22 April 2016 │ 12 pages

Global

The Credit Index Call

Relative value in high yield: iBoxx HY versus CDX HY

- **iBoxx HY total return swaps gaining traction** — Investors are warming up to this new product that replicates the total return on a standardized portfolio of USD HY bonds. The steady growth in volumes indicates investor interest is growing in using this product both for getting exposure to cash credit beta as well as hedging.

- **Comparing CDX HY to iBoxx HY is not always easy** — Recent price action suggests iBoxx HY is poised to outperform CDX HY after recent underperformance due to an energy-led sell-off. However, other dynamics including rate risk, exposure to wider tails in the energy sector and the relatively constant duration of iBoxx HY may be potential obstacles to relative outperformance.

- **We recommend long iBoxx TRS, short CDX HY** — Overall, in the short term, we judge that the higher beta of iBoxx TRS relative to CDX HY is likely to win out in the face of central bank dominated flow technicals. We advocate going long the June maturity iBoxx TRS combined with a June maturity ATM put option in CDX HY. The put option adds some convexity to the net trade in case markets move against the trade.

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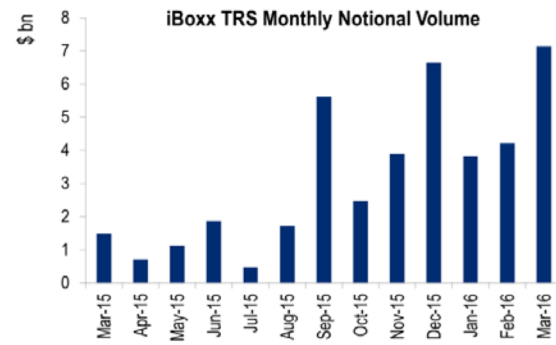
With thanks to
Calvin Vinitwatanakhun

Relative Value in iBoxx HY versus CDX HY

Volumes in iBoxx Total Return Swaps (TRS) have been steadily growing over the past several months as the product continues to gain traction with investors (see Figure 1). Details of the iBoxx TRS mechanics are described in our primer (see here) – very briefly, a TRS allows investors to gain exposure to the total returns on a portfolio of cash bonds over a pre-specified period (usually less than a year) in exchange for LIBOR.

Figure 1. Notional traded in iBoxx TRS has been steadily rising.



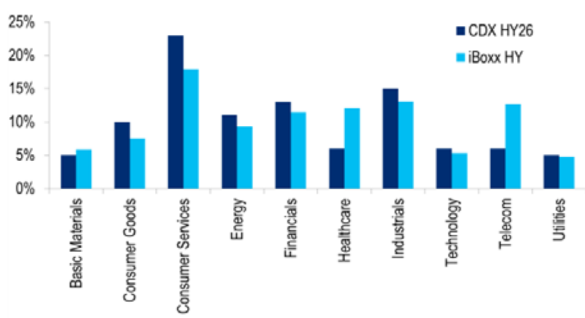
Source: Bloomberg SDR, Citi Research

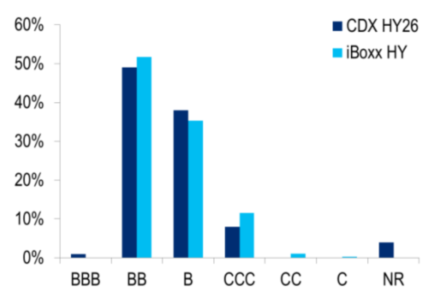
The iBoxx TRS product refers to one of the standardized iBoxx bond portfolios, the most popular one being the iBoxx USD Liquid High Yield Index. Recent conversations with investors indicate that there is considerable interest in understanding the factors driving the performance dynamics of iBoxx HY and how that relates to its synthetic counterpart, CDX HY. In this report, we have attempted to shed some light on this issue.

Comparing iBoxx HY to CDX HY….

The iBoxx USD Liquid High Yield Index (Bloomberg ticker: IBOXHY) is a portfolio of liquid high yield bonds[1], which is rebalanced at the end of every month. Currently, the portfolio consists of 967 high yield bonds denominated in USD with the rating and sector distribution shown in Figure 2. For CDX HY, we have a portfolio of 100 credits. The rating and sector distributions for the current on-the-run CDX HY (series 26) portfolio are shown in Figure 2.

Figure 2. Sector (left) and rating (right) distributions for iBoxx HY and CDX HY portfolios. All data is as of EOD 20-Apr-2016.



