

iTraxx Options Views & Trades

Vol starts the year expensive – we start by selling receivers

- **Short term** – Implied vol starts the year on the expensive side (vs. spreads and vs. realised); we expect that to normalize soon and recommend selling options. Skew-wise, the year starts with very flat skews on both the payer and the receiver side; bullish price action which makes us favor low cost defensive trades. “Tactical” trade ideas:
 - **Sell no-delta Crossover February receivers** to tactically fade the recent index tightening, taking advantage of the high implied vol and flat short dated receiver skews.
 - **Crossover delta-hedged 3m bearish risk reversal** (buying OTM payers vs. selling OTM receivers) to position for both payer and receiver skews to steepen.
 - Looking for longs? Can use Senior Financials receiver spreads to take advantage of the flat skew and position for a moderate, not large, tightening.
- **Medium term** – Implied vol to drift tighter with spreads; P&L of selling vol to probably still be positive but to continue falling. “Systematic” trade ideas for 2014:
 - **Sell Main 1m no-delta straddles** to position for a range-bound market.
 - **Payer spreads to continue outperforming index shorts as hedges.** We are not bearish, just want to take exposure to the fact that payer spreads should beat index shorts as hedges; thus we are, at the same time, entering into an outright index long (with the same notional).
 - **Sell Crossover receivers to buy Senior Financial receivers**, i.e. expecting Crossover to underperform Senior Financials as spreads stabilize/tighten.

Abel Elizalde

+44-20-3569-4446

abel.elizalde@citi.com

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

Citi Research is a division of Citigroup Global Markets Inc. (the “Firm”), which does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the Firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

We start with a review of short term movements and views in the options market, followed by our medium term views and themes for this year. We then briefly highlight “market infrastructure” developments – those from 2013 and what we expect for 2014. Finally, we provide details and analysis on four of the trade ideas mentioned in the front page.

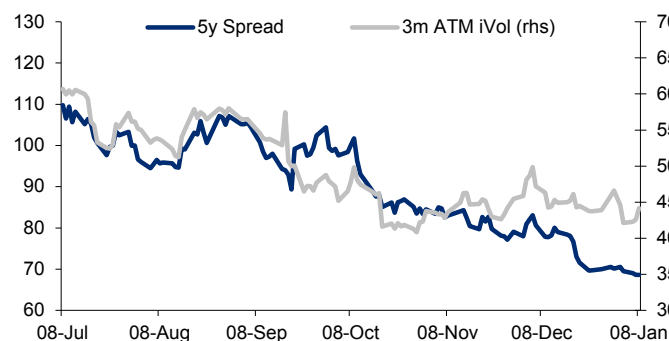
Short term ...

Track movements in volatility with our daily analytics: [iTraxx](#) and [CDX](#). Ready-made charts and tables with everything you need to track what's happening in the options market.

Implied vol starts the year on the high side – we expect that to normalize soon; sell options. Both vs. spreads as well as vs. realised volatility, implied volatility has started the year looking expensive – see Figure 1 and Figure 2. The ratio of implied to realised volatility has been trending upwards since the lows of mid-2013, not only in credit but also in other asset classes like equities and rates. Thus, we are more inclined to start the year selling rather than buying options; later in this report we recommend two trade ideas to position for this (selling Crossover receivers as a tactical trade and selling no-delta straddles as a systematic trade for 2014).

Figure 1. Main spread & 3m ATM implied volatility

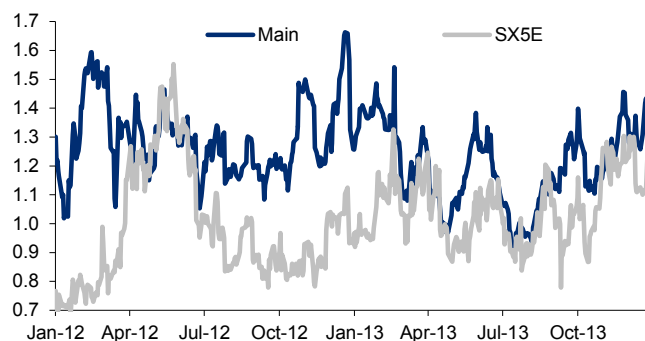
LHS: spreads (bp). RHS: vol (%).



Source: Citi Research, Markit.

Figure 2. Implied to realised volatility ratio

3 months.

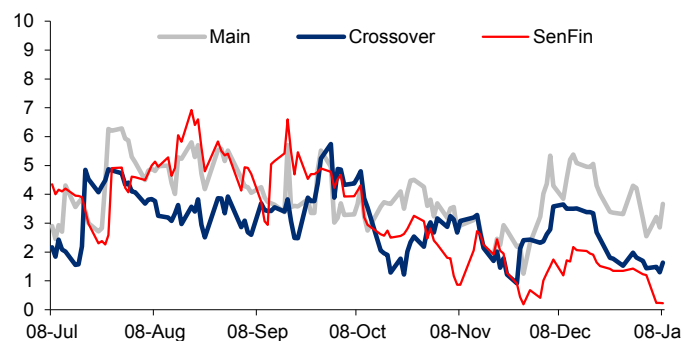


Source: Citi Research, Markit, Bloomberg.

Skew-wise, the year starts with very flat skews on both the payer and the receiver side – bullish price action. This is particularly the case in short dated (1m) Crossover and Senior Financials; not so much for longer dated expiries and Main (or CDX IG/HY where skews have been steepening). 1m skews in Crossover and Senior Financials are close to fully flat across all deltas.

Figure 3. Receiver skews (3m, %)

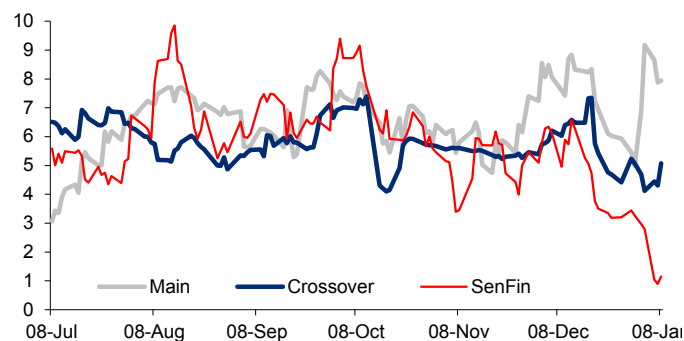
Implied volatility difference between payer options with 50% delta and with 75% delta.



Source: Citi Research, Markit.

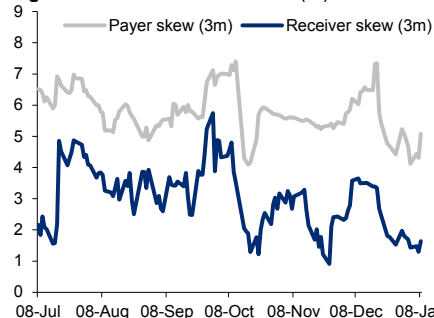
Figure 4. Payer skews (3m, %)

Implied volatility difference between payer options with 25% delta and with 50% delta..



