28 March 2013 | 15 pages

Europe

A hedge for all seasons

How credit's anomalies can keep yours looking trim

- **Mind the potential gap** - The market's new-found wobbliness is prompting increased interest in hedging. Given the low cost of many structures and the magnitude of the risks at stake, we think this makes eminent sense.
- **Wide variations in pricing** – Yet across options, tranches, curves and volatility, some potential hedges seem cheap, yet others are very expensive. The ideal hedge probably combines elements of each.
- **Unstable equilibria** – We see the market as much riskier than the last few months would suggest. The current equilibrium may yet last, but equally we could be tipped into either a moderate widening offset by the central banks, or a tail risk event. Each of these requires a different hedge.
- **Options are best suited to hedging "moderate" widenings** given low at-the-money (ATM) volatility and the steep volatility skew – we particularly like payer spreads.
- **Tail risks are best hedged through 3s5s index flatteners**. They can be maintained almost indefinitely, given how steep curves are, and near positive carry.
- Like options, tranches are a very expensive way of hedging OTM or tail scenarios, given the high correlation which is still priced in. **On the other hand, tranches offer a very attractive way to hedge single name idiosyncratic stories**, i.e. a few names becoming distressed and flattening aggressively. Jun15/18 equity tranche flatteners look ideal for this.
- **The best gardens feature variety** – In an environment like the current one, where the weather is deeply unpredictable and where politicians seem happy to change the rules of the game whenever they are "backed into a corner", the most important thing when hedging is, in our view, having a diversified portfolio.

Investing in options is not suitable for all investors. Please see the disclosures concerning the risks of investing in options below and discuss whether this particular options strategy is suitable for you with your Financial Advisor.

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Spring is here – time to trim your hedges

Cypress hedging is increasingly fashionable

For the first time in many months, investors have been seriously analysing, and in many cases executing, hedging strategies to protect their portfolios against an escalation of the market weakness the Cypriot bail-out has triggered. Our recent conversations highlight three different types of risks clients are currently worried about and are actively looking to hedge:

- **A moderate market widening** – which we can characterise as Main/Crossover widening by 30/120bp respectively, with all credits widening by a similar amount – i.e. a "general" spread widening where each credit widens according to their recent spread beta.
- **A tail-event** – which we can characterise as a large widening (e.g. Main/Crossover widening above 200/800bp) accompanied by forced-selling and capitulation.
- **Idiosyncratic/default risks** – i.e. a few credits becoming distressed with the overall market not widening substantially.

And yet the problem most investors face is that hedges (as any gardener well knows) are expensive to maintain. Over the past year, the central banks have consistently made hedging unprofitable. The temptation would be to abandon hedging altogether. Yet given the magnitude of the risks, we think this would be a mistake.

We think much can be achieved by judicious selection: different hedges have different characteristics, and some are more expensive than others. This short note describes what we believe are the most attractive strategies for each of the three types of risks using CDS indices, options and tranches. First, we describe the pricing anomalies within credit. Second, we give our views regarding the likelihood of each risk scenario. Finally, we look in more detail at specific hedge trades.

Some hedges are more expensive than others

Not all hedging is equal

When constructing hedges, investors should take advantage of those products which are showing stretched valuations - either to source protection or to use them to pay for protection in other products. As with the market itself, we think your view as to which hedges are appropriate should have just as much to do with how they are priced as with your fundamental views on which risks are relevant. As the next section describes, credit features some areas where hedges seem cheap and others where they seem expensive – even in index-based derivatives which offer high liquidity and relatively tight bid-offer spreads.

