

Options vs. Curves: Playing with Tail Risk

Sell it where it's expensive & buy it where it's cheap

■ Expensive tail risk: OTM payers – Sell it.

- The credit index options market continues to be dominated by hedging flows. Investors remain better buyers of options, especially OTM payer options for tail-hedging.
- As a consequence, implied vol tends to trade expensive to realised, particularly for OTM payers (as can be seen in the steep skews).

■ Cheap tail risk: 3s5s flatteners – Buy it.

- Curve flatteners proved to be an effective tail hedge in the last tail event (triggered by Lehman's default in October 2008): the spread curve, which had steepened with the widening up until then as investors rushed to buy 5y protection, collapsed and inverted very quickly.
- Front-end curves are currently so steep that 3s5s duration weighted flatteners have been positive carry and roll down for a while.

■ Trade: buy 3s5s flatteners & sell (no-delta) OTM payers in iTraxx Main.

- **The trade is positive time value in both legs** if spreads remain where they are, and we expect not to have a negative MtM in a tail event.
- We use 3m 120bp payer options with a notional equal to 75% of the notional on the 5y leg of the flattener. We plan to roll this trade as follows: 3s5s duration weighted flattener – using on-the-run indices and rolling the curve position at roll dates and/or when the trade DVO1 ratio differs more than 5% from the current ratio. 3m 120bp payer sold – we roll it to a new payer at expiry.

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Figure 1. Main 3s5s DV01-neutral flattener

Tenor	Protection	Spread (bp)	Notional (€m)	3m Time (€m)
3y	Buy	41	-164	-0.22
5y	Sell	74	100	0.31
		33	-64	0.09

Source: Citi Research, Markit. Assuming the 3y spread rolls down the curve using a 1y spread equal to the index theoretical spread. Prices as of COB yesterday.

Figure 2. Main 120bp May payer sold

Type	Strike	Expiry	Price	Position	Notional (€m)
Payer	120	21-May	6.3c	Sell	75

Source: Citi Research, Markit. Indicative mid-price as of COB yesterday.

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

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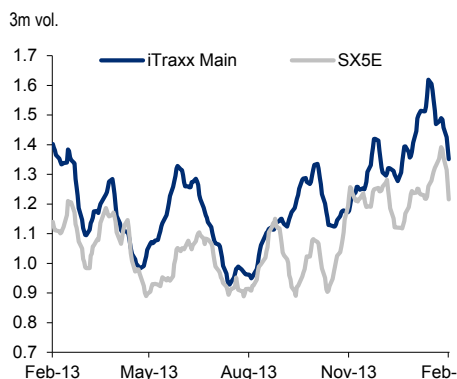
Expensive tail risk: OTM payers

The credit index options market continues to be dominated by hedging flows, with investors better buyers of options, especially OTM payer options for tail-hedging: this was the main conclusion of our recent review of option flows in 2013 – see [Credit Options - What did investors do in 2013?: What will they do in 2014?](#)

Credit implied vol is generally expensive, especially for very OTM payers (steep skew)

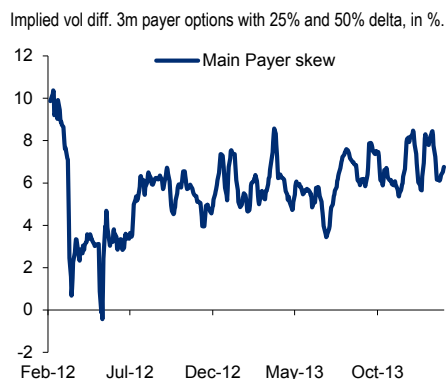
As a consequence, (i) credit implied vol tends to generally trade substantially higher than realised, especially when compared to other asset classes (see Figure 4), and (ii) the payer volatility skew tends to be on the steep side, overshooting in periods of market weakness when investors rush for tail hedges in options – as we clearly saw at the end of January (see Figure 5 and Figure 6).

Figure 3. Implied to realised vol



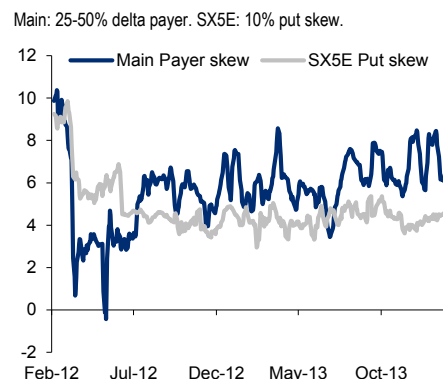
Source: Citi Research, Markit, Bloomberg. 5d moving av.