Source: Citi Research, Markit.

Figure 5. Crossover 3m skews (%)



Source: Citi Research. Implied volatility difference between payer options with 50% and 75% delta (receiver skew) and 25% and 50% delta (payer skew). 5d moving average.

Flat skews paint a bullish picture (investors buying OTM receivers, selling OTM payers) which the option credit market is not used to. However, if 2014 plays out as everyone expects (i.e. tighter and boring spreads with investors forced to follow the trend without very high conviction), flat skews could become the norm as investors will not likely be as keen as they have historically been to spend much money in hedges, and will use any derivative instrument to extract some premium (i.e. to take risk).

Although not bearish for 2014, we are happy to take advantage of the flat **Crossover** receiver skew to add low cost defensive positions in the index which we think looks tighter from a fundamental and pricing point of view (see our arguments in trade No. 4 in the last section):

- We recommend **selling no-delta February receivers** to tactically fade the recent index tightening taking advantage of the high implied vol and flat short dated receiver skews; we review this trade in a later section.
- Second, we could position for both payer and receiver skews to steepen (from their current very flat levels – see Figure 5) via a **delta-hedged 3m bearish risk reversal** (buying OTM payers vs. selling OTM receivers).

Finally, we believe investors looking for longs should consider receiver spreads to take advantage of the flat skew and position for a moderate, not large, tightening in the short term; Senior Financials look the best choice.

Looking for longs? Receiver spreads

Don't position for a large move, and take advantage of the flat skew.

Medium term ...

For more details:

[Credit Options - What did investors do in 2013?: What will they do in 2014?](#) (2013 European Credit Conference Presentation)

[Global Structured Credit Outlook: A Rockier Ride](#) (R Roy, A Basu, K Malhotra, R Brauchler)

Figure 6. Implied to realised vol ratio



Source: Citi Research, Markit. 3m vol. 20d moving average.

2014 – Views & trading themes

Implied vol to drift tighter with spreads – Our base case scenario in Europe is for spreads to drift tighter realizing lower volatility than last year (see our views for the US [here](#)).¹ In our view, we are transitioning to a market more similar to the one we saw in 2004/06 than what we've experienced in the past few years. We do expect widening episodes where spreads realize high vol, but we think they will be (i) less frequent than we've grown used to and (ii) relatively short lived as investors are quick to take the other side in a market where timing will be one of the very few ways to make any alpha.

P&L of selling vol to probably still be positive but to continue falling – We also expect the premium of implied to realised vol to continue compressing. The average implied to realised volatility ratio over the past 3 years has progressively decreased (1.7 / 1.3 / 1.1 in 2011 / 12 / 13) as more investors decided to sell vol as a carry/alpha strategy – see Figure 6. We expect this to continue given that investors will likely be less keen to pay out for any hedges going forward, and start looking at the options market more as another way to extract carry than to spend it.

Thus, the options market in 2014 could potentially be different to what we have been used to. In this new environment, there are a few trading themes which we think will be profitable over the year:

- **Selling no-delta straddles to position for a range-bound market.**
- **Payer spreads** to continue outperforming index shorts as hedges.
- **Sell Crossover receivers to buy Senior Financial receivers**, i.e. expecting Crossover to underperform Senior Financials as spreads stabilize/tighten.

These are medium term trades which we think are worth rolling throughout the year. We provide more details in the last section.

¹ See also our European Credit Outlook presentation "[Vol is dead! Long live risk repression!": Is 2014 a year to yield or rebel?](#)", H Lorenzen, 6-Dec.

Market structure trends

2013 First, a few quick bullets encapsulating how 2013 went for the options market:

- **Growth – Continued.** Market-wise and globally, option volumes were ~45% up from 2013 and ~70% up from 2011 using DTCC data. In iTraxx options our numbers show volumes more than doubling in 2013.
- **Client split – More asset managers and hedge fund trading,** less inter-dealer volume. Europe (vs. US) sees more trading from CVA desks and less from loan desks and real money investors.
- **Usage –** Payers traded much more – i.e. **still a “hedging” market** for most investors. Clients were net buyers of payers, especially very OTM payers (**tail-hedging**). On the receiver side, selling **slightly OTM receivers** was the most popular strategy on a net basis: covered receivers to enhance the carry of long risk portfolios without adding long risk exposure.
- **Competition – More active dealers** (from ~6 to ~10) from our understanding; **lower bid-offers** (from 3-4 to 1.5-2 cents); **non-price competition becoming more important for clients** (consistency, relationship, color, research, data, analytics).

2014 Finally, a few more bullets encapsulating trends we expect for 2014:

- **Market consolidation volume-wise:** hard to maintain the pace of growth over the past years.
- **Increased transparency.** Moving from OTC to screens in a similar fashion to the changes experienced by indices over the past years.
- **Increased liquidity on the receiver side** – Investors usage of the product to progressively shift from hedging to adding risk.
- **Investors to continue improving the efficiency of their hedging styles.**
- **Potentially less breadth of strikes in Main** – Assuming trading ranges settle on a new (narrower) level; similar to CDX IG in 2013.
- **Transition towards a more relative value/vol market** (like equities) to continue (from a directional/hedging market).

Trade Ideas

No. 1 – Sell short dated Crossover receiver

Tactical trade

- **CDS indices have run too fast too quick – we expect a pause or a moderate reversal.** Although we are not bearish by any means, we think index spreads will have a hard time tightening a lot further in the near term.
- High implied volatility (vs. spreads and realised volatility) and flat short dated skews (Figure 8) offer a **good entry point to sell 1m receiver options**.
- **Investors with long risk portfolios** who are becoming increasingly concerned by the recent tightening but do not want to pay for hedges should sell receiver options: add a small short, pick up some carry if we do not tighten at the expense of giving up some of the portfolio upside if we tighten.
- Fundamentally, we prefer shorts in Crossover, but we do not think any particular index will underperform substantially over just 1 month. Pricing-wise, the 1m implied to realised ratio is the highest in Crossover (~1.6x) and the Crossover skew is, together with Senior Financials, flatter than in Main. Thus, we choose Crossover for our trade recommendation below.
- Selling a 275bp February Receiver in Crossover generates a breakeven spread at expiry of around ~268bp (vs. current spread of 284bp).

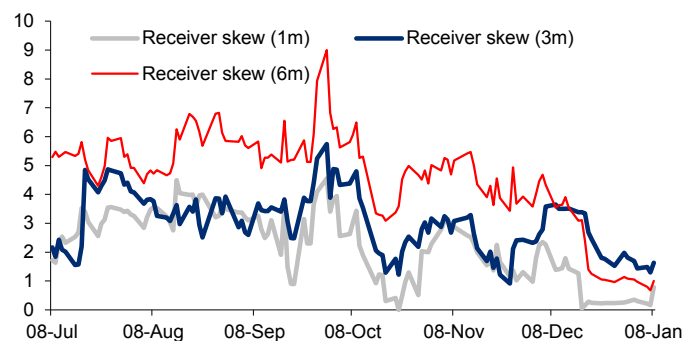
Figure 7. Trade details

Type	Strike	Expiry	Price	Position	Notional	Upfront	Delta	Gamma	Theta	Vega	Vol %
Receiver	275	19-Feb	32.4c	Sell	50,000,000	162,100	7,200	-100	2,200	-7,650	34.0%
Index	@ 284.5 bp			No position							

Source: Citi Research. Indicative prices shown.

