



JANUARY 2015 NEWSLETTER

Dear Investor,

Happy New Year! The Global Volatility Summit brings together volatility and tail hedge managers, institutional investors, thought provoking speakers, and other industry experts to discuss the volatility markets and the roles volatility can play in institutional investors' portfolios. The 6th Annual Global Volatility Summit will take place on Wednesday, March 11th, 2015 in New York City.

Registration for the 2015 event is open! We encourage you to register soon as space is limited: www.globalvolatilitysummit.com. An agenda will be available soon.

Barclays provided the latest piece in the GVS Newsletter Series, written by Maneesh Deshpande and the the Global Equity Derivatives Strategy group as a part of the report *Global Volatility Outlook 2015: The QE Handoff: A Tricky Maneuver*. In the piece, titled "Short Volatility Positioning: A Cause for Concern?", the team addresses short volatility positioning and takes a closer look at concerns around volatility supply and demand, volatility shorting and leveraged ETPs, as well as the effects on liquidity.

Cheers,
Global Volatility Summit

2015 EVENT UPDATE

The Sixth annual Global Volatility Summit ("GVS") will take place March 11th, 2015 at Pier Sixty at Chelsea Piers in New York City

The following managers will be participating in the 2015 event:

BlueMountain Capital
Capstone Investment Advisors
Capula Investment Management
Dominicé & Co. – Asset Management
Fortress Investment Group
Ionic Capital Management
JD Capital Management
Parallax Volatility Advisors
Pine River Capital Management
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Special Report

Short Volatility Positioning: A Cause for Concern?

This is an edited version of a section of the report Global Volatility Outlook 2015: The QE Handoff: A Tricky Maneuver

- Short volatility positioning especially via VIX ETPs is near its all-time high levels but this may not automatically exacerbate volatility spikes, contrary to popular opinion. These investors have simply taken over the liquidity provision from market makers and in turn market makers are required to provide less liquidity. Effectively, the type of market participants shorting volatility has changed from market makers and other sophisticated professionals to end investors.
- Historically, these ETP investors have not aggressively covered their short volatility positions during past volatility spikes since they are less leveraged and unlikely to use a disciplined stop-loss strategy. In the past few months, reaction in the volatility has also been in line with the movement in SPX, thus indicating less nervousness from these investors.
- From a longer-term perspective, the balanced volatility demand and supply situation had led to lower roll cost of VIX futures during the “risk-on” periods. In particular, the current level of roll yield has come back to the 2006 levels when the VIX ETPs did not exist.
- However, volatility shorting is happening via leveraged ETPs and this is a cause for concern especially because effective liquidity is thinner. Managers of these products are required to buy VIX futures as they go up, which could amplify volatility moves.

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Short Volatility Positioning: A Cause for Concern?

Interest in short volatility strategies continues to expand and indeed it appears that, anecdotally as well as from analysis of VIX ETPs flows, the levels are probably at historical highs. This has raised concerns that the next shock might lead to a more exaggerated spike in volatility. As we discuss, while this risk is real, the situation is considerably more nuanced than what appears from a superficial analysis.

At the outset, it is important to realize that, by definition, trading in derivatives is a zero-sum game and as a whole the “market” is, of course, neutral volatility. Thus for every volatility trade there is a buyer and a seller. However, the key question is whether the trade is initiated by the buyer or by the seller. In other words, which side is the price taker (we label this trader as the “investor” or “liquidity taker”) and which side is the liquidity provider (or the “market maker”). The size of the price taker presumably will impact the prices of volatility. For instance, if there are too many price takers selling volatility, the market makers are likely to mark the volatility at lower levels, thus decreasing the level of volatility.

Thus, for gauging the potential impact of short volatility investors during the next shock, it is more important to know whether these volatility sellers are likely to tend to rush to cover short positions if volatility spikes. If they do so, they will squeeze the liquidity, causing volatility to spike higher. Thus, besides understanding whether the volatility supply has indeed switched from “market makers” to new “investors,” it is equally important to know whether these new investors are more likely to be “squeezed” relative to “market makers” if volatility were to go up.

