means that you don't necessarily *want* to be true [...] you have to be careful. This is especially true of something that looks pretty on a chart.
>
> [...] We took unusual care in the past few days to make sure we weren't superimposing unicorns and rainbows on these charts.

And that desire to shun unicorns and rainbows led us to a mostly useless chart, but there was still a sense that there was something very valuable underpinning this hedging bands idea.

> For now, we believe that the signal we've found is simply too weak to rely on. But the fact that the signal is so *clear* is tantalizing. So as much as we hate to keep looking at this (it's horrible), we still think that this is an important, and potentially valuable, venue for inquiry.

And so, after one more week of thinking and data-wringing (and finding flaws in last weekend's test!) we can confidently say that -- yes, there's something here.

It's just not quite what we thought it'd look like.

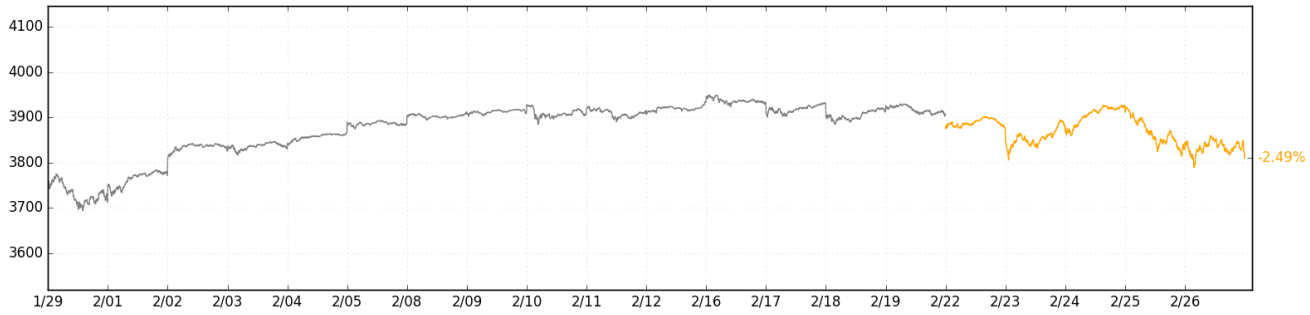
But first...

1. Over the last five days
2. Over the next five days
3. Over-complicating things

Over the last five days
Last weekend, we talked about how we were positioning for the week in a very probability-focused manner. Not only did we discard our long-held VIX short; we got into a structure (long call + long put spread) that would win *significantly* if SPX closed below 3850 or above 4050 -- which GEX+ said was the underrepresented probability.

> This trade, as is stands, will win if SPX closes the week anywhere below 3883, or anywhere above 4017. In the middle, it loses. The sizing is peanuts, because by golly it's not a high probability bet.

And this actually worked, with a weekly close at SPX 3811.



We monetized the put spread toward EOD on Thursday, though, and got into short VIX all over again (from Friday morning):

> And we we happily monetized that put spread yesterday below the 3850 strike. Why did we sell it? Because we really don't have a lot of faith in a *further* decline.
>
> [...]
>
> So when we got rid of our weekly put spread, we sold some March VIX again, at 28.00.

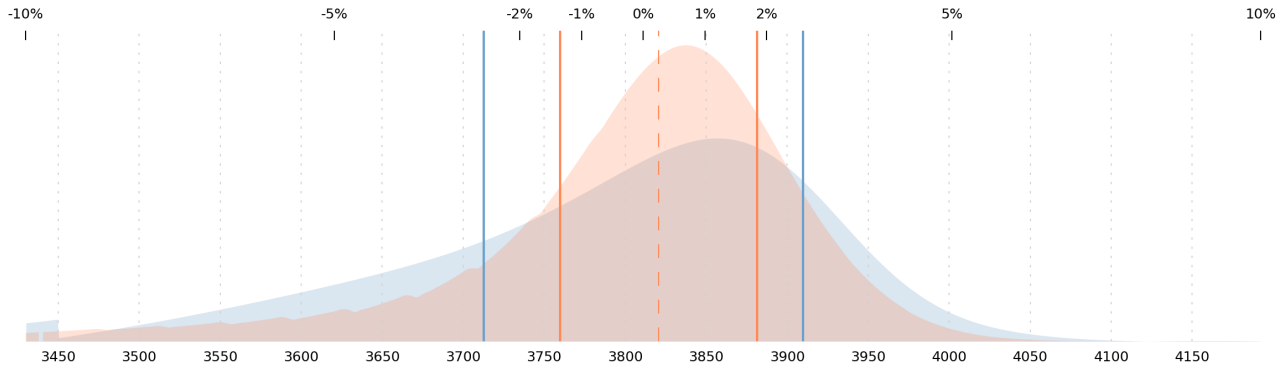
And that's where we're at right now.