Figure 8. Crossover receiver skews (%)

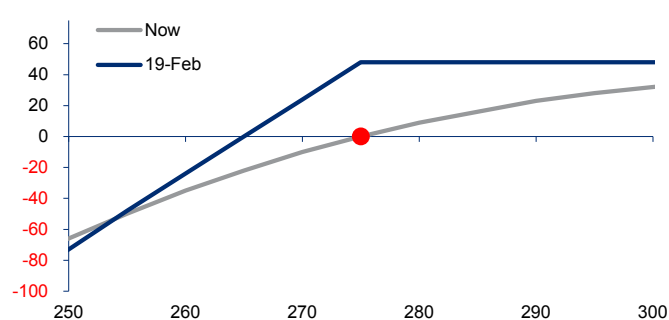
Implied volatility difference between payer options with 50% delta and with 75% delta.



Source: Citi Research, Markit.

Figure 9. Trade spread exposure

In cents of notional traded (100c = 1%).



Source: Citi Research, Markit. Using mids.

No. 2 – Selling 1m Main no-delta straddles

2014 “systematic” trade:

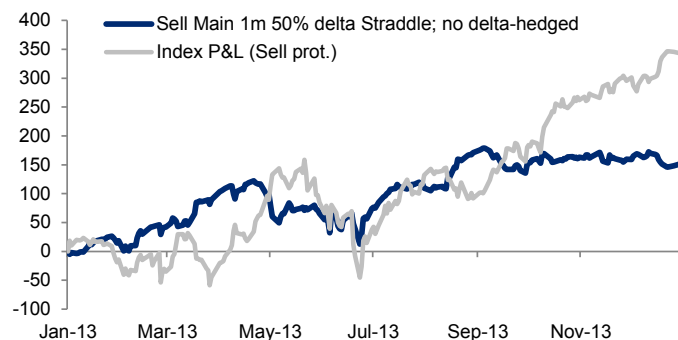
Sell front month no-delta ATM straddles

- **2014 should see spreads trade range-bound, like most of 2013.** We are expecting realized volatility to be low and trending environments not to last too long. We expect investors to add risk into any meaningful widening, realizing how important it will be to squeeze any basis point in a year where market stability is expected to reign. At the same time, although our view for 2014 is constructive, we do realize CDS indices are very tight vs. cash products and, as a consequence, we are not expecting very large tightenings. All in all, we expect the P&L of selling ranges, via no-delta 1m ATM straddles, to be positive and a good “alpha” complement to long risk portfolios – as Figure 10 shows for 2013.
- **Trade the range, not the vol** – i.e. do not delta-hedge. We are calling for lower implied vol but also lower implied to realised premium over the year. Thus, we would refrain, in a systematic trading rule, from delta-hedging and trading gamma (realised vs. implied vol). There will be periods where the implied to realised ratio moves higher, creating good entry points for short vol strategies,² but that will need a more tactical trading effort where timing will be key. In 2013, although less stable, naked straddles were more profitable than delta-hedged ones (see Figure 11).

As an example, a 70bp January / February straddle in Main generates breakeven spreads of around 67/73bp and 62/78bp respectively (at expiry).

Figure 10. Selling 1m no-delta straddles – 2013 cumulative P&L

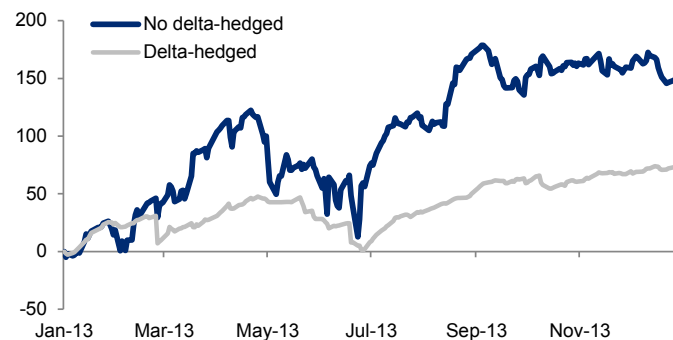
In cents of notional traded (100c = 1%).



Source: Citi Research, Markit. Using mids.

Figure 11. Selling 1m no-delta straddles – 2013 cumulative P&L

In cents of notional traded (100c = 1%).



Source: Citi Research, Markit. Using mids.

We are adding a trading strategy to our model portfolio where we sell a front month ATM straddle, keep it until expiry and enter a new one then.

² See [Global Structured Credit Outlook: A Rockier Ride](#), R Roy, A Basu, K Malhotra, R Brauchler, 20-Dec, p. 30/31.

No. 3 – Main Payer spreads as hedges

2014 “systematic” trade:

3m 25%-60% payer spreads
vs. index longs

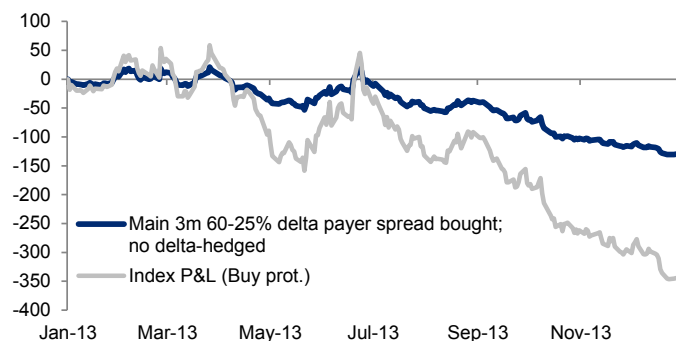
■ **Payer spreads comfortably beat outright index shorts in 2013** – see Figure 12. Without any “major” sell-off and with a clear tightening trend (especially during the second half of the year), payer spreads were at their best: protection for very large widenings was not needed and the losses in tightening environments were limited.

■ **We recommend investors looking for hedges in 2014 to continue using payer spreads.** We expect widenings to be moderate and short-lived as P&L-starved investors will be quick to fade any sell-off. Moreover, if our constructive view of the world for 2014 materializes, payer spreads should suffer less than outright index shorts. Our preferred hedging strategy for 2014 would combine payer spreads for moderate widenings plus protection against large sell-offs via flatteners and (for real-money investors) replacing bond longs with synthetic longs.

Figure 13 shows the trade spread exposure of a 70-85 April payer spread in Main.