Understanding Volatility Supply through VIX Products

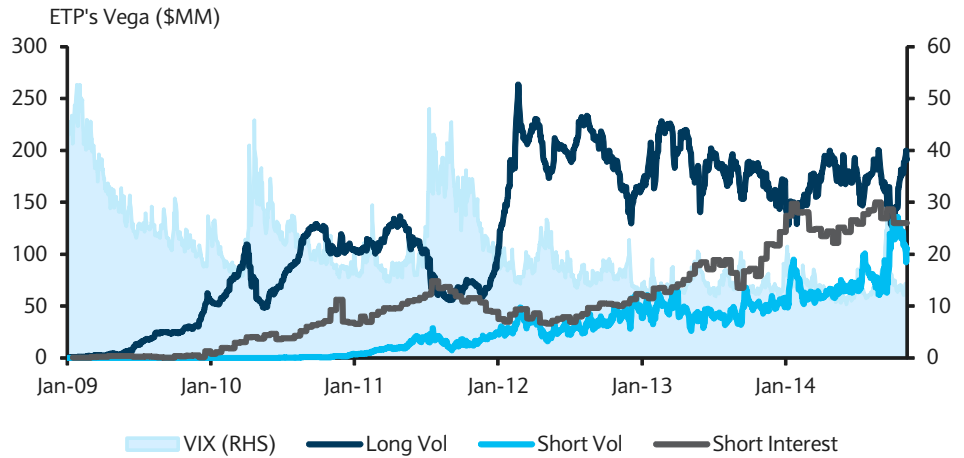
We now examine some empirical data around VIX ETPs to answer both these questions and discuss the constraints faced by different market participants. The key advantage of doing the analysis with VIX products is that it is relatively easy to figure out the “investor” flows as compared with regular options. Thus, we use the VIX products to determine how the volatility supply has evolved in the last few years. This helps us to understand how different volatility sellers react during periods of shock and whether the current volatility sellers are more likely to rush to cover shorts in a market selloff scenario.

Figure 1 shows the AUM (in vega or equivalent VIX futures terms) for all long volatility VIX ETPs (LV-ETP), short volatility ETPs (SV-ETP) and the short interest in long volatility ETPs (SILV-ETP) since 2009.

Note that evaluating the consequences of the short interest is tricky since for every short seller there is, of course, a buyer. Thus it is not obvious whether the short-sell transaction is buyer or seller driven. For instance, it is possible that the demand from a volatility buyer is met directly by a short seller rather than new issuance of a long VIX ETP. This also implies that it is incorrect to net the short interest with the long and short volatility ETPs.

FIGURE 1

With the evolution of VIX ETPs, vega AUM in short volatility and short interest in long volatility ETPs have risen sharply in 2014 to match the long volatility ETPs



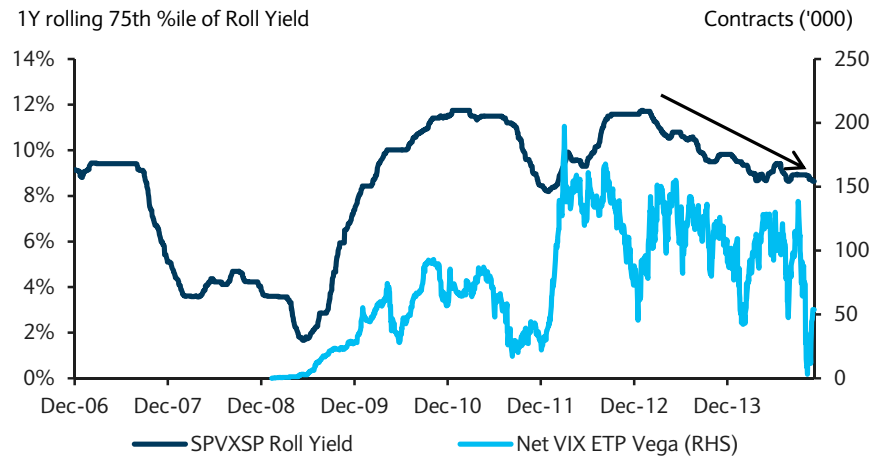
Source: Barclays Research, Bloomberg

From Figure 1, we see that the evolution of the VIX ETPs can be roughly divided into several distinct phases:

- The long volatility phase (January–December 2009): After the launch of VIX ETPs in 2009, the early days were characterized by “ETP investors” being long volatility. Short volatility ETPs did not yet exist and short interest in long volatility ETPs was limited. This demand for volatility was met by market makers/dealers shorting VIX futures and, more directly, shorting SPX options.
- Phase 2 (January 2010 – June 2011): Demand from the long investors continued to increase but short interest in long volatility ETPs started to increase, indicating the emergence of a new class of liquidity providers. In the first half of 2011, SILV-ETP was comparable to LV-ETP.
- Phase 3 (2011 – 2013): LV-ETP reached a plateau. The sharp increase in volatility during 2011 rattled the short sellers and the increase in SILV-ETP moderated. However, some of the slack was taken up by the launch of short volatility ETPs, and SV-ETP started to increase.
- Phase 4 (2014 – current): LV-ETP continued to stagnate but SILV-ETP continued to increase. SV-ETP continued to trend up and increased dramatically after October 2014, while they have recently declined somewhat, their magnitude at one point was similar to LV-ETP. Long volatility ETPs AUM is at the bottom end of its range.

The above analysis clearly indicates that the amount of volatility being shorted on a consistent basis by ETP investors appears to have gone up. This of course simply means that the demand for volatility by one group of investors is being directly met by another set of investors. Effectively, the amount of residual demand that market makers need to provide liquidity for has diminished.

FIGURE 2
Roll yield of short-term VIX futures has been declining in recent years

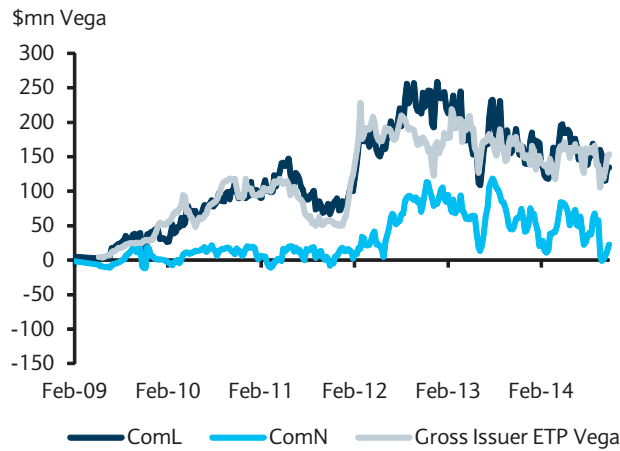


Source: Barclays Research, OptionMetrics, Bloomberg

From a longer-term perspective, Figure 2 shows that roll yield for short-dated VIX futures continues to decline as the amount of volatility being shorted by ETP investors has gone up. We show the 75th percentile rather than the average since the latter is likely to be more biased by the spikes in VIX when the roll yield turns negative. The 75th percentile captures the roll yield during the risk-on periods which we care about. We clearly see a correlation between the level of this “risk-on roll yield” with the level of the net VIX ETP vega. In particular, the current level has now come back to the 2006 level when the VIX ETPs did not exist. In a sense, the current level of roll yield can be seen as a “fair” value of the roll yield, which as we have shown before can be thought of as the cost of owning the convexity inherent in VIX futures.