Over the next five days

Honestly, Friday's data didn't add much to the picture. The GEX+ "illiquidity zone" is still about 5% below spot (SPX 3650), DIX is still inconclusive, but not bearish, or indicative of liquidity troubles. Net put delta (NPD) at -4 suggests that there was a wee bit more put-selling than usual, but in light of the recent put-buying frenzy, that doesn't seem immediately interesting. As we said on Friday, VGR is back in a more bullish zone, predicting a drop in VIX.

But maybe we're being too rosy: The fixed-income and fixed-income vol traders will tell you that last week was scary, and this seems apparent in the rise in rates vol (take a look at a chart of MOVE), but that stuff is way above our pay grade. All we can figure is that a rise in rates vol actually pushes risk-parity and vol-targeting types back into equities, if only temporarily. Or is that a self-serving conclusion...

In any case, we're sticking with our [substantial] short March VIX position. But for some more context, take a peek at the 1-week probability density comparison: GEX+ versus market IVs.



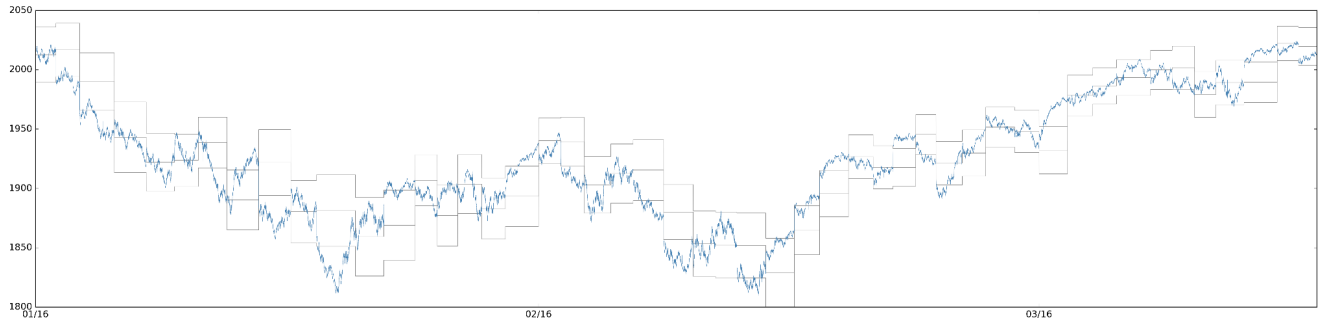
I.e., it's a bad time to buy options, according to GEX+.

We often regret saying this lately, but it looks like it ought to be a good week to sell iron flies, too. But to be clear, we're just going to be super basic and sell VIX. Maybe pick up a Starbucks coffee, too.

Over-complicating things

So, to start with, strip down *all* our hubris (this will take some time): Take away the prior hedging bands' assumption that dealers hedge continuously throughout the day, and thus the assumption that intraday dealer hedging bands move in beautiful, curvy patterns (weren't those pretty?). Strip all of that away, and just assume -- in the simplest fashion -- that anyone who's delta-hedging *in a big way* does it at the close to access that end-of-day liquidity, and that the center of the next day's hedging band is -- when everything is averaged out -- the prior close.

Also, assume that because of this, intraday delta-hedging impacts are subtle, and are mostly in line with a static 1-standard-deviation band around yesterday's closing price. Because if most hedgers are using the close to access liquidity, then the prior close is indeed the likely reference point for re-hedges. And folks probably think in terms of standard deviations, or fractions thereof (e.g., 0.5 stdev), because everyone knows what those are. Keep it simple. And for a small, illustrative sample, that stripped-down hedging band looks like this (2.5 months of data):

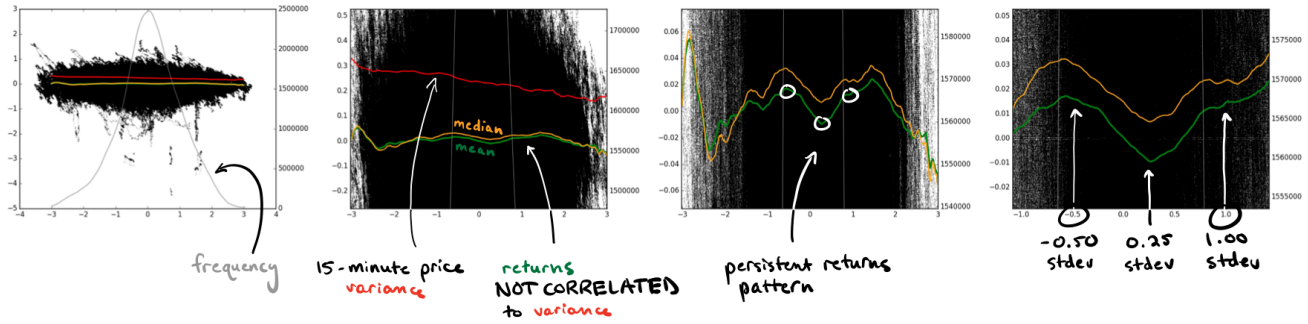


These bands use 1-week implied volatility to inform their width, since 1-week options must, to *some* extent, be reflective of the price of gamma (else folks will buy/sell options to bring it back in line). Besides, IVs will more or less be the yardstick by which everyone measures their deltas anyway, and right now, we're more concerned about the *location* of potential delta-hedges than their *magnitude* (which is what GEX is measuring already).