Figure 12. Payer spreads vs. Index short – 2013 cumulative P&L

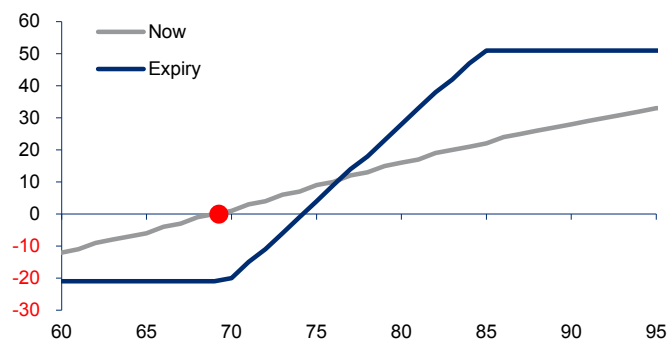
In cents of notional traded (100c = 1%).



Source: Citi Research, Markit. Using mids.

Figure 13. April payer spread – Trade spread exposure

In cents of notional traded (100c = 1%). 70-85bp strikes.



Source: Citi Research, Markit. Using mids.

We are adding a trading strategy to our model portfolio where we buy a 3m 25-60% delta payer spread, keep it until it is no longer 3m and enter a new 3m one then. Since we are not bearish but just want to take exposure to the fact that payer spreads should beat index shorts as hedges, we are, at the same time, entering into an outright index long (with the same notional). The resulting trade is equivalent to entering bullish risk reversals.

No. 4 – Sell Crossover vs. buy Senior Financial receivers

2014 “systematic” trade:

3m Crossover vs. Senior Fin. receivers

Figure 14. Ratio of Crossover to Senior Fin. Implied vol



Source: Citi Research, Markit. 3m vol. 5d moving average.

■ In synthetics, investors to favor levered IG – Long risk Main vs. Xover.

Stabilising or tightening from current levels represents a game changer in terms of the investment dynamics which will drive markets going forward. At current or tighter levels, we think relative value relationships will be much closer to the ones back in 2005-2008 than the ones over the past three years. In synthetics, investment grade spreads should be the main beneficiaries on the back of investors looking for leverage. In a low volatility environment we believe investors will be more inclined (than in the recent past) to look for high spread longs by leveraging up investment grade spreads than by venturing into high yield.

■ Within IG, there is still room for financials to outperform – Long risk Senior Financials vs. Main.

The outperformance of financials is another trend we expect to continue playing out in 2014 as investors adjust to a new world of tight spreads, where every basis point counts. As we highlighted in early November, the basis between financials and non-financials was too tempting and investors struggling to find longs would soon start taking advantage. We expect to see Senior Financial spreads trading inside Main in 2014 – currently spreads are 84bp vs. 70bp.

■ Putting it altogether ... Long risk Senior Financials vs. Crossover via receiver options.

Although we do not see a large downside if spreads widen, we believe the upside of this trade is mostly if spreads tighten from here, hence our recommendation via receiver options. The ratio of Crossover to Senior Financials implied vol is quite high from a historical point of view (Figure 15 and Figure 16), which creates a good entry point for our trade.

Figure 15. Ratio of Crossover to Senior Financial spreads

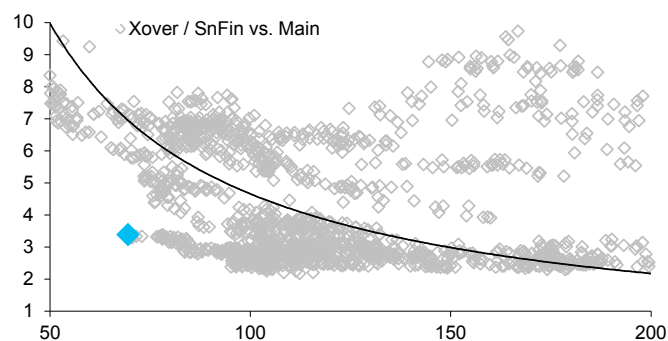
5y on-the-run indices.



Source: Citi Research, Markit.

Figure 16. Ratio of Crossover to Senior Fin. spreads vs. Main spreads

Y-axis: spread ratio. X-axis: Main 5y spreads, in bp.



Source: Citi Research, Markit. Using on-the-run indices. Daily data since 2008.

We are adding a trading strategy to our model portfolio where we buy 3m ATM (50% delta) 3m Senior Fin. receivers and sell Crossover receivers; we keep them until they are no longer 3m and enter new 3m ones then. We use the current ratio of index spreads (~3.4) to size the trade, i.e. buying 3.4 Senior Fin. receivers for each Crossover receiver we sell.

Trade Recommendations Summary

This section provides details of the trade ideas recommended in our published research.

We are opening the four trades recommended in the last section of this report.

Figure 17. Open trades – Summary and P&L

Trade Description	Leg	Format	Direct.	Notnl.	Entry Upfront	Entry Spread	Entry Coupon	Current Upf.	Current Spread	P&L* Total	P&L* Month**
iTraxx Main Eq. Notional Flatteners 05-Sep-13	Main S19 3y	Prot.	Buy	1.00	-0.97%	65	100	-1.74%	29	-1.11%	-0.43%
	Main S19 5y	Prot.	Sell	1.00	0.24%	105	100	-1.72%	60	2.30%	0.73%
									Total	1.19%	0.30%
S9 6-9% vs. S20 Crossover 15-Nov-13	Main S9 6-9% Jun-18	Prot.	Sell	1.17	-0.25%	294	300	-3.43%	219	4.24%	
	Crossover S20 Dec-18	Prot.	Buy	1.00	-7.07%	344	500	-9.92%	275	-3.60%	
									Total	0.64%	
S9 super senior vs. light delta 15-Nov-13	Main S9 22-100% Jun-18	Prot.	Sell	1.00	0.18%	30	25	0.01%	25	0.20%	0.23%
	Main S9 index Jun-18	Prot.	Buy	0.33	-3.65%	93	175	-4.35%	74	-0.32%	-0.23%
									Total	-0.12%	-0.01%
75-85 Main January strangle 09-Dec-13	75bp Jan Main receiver	Price	Sell	1.00	0.08%			0.21%		-0.13%	
	85bp Jan Main Payer	Price	Sell	1.00	0.13%			0.01%		0.12%	
									Total	-0.01%	
Sell Crossover Receiver 09-Jan-14	275bp Feb. Receiver	Price	Sell	1.00	0.32%						
									Total		
Sell 1m Main straddles *** 09-Jan-14	Sell 1m Main straddles	Price	Buy	1.00	0.00%						
									Total		
Payer spread vs. index long *** 09-Jan-14	Buy 3m 25-60% pay spread	Price	Buy	1.00	0.00%						
	Buy index prot.	Price	Sell	1.00	0.00%						
									Total		
SenFin vs. Xover Recs *** 09-Jan-14	Buy 3m SenFin Recs	Price	Buy	3.40	0.00%						
	Sell 3m Xover Recs	Price	Sell	1.00	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 %.