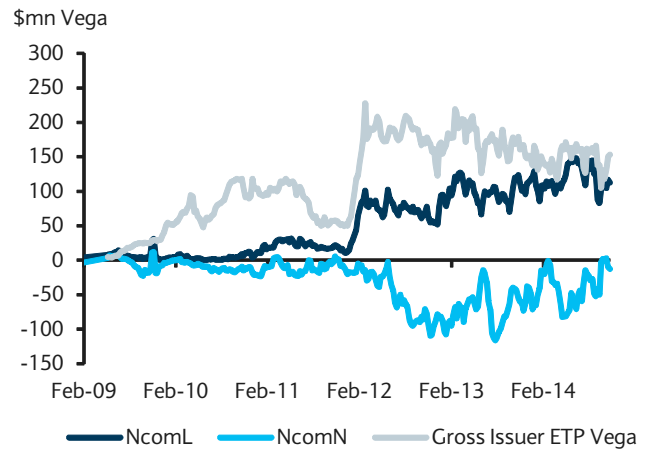
In addition, the nature of the “market maker” has also evolved. Figure 3 and Figure 4 show the open interest in VIX futures between the commercial (“hedgers”) and non-commercial (“speculators”) traders. Prior to 2012 most of the short VIX futures position was also in the commercial trader category; however, beginning in 2012, the open interest in the non-commercial bucket increased, with a net short bias indicating that the liquidity provision shifted to a new category of liquidity providers. More recently, the net short position has diminished considerably as investors in short volatility ETPs are providing the required liquidity. The figures also shows the gross vega exposure from ETPs for the issuers which is calculated by first netting the exposures for each issuer and then taking the gross exposure across all the issuers.

FIGURE 3
Prior to 2012, only commercial traders were short volatility suppliers



Source: Barclays Research, Bloomberg, OptionMetrics, CFTC.
 Note: Gross ETP vega is first netted by each ETP issuer and then grossed
 ComL/ComN are the Long/Net open interest of commercial VIX futures traders

FIGURE 4
Since 2012, this role has shifted: first, to non-commercial traders, then, more recently, to the short VIX ETP investors



Source: Barclays Research, Bloomberg, OptionMetrics, CFTC.
 Note: Gross ETP vega is first netted by each ETP issuer and then grossed.
 NcomL/NcomN are the Long/Net open interest of non-commercial VIX futures traders

In our opinion, investors who use VIX futures instead of VIX ETPs to short volatility do so because of either higher leverage or because they are sophisticated traders. Since VIX futures require much lower margins than the VIX ETPs, investors looking for leverage will use VIX futures to implement short volatility. Another reason is that VIX ETPs have a predefined roll schedule for VIX futures, and investors using more sophisticated trading strategies would likely use VIX futures, which will allow them more flexibility.

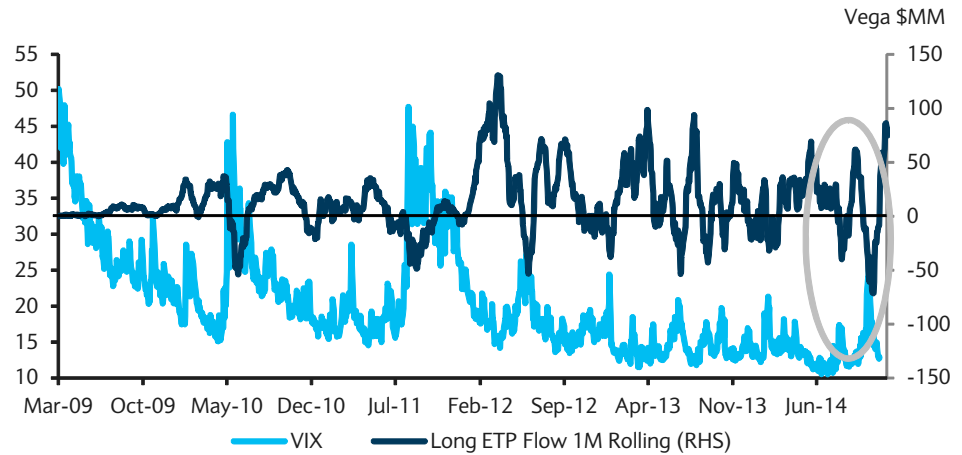
What Happens When VIX Spikes?