Figure 4. Main payer vol skew



Source: Citi Research, Markit. 5d moving av.

Figure 5. Main vs. SX5E vol skew



Source: Citi Research, Markit. 5d moving av.

The options market has become “the place to go” for investors looking for hedges, in particular tail hedges. In the past, investors looking for hedges used to favor indices (for “moderate” hedges) and senior tranches (for “tail” hedges). The shift in hedging flows from other markets to the options space has exacerbated the expensiveness of hedging tail risk in this market.

We think investors should sell tail risk in the options market, where it is expensive, and buy it elsewhere. Selling no-delta OTM payers is the most obvious way to do this.

Investors can use our recently launched [Online Options Pricing Tool](#) to price and analyse the P&L profile of option trades; the tool automatically loads prices as of COB yesterday, which investors can overwrite. Please contact your sales representative for a demo.

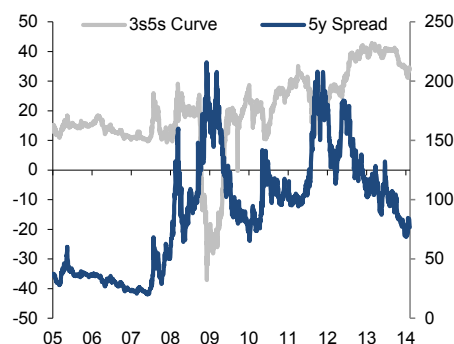
[This](#) is an example of a 120bp OTM payer spread in Main, expiring in May, pricing at ~6c with a 12% delta and 63% implied vol (vs. a 50% ATM vol).

Cheap tail risk: 3s5s flatteners

Curve flatteners proved to be an effective tail hedge in the last tail event (triggered by Lehman's default in October 2008): the spread curve, which had steepened with the widening up until then as investors rushed to buy 5y protection, collapsed and inverted very quickly as investors started hitting liquidity constraints and became forced-sellers. Market participants rushed to buy short dated protection to hedge default risk and the curve moved from +25bp to -30bp very quickly – see Figure 6 and Figure 7.

Figure 6. Main 3s5s & 5y spread

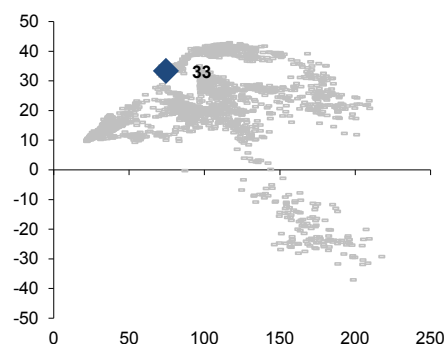
LHS: curve, bp. RHS: 5y spread, bp.



Source: Citi Research, Markit. On-the-run index.

Figure 7. Main 3s5s vs. 5y spread

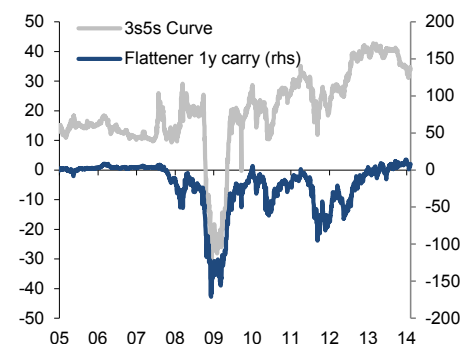
Y-axis: curve, bp. X-axis: 5y spread, bp.



Source: Citi Research, Markit. On-the-run index.

Figure 8. 3s5s curve vs. flattener carry

LHS: curve, bp. RHS: annual carry, in cents of 5y notional.*



Source: Citi Research, Markit. * Assuming full running trading (i.e. no coupon and 0% upfront) and excluding slide/roll down.

As we've highlighted many times, front-end curves are currently so steep that 3s5s duration weighted flatteners have been positive carry and roll down for a while (see Figure 8). It is unusual for a trade which provides positive default exposure and tail risk protection to have zero or positive carry. As Figure 9 shows, a Main 3s5s duration weighted flattener currently offers around +9c of carry and roll down for a 3m horizon.

