S&P 500 Weekly Forecast 2/15

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Subject: S&P 500 Weekly Forecast 2/15

Date: Monday, February 15, 2021 9:00 PM

Size: 433 KB

Hey everyone,

Quick big-picture recap: S&P 500 gamma exposure (GEX) measures how many dollars have to be bought (sold) by option dealers for every 1-point move down (up) in the index. Using historical analysis, we can assess how many dollars in GEX it tends to take to impact the movement of the index, and we can derive a "gamma-implied volatility" (GIV) from that. Then we can take the next step and run a scenario analysis on all existing options, and see how dealers will need to hedge in the event of a 1% move up, or a 10% move down, or a 5% move down with a sharp rise in market IVs. Or whatever.

This is the point of the GEX+ and GIV heatmaps on the Risk Report PDF. You already know these things.

But these heatmaps only have (1) a spot price dimension, (2) a volatility dimension, and (3) a GEX+ level (or GIV) dimension. They do *not* have a time dimension. And if you're interested in how the index price series evolves over time with respect to the dynamic hedging of option dealers, then you need to try to do what traders have been doing for centuries: *Draw some lines on a price chart.*

Indeed, you may recall that this was one of our "ambitions for 2021" (from the 12/27/20 note):

> *Bonus: We'd also like to be able to "triangulate" some intraday hedging bands for SPX, based on the prior day's ranges and likely delta-hedge points, since we're thinking this will come in handy for timing our long vol with a bit more precision.*

We followed that up immediately (on 1/3/21) with a bungling, amateurish attempt at drawing those hedging bands. Our bungling amateurism proved fruitful, in that we were able to see a very clear signal *despite* our naive method.

I.e., when the index closed well *above* the center of dealers' hedging bands, next-day returns were *lower*. When the index closed well *below*, next-day returns were *higher*. This is what we expected to see. It means that hedging bands are, to some extent, real, and are visible in the data. And that they play a quantifiable role in day-to-day SPX returns.
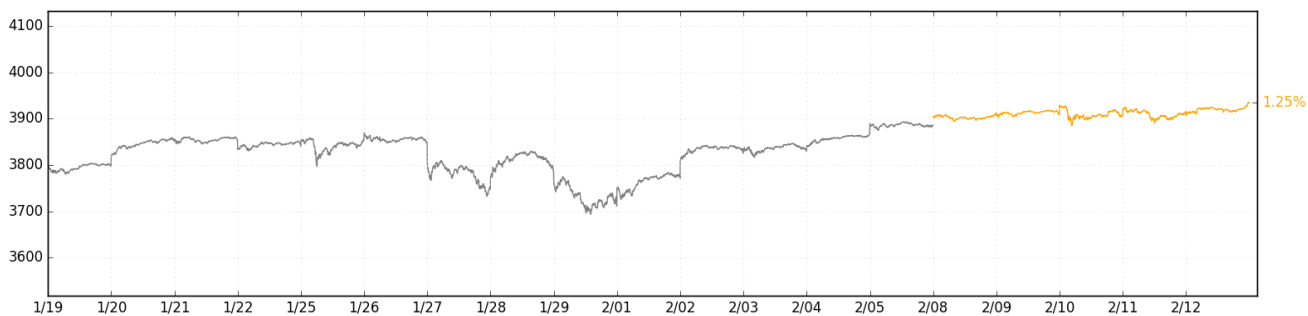
So now let's take the next step.

But first...

1. Pumpers
2. Dumpers
3. Bumpers

Pumpers

The S&P 500 went up again.

Our outlook on the week, if you don't recall, was to be short VIX, but long a 1-week put spread. The VIX position gave us shadow deltas, short vol-of-vol, and short skew; the put spread gave us some short deltas, but without being long vol-of-vol or long skew. The near-term long vol versus the farther-out short vol also took advantage of a really steep SPX IV term structure. This gave us just about everything that we wanted, and it worked out well (what would make this trade really fail is if SPX melted up and VIX went up with it, and that didn't happen).

Toward the end of the week, we basically rolled the same position. We're now short March VIX and long another put spread for Friday.

Dumpers
Obviously, our outlook for this (short) week is really similar to last week. And that's because that's what the data is telling us.

The vanna-gamma ratio (VGR) is in the -2s. That means lots of market vol-sensitivity, and that IVs have a hard time falling more. VIX is more likely to go up than down.

But at the same time, SPX net put delta (NPD) tells us that customers are *still* rolling long put positions. They *still* want put protection, and they're *still* paying up for it. This means that, if SPX falls, skew will inevitably be overpriced. I.e., since there's tons of natural put supply (customers who already own puts), skew will become oversupplied as those puts start being sold. So even if we think VIX should go up, we don't think it should go up a lot, and we also think that betting on the left tail of SPX is a losing proposition right now.

Which leaves us short VIX while betting in a left-shoulder event on the 1-week timeframe (like a 1.5% loss or something). And by golly is it a cheap bet right now: This week's ATM SPX vols were priced at 7% to 11% as of the close on Friday. And with GEX+ at $700mm (implying a GIV of 9%), these options seem very desirable to buy.