In the previous section we discussed how the type of market participants shorting volatility has changed from market makers and other sophisticated professionals to end investors. We next examine how these investors have reacted, and are likely to react, to volatility spikes.

Before examining the behavior of the short volatility participants, it is worth reiterating that the behavior of the long volatility investors who use VIX ETPs is fundamentally different from those who use short-dated equity index puts. Once the market falls, the latter group can monetize their puts by simply letting them expire. Even if they do choose to exit prior to expiry, typically the options are deep in the money and so the impact on implied volatility is not very significant. On the other hand, since VIX ETPs are implied volatility instruments, monetization requires that the holder sells his position. Indeed, Figure 5 shows that the AUM in the long volatility ETPs has declined whenever VIX has spiked. This increased volatility supply whenever VIX has spiked is quite unusual and a completely new dynamic that did not exist in the volatility market before 2009. To summarize, the volatility shorts have had ample liquidity to cover their short positions if they so desire.

FIGURE 5

Investors in long volatility ETP typically sell when VIX spikes



Source: Barclays Research, Bloomberg, OptionMetrics, CBOE

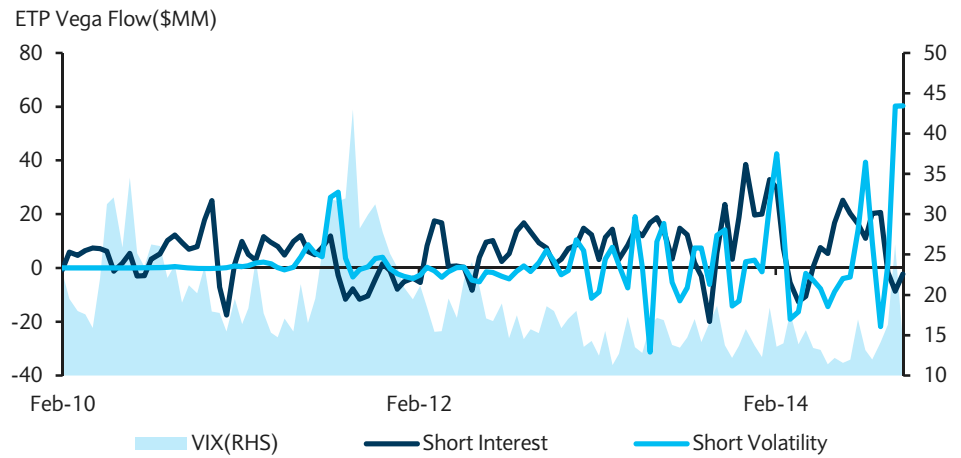
As we discussed above, the type of market participants who are shorting volatility has partially evolved from market makers to non-commercial suppliers using VIX futures to ETP investors. The key question becomes: are these “investors” likely to be more aggressive about covering their shorts when VIX spikes? This boils down to a focus on the leverage being used for these investments, the size of these positions relative to overall risk exposure of the trader and the pressures to risk-manage the position.

Firstly, from a leverage perspective, buying a short volatility ETP actually has less leverage versus, say, a hedge fund shorting VIX futures which is only required to put up the margin. The ETP holder’s investment protects him in the event of a 100% move up in the VIX future. On the other hand, shorting of long volatility ETPs is similar to any other stock and thus it is reasonable to assume that investors need to put down 50% of the notional. Secondly, absent the pressures of monthly performance, an end investor is likely to have less pressure to institute stop-losses. On the other hand, dealers, relative to other leveraged investors, historically have had bigger balance sheets that can withstand losses. Thus, arguably the tendency to cover volatility shorts would be the highest with leveraged/hedge-fund investors, followed by dealers, and actual “investors” would be the least likely to react to volatility spikes. Thus, paradoxically, the increase in short volatility positions to “ETP investors” should decrease the risk of volatility spikes.