Figure 9. Main 3s5s DV01-neutral flattener

Tenor	Protection	Maturity	Spread (bp)	Coupon (bp)	Upfront (%)	Notional (€m)	Annual Coupon (€m)	Annual Upfront (€m)	3m Carry (€m)	3m Slide (€m)	3m Time (€m)
3y	Buy	20-Dec-16	41	100	-1.67%	-164	-1.64	2.75	-0.41	0.19	-0.22
5y	Sell	20-Dec-18	74	100	-1.20%	100	1.00	-1.20	0.25	0.06	0.31
			33		Total	-64	-0.64	1.55	-0.16	0.25	0.09

Source: Citi Research, Markit. Assuming the 3y spread rolls down the curve using a 1y spread equal to the index theoretical spread. Prices as of COB yesterday.

We like flatteners for both bullish and tail-risk scenarios. We think flatteners will likely underperform in a moderate widening as investors favor buying 5y protection. Our preference is still for 3s5s flatteners as they offer positive carry (5s10s flatteners are still small negative carry and roll down).

Those investors interested in the historical P&L of curve trades can check our online [iTraxx Curve P&L Report](#).

Thus, our preferred way of adding tail hedges is via flatteners, with a positive MtM if nothing moves.

Trade: 3s5s flatteners & sell OTM payers

“Rolling” Trade specifics

3s5s duration weighted flattener – Using on-the-run indices and rolling the curve position at roll dates and/or when the trade DVO1 ratio differs more than 5% from the current ratio.

3m 120bp payer sold – We roll it to a new payer at expiry.

Notionals – The option notional is 75% of the 5y notional on the flattener trade.

We recommend investors sell tail risk by selling OTM payers and buy it by entering 3s5s duration weighted steepeners. The trade is positive time value in both legs if spreads remain where they are.

The most difficult part of these relative value trades is to choose the option strike and the notional on each leg.

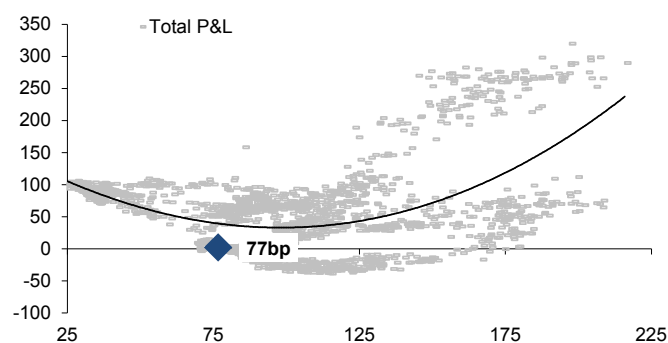
We choose to sell **120bp strike payers in Main** given that, back in Q4 2008, the curve stopped steepening and started flattening when Main moved above ~120bp. We use 3m options because, for strikes of 120bp, shorter dated options have so little delta that their price is very low. For example, the prices (mid) and deltas of 120bp strike options in Main as of COB yesterday were: 0.3c / 1.2% March, 2.1c / 5.5% April, 6.3c / 12.4% May.

In order to decide the notional on the payer option, we first look at what would be the P&L of a 3s5s flattener if history repeats itself in 3m time and we go back to each of the spread & curve combinations we have had since 2005 (i.e. all the combinations in the scatterplot in Figure 7). This P&L is shown in Figure 10: if 5y spreads were to go back to 200bp with the curve inverted at -35bp, a 3s5s flattener would make around 3% (300c) of the 5y notional traded.

We next compare the P&L of a flattener with the P&L at expiry of a 120bp **3m payer option** bought, assuming the option notional is 0.5x and **0.75x the notional on the 5y leg of the flattener** respectively – see Figure 11. The option P&L with a 0.75x notional tracks reasonably well the P&L of a flattener when spreads widen above 120bp and curves invert.