Curves are very steep – in particular 3s5s

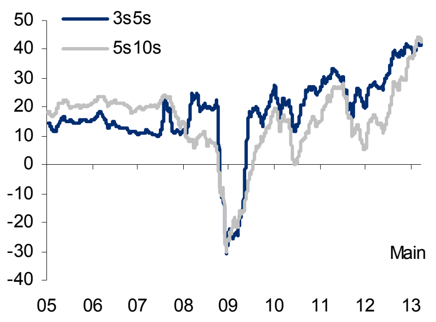
Curved hedges are like yew (*Taxus baccata*): evergreen, and last almost indefinitely

Judging from the steepness of CDS curves across sectors and regions, central banks have been successful in convincing investors that near term default risks are extremely low. And yet even the 3-year point is far enough out that substantial risks could easily materialize: our economists' forecasts have both Spain and Italy restructuring around 2016. Besides, as we have argued recently,[1] the front end of CDS curves has reached such extreme levels that we do not think they can steepen any further: in many cases investors are now getting paid (in carry + slide) for entering duration weighted flatteners with positive default exposure.

[1] See "*Flatteners in iTraxx Equity Tranches*", 6 Mar.

Figure 1. iTraxx Main curves

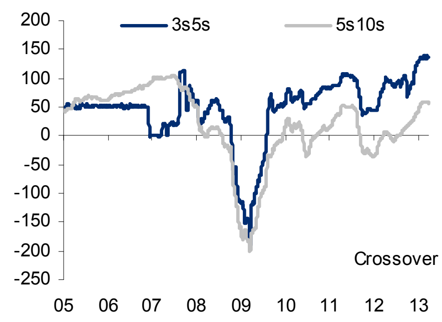
Bp difference.



Source: Citi Research, Markit. 10 days moving average.

Figure 2. iTraxx Crossover curves

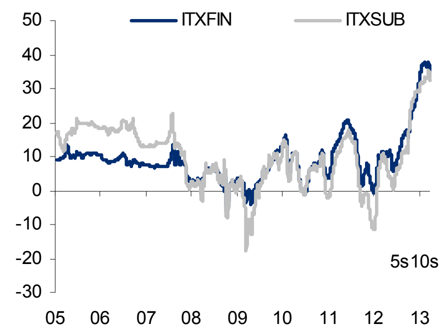
Bp difference.



Source: Citi Research, Markit. 10 days moving average.

Figure 3. iTraxx Financials

Bp difference.



Source: Citi Research, Markit. 10 days moving average.

Although 3s5s curves are very steep and we do not expect them to steepen any further, we only expect aggressive flattening in the "average" single name if a tail-event materializes, forcing investors to hedge short-dated default risk across the board. This seems a possibility if systemic risks materialize (the most obvious being widespread use of bank bail-in), but could be a long time in coming. And yet, **given that duration-weighted flatteners can be maintained almost indefinitely at virtually zero cost, we think 3s5s index flatteners are one of the most attractive tail-hedges**.

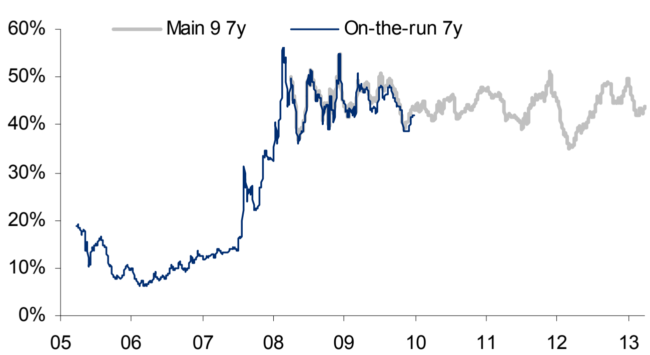
Tranche correlations remain elevated

Box hedging through tranches (*Buxus sempervirens*): expensive for tail risk, but great for idiosyncratic shapes

Tranche correlations are close to all-time highs (Figure 4), indicating that investors are still willing to aggressively pay for tail-hedges via shorts in senior tranches. Thus, we do not think tail-hedges in tranches are priced attractively and would refrain from recommending them. However, the flipside of the coin is that such **high levels of correlation make equity tranches an attractive way to hedge defaults and idiosyncratic risks**. Our preferred way to position for this is by buying Jun15 equity tranche protection, funding it with long risk positions in Jun18 equity tranches (i.e. an equity tranche flattener). [2]

