

S&P 500 Weekly Forecast 6/28

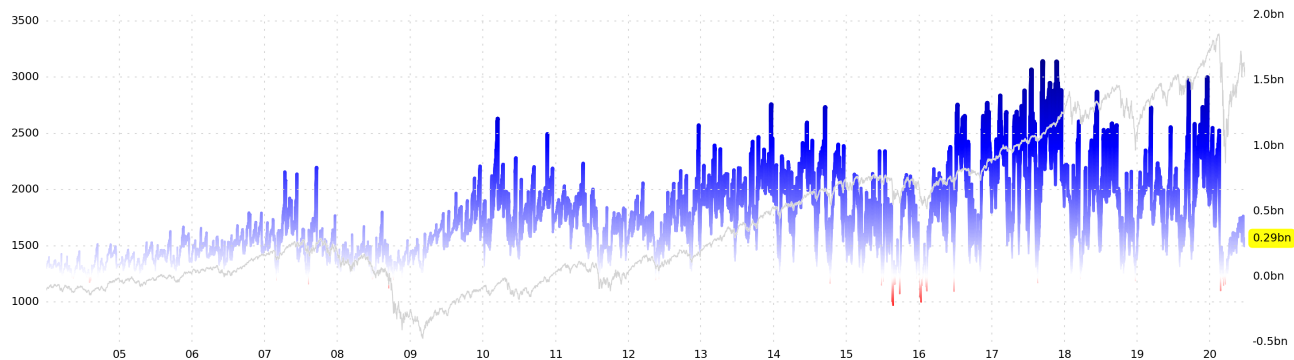
From: SqueezeMetrics <info@sqzme.co>
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Hey everyone,

So, we've been throwing charts around for a few months now, trying to get at the way we can use dealers' gamma *and* vanna exposures to gauge liquidity and volatility risks in the S&P 500. The first "success" was the heatmaps, because they told us about all of the possibilities: What happens if SPX falls? If VIX rises? What happens to the amount of liquidity being provided to the market by SPX option dealers? What degree of volatility is that historically associated with?

The heatmaps were what allowed us to confidently assert, for the last few months, that the market is subjected to no crash risk, where "crash risk" is a risk of sudden illiquidity that allows the index to fall more than 10% in a short time. "No crash risk" is actually pretty unusual -- the market *usually* has a small risk of sudden, dramatic illiquidity. The last few months have been a rare exception.

Yet, at the same time, gamma exposure *hasn't* been able to recover to where top-of-book liquidity is dramatically affected, and where volatility invariably compresses. Last weekend, we pointed out that we believe this is because option OI has been spread out across a wide range of strikes, due to recent volatility. As you may recall, GEX gets higher when (a) there are lots of sold options at-the-money, and (b) implied volatility is low. Neither of these have been the case recently, and GEX has stayed pretty low as a result.



What this all means, in liquidity terms, is that *depth of book* has been relatively better than *top of book*. Usually, there is very little liquidity committed to making a market in the event of a sharp drop, but there is a lot of liquidity committed to making a market as long as things stay calm (this is why people complain about HFT -- it withdraws liquidity when it's needed most). The usual state of affairs features leptokurtic distributions, with low volatility, but sharp corrections. This *current* state, though, gives way to relatively more platykurtic (or maybe just more Gaussian) distributions, where volatility doesn't really rise that much after the index falls a lot -- i.e., "vol of vol" is low.

Because "crash risk" is such a vital statistic, we're pretty stoked about how well the heatmaps have done at mapping out liquidity and showing us where things could get rough. But at the same time, we've been disappointed in how gamma-implied vol (GIV) has underestimated day-to-day volatility. We knew these were

really aggressive forecasts (and we've even opined on how they're likely to make us look stupid), but lately, it feels like they're actually missing something: The reality of volatility is not what GIV is saying, and not what VIX is saying, but somewhere in-between. E.g., if GIV is 13 and VIX is 35, maybe we should expect daily volatility to be around 24 (average 1.20% daily moves). This seems closer to the truth.

And this is part of a broader point that we've riffed on before: That it's never enough to know how much liquidity is being provided -- you also need to know how much liquidity is likely to be taken. Sometimes (i.e., when VIX is high, and when NYSE Composite volume is high), more liquidity is clearly being taken, and in that case, +\$300mm in gamma exposure just isn't going to keep a lid on vol. So we're throwing in the towel and acknowledging that we need to quantify "sentiment," or whatever you might call the market's proclivity to demand more liquidity than usual. (Some of you have been doing this on your own, e.g., by tracking the spread between GIV and VIX.)