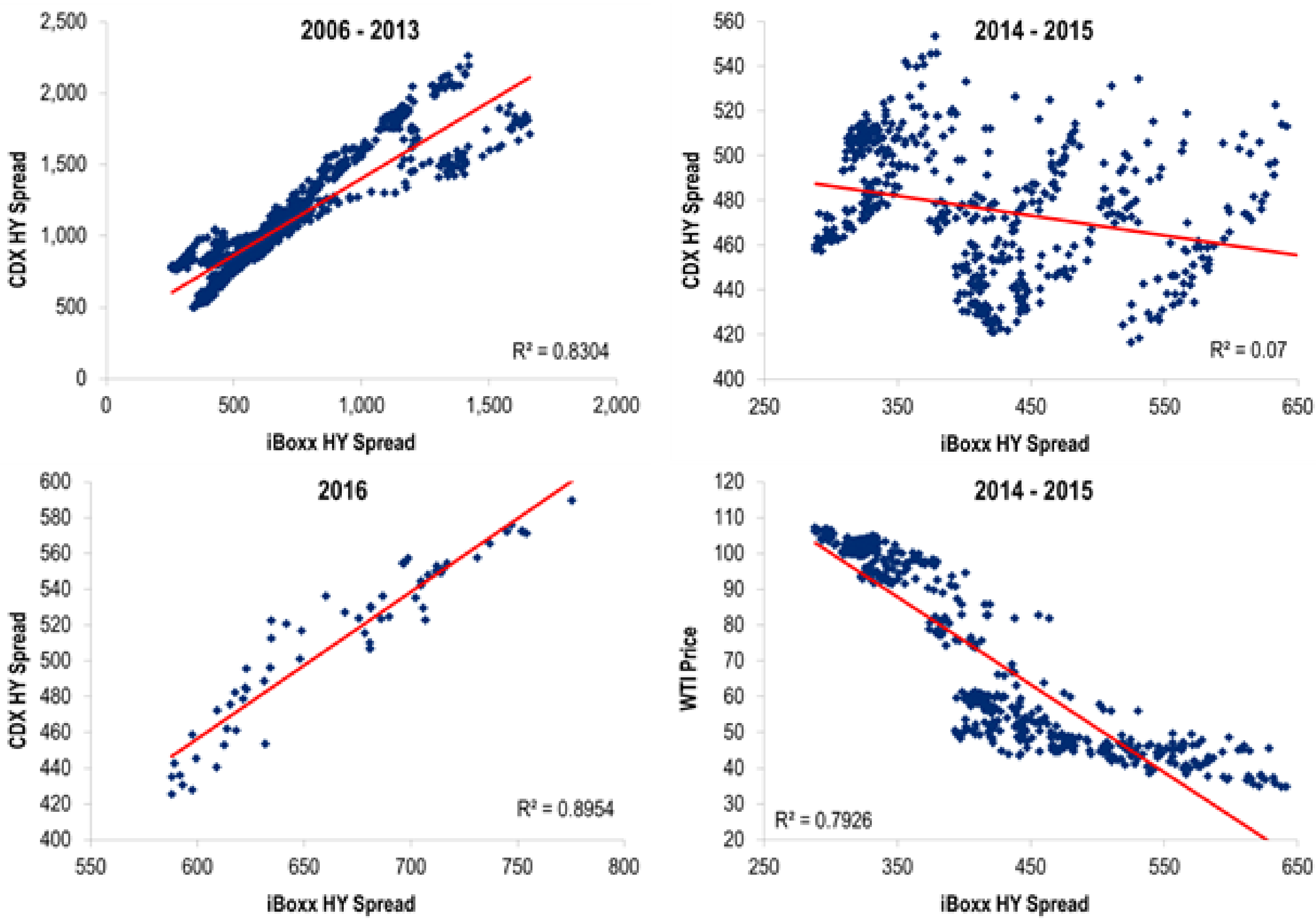


Source: Markit, Citi Research

[1] For details, please refer to http://content.markitcdn.com/www.markit.com/Company/Files/DownloadFiles?CMSID=ee7a23b40f304b8b99b999549dfa1d5f

Given that both products refer to high yield credit portfolios, one would expect iBoxx and CDX to closely track each other which appears to be true for the most part. However, during the 2014-2015 period, the correlation between the two products broke down. Indeed, this was the period during which iBoxx significantly underperformed CDX because of the mismatch in the energy sector allocation (see Figure 3 and Figure 5). A simple factor model of iBoxx HY spreads indicates that oil prices were one of the major driving forces during this period.