Figure 4. Equity tranche implied correlation

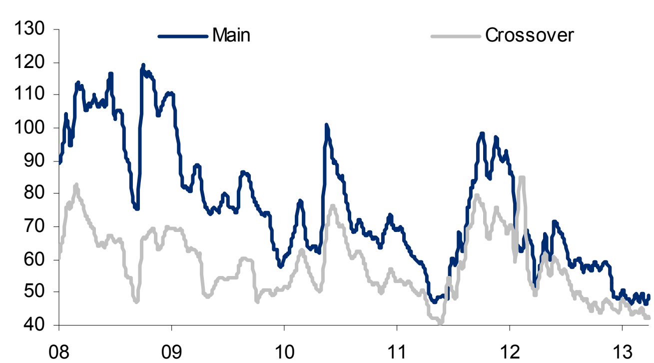
In %.



Source: Citi Research, Markit. 5 days moving average.

Figure 5. iTraxx Main and Crossover implied volatility

3m ATM implied volatility, in %.



Source: Citi Research, Markit. 10 days moving average.

[2] See "*Flatteners in iTraxx Equity Tranches*", 6 Mar.

ATM implied volatility is historically low in credit

ATM vol (young *Leylandii*): cheap and fast-growing, but little protection from extreme events

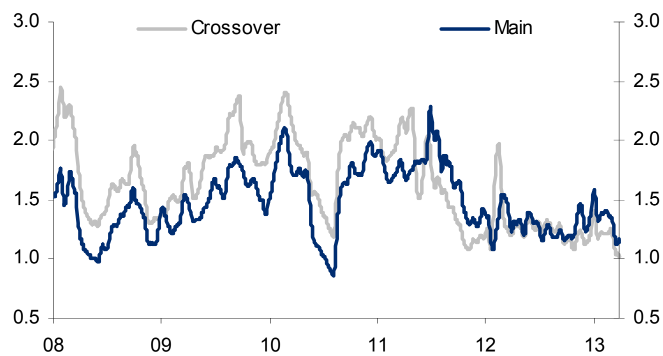
ATM implied volatilities in iTraxx indices are not only low from an absolute point of view (Figure 7) but also when compared to realised volatility (Figure 6), with the ratio of implied to realised volatility very close to one – something very rarely seen in credit index options. This means that **hedging via options has never been more attractive in credit … as long as investors want to hedge "moderate" (i.e. relatively at-the-money) scenarios and not "tail" (i.e. OTM scenarios) as we show next**.

Credit implied volatility skew is elevated

OTM vol (mature *Leylandii*): better sold than bought – overly popular and overpriced

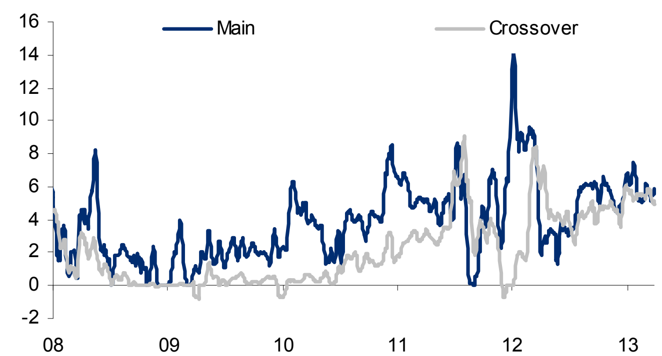
The demand for OTM hedges via payer options in credit indices is much greater than the demand for ATM options, causing the volatility skew in credit indices to be very steep – see Figure 7. Although the structural gap between buyers and sellers of credit index options has largely disappeared, that is mainly the case for ATM options but not for OTM payer options. The number of investors looking to buy OTM payers to hedge portfolios still outweighs the number of those willing to take the other side, and volatility skews in credit index options remain elevated. Thus, **tail hedges are expensive in credit options relative to "moderate" hedges**.

Figure 6. iTraxx Main and Crossover implied to realised vol ratio
3m at-the-money implied volatility divided by 3m realised volatility.



Source: Citi Research, Markit. 5 days moving average.

Figure 7. All skewed up - iTraxx Main and Crossover volatility skew
Difference between 3m implied volatility between 25% and 50% delta payer options, %.



Source: Citi Research, Markit. 10-day moving average.