Figure 10. 3s5s Flattener 3m P&L vs. 5y spread

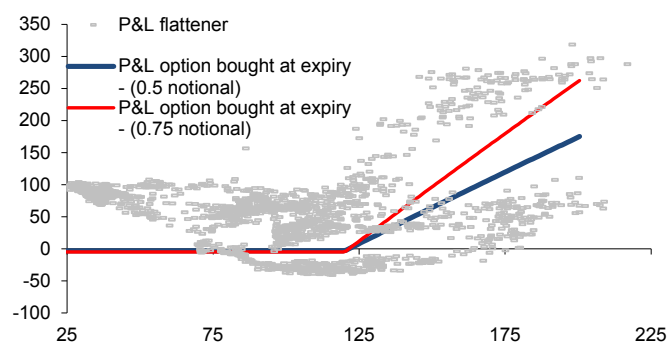
In cents (100c = 1%) of the 5y notional. Using a 3m horizon, for all the spread & curve historical combinations shown in Figure 7.



Source: Citi Research, Markit.

Figure 11. P&L vs. 5y spread – 3m 120bp payer bought vs. 3s5s flattener

P&L, in 3m time, in cents of the 5y notional on the flattener. For the flattener we use all the spread and curve historical combinations shown in Figure 7.



Source: Citi Research, Markit.

Figure 11 also shows that, if a 0.75x notional is chosen on the option leg, the relative value trade would suffer when spreads widen and but the curve doesn't invert, which is what happened over the weeks leading to the tail event in October 2008. Thus, we should expect this trade to lose money in moderate widenings which do not trigger a tail event (where investors are forced-sellers and many rush to hedge default risk). Investors who want to mitigate this could use a lower notional on the payer option sold, e.g. 0.5x of the 5y flattener leg.

Trade Recommendations Summary

We are opening the trade recommended in this report and taking profits on our equal notional flattener and Crossover 275bp February receiver sold.

Figure 12. Open trades – Summary and P&L

Trade Description	Leg	Format	Direct.	Notnl.	Entry Upfront	Entry Spread	Coupon	Current Upf.	Current Spread	P&L* Total	P&L* Month**
S9 6-9% vs. S20 Crossover 15-Nov-13	Main S9 6-9% Jun-18 Crossover S20 Dec-18	Prot. Prot.	Sell Buy	1.17 1.00	-0.25% -7.07%	294 344	300 500	-2.97% -9.55%	228 280	4.05% -3.72%	-0.18% -0.79%
									Total	0.34%	-0.97%
Sell 1m Main straddles *** 09-Jan-14	Sell 1m Main straddles	Price	Buy	1.00	0.00%			0.06%		0.06%	
									Total	0.06%	
Payer spread vs. index long *** 09-Jan-14	Buy 3m 25-60% pay spread Buy index prot.	Price Price	Buy Sell	1.00 1.00	0.00% 0.00%			0.05% 0.09%		0.05% -0.09%	
									Total	-0.04%	
SenFin vs. Xover Recs *** 09-Jan-14	3m SenFin Recs 3m Xover Recs	Price Price	Buy Sell	3.40 1.00	0.00% 0.00%			-0.08% 0.24%		-0.28% -0.24%	
									Total	-0.51%	
3-6% vs. super senior 14-Jan-14	Main S9 3-6% Jun-18 Main S9 22-100% Jun-18	Prot. Prot.	Sell Buy	1.00 9.00	-5.50% 0.03%	366 26.625	500 25	-4.90% 0.17%	378 29	-0.20% 1.07%	0.10% 1.19%
									Total	0.54%	
Main vs. SenFin vol *** 21-Jan-14	Sell delta-hedged Feb 70 Main straddles Buy delta-hedged Feb 80 SenFin straddles	Price Price	Sell Buy	1.00 0.50	0.00% 0.00%			-0.07% -0.05%		0.07% -0.02%	
									Total	0.05%	
Flattener vs. OTM payer *** 13-Feb-14	3s5s flattener Main 3m 120bp Main payer	Price Price	Buy Sell	1.00 0.75	0.00% 0.00%						
									Total		

Source: Citi Research. Spreads and coupons in bp. * P&L expressed as % of the leg with notional equal to 1. ** Over the last month. Prices as of COB yesterday. *** We track the trade P&L by using an initial 0% upfront and a current upfront equal to the trade P&L in %.

Figure 13. Open and closed trades summary statistics

Number	Open	Closed*	Percentage	Open	Closed*
In profit	4	14	In profit	67%	78%
In loss	2	4	In loss	33%	22%
	6	18			

Source: Citi Research. * Since 1-Jun-13. Excluding the trade ideas opened in the current publication.