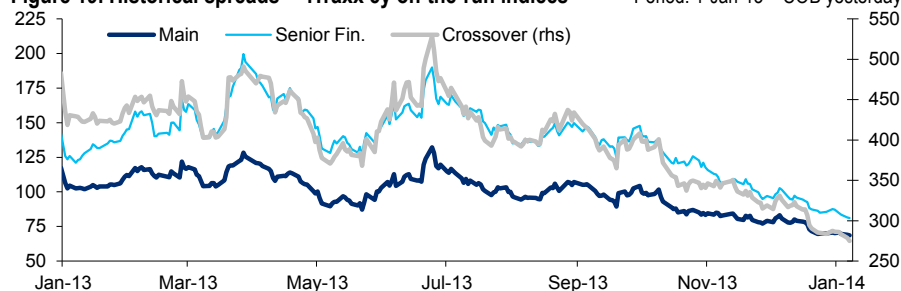
Figure 18. Open and closed trades summary statistics

Number	Open	Closed*	Percentage	Open	Closed*
In profit	2	11	In profit	50%	79%
In loss	2	3	In loss	50%	21%
	4	14			

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

Representative Market Conditions

Figure 19. Historical spreads – iTraxx 5y on-the-run indices



Source: Citi Research, Markit. In bp.

Figure 20. Closed trades since Jun-13 – Summary and P&L

Trade Description	Leg	Format	Direct.	Notnl.	Entry Upfront	Entry Spread	Entry Coupon	Current Upfront	Current 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. Xover Rec. Ladder	325 Xover Nov Rec	Price	Sell	2.00	0.18%			0.02%		0.32%
23-Oct-13	350 Xover Nov Rec	Price	Sell	1.00	0.61%			0.47%		0.14%
	375 Xover Nov Rec	Price	Buy	1.00	1.45%			1.46%		0.01%
									Total	0.47%

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.

The portion of this research report regarding non-OCC issued options is not intended for US clients other than Qualified Institutional Buyers. Investing in options is not suitable for all investors. Please see the disclosures concerning the risks of investing in options below and discuss with your Financial Advisor whether this particular options strategy is suitable for you. Interested investors should contact our trading desk for updated price and liquidity information. Also, complex option strategies may entail higher commissions costs. Please contact us for more details on the trades discussed.

Analytics, Past Trade Ideas & Publications

Figure 21. Analytics – Available at Citi Velocity

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

Source: Citi Research.

Figure 22. Past Trade Ideas

Sell strangles and go on holidays: Position for spreads to stay in the recent range in mid-January	9 Dec 2013
Sell S9 Jun-18 6-9% protection vs. Xover 5y S20	15 Nov 2013
Sell S9 Jun-18 22-100% protection vs. light delta	15 Nov 2013
Long risk Senior Fins. vs. short risk Main	5 Nov 2013
Crossover receiver ladders	23 Oct 2013
Long risk CDX IG vs. Main via Receivers	15 Oct 2013
Buy Senior Financials straddles vs. sell Crossover straddles	9 Oct 2013
Long risk equity vs. short risk 3-6% in S19 Jun-16 (3y)	26 Sep 2013
Long risk S19 Jun-18 (5y) 3-6% vs. 5y S20 Crossover	26 Sep 2013
Long risk iTraxx S9 Jun-18 (10y) super senior vs. short risk CDX IG S9 Dec-17 (10y) super senior	26 Sep 2013
Equal Notional 3s5s Flatteners: Adding cautious longs by selling forward protection	5 Sep 2013
Sub/Senior compression trades in European banks	13 Aug 2013
iTraxx Senior Financials vs. CDX IG via Receivers	7 Aug 2013
Sell Jun-16 3-6% Series 19 protection vs. Buy Jun-18 Series 9 index protection	9 Jul 2013
Option trades ahead of the FOMC	18 Jun 2013
iTraxx Series 9 vs. Series 19 Jun-18 equity tranches	5 Jun 2013
Hedging via Crossover Bearish Ladders	16 May 2013
Buy Main straddles; sell CDX IG straddles	1 May 2013
Views & Trades on iTraxx Series 9 Tranches	18 April 2013
Beware of retail and food leveraging – short risk retailers & food vs. Main Non-Financials	18 April 2013
Receiver 1x2s – Mind the tail if going long	2 Apr 2013
Hedging menu: payer spreads, 3s5s flatteners and Jun 15/18 equity tranche flatteners	28 Mar 2013
Long insurers vs. short premium autos	19 Mar 2013
Flatteners in iTraxx Equity Tranches	6 Mar 2013
Long risk 3-6% vs. short risk 0-3% - Jun-15 iTraxx Series 9 tranches	12 Feb 2013
Long risk Main vs. Crossover via indices and receiver options	12 Feb 2013

Source: Citi Research.

Figure 23. Other publications

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
Europe Returns: Assessing value across flow and structured credit assets	22 Nov 2013
iTraxx Tranches Views & Trades: Mezz may be back next year	15 Nov 2013
Financial CDS to get a re-vamp	7 Aug 2013
What bail-in means for CDS	11 Feb 2013

Source: Citi Research.

Options Risk Disclosure - Please Read Carefully

This section discusses possible options strategies that you may choose to employ in conjunction with the company securities discussed herein. If you choose to engage in the options transactions discussed within this document, you must have an approved options account and will be subject to certain criteria which may ultimately prevent you from engaging in certain option strategies. It is important for you as an investor to know and understand that Options do involve risk and sometimes, significant risk, therefore may not be appropriate for all investors. If you buy options, the maximum loss is the premium. If you sell put options, the risk is the entire notional below the strike. If you sell call options, the risk is unlimited. The actual profit or loss from any trade will depend on the price at which the trades are executed. The prices used herein are historical and may not be available when you order is entered. Commissions and other transaction costs are not considered in these examples.

Please speak to your Financial Advisor to ensure you have a full understanding of the risk and reward of the strategy you are considering. Strategies that are opened or closed differently than what is discussed in this document could have a significantly different outcome from what is described. It should be noted that certain Index options might have special settlement dates or settlement requirements that are different from traditional equity options. Commissions, taxes, and margin costs have not been included but will affect the outcome of any option transaction and should be considered. However, they can have a significant impact on the profitability of options transactions and should be considered carefully before entering into any option strategy. Because of the importance of tax considerations to all option transactions, the investor considering options should consult with his/her tax advisor as to how their tax situation is affected by the outcome of contemplated options transactions. Certain options trades/strategies must be executed in a margin account. Transactions executed in a margin account can require the investor to periodically deposit additional collateral into the account in order to maintain the positions. The preceding language is not a full description of all possible risks associated with options trading.

For a more complete description on the uses and risks of options, please see the document titled Characteristics and Risks of Standardized Options. If you would like an additional copy of this document please contact Citigroup Global Markets Inc., Options Department, 390 Greenwich Street, New York, NY 10013. Options are not suitable for all investors. Before entering into any transaction using listed options, investors should read and understand the current Options Clearing Corp. Disclosure Document (Characteristics and Risks of Standardized Options) at <http://www.theocc.com/about/publications/character-risks.jsp>, http://www.theocc.com/components/docs/May_2010_ODD_Definitive_Supplement.pdf and http://www.theocc.com/components/docs/January_2011_ODD_Definitive_Supplement.pdf. Investing in options other than Standardized Options may entail additional risks.