Figure 3. CDX HY and iBoxx HY spreads have been correlated through most of history (top left, bottom left), except for the 2014-2015 period (top right). During this period, our analysis indicates that the main driver of iBoxx HY spreads was oil prices (bottom right).



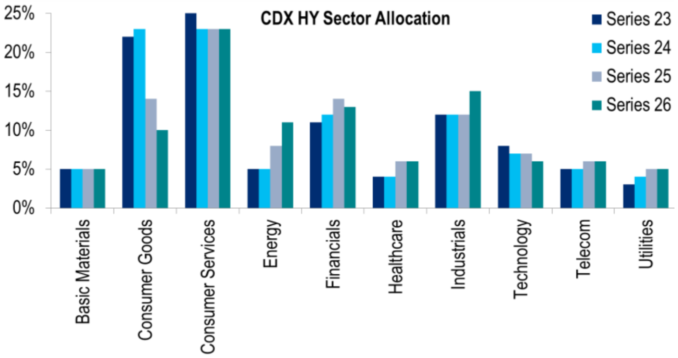
Source: Bloomberg, Markit, Citi Research

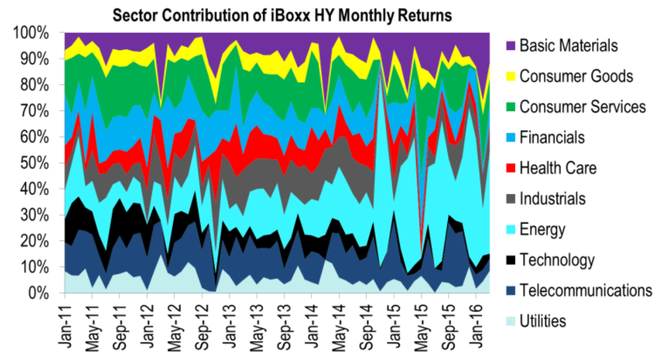
Recently, the correlation seems to be coming back (see Figure 3 (bottom left) as new requirements regarding index construction were introduced to bridge the gap between CDX HY and the cash universe. Currently, the rules state that the difference in sector allocation between CDX and iBoxx cannot be more than 3% for any individual sector. Consequently, the energy exposure for CDX has gone from 5% in 2014 to 11% in 2016 (see Figure 4 (left)).

So now that CDX and iBoxx portfolio compositions have become more similar, does this mean that we will see iBoxx make up for some of its underperformance? Indeed, given that the energy sector has been the prime driver of iBoxx performance over the past year or so (see Figure 4 (right)), it would certainly seem to be the logical conclusion. In addition, given that the Citi commodity strategists are forecasting a price increase in oil to low 50s/bbl by the end of 2016, rising to low

60s/bbl by the end of 2017 (see here), we would expect iBoxx to regain lost ground going forward.

Figure 4. Energy allocation to the CDX HY portfolio has steadily gone up from 2014 (Series 23/24) to now (Series 26) as a result of the changes in portfolio construction rules (left). During the same period, iBoxx HY portfolio returns have been mainly driven by the energy sector (right).





Source: Markit, Citi Research

....Is not that simple

However, the reality may be more nuanced. First, let us consider the distribution of spreads in the energy sector for both iBoxx HY and CDX HY. The average spread[2] for energy credits in iBoxx HY is 1587bp compared to 1025bp for CDX HY, while the median is 784bp for iBoxx versus 802bp for CDX. Given that the mean is much more influenced by outliers than the median, we conclude that the iBoxx energy portfolio has a much wider tail (outliers) than the CDX energy portfolio, which increases the risk for the iBoxx portfolio in case of a further leg down in oil prices.

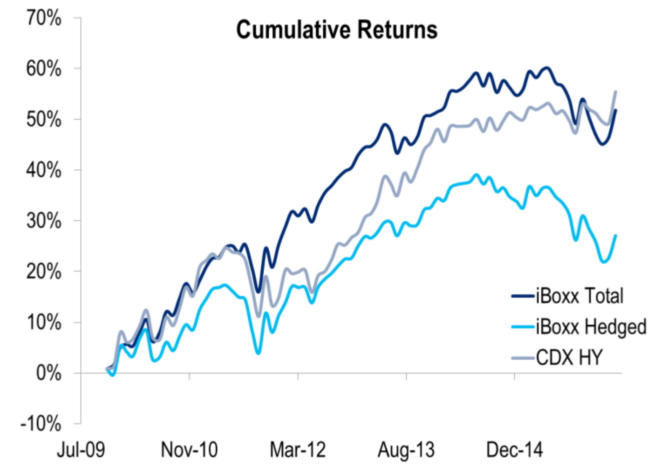
Furthermore, even if oil prices were to rally, it is unclear as to what level oil prices should reach for some of the more distressed energy credits to be solvent or profitable again. The current estimates from Citi strategists forecast a price of low 60s/bbl by the end 2017, which may not be soon enough or high enough for some of these credits.

