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- VIX has dropped to 12.3, as the spread between SPX realized vol and VIX is still lower than 2017 levels
- The MRA Macro Model for VIX suggests that the VIX should be 14.1 based purely on economic fundamentals
- Seagull spreads on the VIX work well when initiated during low VIX environments, in our view like the current VIX levels, with inherently a supportive risk-reward profile due to the natural skew in the returns of VIX

Derivatives Strategy
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Trade Idea:

- **Sell VIX July 12 put to Buy 16-20 call spread for 0.15 (ref. 12.34, 43d)**

Skewness of VIX changes

Early on as an equity derivatives trader it becomes apparent that implied volatility generally: 1) slowly grinds down or 2) quickly jumps up. As options function as market insurance, usually option sellers harvest a premium of implied over realized volatility (over time pushing down the price of vol). Every now and then, VIX explodes as demand for protection increases, and market hedges pay off.

This pattern shows itself in the skewness of daily changes in the VIX Index. A popular skewness statistic, *Pearson's moment coefficient of skewness*, is 1.49, compared to 0 for the normal distribution. This means that the data is “skewed right”; the right tails are longer than the left tails. Another useful statistic is kurtosis, which is a measurement of how “fat” the tails of a distribution are. Daily moves in the VIX have a *sample excess kurtosis* (the amount of kurtosis beyond the standard number of 3 for the normal distribution) of 27.2, meaning tail events for VIX happen far more likely than from the normal distribution.

The *seagull* option strategy on the VIX utilizes the positive skew of VIX returns by selling a VIX put (or put spread) and buying a VIX call spread. Calls are more expensive than puts for VIX because VIX options exhibit *call skew*, the opposite of *put skew* in index and equity options, therefore selling a further OTM call helps to keep the trade around premium neutral. However, before we look at specific structures for this trade, it makes sense to evaluate current market conditions and evaluate the seagull’s performance.

VIX call skew vs SPX put skew (scaled by ATM vol, 10-day moving average)

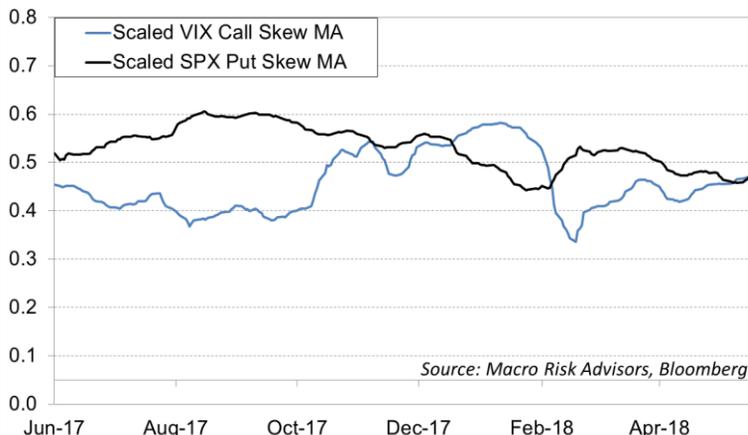


Figure 1: 10-day moving average of VIX call skew vs SPX put skew (scaled)

Source: Macro Risk Advisors, Bloomberg

The spread between VIX skew (25d call vol – 25d put vol scaled by at-the-money vol) and SPX skew (25d put vol – 25d call vol scaled by at-the-money vol) is shown in **Figure 1**. The current spread shows scaled SPX skew just 0.04 vols higher than scaled VIX skew, in the 39th percentile of its 1-year range, suggesting that the current pricing of VIX skew vs SPX skew is near its fair value.

Our proprietary MRA Macro Model for VIX, updated monthly using the purely economic inputs of 1) economic activity indicators 2) economic uncertainty indicators and 3) corporate performance measures (not price-based at all) suggests that the VIX should currently be **14.1**. The average VIX over the last 30 days is lower at 13.4.