Which risks are most likely?

The weather remains unusually unpredictable…

With the relative pricing of different instruments in mind, we can now examine just which risks seem likely. Frankly, we think this is complicated, with markets likely to oscillate between one of several states, and yet the transitions between them remaining relatively unpredictable.

We have long argued that sustainable growth will not return to Europe until banks, sovereigns, and, in quite a few member states, households have deleveraged materially. In this respect, bail-in in Cyprus is a significant step forward (see *Global Economics View – The euro area recovery starts with Cyprus*, 18 Mar), and we expect a similar model to be used elsewhere (see *Behold the new form of bail-in*, 25 Mar). That said, the magnitude of the challenges, the difficulty of the politics and the complex interaction between the politics and pressure from the market make both the path and in particular the timing hugely uncertain. Until Cyprus, many steps policymakers were taking seemed to be moving them away from the difficult decisions which will ultimately lead to debt restructuring, not towards it: think of the emphasis on structural rather than cyclical deficits, or the move towards forebearance rather than foreclosures in Spain, for example. And such a move was in turn being facilitated by the market's docility.

…but may settle for extended periods in one of three states

In market terms we think this makes for a series of **unstable equilibria**, each one calling for a different type of risk and hedging strategy:

Hedge for idiosyncratic events

- **Uneasy stasis**: more or less the market's current state, in which the unresolved nature of political and longer-term economic problems makes things riskier than they seem on the surface, but where volatility is effectively suppressed. The illiquidity of credit (and, increasingly, other markets) adds to this effect. While this equilibrium holds, spreads in general should be stable or even tighten, and it is clearly better to sell volatility rather than buy it. The main risk factors are likely to be idiosyncratic events in single-name credit, for example through LBOs or surprise defaults.

Hedge for moderate widenings

- **The central bank put**: even if we break out from the uneasy stasis, there is another equilibrium in which the central bank put holds. This is more or less the situation we have been in for the last couple of years, where volatility is higher than at present, but every time the market really sells off, the policymakers eventually come up with a response which causes it to rally back (Figure 8). In this equilibrium, you want to position from widening relative to today's levels, but should be happy to take advantage of the steep skew and sell moderately OTM volatility.

Hedge for the worst

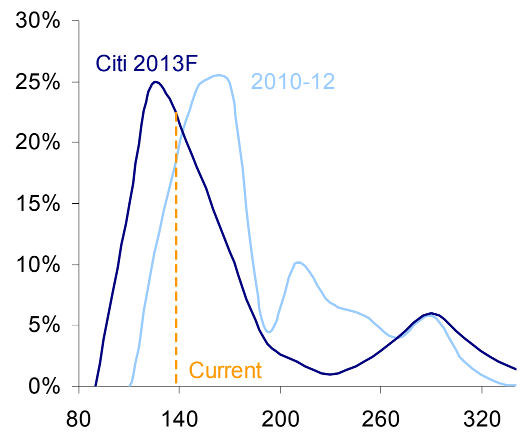
- **The tail event**: there is a chance that a moderate widening turns into a more extreme widening, in particular if we find that central banks are less omnipotent or less willing to exercise their power than investors currently believe. While most would attach a low probability to this, it is a significant concern for us: the presence of Spain or Italy in an OMT programme would do much to reveal its limitations, and at some point we think markets will call into question the central banks' ability to create growth amid an environment of widespread deleveraging. Clearly this equilibrium (which, once entered, could be self-reinforcing) calls for deeply OTM hedges, but which ideally can be sat upon for the extended period which might be required before we arrive there. The low liquidity that credit markets have exhibited post the Italian- and Cyprus-led widenings exacerbates the probability of a "moderate" widening becoming a large one if real money investors decide to start unwinding positions, even in small amounts.

Figure 8. Cycle of inaction

Source: Citi Research.

Figure 9. The devil is in the distribution

iBoxx spread histogram 2010-2012 vs stylized 2013 forecast, bp.



Source: Citi Research. See *Living the fairy tale - Can credit Goldilocks defy the bears?*, H. Lorenzen, 12 Mar.