Turning to actual experience, Figure 6 shows the monthly flows into short volatility ETPs and changes in the short interest in long volatility ETPs. Figure 7 and Figure 8 show a scatter plot of the changes in these quantities versus changes in VIX.

FIGURE 6

VIX spikes tend to increase the flow into short volatility ETPs and short interest for long ETPs

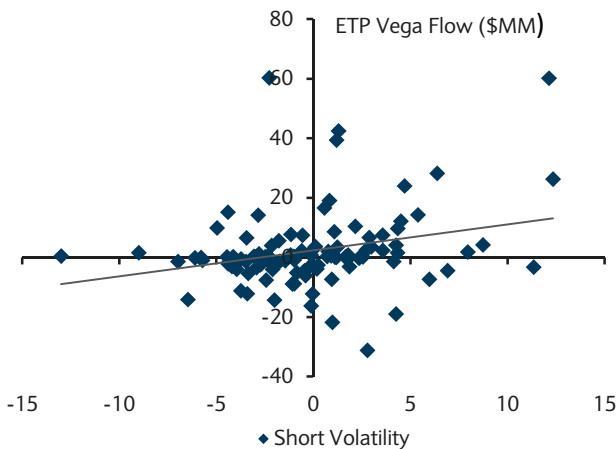


Source: Barclays Research, Bloomberg, OptionMetrics, CBOE

Broadly speaking, we see that flows into short volatility ETPs and amount of short interest in long volatility ETPs usually go up when VIX increases, although the correlation is quite low. Thus, empirically, there is no evidence that these “investors” always cover their short volatility exposure when volatility spikes.

FIGURE 7

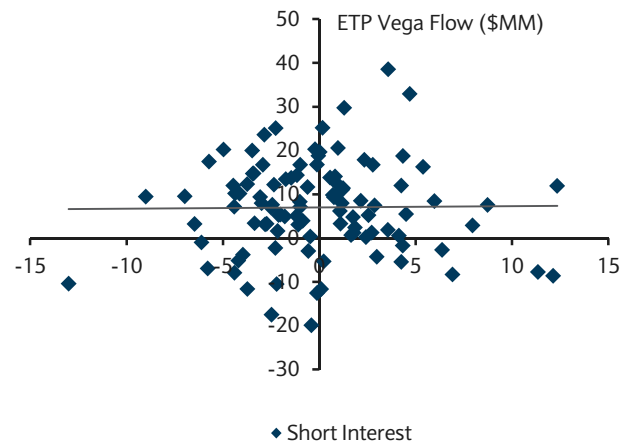
Flows into Short Volatility ETPs during VIX spikes show ETP investors don't always cover their short volatility positions...



Source: Barclays Research, Bloomberg, OptionMetrics, CBOE

FIGURE 8

...with a similar trend seen with investors who short-sell long ETPs to gain short volatility exposure