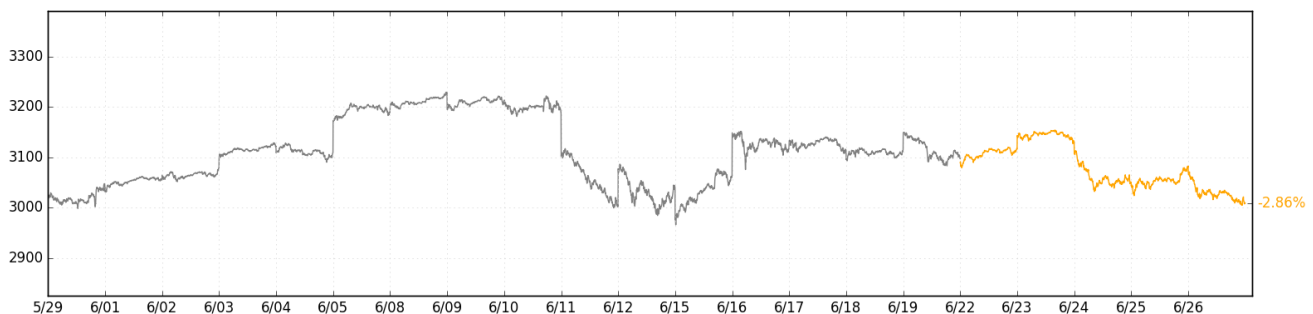
But before we get any further, we need to put a pin in these heatmaps -- and it's about time that you have a daily summary with some consistent data. So, a PDF document is attached -- it's a utilitarian chart-dump that summarizes S&P 500 liquidity risk *vis-à-vis* SPX options. This will be available every day around 5:00am starting on Tuesday morning on the GammaVol page (<https://squeezemetrics.com/monitor/v/gxv>). We'll remind you to look for it when it's up.

The rest of this note is going to draw on that Risk Report PDF to walk through the forecast.

1. Last five
2. Next four
3. Getting sentimental

Last five

The index did this:



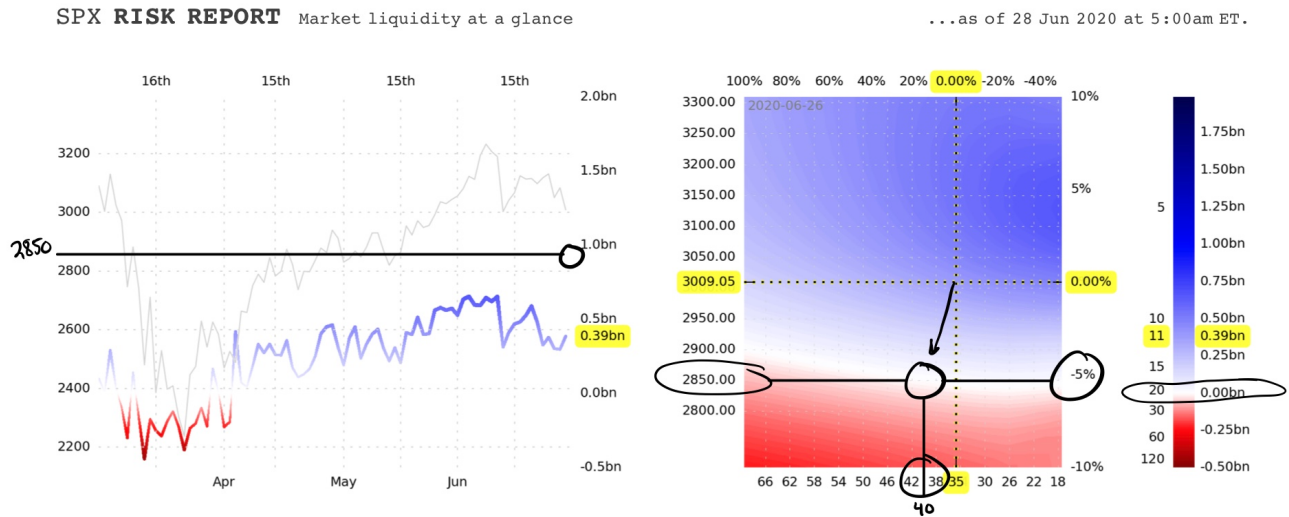
At 1.44% average daily moves and a 2.86% weekly move, SPX realized underperformed VIX-implied vol as SPX fell. As a result, VIX itself was pretty much unchanged on the week. This is the virtuous combination that made us tout this (*twice!*) in last weekend's note:

But if you're tied to more liquid instruments, why not short VIX with a bit of short SPX? There's a lot of meat on that, too.

We're still not pleased with our results, though. Like we said above, realized vol has been well above our forecast, somewhere between GIV and VIX. No *huge* disappointments, but no big wins either. On balance, the week was neither a win nor a loss.

Next four

Short week coming up, in case you forgot! Let's walk through what it's likely to look like, given the data on the attached PDF. Let's start by looking at the GEX heatmap and context chart in the top row.