For us, an ideal hedging strategy would probably contain elements of all three equilibria: while we would agree that policymakers have probably managed to suppress some of the pressures which might otherwise have caused moderate market widening, we are much less confident than the consensus about the extent to which tail risks have fallen. Figure 9 shows a schematic estimation we used in our 2013 outlook of how we see risk relative to where spreads have spent their time over the past two years.

Our recommended hedges

A combination of hedges should leave your garden looking lovely whatever the weather

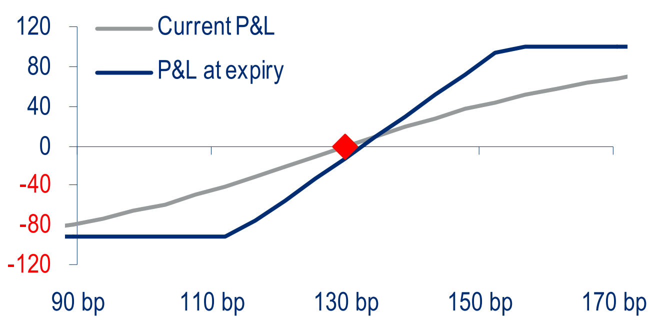
The unstable nature of the three equilibria we described above reinforces our view that investors should be prepared for them with different hedges. Although there may not be a hedge for all seasons, a combination of them will do – especially if investors take advantage of the current anomalies in the credit derivatives market to make those hedges as cheap and effective as possible.

"Moderate" widenings – Option payer spreads

Sell expensive OTM *leylandii* and buy cheap ATM ones

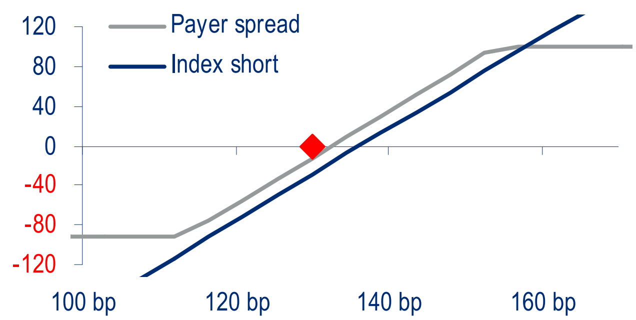
Payer spreads – i.e. buying an ATM payer and selling an OTM payer – represent the most attractive hedge for "moderate" widenings. As Figure 10 shows for a Main payer spread, compared with buying an ATM payer, the investor foregoes their potential upside at very wide spreads by selling one OTM payer. Given how steep the volatility skew is, this is very attractive from a pricing point of view. The investor loses the initial cost of the payer spread if spreads tighten below the strike of the ATM payer bought. Figure 11 compares the P&L, at option expiry, of an iTraxx Main June 110-150 payer spread and an outright index short; the 10% difference between the 110 and 150 strike implied volatility, i.e. skew, works in favour of the payer spread.

Figure 10. iTraxx Main June 110-150 Payer Spread
Trade P&L - € per €10.000 notional of the low strike payer bought.



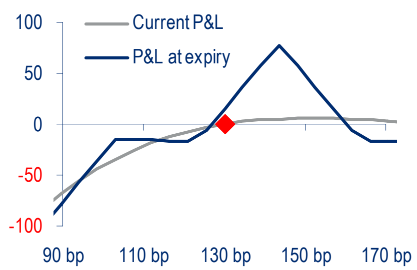
Source: Citi Research.

Figure 11. P&L at the option expiry (19-Jun)
Trade P&L - € per €10.000 notional.



Source: Citi Research.

Figure 12. Main June 120-140-160 Butterfly + 100 receiver
Trade P&L - € per €10.000 notional.



Source: Citi Research

Investors who are convinced that we will not see a tail-event and want to take advantage of the high volatility skew can enter **payer 1x2s** – i.e. buying an ATM payer and selling two OTM payers. Essentially, if kept until expiry, the investor makes money in a "moderate" widening and loses money in a large widening. In the current market environment, very few investors will be happy to take the tail-exposure payer 1x2s generate – the costs of this strategy (not only in terms of portfolio MtM but mainly in terms of the likelihood of losing your job) if a tail-event materialises are substantial. Probably for that very same reason, investors are willing to pay a high price (in volatility terms) for tail hedges. Straight payer spreads take advantage of this without generating losses in a tail-event scenario.

