Skews in a Low Volatility, Tight Spread Environment

SELL PAYER SPREADS TO FUND BUYING PROTECTION

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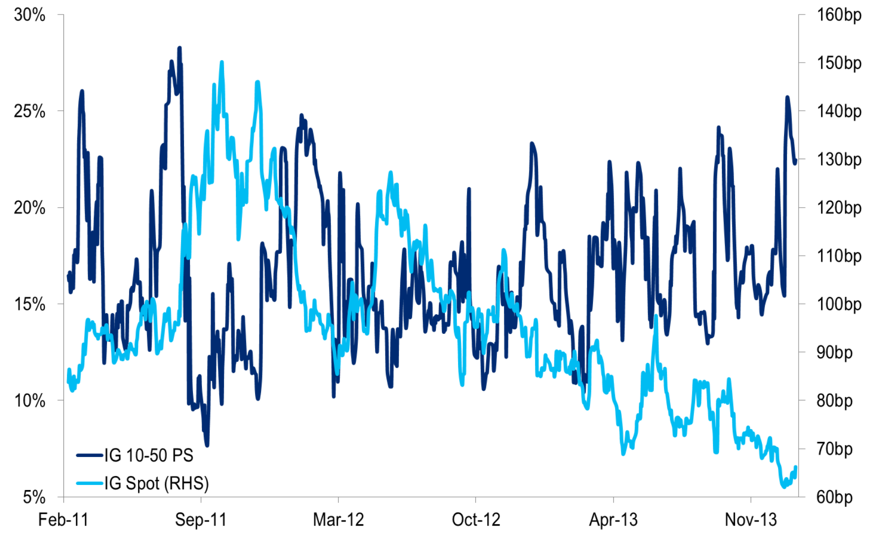
Credit

Global

What are high payer skews indicating?

Yes, we are not as constructive on US corporate credit as we were at the same time last year – spreads are tight, there are regulatory headwinds, and a gradual removal of Fed accommodation is in the offing (see Global Structured Credit Outlook: A Rockier Ride for more details). However, does that justify what we are seeing in the US credit option markets? Specifically, CDX IG payer skews are currently trading at close to 1 year highs (94th percentile of 1 year range), even as implied volatility levels are trading close to 1 year lows (6th percentile). In fact, if we go back even further in time, skews appear to be in the 90th percentile of a 3 year range, which includes the market meltdown in 2011 after the US downgrade (see Fig 1).

Fig 1. 3M CDX IG payer skews (10 – 50 delta payer) have risen sharply recently, while underlying index spreads have continued to fall. Currently, CDX IG trades at close to 1 year lows, and payers skews close to 1 year highs



Source: Markit, Citi Research

Surely, the situation is not so extreme? After all, economic growth is picking up in the US and economists estimate that the fiscal drag from policy will dissipate over this year. At the same time, credit spreads are tight and absolute levels of implied volatility have been either falling or remaining range bound over the past several months (see Fig 2). So should we be looking at the payer skews as the proverbial canary in the coal mine – while we are all getting complacent, is the volatility market indicating that there is some systemic risk event in the offing?

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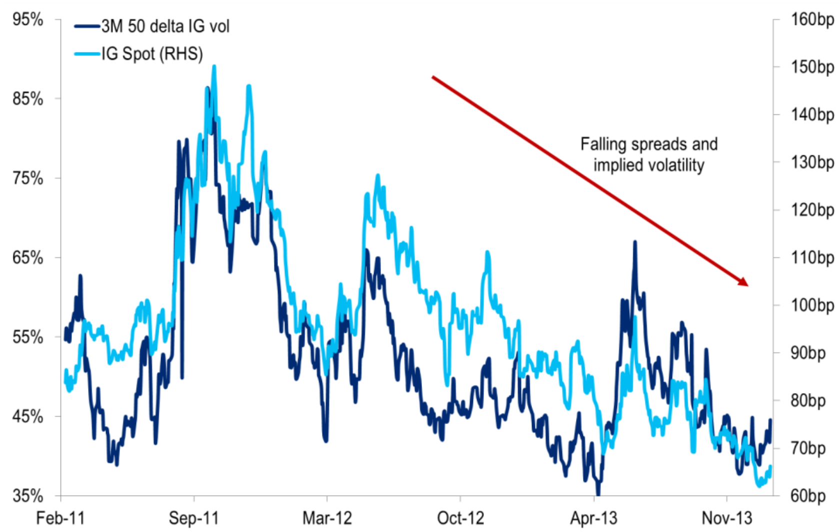
Fig 2. Falling spreads and implied volatility in the past 3 months do not seem to support the high levels of payer skew, which are usually an indicator of heightened credit risk.