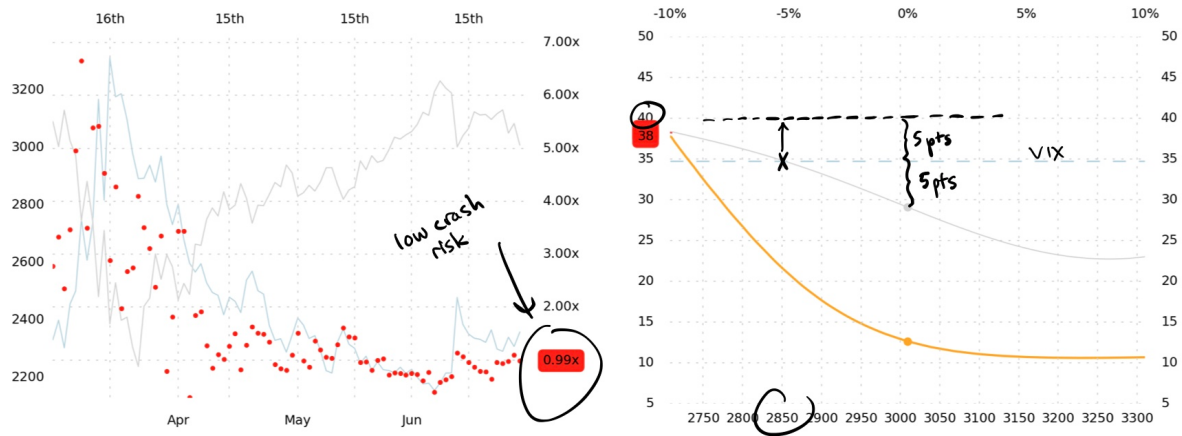
Here, we want to get a feel for where zero GEX is -- the beginning of the illiquidity zone -- because that's where scary, sustained volatility can begin. From the looks of it's around SPX 2850 that the red zone begins. Whether it's a bit higher or lower depends on what you believe VIX would do in the event of a 5% drop in SPX. Our guess is that VIX would end up around 40 (supposing the drop occurred over a few days).

Now look at the context chart to the left. Does it look possible that SPX would fall to 2850? Sure. What was GEX+ last time SPX was at that price? Looks like it was around \$0.4bn. So if SPX fell back to 2850, it'd probably become more volatile than it was last time it was at 2850, since GEX+ would be lower.

But how volatile? Nothing too scary, obviously, since we can tell from the colormap key at the far right that a GEX+ of 0 is associated with around 21 vol. And while it rises rapidly from there, zero GEX+ is not dangerous per se. So, all in all, if SPX fell to 2850, GEX-implied vol would rise to 20 and VIX would be around 40. That's not a dangerous scenario. A dangerous scenario is when VIX rises to 40 and GEX-implied vol rises to 80.

In other words, this market is more liquid than VIX seems to think it is, and this insulates the index from a crash.

You may be wondering how we got to our guess that VIX would be 40 if SPX fell 5%. We did that by looking at the 30-day SPX IV skew at the bottom-right of the page (gray line).



So, in theory, this vol skew tells us something about spot-vol correlation. I.e., if SPX falls to 2850, this skew says that 30-day ATM vols will be 35 (ATM vol is supposed to "slide down" the curve). But if ATM vols rise from 30 to 35, what happens to VIX? (VIX is the light blue dashed line.) Something very similar -- since VIX is a function of 30-day SPX vols. So that's why we're guessing that VIX would rise 5 points to 40, because the market says that ATM IV would rise 5 points to 35. Make sense? It's a reasonable approximation.

Also, if you look at the left panel, you'll see that our measure of crash risk is at around 1.00x, which says that GIV and IV essentially agree about the liquidity/vol situation in the event of a 10% drop in the index. You can see from the -10% comparison of the orange and gray skews that both GIV and IV forecast a vol at 38 if the index were to fall that far. A crash risk of 1.00x is historically very low, so this is still considered really safe (which matches what we saw in the GEX heatmap).

One last gut-check: What would happen to GIV and VIX if things got as bad as we can imagine? I.e., what if VIX rose 100% and SPX fell 10%? Well, that far, bottom-left corner of the GIV heatmap (annotation [here](#)) is 45 vol (2.25% average daily moves), but in order to achieve 45 vol, VIX would have to be 70! This would be unsustainable, and is nigh impossible in the near term. In sum, this tells us that the market is pricing in more liquidity risk across the board than there actually is. This has been true for months. There is no crash risk.

As for near-term movement, if we were to use our "somewhere between VIX and GIV" heuristic, we should expect vol to be around 23 (mean of 35 and 11). And if we look at the GIV colormap key, we see that 23 vol is associated with somewhere between 1.00% and 1.25% average daily moves. (If you want to do it yourself, multiply 23 by the square root of 1/252, then multiply that product by 0.7978. The answer is 1.16%.)

So that's what we're expecting for the next four days: No crash risk, and an average of 1.16% daily moves.

Make sense? Let us know what we can clarify.

Getting sentimental

We've been getting some neat feedback as far as measuring sentiment goes. One reader's idea: Subtracting GIV from VIX should theoretically isolate a "fear factor" from VIX. Interesting. Other readers were responsible for the idea to track net delta flows in SPX options every day -- this has already been interesting, and we think it should feature prominently in sentiment and flow analysis. An obvious thing to track would be realized volatility. A less-obvious thing to track would be NYSE Composite volume, which has a very strong relationship with forward volatility and seems like a good proxy for "liquidity-taking" activity.

In the same way that we dumped a mess of charts on the Risk Report PDF, we'd like to do the same for a Sentiment Sheet. So let us know if there's anything sentimental you'd like to see -- and thank you all for the

ideas so far.

Enjoy the holiday week!

The SqueezeMetrics Team

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