Representative Market Conditions

Figure 14. Historical spreads – iTraxx 5y on-the-run indices

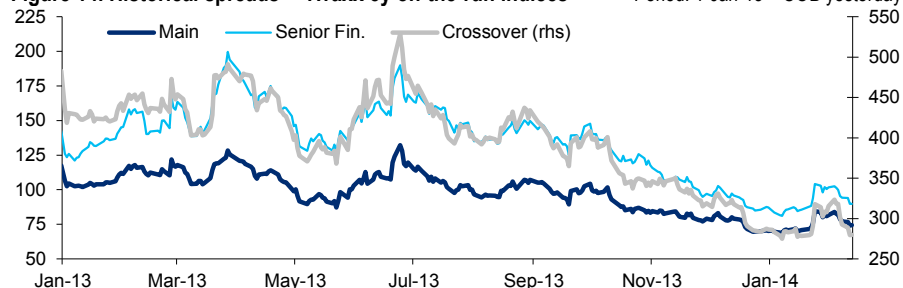


Figure 15. Closed trades since Jun-13 – Summary and P&L

Trade Description	Leg	Format	Direct.	Notnl.	Entry Upfront	Entry Spread	Coupon	Final Upfront	Final Spread	P&L* Total
Main July Receiver Fly	105bp Receiver	Price	Buy	1.00	0.25%			0.23%		-0.01%
Opened: 18-Jun-13	90bp Receiver	Price	Sell	2.00	0.04%			0.00%		0.07%
Closed: Expiry	75bp Receiver	Price	Buy	1.00	0.00%			0.00%		0.00%
									Total	0.06%
Senior Fin vs. CDX IG Receivers	SenFin October 140bp receiver	Price	Buy	1.00	0.53%			0.69%		0.17%
Opened: 26-Jul-13	CDX IG October 75bp receiver	Price	Sell	2.00	0.19%			0.18%		0.02%
Closed: 13-Aug-13									Total	0.19%
Series 9 vs. Series 19 equity	iTraxx Main S9 0-3% Jun-18 (10y)	Prot.	Buy	1.00	46.25%	1,720	500	39.82%	1,703	-7.98%
Opened: 5-Jun-13	iTraxx Main S9 Index Jun-18 (10y)	Prot.	Sell	5.00	-2.05%	132	175	-2.73%	114	6.12%
Closed: 25-Sep-13	iTraxx Main S19 0-3% Jun-18 (5y)	Prot.	Sell	1.00	31.75%	1,227	500	25.15%	1,188	8.15%
	iTraxx Main S19 Index Jun-18 (5y)	Prot.	Buy	6.20	0.39%	108	100	-0.53%	88	-7.63%
									Total	-1.34%
S19 Jun-16 3-6% vs. S9 Jun-18 Index	iTraxx Main S19 3-6% Jun-16 (3y)	Prot.	Sell	1.00	-3.59%	375	500	-7.23%	229	4.72%
Opened: 9-Jul-13	iTraxx Main S9 Index Jun-18 (10y)	Prot.	Buy	2.50	-1.58%	138	175	-2.73%	114	-3.83%
Closed: 25-Sep-13									Total	0.89%
Commerzbank sub/senior compr.	Sub CDS	Prot.	Sell	1.00	-5.65%	375	500	-8.03%	327	3.24%
Opened: 13-Aug-13	Senior CDS	Prot.	Buy	2.51	2.37%	150	100	1.95%	140	-1.49%
Closed: 14-Sep-13									Total	1.75%
RBS sub/senior compr.	Sub CDS	Prot.	Sell	1.00	-7.71%	339	500	-11.10%	254	4.25%
Opened: 13-Aug-13	Senior CDS	Prot.	Buy	2.02	2.80%	168	100	1.77%	139	-2.43%
Closed: 14-Sep-13									Total	1.82%
BNP sub/senior compr.	Sub CDS	Prot.	Sell	1.00	-14.42%	198	500	-16.21%	168	2.65%
Opened: 13-Aug-13	Senior CDS	Prot.	Buy	1.68	0.86%	118	100	0.26%	105	-1.30%
Closed: 14-Sep-13									Total	1.36%
S19 3-6% vs. S20 Crossover	Main S19 3-6% Jun-18	Prot.	Sell	1.00	-3.25%	422	500	-5.70%	366	2.99%
Opened: 26-Sep-13	Crossover S20 Dec-18	Prot.	Buy	1.00	-5.18%	386	500	-6.96%	343	-2.32%
Closed: 4-Nov-13									Total	0.67%
iTraxx vs. CDX IG super senior	Main S9 22-100% Jun-18	Prot.	Sell	1.00	0.60%	37	25	0.34%	32	0.29%
Opened: 26-Sep-13	CDX IG S9 30-100% Dec-17	Prot.	Buy	1.00	-3.54%	13	100	-3.43%	16	0.00%