Source: Barclays Research, Bloomberg, OptionMetrics, CBOE

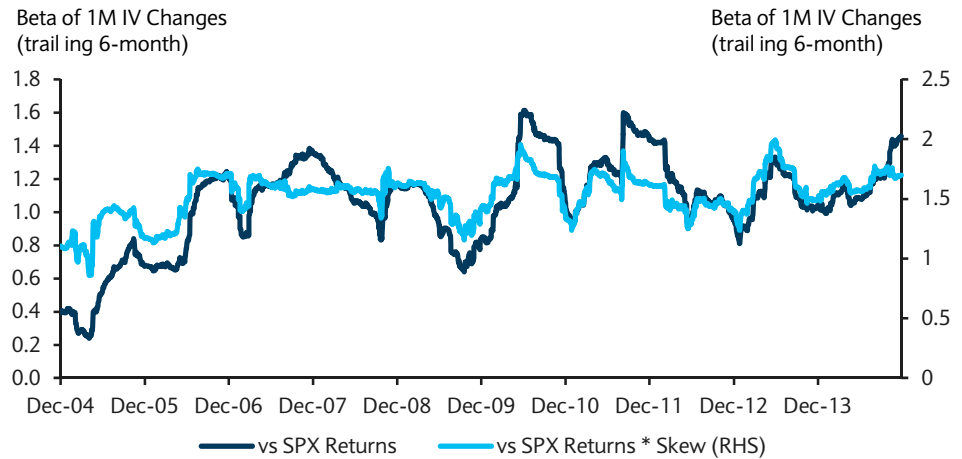
The fact that the base level of short volatility positions is not very tightly tied to the level of volatility is quite rational since, as we have discussed in prior publications, shorting volatility when it is low can still be profitable as long as the realized volatility is even lower or the term structure of VIX futures remains steep.

Another way to check whether equity volatility has become more reactive to changes in the underlying index is to examine the Skew Stickiness Ratio (SSR). Recall that this is simply the beta of a regression of changes in at-the-money (ATM) volatility versus the product of skew and percent changes in the underlying index. Thus, if volatility dynamics were “sticky strike” this coefficient would be exactly one. In reality this ratio is higher than one since strike volatilities also react to changes in spot price. Thus, one way to see if the short volatility

positioning is resulting in more reactivity in equity volatility is to examine changes in SSR through time. In Figure 9 we look at the SSR for 1M volatility using a six-month moving average. We also show the betas without the skew factors.

FIGURE 9

Reactivity of equity volatility to SPX returns has not changed materially



Source: Barclays Research, Bloomberg, OptionMetrics

We see that the SSR ratios have not materially changed over the past few years. Even during the recent, particularly volatile, episode in October, the move in equity volatility can be almost fully explained by the move in SPX and skew. The higher level of skew during September and October makes the non-skew adjusted betas higher recently but once we take the level of skew into account the impact almost disappears.

Besides a base level of increase in short volatility positions over the past few years, there is another group of market participants who aggressively sell volatility only when it is elevated. While this behavior has always existed, this has become even more popular and entrenched given the range-bound nature of VIX over the past two years as investors have become accustomed to trade the range-bound behavior of VIX. This provides additional supply for participants looking to cover their short positions.

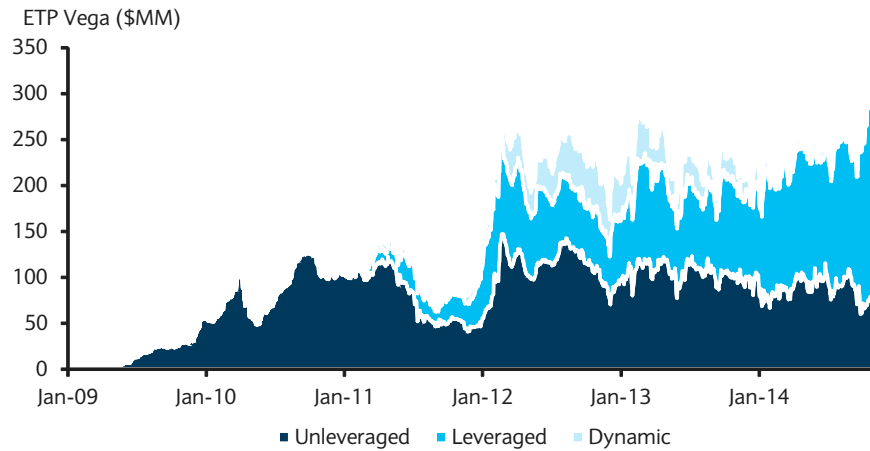
Finally, as discussed above, while VIX-based hedgers have always monetized their hedges, it appears that the range-bound behavior of VIX has also forced other institutional hedgers who use index puts or VIX call spreads to be much more active in their hedging strategies. For instance, during the mid-October selloff, anecdotally, the majority of the trading flow we saw was to monetize hedges.