Macro model of VIX vs. monthly average VIX, 2001-2018

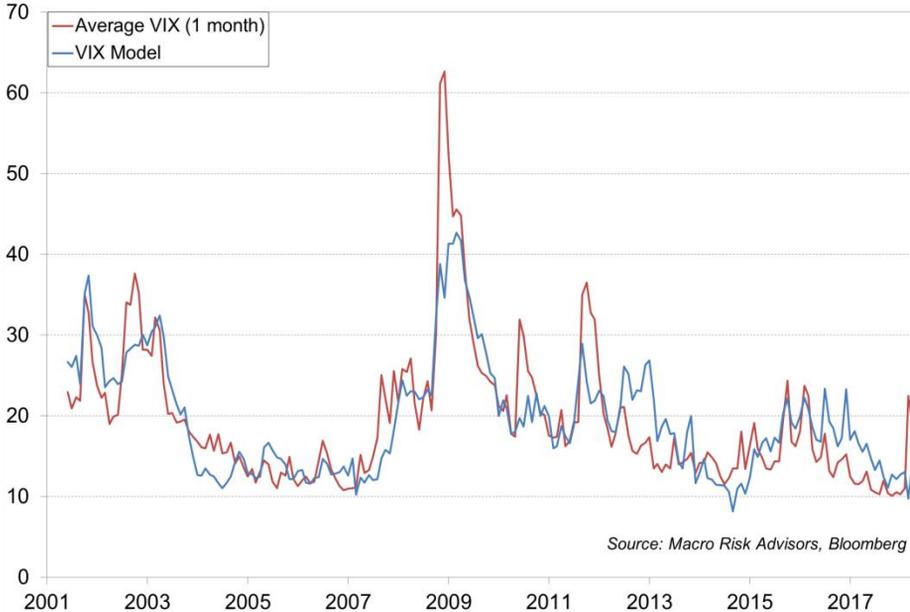


Figure 2: Average monthly VIX vs MRA Macro Model

Another way to assess the “fair value” of VIX is by adding a volatility risk premium estimate to the previous 1-month realized volatility for the SPX. Over the course of 2017, the average spread between VIX and SPX 30-day realized volatility was 4.26. Currently it is 2.00, as VIX has dropped to pre-VIX blowup levels (**Figure 3**).

VIX vs trailing 30-day SPX realized volatility

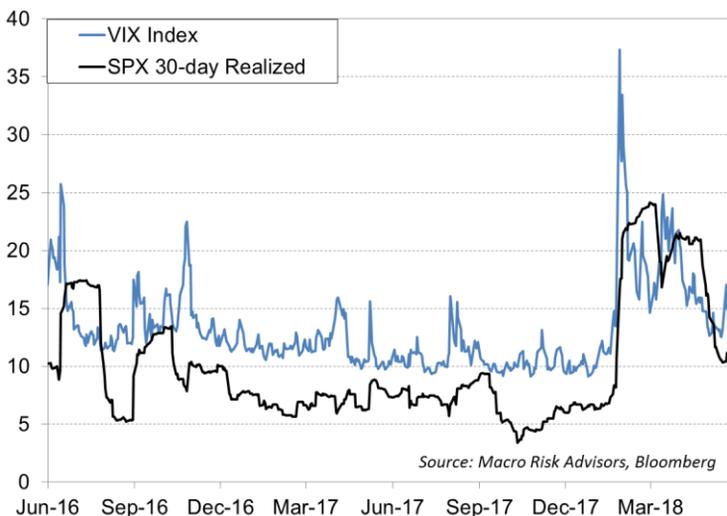


Figure 3: VIX vs SPX realized volatility

It's generally foolhardy to attempt to predict the VIX, but the current spread between implied and realized vol suggest that the VIX might be near a floor. Current SPX trailing 30-day realized volatility is 10.3, compared to the 2017 average of 6.83, while VIX is currently 12.3, just over a point higher than the 2017 average of 11.1.

A Flock of Seagulls

Our version of the seagull (sell OTM put, buy ATM call, sell OTM call) structure on VIX is ideal if a trader thinks the index might be near a floor, especially if a bid to volatility causes the long call strike to be in-the-money.