Butterflies represent an alternative strategy to hedge moderate widenings via options; investors can cheapen them by selling an OTM receiver (see Figure 12**Error! Reference source not found.**). We prefer payer spreads because they take advantage of the steep skew and provide a higher delta.

Tail-events – "Overweight" 3s5s index flatteners

Now is a good time to plant a long-lasting border of yew

Curves will not likely flatten in a "moderate" widening; however, a tail-event should cause capitulation, forced-selling and widespread default hedging which, in our view, would cause curves to aggressively flatten. A tail-event is only likely to materialise if investors lose faith in the value of the "central bank put", but in that case, the rationale for steep curves would evaporate and curves flatten very quickly.

An iTraxx Main 3s5s duration-weighted flattener has a total time value cost (carry + slide) of around 7 cents of the 5y notional if kept for three months, as Figure 7 shows. It can be shown that 1bp curve flattening in the next three months would suffice to cause the trade to break-even.

Figure 13. iTraxx Main Series 19 3s5s Flattener

Tenor	Maturity	Spread (bp)	Coupon (bp)	Upfront (%)	Notional (€)	Coupon (€)	Annual Upfront (€)	Annual Carry (€)	3m Slide (€)	3m Time (€)
3y	20-Jun-16	87	100	-0.41%	-15,688,714	-156,887	63,855	-39,222	-15,452	-54,674
5y	20-Jun-18	129	100	1.46%	10,000,000	100,000	145,822	25,000	22,353	47,353
3s5s Flattener		**42**		**Total**	**-5,688,714**	**-56,887**	**209,677**	**-14,222**	**6,901**	**-7,321**

Source: Citi Research, Markit. Mid spreads as of COB 27 March.

We have recently highlighted that a large proportion of iTraxx constituents offer positive time value 3s5s duration weighted flatteners. In our view, this represents a strong technical which should prevent any further steepening in 3s5s curves – we expect CVA desks to enter flatteners for any index or single name offering positive time value flatteners. We prefer 3s5s flatteners to 5s10s flatteners mainly because this technical is only affecting 3s5s curves so far. This drove our iTraxx Main 3s5s flattener recommendation in our *European credit outlook 2013* (3 Jan).

We believe 3s5s flatteners offer one of the most attractive tail-hedges given their cost and the low probability of 3s5s curves steepening further.

Idiosyncratic/default risks – Jun-15 iTraxx S9 equity tranche shorts

Reduce the cost of *Buxus* with equity tranche flatteners

The high level of correlation priced in the tranche market – see Figure 4 – makes Jun15 equity tranches a very attractive way of hedging idiosyncratic risks, i.e. the chance of a few single names becoming distressed without the general market widening much. Running an outright Jun15 equity short is very expensive given its high upfront (~25.5%) and coupon (5%). As a consequence, we recommend investors couple the Jun15 equity short with a Jun18 equity long, as we recommended in a recent note. Given that whichever name becomes distressed will likely flatten aggressively, an equity flattener provides an attractive way to position for this with a very low cost. The Jun18 equity tranche is trading at around 55.75% upfront plus a 5% coupon, which is equivalent to around 70% upfront. We believe this level is wide enough to attract investors looking for distressed assets.

As with any other front-end curve, the iTraxx Series 9 Equity Jun15/18 (7s10s) curve is currently trading at record steep levels (30.25%) – Figure 15 and Figure 16. The 3m time value of the trade is +16 cents (i.e. positive) of the Jun18 notional, as Figure 14 shows.[3]