Appendix A-1

Analyst Certification

The research analyst(s) primarily responsible for the preparation and content of this research report are named in bold text in the author block at the front of the product except for those sections where an analyst's name appears in bold alongside content which is attributable to that analyst. Each of these analyst(s) certify, with respect to the section(s) of the report for which they are responsible, that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc and its affiliates. No part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst in this report.

IMPORTANT DISCLOSURES

Analysts' compensation is determined based upon activities and services intended to benefit the investor clients of Citigroup Global Markets Inc. and its affiliates ("the Firm"). Like all Firm employees, analysts receive compensation that is impacted by overall firm profitability which includes investment banking revenues.

For important disclosures (including copies of historical disclosures) regarding the companies that are the subject of this Citi Research product ("the Product"), please contact Citi Research, 388 Greenwich Street, 28th Floor, New York, NY, 10013, Attention: Legal/Compliance [E6WYB6412478]. In addition, the same important disclosures, with the exception of the Valuation and Risk assessments and historical disclosures, are contained on the Firm's disclosure website at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures. Valuation and Risk assessments can be found in the text of the most recent research note/report regarding the subject company. Historical disclosures (for up to the past three years) will be provided upon request.

NON-US RESEARCH ANALYST DISCLOSURES

Non-US research analysts who have prepared this report (i.e., all research analysts listed below other than those identified as employed by Citigroup Global Markets Inc.) are not registered/qualified as research analysts with FINRA. Such research analysts may not be associated persons of the member organization and therefore may not be subject to the NYSE Rule 472 and NASD Rule 2711 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account. The legal entities employing the authors of this report are listed below:

Citigroup Global Markets Ltd

Abel Elizalde; Hans Lorenzen; Ratul Roy

Citigroup Global Markets Inc

Ryan Brauchler; Anindya Basu; Karan Malhotra

OTHER DISCLOSURES

For securities recommended in the Product in which the Firm is not a market maker, the Firm is a liquidity provider in the issuers' financial instruments and may act as principal in connection with such transactions. The Firm is a regular issuer of traded financial instruments linked to securities that may have been recommended in the Product. The Firm regularly trades in the securities of the issuer(s) discussed in the Product. The Firm may engage in securities transactions in a manner inconsistent with the Product and, with respect to securities covered by the Product, will buy or sell from customers on a principal basis.

Securities recommended, offered, or sold by the Firm: (i) are not insured by the Federal Deposit Insurance Corporation; (ii) are not deposits or other obligations of any insured depository institution (including Citibank); and (iii) are subject to investment risks, including the possible loss of the principal amount invested. Although information has been obtained from and is based upon sources that the Firm believes to be reliable, we do not guarantee its accuracy and it may be incomplete and condensed. Note, however, that the Firm has taken all reasonable steps to determine the accuracy and completeness of the disclosures made in the Important Disclosures section of the Product. The Firm's research department has received assistance from the subject company(ies) referred to in this Product including, but not limited to, discussions with management of the subject company(ies). Firm policy prohibits research analysts from sending draft research to subject companies. However, it should be presumed that the author of the Product has had discussions with the subject company to ensure factual accuracy prior to publication. All opinions, projections and estimates constitute the judgment of the author as of the date of the Product and these, plus any other information contained in the Product, are subject to change without notice. Prices and availability of financial instruments also are subject to change without notice. Notwithstanding other departments within the Firm advising the companies discussed in this Product, information obtained in such role is not used in the preparation of the Product. Although Citi Research does not set a predetermined frequency for publication, if the Product is a fundamental research report, it is the intention of Citi Research to provide research coverage of the/those issuer(s) mentioned therein, including in response to news affecting this issuer, subject to applicable quiet periods and capacity constraints. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security. Any decision to purchase securities mentioned in the Product must take into account existing public information on such security or any registered prospectus.

Investing in non-U.S. securities, including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of the U.S. Securities and Exchange Commission. There may be limited information available on foreign securities. Foreign companies are generally not subject to uniform audit and reporting standards, practices and requirements comparable to those in the U.S. Securities of some foreign companies may be less liquid and their prices more volatile than securities of comparable U.S. companies. In addition, exchange rate movements may have an adverse effect on the value of an investment in a foreign stock and its corresponding dividend payment for U.S. investors. Net dividends to ADR investors are estimated, using withholding tax rates conventions, deemed accurate, but investors are urged to consult their tax advisor for exact dividend computations. Investors who have received the Product from the Firm may be prohibited in certain states or other jurisdictions from purchasing securities mentioned in the Product from the Firm. Please ask your Financial Consultant for additional details. Citigroup Global Markets Inc. takes responsibility for the Product in the United States. Any orders by US investors resulting from the information contained in the Product may be placed only through Citigroup Global Markets Inc.

The Citigroup legal entity that takes responsibility for the production of the Product is the legal entity which the first named author is employed by. The Product is made available in **Australia** through Citi Global Markets Australia Pty Ltd. (ABN 64 003 114 832 and AFSL No. 240992), participant of