We ran a historical backtest of VIX seagull structures since October 2010, shown in **Figure 4**. We constructed the backtest by selling 1M 15d puts to finance owning the 1M 50d-15d call spread, rolling at expiration (we use simulated monthly expirations and back out market option prices by applying the Black-Scholes formula to the market implied vols).

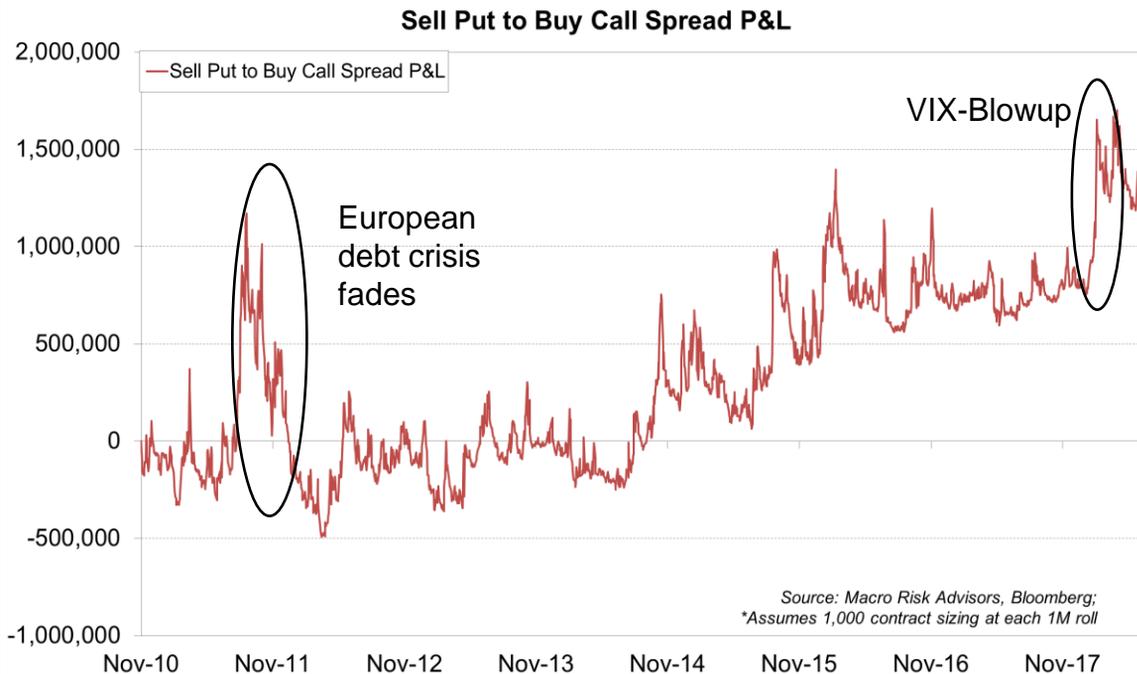


Figure 4: VIX seagull strategy performance over time

When breaking down the P&L of this trade, the short put leg of the trade lost \$43,300 over the 8-year period, while the long call spread leg actually generated \$1.2 million itself. From the P&L chart above, we can see that the strategy grossly underperforms when initiated in a high vol period. For example, In our simulated backtest, 1M rolls during the peak of the European sovereign debt crisis proved dangerous, as when vol did come back in, our short put leg became deep in-the-money.

As a matter of fact, the main times VIX drops rapidly in a short period of time are when 1) A catalyst for market risk goes away, or 2) A market-impacting event concludes.