Impact of Leveraged ETPs

At first glance, the fact that the long and short volatility ETPs are balancing each other out might be viewed as a healthy sign; however, one key wrinkle is that the short volatility ETPs, similar to the leveraged ETPs, have an important negative gamma dynamic that complicates the story. The ETP managers are required to buy more VIX futures as they go up in order to maintain the same daily leveraged exposure. This dynamic is independent of how the actual buyers of the leveraged ETPs behave but is forced by the action of the ETP issuers/managers given the intrinsic nature of these instruments.

As shown in Figure 10, the AUM in leveraged ETPs continues to rise. Note that the leveraged ETPs include both the 2x long ETPs and the 1x Short ETPs.

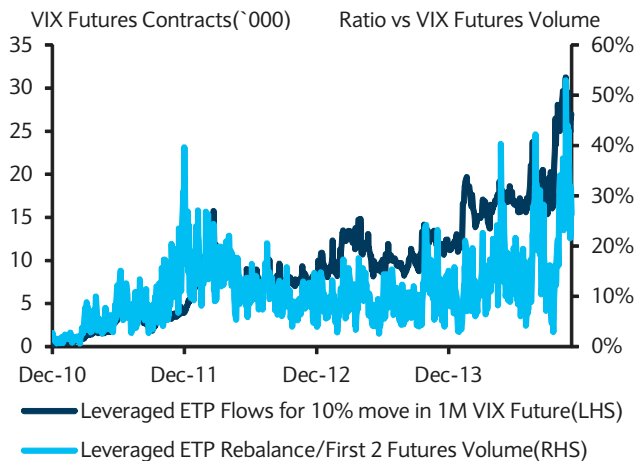
FIGURE 10
AUM in leveraged ETPs is now larger than in non-leveraged products



Source: Barclays Research, Bloomberg, OptionMetrics, CBOE

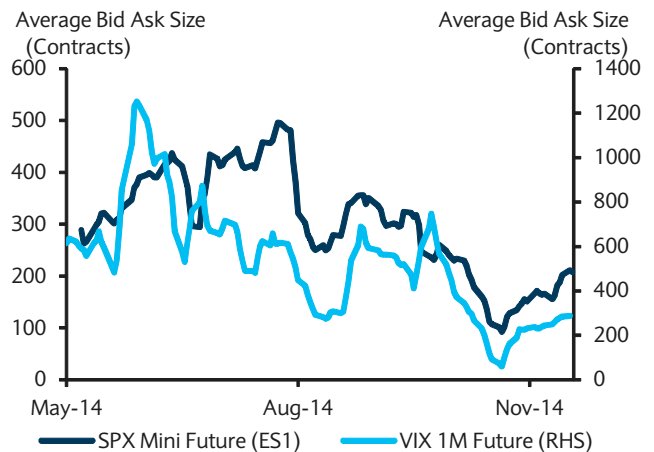
We estimate that if the 1M VIX future were to increase by 10% (~1.5 volatility points) over a day, ETP managers would need to buy nearly 30k contracts (Figure 11). The number of contracts required to be traded increases linearly with the percentage move in one-month VIX futures. One redeeming feature is that the liquidity in VIX futures continues to increase and nearly 300k contracts were traded during mid-October. However, some of this liquidity might be misleading. As shown in Figure 12, bid-offer sizes declined after October 14; thus, the effect of the next big move could be quite significant. To be sure, the reduced liquidity does not appear to be just the case of VIX futures, even SPX futures have seen some reduction in liquidity since the October selloff.

FIGURE 11
Expected flow due to leveraged VIX ETPs rebalancing has increased...



Source: Bloomberg, CBOE, Barclays Research

FIGURE 12
...While liquidity in VIX and SPX futures has declined after the recent selloff and not recovered



Source: Bloomberg, CBOE, Barclays Research

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