Closed: 4-Nov-13									Total	0.29%
Senior Fin vs. Xover straddle	Xover Dec-13 400bp straddle	Price	Sell	1.00	2.64%			2.63%		0.00%
Opened: 9-Oct-13	SenFin Dec-13 140bp straddle	Price	Buy	2.05	1.29%			1.48%		0.40%
Closed: 15-Nov-13									Total	0.40%
325-350-375 Nov. Crossover Receiver Ladder	325 Xover Nov Rec	Price	Sell	2.00	0.18%			0.02%		0.32%
Opened: 23-Oct-13	350 Xover Nov Rec	Price	Sell	1.00	0.61%			0.47%		0.14%
Closed: 15-Nov-13	375 Xover Nov Rec	Price	Buy	1.00	1.45%			1.46%		0.01%
									Total	0.47%
CDX IG vs. Main Receivers	CDX IG S21 Nov 85 Receiver	Price	Buy	1.00	0.47%			0.62%		0.15%
Opened: 15-Oct-13	Main S20 Nov 100 Receiver	Price	Sell	1.00	0.52%			0.91%		-0.39%
Closed: Expired 20-Nov-13									Total	-0.24%
S19 Jun-16 0-3% vs. 3-6%	Main S19 0-3% Jun-16	Prot.	Sell	1.00	8.00%	839	500	3.88%	725	5.11%
Open: 26-Sep-13	Main S19 3-6% Jun-16	Prot.	Buy	2.00	-7.00%	234	500	-9.75%	132	-7.47%
Closed: 9-Dec-13									Total	-2.36%
SenFin vs. Main	Senior Fin. 5y S20	Prot.	Sell	1.00	0.60%	112	100	0.07%	102	0.61%
Open: 26-Sep-13	Main 5y S20	Prot.	Buy	1.35	-0.79%	84	100	-0.94%	81	-0.32%
Closed: 9-Dec-13									Total	0.29%
S9 super senior vs. light delta	Main S9 22-100% Jun-18	Prot.	Sell	1.00	0.18%	30	25	0.03%	26	0.19%
Open: 15-Nov-13	Main S9 index Jun-18	Prot.	Buy	0.33	-3.65%	93	175	-4.24%	77	-0.29%
Close: 14-Jan-14									Total	-0.10%
75-85 Main January strangle	75bp Jan Main receiver	Price	Sell	1.00	0.08%			0.19%		-0.11%
Open: 9-Dec-13	85bp Jan Main Payer	Price	Sell	1.00	0.13%			0.00%		0.13%
Close: 14-Jan-14									Total	0.02%
Sell Crossover Receiver	275bp Feb. Receiver	Price	Sell	1.00	0.32%			0.17%		0.15%
Open: 9-Jan-14										
Close: 13-Feb-14									Total	0.15%
iTraxx Main Eq. Notional Flatteners	Main S19 3y	Prot.	Buy	1.00	-0.97%	65	100	-1.57%	33	-1.04%
Open: 5-Sep-13	Main S19 5y	Prot.	Sell	1.00	0.24%	105	100	-1.47%	65	2.15%
Close: 13-Feb-14									Total	1.11%

Source: Citi Research. Spreads and coupons in bp. * P&L expressed as % of the leg with notional equal to 1. *** We track the trade P&L by using an initial 0% upfront and a final upfront equal to the trade P&L in %.

Notes: The list of open trades reflects our current views; we have no plans to provide regular coverage or updates to these trades. P&L on trade ideas includes carry and roll costs but not trading commissions/costs. Results should not, and cannot, be viewed as an indicator of future performance.