The second issue is that of rates. iBoxx HY has rate duration risk while CDX HY is a pure spread product. Using the iBoxx HY rate hedged total return index, we are able to strip out the contribution of the rate component (see Figure 5 (left)). Clearly, falling rates during the post 2008/QE period have had a major impact on the performance of the iBoxx HY index. In fact, in spread terms, iBoxx HY continues to underperform CDX HY even now, while the total return on iBoxx has started to make up for lost ground.

This will likely be an issue in the future since the Fed has at least started the process of rate normalization with the hike in December. More recently though, we have seen fairly dovish rhetoric from the Fed (e.g., Chair Yellen's speech to the NY Economic Club) that has prompted the Citi economists to revise their expectations for further rate hikes this year down to one (see here). Even if rates continue to remain low, the likelihood of a significant rally in rates is muted given how close we currently are to post-crisis tights (see Figure 5 (right)).

[2] All spreads are as of EOD 19-Apr-2016.

Figure 5. Falling rates have been a major contributor to iBoxx HY total returns (left), but there is not much scope for tightening in rates as they appear to be fairly close to post-crisis tights (right).



Source: Bloomberg, Markit, Citi Research

Third, if the energy sector is no longer the driving force for iBoxx performance, what other sectors might take its place? To understand this better, we performed a principal component analysis (PCA) on the notional-weighted monthly total returns for each sector. As the informed reader knows, the first PCA component is the one that explains the highest percentage of the variation in monthly returns, followed by the second and so on. Every PCA component assigns a weight to each sector (called a factor loading) – the higher the factor loading is, the more important is the sector.

Figure 6. Results of the PCA analysis for monthly returns broken down by iBoxx HY sectors.

Sector	PCA Components (Most to least important)									
	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
Basic.Materials	-0.31	0.36	-0.06	0.14	-0.82	0.19	-0.06	0.14	-0.08	0.08
Consumer.Goods	-0.34	-0.04	0.01	0.14	0.07	-0.41	0.25	-0.27	-0.59	0.45
Consumer.Services	-0.34	-0.20	0.05	0.35	0.03	0.09	-0.12	-0.27	-0.26	-0.75
Financials	-0.34	-0.13	0.11	0.00	0.16	-0.28	-0.34	0.79	-0.11	-0.03
Health.Care	-0.30	-0.36	-0.30	-0.76	-0.19	-0.05	-0.17	-0.20	0.00	-0.05
Industrials	-0.33	0.14	-0.33	0.15	0.03	-0.49	0.35	-0.02	0.59	-0.15
Energy	-0.25	0.74	0.06	-0.23	0.37	0.02	-0.39	-0.22	0.00	-0.02
Technology	-0.32	-0.31	0.47	0.22	-0.03	0.08	-0.33	-0.28	0.46	0.35
Telecommunications	-0.32	-0.10	-0.53	0.20	0.32	0.61	0.07	0.12	0.01	0.25
Utilities	-0.32	0.07	0.52	-0.32	0.09	0.29	0.62	0.16	0.03	-0.11
Variance Contribution	82.1%	8.1%	3.0%	1.9%	1.6%	1.2%	0.9%	0.6%	0.3%	0.2%

Source: Markit, Citi Research

PC1 through PC10 are the principal components, in order of importance. The bottom line (Variance Contribution) shows how much of the return variance is explained by each component – the first 4 together explain 95% of the variation. The numbers in the matrix are the "factor loadings" – denoting how much each sector contributes to each principal component. Any cell in red or green denotes a large factor loading, and is therefore an important sector for that component.

We found that for the period between 2011 and 2015, the first 4 PCA components explained are the most important ones (see Figure 6). Out of these, the first component was the "market" component, which is basically an average of the various sectors (assigning roughly equal weights to each sector), but the 2nd, 3rd, and 4th components assigned high weights to the energy/basic materials, utilities/technology, and healthcare sectors, respectively. In other words, the most important driving sectors over this period after the energy/basic materials sectors were the utilities, technology, and healthcare sectors.