The Probability Page says it best. Check out the 1-day (Tuesday) probability density comparison.
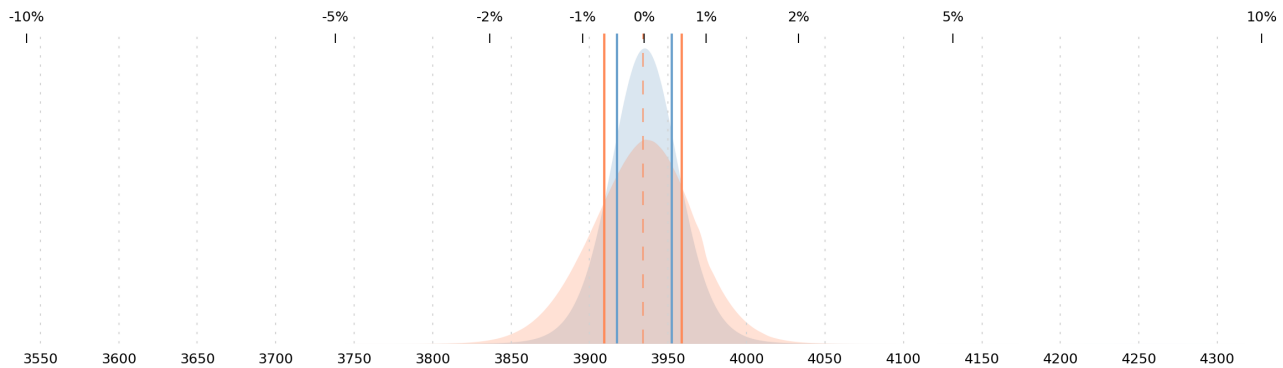
While GEX+ says that SPX 4000 and SPX 3850 are both within the realm of possibility, market prices imply they're, like, 3-sigma or something. Notice how the greatest mispricing appears to be between 1% and 2% losses (where the orange density is a lot taller than the blue). And that's pretty much why we're long put spreads for this week. Is it the most likely outcome? Of course not. Is it a mispriced outcome? Sure looks like it.

*(Judging by E-minis right now, we'll have to roll those put spreads up again... *sigh*)*

Unlike last week, where we weren't leaning too hard -- if we *don't* get some kind of dip that we can monetize this week, we're going to be on the losing side of the trade. So wish us luck.

Bumpers
Our naive method for gauging delta-hedging bands looked like this:

> The width of the band is determined by GEX+. It's the 1-day gamma-implied vol (GIV), expressed in terms of mean absolute deviation (MAD), and moving perfectly in lock-step with prices (for simplicity). And despite using our own data to describe what's going on here, it should be clear that this "theme" has been explored a thousand times before in "overbought/oversold" oscillators of all shapes and sizes, from RSI to Bollinger Bands:
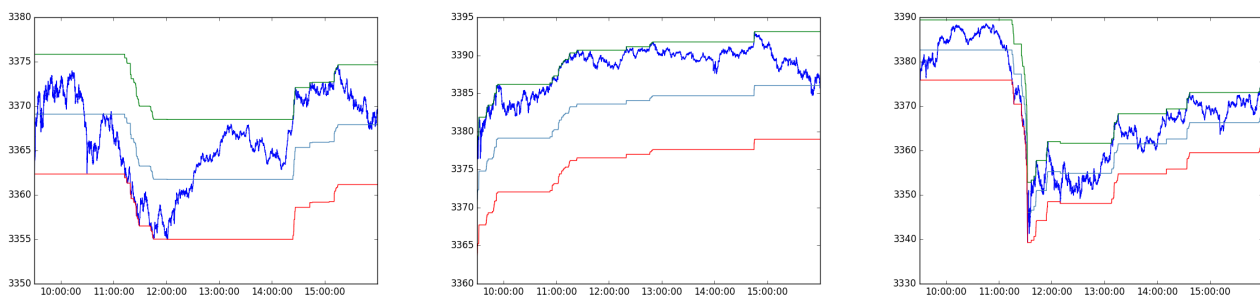

This time, though, let's compute the GEX curve precisely, and actually use *dollars* to draw the hedging bands. Lets also acknowledge that dealers' desire to re-hedge their deltas will be a function (an exponential function!) of exactly how far spot is away from their last hedge. The further, the more likely they'll want to re-hedge, and the more dollars will flow in. Finally, let's introduce a "friction" function -- re-hedges will happen over the course of minutes to hours, not instantaneously. So let's allow for a *lag* between spot moves and re-hedges, to reflect that behavior.

Here's our chosen dollar-constant: *Each band (upper and lower) is $5bn away from spot.* I.e., if SPX touches the lower band, dealers theoretically have to buy $5bn of SPX to re-hedge their deltas. Yes, this is an

arbitrary number, and yes, it's meant to be arbitrary.