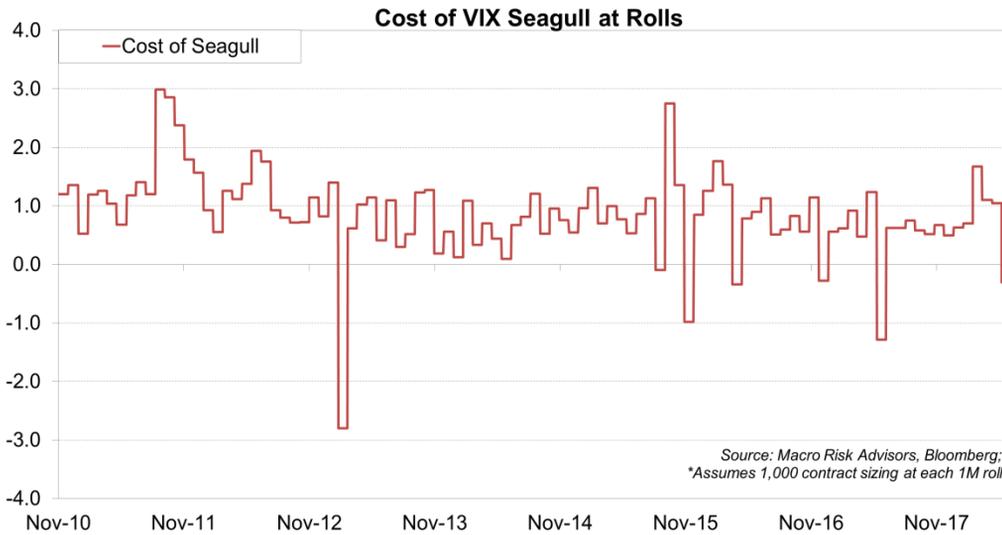


Figure 5: Cost of seagull strategy (buy 1M 50-15 delta VIX call spread, sell 1M 15 delta VIX put) over time (rolled monthly at expiration)

The plot above shows that the cost of putting on the seagull trade (based on 15-50-15 delta strikes) is highest during times of elevated market stress, compounding the issues with VIX deteriorating post-spike. During certain low-vol periods, the trade can even be done for a credit. We think current conditions form an ideal market environment to put on the trade, with VIX appearing to be close to a floor and continued macro volatility catalysts (e.g. trade wars, upcoming OPEC meeting) setting up for a potential large standard deviation *black swan* move.

Sell VIX July 12 put to Buy 16-20 call spread for 0.15 (ref. 12.34, 43d)

The July 12-16-20 seagull for VIX (sell 22d put, buy 46d call, sell 26d call), a modification of the 15-50-15 structure, can be done for a small debit with a little more than a month until expiration.

The P&L of this spread is shown in **Figure 6**.

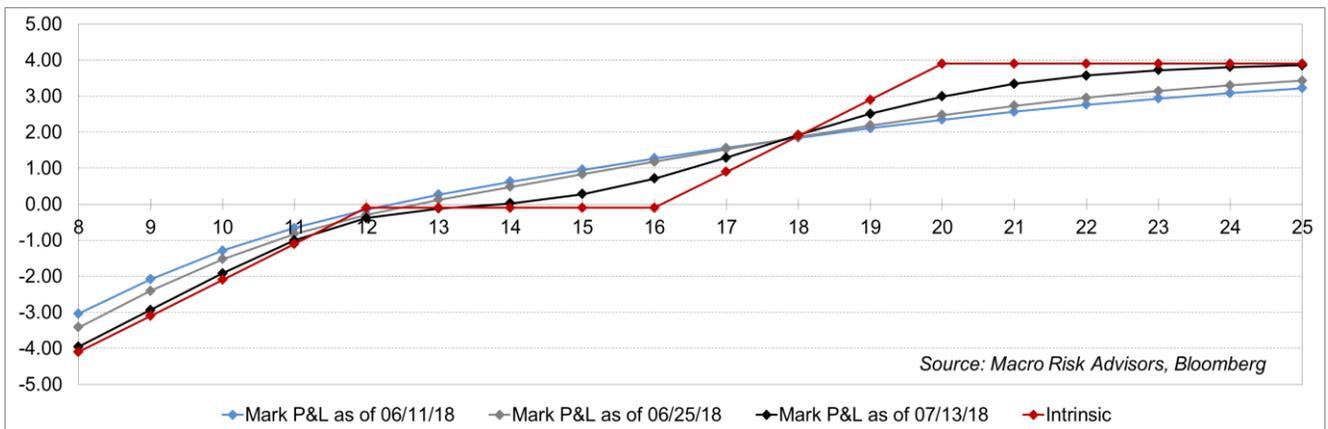


Figure 6: P&L of July 12-16-20 seagull