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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Analytics, Past Trade Ideas & Publications

Figure 16. Analytics – Available at Citi Velocity

Options	iTraxx Volatility Report CDX Volatility Report European Cross-Asset Volatility Report Volatility P&L Report – Credit Indices	Tranches	iTraxx Series 9 Tranche Report iTraxx Series 19 Tranche Report
Curves	iTraxx Curve P&L Report	Indices	CDS Indices Positioning Report CDS Indices Trading Volumes Report

Source: Citi Research.

Figure 17. Past Trade Ideas

Options -	Sell Main vol. buy SenFin vol	21 Jan 2014
Tranches -	More mezz. less seniors - 3-6% vs. super senior	15 Jan 2014
Options -	SenFin vs. Xover Recs	9 Jan 2014
Options -	Payer spread vs. index long	9 Jan 2014
Options -	Sell 1m Main straddles	9 Jan 2014
Options -	Sell Crossover Receiver	9 Jan 2014
Options -	Sell strangles and go on holidays: Position for spreads to stay in the recent range in mid-January	9 Dec 2013
Tranches -	Sell S9 Jun-18 6-9% protection vs. Xover 5y S20	15 Nov 2013
Tranches -	Sell S9 Jun-18 22-100% protection vs. light delta	15 Nov 2013
Indices -	Long risk Senior Fins. vs. short risk Main	5 Nov 2013
Options -	Crossover receiver ladders	23 Oct 2013
Options -	Long risk CDX IG vs. Main via Receivers	15 Oct 2013
Options -	Buy Senior Financials straddles vs. sell Crossover straddles	9 Oct 2013
Tranches -	Long risk equity vs. short risk 3-6% in S19 Jun-16 (3y)	26 Sep 2013
Tranches -	Long risk S19 Jun-18 (5y) 3-6% vs. 5y S20 Crossover	26 Sep 2013
Tranches -	Long risk iTraxx S9 Jun-18 (10y) super senior vs. short risk CDX IG S9 Dec-17 (10y) super senior	26 Sep 2013
Indices -	Equal Notional 3s5s Flatteners: Adding cautious longs by selling forward protection	5 Sep 2013
Single Names -	Sub/Senior compression trades in European banks	13 Aug 2013
Options -	iTraxx Senior Financials vs. CDX IG via Receivers	7 Aug 2013
Tranches -	Sell Jun-16 3-6% Series 19 protection vs. Buy Jun-18 Series 9 index protection	9 Jul 2013
Options -	Option trades ahead of the FOMC	18 Jun 2013
Tranches -	iTraxx Series 9 vs. Series 19 Jun-18 equity tranches	5 Jun 2013
Options -	Hedging via Crossover Bearish Ladders	16 May 2013
Options -	Buy Main straddles; sell CDX IG straddles	1 May 2013
Tranches -	Views & Trades on iTraxx Series 9 Tranches	18 April 2013
Single Names -	Beware of retail and food releveraging – short risk retailers & food vs. Main Non-Financials	18 April 2013
Options -	Receiver 1x2s – Mind the tail if going long	2 Apr 2013
Single Names -	Long insurers vs. short premium autos	19 Mar 2013
Tranches -	Flatteners in iTraxx Equity Tranches	6 Mar 2013
Tranches -	Long risk 3-6% vs. short risk 0-3% - Jun-15 iTraxx Series 9 tranches	12 Feb 2013
Options -	Long risk Main vs. Crossover via indices and receiver options	12 Feb 2013

Source: Citi Research.

Figure 18. Other publications

iTraxx Roll - Potential Changes: Crossover number of constituents will increase to 60 names	10 Feb 2014
2014 European Credit Outlook: Strategy // Positioning and Trades	13 Jan 2014
Global Structured Credit Outlook: A Rockier Ride (R Roy, A Basu, K Malhotra, R Brauchler)	20 Dec 2013
2013 Trading Volumes in European Credit: CDS Indices, Single Name CDS and IG Bonds	5 Dec 2013
Credit Options - What did investors do in 2013?: What will they do in 2014? (2013 European Credit Conference Presentation)	4 Dec 2013
Credit Index Options 1-0-1: Launching our option pricing tool @ CitiVelocity (2013 European Credit Conference Presentation)	2 Dec 2013
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Appendix A-1

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