When we model all of this together, we get hedging bands that look like this, where green is the lower band and red is the upper band:
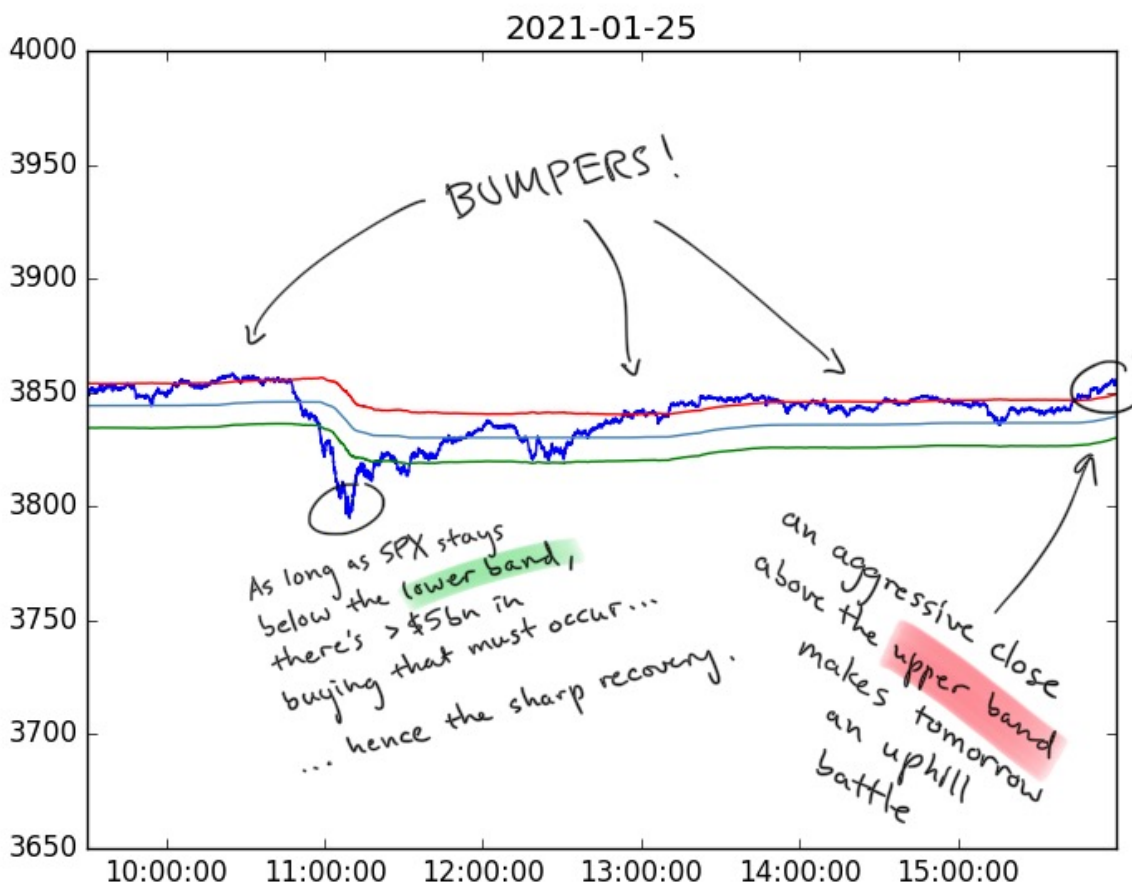
And to get a feel for what these hedging bands would have looked like every day from January to today, take a peek at this little slideshow. Imagine that, every time price is *below* the green band, dealers are compelled to, at least passively, *buy* some SPX; and to *sell* when price is *above* the red band. Kinda makes sense, right?

At first glance, this seems like it may be more helpful than the *ad hoc* method we were using before, and more accurate. However, we don't think it's going to be so simple. These new bands look like they'll be useful for understanding intraday dynamics, but after a couple initial tests, it doesn't look like they're *as* useful for betting on next-day returns (fascinating implications!).

So in this coming week, we'll be performing a battery of tests. What happens if we widen these bands from $5bn to $10bn? What happens when we test close-to-close versus open-to-close (or close-to-open!) returns? How about intraday? What if you buy when SPX is 2x below the lower hedging band? What if we normalize to GIV instead of dollar-GEX? WHAT DOES IT ALL MEAN?!

In any case, here's something we find really cool: If you watch that slideshow, freeze the frame on 1/29. See how, as price falls, the hedging bands dramatically widen? That's because, on 1/29, GEX was falling very quickly with price (the GEX curve was very steep), which rapidly weakened the lower hedging band, allowing

for more downside than you'd usually get.

You already know that a quick drop in GEX is a huge deal for the S&P 500 (and single stocks), but you've probably never been able to *visualize* how it impacts intraday prices. Cool, huh? Now... knowing that vanna is a function of spot-vol covariance, and that spot-vol covariance is a function of latent customer supply or demand, can't we eventually draw *VEX* bands on a chart, too?

Well, we're gonna try, anyway.

In the meantime, enjoy the short week!

The SqueezeMetrics Team