

## PORTFOLIO CONSTRUCTION

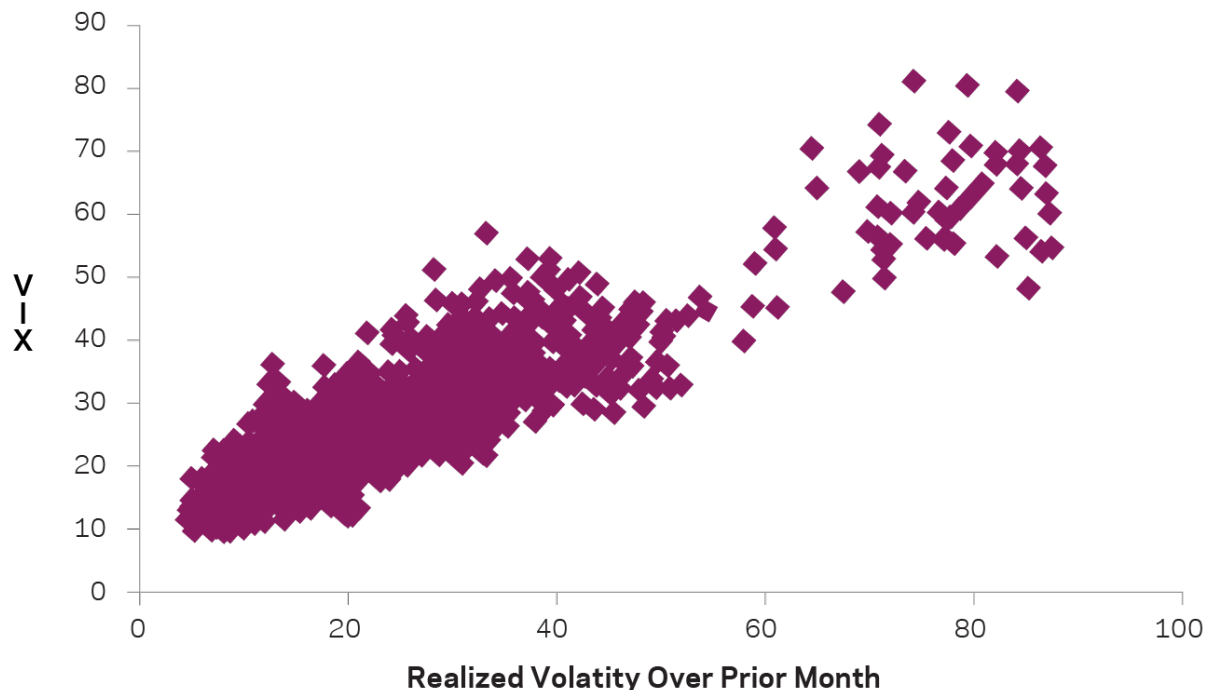
### Please Stop Talking About the VIX So Much

July 30, 2017

If anyone reading this has always meant “recent realized return volatility” when commenting on the VIX, and has never attached much importance to it beyond that, please stop reading as the below has little point for you. But if you think the VIX is much deeper than that, read on!

It has become quite commonplace to note that the VIX is very low and to worry about it. Indeed, the VIX really is very low right now (i.e., less than 1st percentile low). I tend to think this is less of a worry than most (not that there aren't other nice things to worry about, and it's hard to disentangle them all as they are often versions of the same thing). But this note isn't about that. It's about a much simpler, smaller, but still important, issue — that when people talk about the VIX they are almost entirely talking about recent realized volatility. But somehow, because the VIX is a current forward looking measure (really a type of price) people seem to attach more to it than that. To simply just say, “things have not been bouncing around a lot lately” doesn't quite sound like a damning indictment of current complacency as much as just a fact. Yet the VIX and realized volatility are almost entirely the same thing.

Below is a plot of the VIX against the realized daily backward looking 20-day volatility (almost a month in trading days) from 1990-present.<sup>1</sup>



If you regress the VIX on the realized volatility over the prior month, you get a 78% R-squared. If you extend the regression to also include a slightly longer measure of realized volatility (60-day volatility) the R-squared goes up a bit to 82% and the regression results look like this<sup>2</sup>:

$$VIX - 6.7 + 0.44 * 20\text{-day Volatility} + 0.37 * 60\text{-day Volatility}^{**}$$

\*\*The intercept is a big positive (6.7) for two reasons: (1) the coefficients on realized volatility add up to less than 1.0 (0.44 + 0.37 = 0.81), likely due to mean-reverting expectations and that missing part has to land in the intercept. (2) the VIX is on average higher than realized volatility, the source of what we sometimes call the "volatility risk premium." This is another way of saying insurance is costly and selling insurance on average profitable (though perhaps scary!).

The observed values today (intra-day 7/27/2017 when I wrote this) are a VIX of 10.3, a realized 20-day volatility of 6.9, and a realized 60-day volatility of 7.3. Using the above model, the forecasted VIX today is 12.4. So indeed today's VIX of 10.3 is a bit low vs. this model's best guess. That 10.3 versus 12.4 is a -0.6 standard deviation event error in case you are wondering (meaning the VIX is not shockingly low at all versus the model's forecast). So if people want to worry that the VIX is -0.6 more complacent than usual at these levels of realized volatility, go for it.

More importantly, it's perfectly fine to comment on realized volatility being very low and to worry about that. But we shouldn't think the VIX is telling us more than that.<sup>3</sup> And, importantly, I do think when commentators discuss the VIX they often think it has more import and gravitas than it really does. The VIX tells us almost nothing beyond how much markets have been bouncing around lately. So, instead of saying "the VIX is shockingly low" why not say "markets have been shockingly calm lately"? If you agree the latter is what you're really saying, we are simpatico. If you believe that says the same thing about investor complacency, great.

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[1] Sources: CBOE and Bloomberg. Date range: January 2, 1990 to July 27, 2017. Realized volatility is calculated using daily continuously compounded returns. Chart is for illustrative purposes only.

[2] I tried to keep it super simple here. If I were trying to build the best, most robust model it could likely be improved but I also think the message would very likely be the same. For instance, we also think the VIX has an even shorter term component than the prior 20-days, but you really need intra-day prices to measure that and this is beyond the scope of this short note. Additional examples are that the spread between the VIX and prior realized volatility tends to persist and tends to widen when very recent prior returns are more negative.

[3] OK, the VIX might be telling us a bit more, but only when being compared to something relevant, not on its own. We think the VIX compared to realized volatility (I do a very coarse simple version of this comparison above) may tell us something about risk aversion and the volatility risk premium, and some have argued it's a forecaster of equity returns. For instance, if the VIX were decently high during this period of calm, then that would indeed be a story. But this is a subtler comparison than the common observation (the VIX is super low, people are too complacent!) that I critique here. Indeed, in my coarse model detailed above, this comparison is well less than a 1.0 standard deviation event today.

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