So, with this really simple method in place, let's look at all data from 2016 to present again, minute-to-minute. What we want to know is whether there are any particular locations between those hedging bands where predictable behavior transpires. And we want that behavior to be *visibly consistent* regardless of *time of day*, regardless of *market trend*, and regardless of *year*.

And so we tested across time, during downtrends, with 5-minute prices, 15-, 30-, 60-minute. We tested years in isolation, shakier periods, volatile periods, etc. And no matter how we test it, we see the same exact pattern peeking out.

Beginning with the zoomed-out scatterplot and zooming in to see the mean and median rolling 15-minute intraday returns...



Neat, huh? Let's go panel-by-panel.

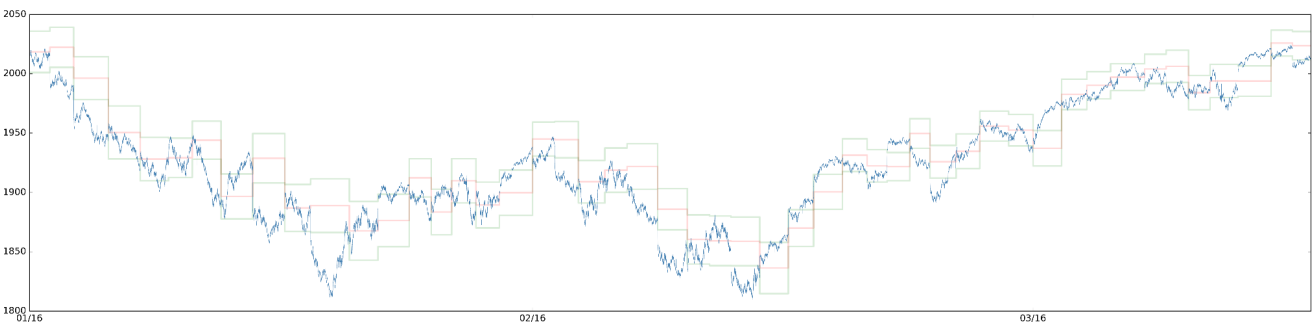
1.
First of all, for context, take a peek at the leftmost panel above. The x-axis is denominated in 1-standard-deviation bands. So, "1" is the upper band, and "-1" is the lower band. You'll notice right away that most of the data falls within 2 standard deviations -- as you'd expect. The y-axis, meanwhile, normalizes 15-minute price return to the same units as the x-axis, for consistency. So, 0.30 on the y-axis means 0.30 standard deviations (30% of the width of the hedging band), and 0.01 means 0.01 standard deviations (1% of the width of the hedging band).

What is 1% of the width of a hedging band? Well, if the hedging band is 50 SPX points wide, then 1% of 50 is 0.50 points. Since E-minis have a tick size of 0.25, this would be two ticks. Make sense?

2.
Moving on, the second panel is where the excitement begins. Generally, we expect to see volatility negatively correlated to equity index returns. Risk-adjusted returns are supposed to stay constant, so when variance goes up, returns should go up too. But you can see, even from afar, that there's an idiosyncratic wiggle in returns (mean and median) where the data is most abundant. Now let's zoom in more!

3.
Here, you get a sense of the scale of the anomaly. The average returns range from around -0.01 to 0.02. That's representative of a 3% range in the hedging band. So, e.g., if the hedging band is 50 points wide, that's 1.5 SPX points (6 ES ticks) of difference between the upper estimate and the lower. On a 15-minute timeframe, that's *actually quite a lot.*

4.
One last, closer look at the scale, and where the "bands" appear to be located. It seems natural to choose three points to represent what's going on here, with a *bearish* fulcrum around that +0.25 standard deviation level and two symmetrically equidistant (+/-0.75 stdev) *bullish* levels at -0.50 and +1.00. And so let's re-draw the super-basic, stripped-down hedging bands from above, but with *these* levels (-0.50, +0.25, +1.00):



That's interesting. Not sure about you, but we're thinking that this actually makes sense. Around the lower 0.50 standard deviation band, there is *support*. Around the upper 1.00 standard deviation band, there is *momentum*. Between the two, there's nothing.

Let's call these *support-momentum* bands, or "SuMo bands!" (Yes, we've been trying to name something "SuMo" for a while now, so just let us have this moment.)

We're going to try to build a longer history of this so we can do better testing (all of the above is 2016 to present), then we're going to send along a spreadsheet of that in case the reader would like to give it a try. There are innumerable applications to a dataset like this, and many possible implications for strategies other than intraday ES trading.

And yes, we expect to be able to supply these levels with the usual morning GEX+ data in the not-at-all-distant future. And of course, we'll be following up on this throughout the week.

E-minis looking buoyant. March VIX under 26. Enjoy!

The SqueezeMetrics Team