Both CDX HY26 and iBoxx currently have roughly identical sector weights for the utilities and technology sectors, but the iBoxx portfolio is overweight healthcare relative to CDX (see Figure 2 (left)). Going forward, we believe that the healthcare sector could be a differentiating factor in the relative performance of iBoxx versus CDX.

Lastly, there is the question of rolldown. The maturity of each CDX HY series is fixed, which means that a long position in CDX HY is a diminishing duration asset as we approach the maturity of the swap. Since credit curves are upward sloping in normal market conditions, the long position benefits from rolling down this curve. In contrast, due to the monthly rebalancing process, the iBoxx HY duration is roughly constant over time, which means the rolldown benefits are not significant.

What does it all mean?

We believe that in the short term iBoxx HY is likely to outperform CDX HY and is therefore a better long on a standalone basis or as a long/short versus CDX HY. Primarily, our view is based upon our expectations of a continued credit market rally over the short term (see here for a more detailed discussion of our view), which allows for iBoxx HY to outperform CDX HY, given its higher beta to CDX HY on a total return basis. Specifically, we compute the total return beta of iBoxx HY to CDX HY to be 1.07, using data going back to January 2015.

We are also of the opinion that the concerns outlined in the previous section are more likely to play out in the medium to longer term. Even though energy credits in iBoxx have a wider tail, in the short term we believe the risks are appropriately priced in, especially if central banks continue to be supportive. The rate environment will also be supportive by an accommodative central bank in the short term, which should help iBoxx HY outperform.

Furthermore, the beta of iBoxx HY spread returns (rate hedged) to CDX HY at 1.23 is higher than the beta for iBoxx HY total returns. What this means is that if credit markets were to rally in the short term, the credit component is likely to more than make up for a drag from a potential modest sell-off in rates. We also remain less concerned about rolldown effects since the trade horizon is relatively short term.

Long iBoxx HY, short CDX HY

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We recommend going long the June 2016 maturity iBoxx HY TRS combined with a short position in CDX HY using an ATM put option. The details of the trade are shown in Figure 7. The recent fall in implied volatility levels as the market has rallied provides an attractive entry point for the option leg.

Figure 7. Trade details, all prices/spreads as of EOD 20-Apr-2016.

Trade	Index	Spot/NAV	Maturity	Price/Level	Strike	Notional	Upfront	Delta
Long TRS	iBoxx USD Liquid HY	233.28	20-Jun-16	233.375		60mm	31,750	-100%
Buy Payer	CDX HY26	103.71	15-Jun-16	126.29	103.5	100mm	-1,262,852	61%
Net							-1,231,102	

Source: Citi Research
Upfront for TRS position calculated as the Libor leg for the stub period between previous IMM date and now to be refunded to the buyer.

We show a scenario analysis of the trade upon swap expiry in Figure 8. We have used a spread beta of 1.28 between iBoxx and CDX using spread data going back 6 months. This is used to calculate the projected iBoxx spread move from CDX spread moves for each scenario.

We find that the net trade has some positive convexity. It remains profitable in our projected base case, i.e. if CDX HY spreads were to tighten anywhere between 0-100bp. If spreads were to widen, the trade loses money for widening anywhere between 0-50bp, but beyond that, the convexity kicks in and the option leg of the trade makes up for any losses on the long iBoxx leg.

Figure 8. Scenario analysis for the proposed trade at maturity.

Spread Move		At Maturity			
CDX	iBoxx	CDX Price	Option P&L	iBoxx P&L	Net P&L
-100	-128	108.00	-1,262,852	3,661,524	2,398,672
-50	-64	105.75	-1,262,852	2,155,841	892,989
-25	-32	104.75	-1,262,852	1,403,000	140,148
25	32	102.50	-262,852	-102,683	-365,535
50	64	101.50	737,148	-855,524	-118,376
100	128	99.50	2,737,148	-2,361,207	375,941
150	192	97.50	4,737,148	-3,866,890	870,258
200	256	95.50	6,737,148	-5,372,573	1,364,575
250	320	93.75	8,487,148	-6,878,256	1,608,892

Source: Citi Research

The main risks to this trade include a modest spread widening (as we point out in the previous paragraph) and CDX HY outperforming iBoxx HY in a rally going forward.

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Appendix A-1

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