the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in Australia to Private Banking wholesale clients through Citigroup Pty Limited (ABN 88 004 325 080 and AFSL 238098). Citigroup Pty Limited provides all financial product advice to Australian Private Banking wholesale clients through bankers and relationship managers. If there is any doubt about the suitability of investments held in Citigroup Private Bank accounts, investors should contact the Citigroup Private Bank in Australia. Citigroup companies may compensate affiliates and their representatives for providing products and services to clients. The Product is made available in **Brazil** by Citigroup Global Markets Brasil - CCTVM SA, which is regulated by CVM - Comissão de Valores Mobiliários, BACEN - Brazilian Central Bank, APIMEC - Associação dos Analistas e Profissionais de Investimento do Mercado de Capitais and ANBID - Associação Nacional dos Bancos de Investimento. Av. Paulista, 1111 - 11º andar - CEP. 01311920 - São Paulo - SP. If the Product is being made available in certain provinces of **Canada** by Citigroup Global Markets (Canada) Inc. ("CGM Canada"), CGM Canada has approved the Product. Citigroup Place, 123 Front Street West, Suite 1100, Toronto, Ontario M5J 2M3. This product is available in **Chile** through Banchile Corredores de Bolsa S.A., an indirect subsidiary of Citigroup Inc., which is regulated by the Superintendencia de Valores y Seguros. Agustinas 975, piso 2, Santiago, Chile. The Product is distributed in **Germany** by Citigroup Global Markets Deutschland AG ("CGMD"), which is regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin). CGMD, Reuterweg 16, 60323 Frankfurt am Main. Research which relates to "securities" (as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong)) is issued in **Hong Kong** by, or on behalf of, Citigroup Global Markets Asia Limited which takes full responsibility for its content. Citigroup Global Markets Asia Ltd. is regulated by Hong Kong Securities and Futures Commission. If the Research is made available through Citibank, N.A., Hong Kong Branch, for its clients in Citi Private Bank, it is made available by Citibank N.A., Citibank Tower, Citibank Plaza, 3 Garden Road, Hong Kong. Citibank N.A. is regulated by the Hong Kong Monetary Authority. Please contact your Private Banker in Citibank N.A., Hong Kong, Branch if you have any queries on or any matters arising from or in connection with this document. The Product is made available in **India** by Citigroup Global Markets India Private Limited, which is regulated by Securities and Exchange Board of India. Bakhtawar, Nariman Point, Mumbai 400-021. The Product is made available in **Indonesia** through PT Citigroup Securities Indonesia. 5/F, Citibank Tower, Bapindo Plaza, Jl. Jend. Sudirman Kav. 54-55, Jakarta 12190. Neither this Product nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens wherever they are domiciled or to Indonesian residents except in compliance with applicable capital market laws and regulations. This Product is not an offer of securities in Indonesia. The securities referred to in this Product have not been registered with the Capital Market and Financial Institutions Supervisory Agency (BAPEPAM-LK) pursuant to relevant capital market laws and regulations, and may not be offered or sold within the territory of the Republic of Indonesia or to Indonesian citizens through a public offering or in circumstances which constitute an offer within the meaning of the Indonesian capital market laws and regulations. The Product is made available in **Israel** through Citibank NA, regulated by the Bank of Israel and the Israeli Securities Authority. Citibank, N.A., Platinum Building, 21 Ha'arba'ah St, Tel Aviv, Israel. The Product is made available in **Italy** by Citigroup Global Markets Limited, which is authorised by the PRA and regulated by the FCA and the PRA. Via dei Mercanti, 12, Milan, 20121, Italy. The Product is made available in **Japan** by Citigroup Global Markets Japan Inc. ("CGMJ"), which is regulated by Financial Services Agency, Securities and Exchange Surveillance Commission, Japan Securities Dealers Association, Tokyo Stock Exchange and Osaka Securities Exchange. Shin-Marunouchi Building, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6520 Japan. If the Product was distributed by SMBC Nikko Securities Inc. it is being so distributed under license. In the event that an error is found in an CGMJ research report, a revised version will be posted on the Firm's Citi Velocity website. If you have questions regarding Citi Velocity, please call (81 3) 6270-3019 for help. The Product is made available in **Korea** by Citigroup Global Markets Korea Securities Ltd., which is regulated by the Financial Services Commission, the Financial Supervisory Service and the Korea Financial Investment Association (KOFIA). Citibank Building, 39 Da-dong, Jung-gu, Seoul 100-180, Korea. KOFIA makes available registration information of research analysts on its website. Please visit the following website if you wish to find KOFIA registration information on research analysts of Citigroup Global Markets Korea Securities Ltd. <http://dis.kofia.or.kr/Ps/dis2/fundMgr/DISFundMgrAnalystPop.jsp?companyCd2=A03030&pageDiv=02>. The Product is made available in Korea by Citibank Korea Inc., which is regulated by the Financial Services Commission and the Financial Supervisory Service. Address is Citibank Building, 39 Da-dong, Jung-gu, Seoul 100-180, Korea. The Product is made available in **Malaysia** by Citigroup Global Markets Malaysia Sdn Bhd (Company No. 460819-D) ("CGMM") to its clients and CGMM takes responsibility for its contents. CGMM is regulated by the Securities Commission of Malaysia. Please contact CGMM at Level 43 Menara Citibank, 165 Jalan Ampang, 50450 Kuala Lumpur, Malaysia in respect of any matters arising from, or in connection with, the Product. The Product is made available in **Mexico** by Acciones y Valores Banamex, S.A. De C. V., Casa de Bolsa, Integrante del Grupo Financiero Banamex ("Accival") which is a wholly owned subsidiary of Citigroup Inc. and is regulated by Comision Nacional Bancaria y de Valores. Reforma 398, Col. Juarez, 06600 Mexico, D.F. In **New Zealand** the Product is made available to 'wholesale clients' only as defined by s5C(1) of the Financial Advisers Act 2008 ('FAA') through Citigroup Global Markets Australia Pty Ltd (ABN 64 003 114 832 and AFSL No. 240992), an overseas financial adviser as defined by the FAA, participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in **Pakistan** by Citibank N.A. Pakistan branch, which is regulated by the State Bank of Pakistan and Securities Exchange Commission, Pakistan. AWT Plaza, 1.1. Chundrigar Road, P.O. Box 4889, Karachi-74200. The Product is made available in the **Philippines** through Citicorp Financial Services and Insurance Brokerage Philippines, Inc., which is regulated by the Philippines Securities and Exchange Commission. 20th Floor Citibank Square Bldg. The Product is made available in the Philippines through Citibank NA Philippines branch, Citibank Tower, 8741 Paseo De Roxas, Makati City, Manila. Citibank NA Philippines NA is regulated by The Bangko Sentral ng Pilipinas. The Product is made available in **Poland** by Dom Maklerski Banku Handlowego SA an indirect subsidiary of Citigroup Inc., which is regulated by Komisja Nadzoru Finansowego. Dom Maklerski Banku Handlowego S.A. ul.Senatorska 16, 00-923 Warszawa. The Product is made available in the **Russian Federation** through ZAO Citibank, which is licensed to carry out banking activities in the Russian Federation in accordance with the general banking license issued by the Central Bank of the Russian Federation and brokerage activities in accordance with the license issued by the Federal Service for Financial Markets. Neither the Product nor any information contained in the Product shall be considered as advertising the securities mentioned in this report within the territory of the Russian Federation or outside the Russian Federation. The Product does not constitute an appraisal within the meaning of the Federal Law of the Russian Federation of 29 July 1998 No. 135-FZ (as amended) On Appraisal Activities in the Russian Federation. 8-10 Gasheka Street, 125047 Moscow. The Product is made available in **Singapore** through Citigroup Global Markets Singapore Pte. Ltd. ("CGMSPL"), a capital markets services license holder, and regulated by Monetary Authority of Singapore. Please contact CGMSPL at 8 Marina View, 21st Floor Asia Square Tower 1, Singapore 018960, in respect of any matters arising from, or in connection with, the analysis of this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). The Product is made available by The Citigroup Private Bank in Singapore through Citibank, N.A., Singapore Branch, a licensed bank in Singapore that is regulated by Monetary Authority of Singapore. Please contact your Private Banker in Citibank N.A., Singapore Branch if you have any queries on or any matters arising from or in connection with this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). This report is distributed in Singapore by Citibank