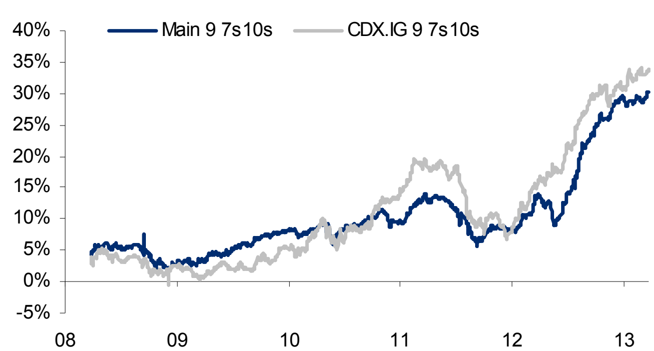
Figure 14. Jun-15/18 Equity Tranche Flattener

Tranche	Index	Maturity	Upfront	Coupon (bp)	Protection	Notional (€m)	Upfront (€m)	Coupon (€m)	12 m time value (€m)
0-3%	ITXEUR S9	20-Jun-15	25.5%	500	Buy	7.2	-1.83	-0.36	-0.30
0-3%	ITXEUR S9	20-Jun-18	55.75%	500	Sell	10.0	5.58	0.50	0.32
		Difference	**30.75%**			**Total**	**3.74**	**0.14**	**0.016**

Source: Citi Research, Markit. Indicative prices as of close 27 March.

Figure 15. iTraxx Main and CDX IG Series 9 7s10s upfront curves

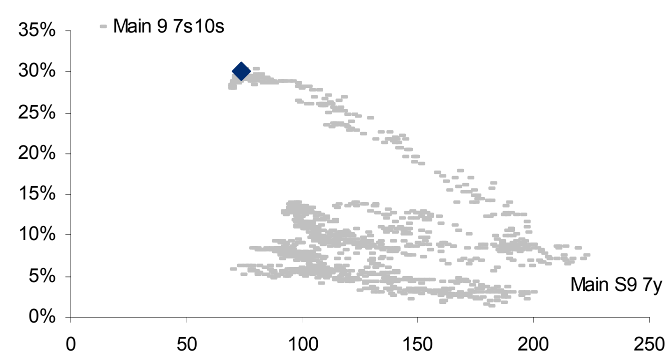
Difference in upfronts. iTraxx S 9 7s10s: Jun-15/18; CDX IG S9 7s10s: Dec-14/17.



Source: Citi Research, Markit.

Figure 16. iTraxx Main Series 9 Equity Upfront curve vs. index spread

Y-axis: upfront curve, in %. X-axis: iTraxx Series 9 7y (Jun-15) index spread, in bp.



Source: Citi Research, Markit. Mid spreads as of COB 8 Feb.

[3] We size the Jun-15/18 equity tranche flattener to be neutral to a general parallel spread movement in the underlying names' spread curves (which cause a parallel spread movement in the index curve). For each unit of protection sold in the Jun18 tranche, we buy 0.72 units of protection on the Jun15 tranche: (Jun18 index duration x Jun18 equity tranche delta) / (Jun15 index duration x Jun15 equity tranche delta).

Recent Trade Ideas

Figure 17. Recent Trade Ideas – chronological order.

Trade Ideas	Date
Long risk CDX IG vs. short risk iTraxx Main	3 Jan 2013
Long risk iTraxx Main vs. short risk iTraxx Crossover	3 Jan 2013
iTraxx Main 3s5s duration weighted flatteners	3 Jan 2013
iTraxx Main payer ladders	3 Jan 2013
Long risk Main vs. Crossover via indices and receiver options	12 Feb 2013
Long risk 3-6% vs. short risk 0-3% - Jun-15 iTraxx Series 9 tranches	12 Feb 2013
Flatteners in iTraxx Equity Tranches	6 Mar 2013
Long insurers vs. short premium autos	19 Mar 2013

Source: Citi Research.

Analytics @ CitiVELOCITY

Figure 18. Analytics – Available at CitiVELOCITY

EUR Corporate Basis Report
GBP Corporate Basis Report
World of Intrinsics
iTraxx & CDX Curve Monitor
Cross-Market Report (Long-Term)
Cross-Market Report
EUR iBoxx Corporate Indices
Sovereign Credit Report
Corporate-Sovereign Correlation Report
CDX Corporate Indices Daily Review

Source: Citi Research.

Risks
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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Appendix A-1

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