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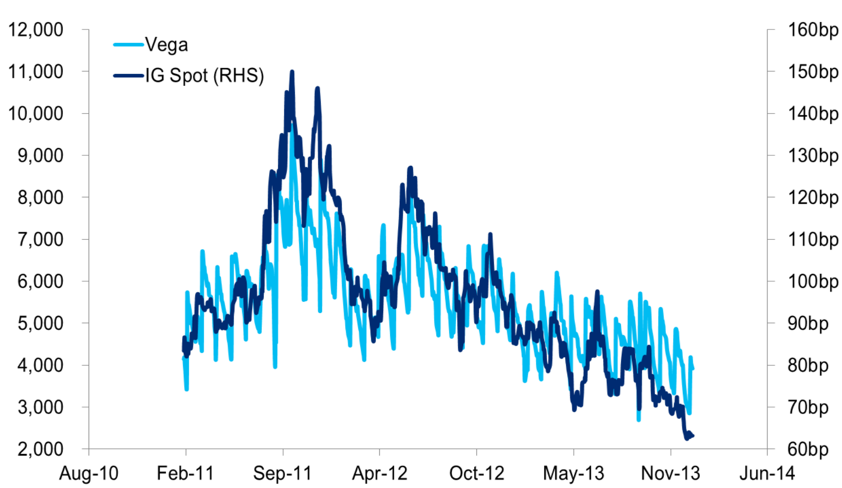
We actually believe that the answer is no. While volatility skews are generally a good indicator of systemic risk in credit markets, the current environment of tight spreads and low volatility has distorted the skew measure.

To understand how this distortion may have come about, consider the relationship between credit spreads, implied volatility levels and option vega, which is the sensitivity of option prices to implied volatility. As spreads tighten, and implied volatility falls, option vega, especially for out-of-the-money (OTM) payers also falls (see Fig 3).

Fig 3. Vega for an OTM option goes down as spreads tighten, and implied volatility falls. Figure shows vega for a 3M 15 delta CDX IG option ($100mm face).



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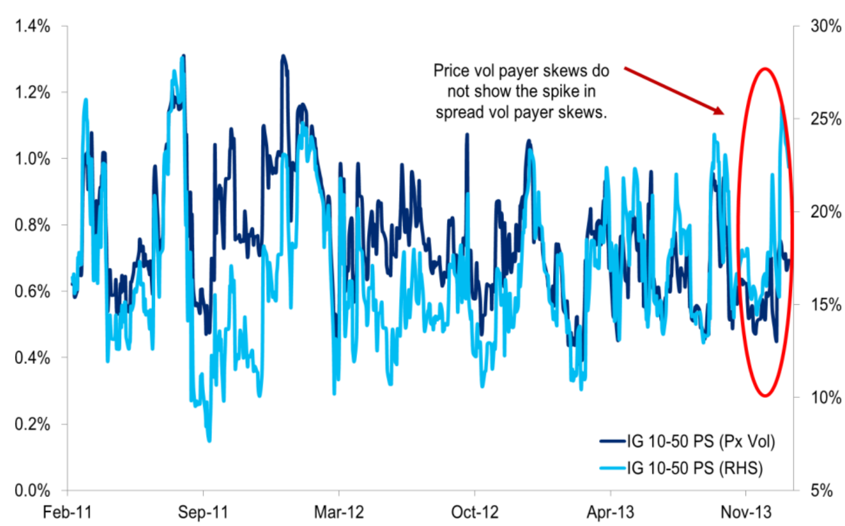
Intuitively, we can explain this as follows. The price of an option rises as its likelihood of expiring in-the-money goes up. This is why ATM options are worth more than OTM options. Now consider an OTM option – if spreads are really tight, and implied volatility is low, then the implied daily move in the underlying index (in bps/day[1]) is also low. Therefore, the likelihood of this OTM option expiring in-the-money is low and consequently it has a low dollar price.

As the implied volatility rises from low levels, the implied daily move (in bps/day) rises, but the tight spreads keep it from going up too fast. So the probability of the OTM option expiring in-the-money does not improve much, which means that its price does not go up significantly. In other words, the sensitivity of the OTM option price to a change in implied volatility (i.e. vega) remains low. Note how both tight spreads and low volatility play a part in keeping the option vega low. For example, if implied volatility were low, but spreads were high enough, a small increase in implied volatility may produce large enough implied bps/day moves to ensure that the likelihood of the option expiring in-the-money is much improved.

So, for an OTM with a very low vega, every unit change in the option price will be equivalent to a large change in implied volatility. In contrast, for an option that is at-the-money or close to it, the vega remains sufficiently high even in a tight spread, low volatility environment simply because it has a much higher likelihood of expiring in-the-money. This translates to smaller moves in volatility per unit of price change. Thus, every time option prices change, there is a disproportionately higher move in the implied volatility of OTM options, which accounts for the rising steepness of the volatility skew in the current environment.

One way to adjust for the low vega problem is to look at equivalent price volatility instead of the usual spread volatility. This is because the increase in duration as spreads tighten can compensate for the "double whammy" effect of low volatility and tight spreads. We see from Fig 4 that payer skews in price volatility terms are not so steep after all.

Fig 4. Payer skews computed using price volatility are able to compensate for the "low vega" of OTM options in a tight spread environment, and are therefore not as steep.



Source: Markit, Citi Research

[1] This is computed by multiplying spot (bp) by the implied volatility (%), then dividing by 16.

Better to sell payer skews?

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Given that payer skews are really not as steep as they appear, would it make sense to sell them? Clearly, in dollar price terms, OTM payers are very cheap historically, and selling payer spreads would provide decent carry premiums. The only issue is that a short payer spread position is effectively long risk. Given our current outlook (see Global Structured Credit Outlook: A Rockier Ride), we feel that a long risk position in credit spreads has more downside than upside.

In our opinion, the best way to take advantage of the situation is to sell payer spreads, and use the premiums to fund a short index position. In other words, we can use payer spreads to create a zero or negative cost short. This way, it makes it more cost effective for an investor to wait for a catalyst that finally sends spreads wider in a meaningful way without having to bleed carry. We feel such a trade is very appropriate for an environment where spreads are mostly drifting in a reasonably tight range and investors lack strong conviction in either direction.

Fig 5. Details for sample trade, all prices/spreads are as of EOD 17-Jan-2014.

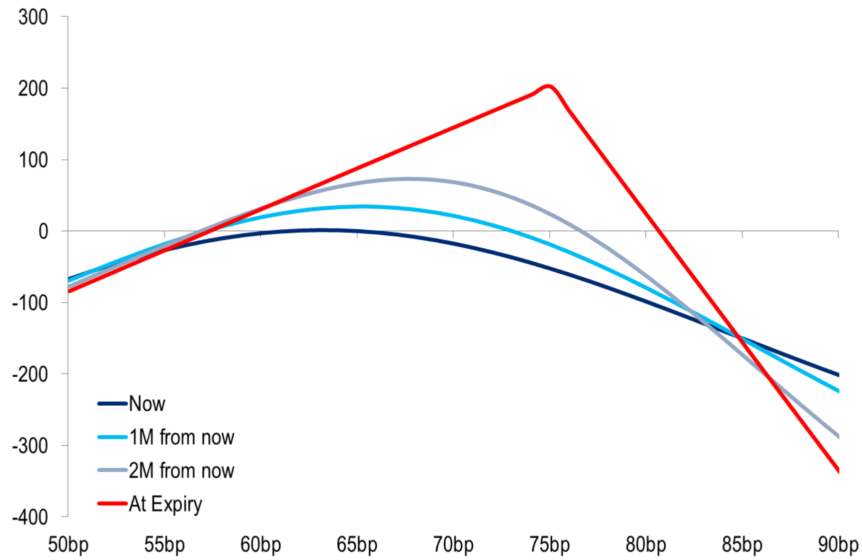
Trade	Index	Strike/Spot	Maturity	Notional	Price	Upfront	Delta	Gamma	Theta	Vega
Sell Payer	IG21	75.00	16-Apr-14	100,000,000	16.37c	163,722	-18,290	-635	2,199	-5,382
Buy Payer	IG21	105.00	16-Apr-14	100,000,000	3.85c	-38,475	4,694	213	-1,085	2,554
Buy Protection	IG21	65.06		25,000,000	65.06bp	411,970	12,055	0	-483	0
Net						537,217	-1,541	-422	631	-2,828

Calculations do not include fees and other transaction costs.
Source: Markit, Citi Research

The details of a sample trade are shown in Fig 5. The trade has a slightly negative carry cost of -8.5bp till option expiry. This implies that the investor actually gets paid to hold the trade to maturity, even if there is no negative catalyst to send spreads wider.

The projected P&L at maturity and at various interim points are shown in Fig 6. The trade expires in the money so long as credit spreads do not move too far from current levels. The break evens for the trade are 57bp and 81bp, respectively. We designed the trade to have a larger cushion on the tightening side, below our estimates of 60bp for a CDX IG floor (see US Credit Weekly: How low can CDX go?) because the current index will go off the run in March. On the widening side, we believe that a breakeven of 81bp is reasonable, since this translates to a 89bp spread for the on-the-run, given the current steepness of credit curves. We think that it is unlikely that there will be such a large move in the next 3 months, given where implied volatility levels are. The long 105 strike payer caps the losses to the downside if spreads widen beyond 105bp.

Fig 6. Projected P&L for sample trade, P&L shown in $'000s.



Source: Markit, Citi Research

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When buying calls and puts (or receivers and payers) the maximum loss is the premium paid. When selling calls (or receivers), the maximum potential loss would occur as the index spread decreases but is limited by the index spread being floored at zero. For puts (or payers), the maximum potential loss (amount below the strike) would eventuate should the index price fall to zero. Sector index options are cash settled. The above calculations do not include any additional fees or transaction costs. Note that ratio writing would leave the writer uncovered in one leg of the trade.

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