Singapore Ltd ("CSL") to selected Citigroup/Citigroup Private Clients. CSL provides no independent research or analysis of the substance or in preparation of this report. Please contact your Citigroup/Citigroup Private Client Relationship Manager in CSL if you have any queries on or any matters arising from or in connection with this report. This report is intended for recipients who are accredited investors as defined under the Securities and Futures Act (Cap. 289). Citigroup Global Markets (Pty) Ltd. is incorporated in the **Republic of South Africa** (company registration number 2000/025866/07) and its registered office is at 145 West Street, Sandton, 2196, Saxonwold. Citigroup Global Markets (Pty) Ltd. is regulated by JSE Securities Exchange South Africa, South African Reserve Bank and the Financial Services Board. The investments and services contained herein are not available to private customers in South Africa. The Product is made available in the **Republic of China** through Citigroup Global Markets Taiwan Securities Company Ltd. ("CGMTS"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan and/or through Citibank Securities (Taiwan) Company Limited ("CSTL"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan, subject to the respective license scope of each entity and the applicable laws and regulations in the Republic of China. CGMTS and CSTL are both regulated by the Securities and Futures Bureau of the Financial Supervisory Commission of Taiwan, the Republic of China. No portion of the Product may be reproduced or quoted in the Republic of China by the press or any third parties [without the written authorization of CGMTS and CSTL]. If the Product covers securities which are not allowed to be offered or traded in the Republic of China, neither the Product nor any information contained in the Product shall be considered as advertising the securities or making recommendation of the securities in the Republic of China. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security or financial products. Any decision to purchase securities or financial products mentioned in the Product must take into account existing public information on such security or the financial products or any registered prospectus. The Product is made available in **Thailand** through Citicorp Securities (Thailand) Ltd., which is regulated by the Securities and Exchange Commission of Thailand. 18/F, 22/F and 29/F, 82 North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand. The Product is made available in **Turkey** through Citibank AS which is regulated by Capital Markets Board. Tekfen Tower, Eski Buyukdere Caddesi # 209 Kat 2B, 23294 Levent, Istanbul, Turkey. In the **U.A.E.**, these materials (the "Materials") are communicated by Citigroup Global Markets Limited, DIFC branch ("CGML"), an entity registered in the Dubai International Financial Center ("DIFC") and licensed and regulated by the Dubai Financial Services Authority ("DFS") to Professional Clients and Market Counterparties only and should not be relied upon or distributed to Retail Clients. A distribution of the different Citi Research ratings distribution, in percentage terms for Investments in each sector covered is made available on request. Financial products and/or services to which the Materials relate will only be made available to Professional Clients and Market Counterparties. The Product is made available in **United Kingdom** by Citigroup Global Markets Limited, which is authorised by the Prudential Regulation Authority ("PRA") and regulated by the Financial Conduct Authority ("FCA") and the PRA. This material may relate to investments or services of a person outside of the UK or to other matters which are not authorised by the PRA nor regulated by the FCA and the PRA and further details as to where this may be the case are available upon request in respect of this material. Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB. The Product is made available in **United States** by Citigroup Global Markets Inc, which is a member of FINRA and registered with the US Securities and Exchange Commission. 388 Greenwich Street, New York, NY 10013. Unless specified to the contrary, within EU Member States, the Product is made available by Citigroup Global Markets Limited, which is authorised by the PRA and regulated by the FCA and the PRA.

Pursuant to Comissão de Valores Mobiliários Rule 483, Citi is required to disclose whether a Citi related company or business has a commercial relationship with the subject company. Considering that Citi operates multiple businesses in more than 100 countries around the world, it is likely that Citi has a commercial relationship with the subject company.

Many European regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of investment research. The policy applicable to Citi Research's Products can be found at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures.

Compensation of equity research analysts is determined by equity research management and Citigroup's senior management and is not linked to specific transactions or recommendations.

The Product is not to be construed as providing investment services in any jurisdiction where the provision of such services would not be permitted.

Subject to the nature and contents of the Product, the investments described therein are subject to fluctuations in price and/or value and investors may get back less than originally invested. Certain high-volatility investments can be subject to sudden and large falls in value that could equal or exceed the amount invested. Certain investments contained in the Product may have tax implications for private customers whereby levels and basis of taxation may be subject to change. If in doubt, investors should seek advice from a tax adviser. The Product does not purport to identify the nature of the specific market or other risks associated with a particular transaction. Advice in the Product is general and should not be construed as personal advice given it has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to their objectives, financial situation and needs. Prior to acquiring any financial product, it is the client's responsibility to obtain the relevant offer document for the product and consider it before making a decision as to whether to purchase the product. Citi Research generally disseminates its research to the Firm's global institutional and retail clients via both proprietary (e.g., Citi Velocity and Citi Personal Wealth Management) and non-proprietary electronic distribution platforms. Certain research may be disseminated only via Citi's proprietary distribution platforms; however such research will not contain changes to earnings forecasts, target price, investment or risk rating or investment thesis or be otherwise inconsistent with the author's previously published research. Certain research is made available only to institutional investors to satisfy regulatory requirements. Individual Citi Research analysts may also opt to circulate published research to one or more clients by email; such email distribution is discretionary and is done only after the research has been disseminated.

The level and types of services provided by Citi Research analysts to clients may vary depending on various factors such as the client's individual preferences as to the frequency and manner of receiving communications from analysts, the client's risk profile and investment focus and perspective (e.g. market-wide, sector specific, long term, short-term etc.), the size and scope of the overall client relationship with Citi and legal and regulatory constraints. Citi Research product may source data from dataCentral. dataCentral is a Citi Research proprietary database, which includes Citi estimates, data from company reports and feeds from Thomson Reuters.

© 2014 Citigroup Global Markets Inc. Citi Research is a division of Citigroup Global Markets Inc. Citi and Citi with Arc Design are trademarks and service marks of Citigroup Inc. and its affiliates and are used and registered throughout the world. All rights reserved. Any unauthorized use, duplication, redistribution or disclosure of this report (the "Product"), including, but not limited to, redistribution of the Product by electronic mail, posting of the Product on a website or page, and/or providing to a third party a link to the Product, is prohibited by law and will result in prosecution. The information contained in the Product is intended solely for the recipient and may not be further distributed by the recipient to any third party. Where included in this report, MSCI sourced information is the exclusive property of Morgan Stanley Capital International Inc. (MSCI). Without prior written permission of MSCI, this information and any

other MSCI intellectual property may not be reproduced, disseminated or used to create any financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI, Morgan Stanley Capital International and the MSCI indexes are services marks of MSCI and its affiliates. The Firm accepts no liability whatsoever for the actions of third parties. The Product may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the Product refers to website material of the Firm, the Firm has not reviewed the linked site. Equally, except to the extent to which the Product refers to website material of the Firm, the Firm takes no responsibility for, and makes no representations or warranties whatsoever as to, the data and information contained therein. Such address or hyperlink (including addresses or hyperlinks to website material of the Firm) is provided solely for your convenience and information and the content of the linked site does not in anyway form part of this document. Accessing such website or following such link through the Product or the website of the Firm shall be at your own risk and the Firm shall have no liability arising out of, or in connection with, any such referenced website.

ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST
