US Credit Alpha

Rally Resumed

Overview 2

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After slowing in mid-July, the big 2016 rally in credit has resumed in the past two weeks. The recent context of supportive technicals and adequate economic and corporate fundamentals continues to be the dominant driver of spread performance.

Focus 4

CDS Index Option Basics

CDS index options – which give the right to buy or sell index protection at a predetermined strike and time in the future – have grown significantly in recent years, evolving into a much more balanced market. Even so, one impediment to investing in CDS options is that they tend to be clouded in 'Greeks and geeks' terminology, which they need not be, as their applications tend to be relatively straightforward. We address this hurdle by providing a detailed and practical introduction to CDS option trading.

Investment Grade and High Yield 30

Steady Ownership in Unsteady Commodities

Year-to-date, the overall ownership breakdown of commodity credits has remained generally steady despite $58bn of fallen angel volumes in the sector, and forced selling has been less severe than expected. Insurance companies continue to have a significant underweight on investment grade commodity securities; however, the share was this low before the downgrades occurred six months ago, and they appear to have retained a significant ownership share in the securities that did get downgraded. There has also been a notable increase in mutual fund ownership of securities rated BB or better.

Structured Credit 35

CLO Equity Returns Get Squeezed

As Libor and swap rates have risen more than ABS spreads have tightened, yields across all structured credit products have increased. In this environment, we still think CLOs and private SLABS look most attractive, though CLO equity returns will be lower.

OVERVIEW

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| Figure 1  Weekly Index Changes |  | Figure 2  Investment Grade Supply Is Pacing Well ahead of Recent Augusts |
| |  |  |  |  | | --- | --- | --- | --- | |  | Wednesday Close | Last Week Close | 4-Week Average | | Credit Index (bp) | 135 | 137 | 136 | | CDX.IG 26 (bp) | 72 | 71 | 72 | | HY Index ($ Price) | 98.46 | 97.78 | 97.84 | | CDX.HY 26 ($ Price) | 104.60 | 104.50 | 104.39 | | Leveraged Loan Index ($ Price) | 93.89 | 93.72 | 93.74 | |  |  |
| Source: Barclays Research |  | Source: Barclays Research |

After slowing in mid-July, the big 2016 rally in credit has resumed in the past two weeks. The US Corporate index touched 147bp on August 2, following a brief sell-off, but has rallied to 138bp since then. The US High Yield index experienced a similar pause, but the price has now risen to $98.8, the highest level since June 2015. The recent context of supportive technicals and adequate economic and corporate fundamentals continues to be the dominant driver of spread performance.

Economic data remain in the “Goldilocks” zone: encouraging, but with few indications of overheating. The July payrolls report (255k net jobs vs. expectations of 180k) helped reinforce a positive economic growth path in the US. The subsequent data have been good enough to keep that impression in place. This is important because the Fed’s Open Market Committee minutes, released this week, suggest that rate hikes are conditional on the data. Because that view was formed prior to the positive jobs report, the solid growth in employment should make it more likely to raise rates in September. On the other hand, CPI inflation (which was reported this week) actually ticked down in the latest report. There likely needs to be more good data (at least a solid August jobs report) before the Fed commits to further rate increases.

Even some factors that we might generally expect to be headwinds are not enough to constrain the market’s momentum. Corporate issuance in August has accelerated: while the pace of new HY bonds has been quite average for August (with typical sequential issuance growth following earlier earnings blackouts), investment grade issuance is pacing about double the average for August in the past two years (Figure 2). This might indicate enough pent-up demand that even a large spike in September issuance will not be enough to outweigh technical demand.

That the rally could continue into September extends our view of a market where short-term technicals dominate, even as medium- and long-term risks continue to build. Given the time-conflicting nature of that view, it might make more sense to express it with options, rather than outright directional positions. In this week’s focus, we present a primer on CDS index options. This market has grown in recent years and has evolved towards a balance between natural buyers and sellers. CDS options are highly versatile instruments, and we see value in using them now as efficient tail risk hedges, as a general overlay to credit exposures at different horizons, or to express relative value views.

The *US Credit Alpha* will not be published in the next two weeks and will return on September 9.

FOCUS

CDS Index Option Basics

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CDS index options provide the right to buy or sell index protection at a predetermined strike and time in the future. They are broadly similar to options on equity indices, with the terminology and quotation similar to that of interest rate swaptions.

The market for CDS options has experienced significant growth in recent years, evolving from what used to be mostly a one-way market into a much more balanced market with the emergence of natural option buyers and sellers.

This has happened not only because of a challenging liquidity environment, necessitating more trading in portfolio products, but also because CDS options are highly versatile instruments, which can be used in many ways, both to complement existing positions but also in their own right. They can be used as efficient tail risk hedges, as a general overlay to credit exposures, to refine spread views, or to express precise relative value views across indices or asset classes.

One impediment to understanding and utilising CDS options, as with most other derivatives, is that they tend to be clouded in ‘Greeks and geeks’ terminology, which they need not be. This is particularly the case with CDS options, even though their application tends to be relatively straightforward. We provide a detailed and practical introduction to CDS option trading, covering the following aspects:

* **Market Overview.** CDS options are available for the following CDS indices: CDX.IG and CDX.HY in the US; and iTraxx Main; iTraxx Crossover; and iTraxx Senior Financial in Europe. Trading activity tends to be focused on options on the on-the-run 5y contact. We discuss the most common reasons why investors trade options and review how different types of accounts – risk managers, hedge funds and real money accounts – use the product.
* **CDS Option Basics.** We introduce the basic terminology for CDS options (more commonly referred to as ‘payers’ and ‘receivers’) and review their payoff profiles at expiry. We also review quotation and trading mechanics and break down the components of a sample CDS option run. We show how to calculate P&L and break-even levels for option trades and discuss three ways to think about the richness/cheapness of CDS options.
* **Common Trades.** We review a large range of CDS option trades, covering hedging of existing index positions, implementing more efficient directional trades than is possible with an index trade, and we discuss how CDS options can be used to implement very specific relative value views between, for example, high grade and high yield.
* **Index Option Dashboard.** In spite of a growing market, access to information about the price moves of CDS options can be challenging. To help investors overcome this hurdle, we publish on a weekly basis a CDS Index Option Dashboard which provides data on each index on which options are traded as well as relative value relationships between pairs of indices. We provide a detailed overview of the contents of the Dashboard.

Market Overview

Option universe and market liquidity

The market for CDS index options has grown significantly since the financial crisis, and today options are actively traded on CDX.IG and CDX.HY in the US, and iTraxx Main, iTraxx Crossover, and iTraxx Senior Financial in Europe.

In terms of market depth and liquidity, we show some general statistics in Figure 1, including the granularity of strikes available from pricing runs, the typical bid-offer and the typical trading size at which the prices shown on runs are valid. For example, looking at the data for iTraxx Main, strikes are typically 2.5bp to 5bp apart, the bid-offer is 2-5 cents (or 2-5bp of the option notional) and the typical trade size is €500-1000mm.

Although dealers usually quote strikes around the spot level of the underlying index with the increments shown in Figure 1, any strike is theoretically possible to trade. Narrower strikes also trade for short-dated options, ie, a month or less to expiry.

A majority of the trades focus on out-of-the-money (OTM) options (spreads both wider and tighter than spot) with a delta greater than 20% (delta refers to the sensitivity of the option price to moves in the underlying index). The trading volume for in-the-money options and for options with a delta less than 20% (far out-of-the-money options) tends to be smaller, although there can at times be meaningful tail-risk hedging activity in low-delta options.

Figure 1

CDS options: strike increment, bid-offer, and typical trade size

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| --- | --- | --- | --- |
| Underlying Index | Strike Increment | Bid-Offer | Typical Trade Size |
| CDX.IG | 2.5-5bp | 2-4c | $500-1000mm |
| CDX.HY | 0.5-1pt | 10-20c | $100-200mm |
| iTraxx Main | 2.5-5bp | 2-5c | €500-1000mm |
| iTraxx Crossover | 12.5-25bp | 7-20c | €100-200mm |
| iTraxx Senior Financial | 5bp | 4-7c | €150-250mm |

Source: Barclays Research

The rationale for trading options

Investors trade options for a variety of reasons, most of which we believe fall under one of the following four categories:

* **Tail-risk hedging:** options provide an efficient way to protect against low-probability but high-impact events (for example, buying a far out-of-the-money payer option for a small amount of premium).
* **Hedging with defined upside/downside:** options can be used to create hedges with defined downside (limited to the premium paid) and also defined upside (when using structures such as 1x1 spreads). Certain structures can also be less costly than the negative carry from buying index protection.
* **Directional spread view:** options can provide a levered way to express a view on spreads (the payoff from options can be multiples of the premium paid).
* **Carry/yield enhancement:** selling options can be a way to express a specific view (bullish, rangebound, bearish) while generating carry for the portfolio. Covered strategies (for example, selling a receiver against a long index position) can also be used to generate additional carry.

Market participants

A broad range of investors trade options, which helps to create two-way interest in the market (via volatility sellers and buyers). In particular, we believe the majority of option investors fall into one of three categories: risk managers, hedge funds, and real money accounts.

* **Risk managers:** these include counterparty desks, portfolio managers and bank loan books. They use OTM payers to hedge against a macro widening or tail risk type of events. During times of high volatility, the non-bank hedgers also use payer spreads and risk reversals to decrease hedging costs.
* **Hedge funds:** these accounts tend to be more flexible in terms of their strategies. They use options to take either directional or rangebound views on the underlying indices. Common trades include selling straddles or strangles as well as getting into 1x2 receiver and payer spreads. Hedge funds can also be sellers of far out-of-the-money payers, basically taking the other side of the tail-risk hedges being put on by risk managers. Some funds also trade cross-asset volatility.
* **Real money accounts:** these accounts are naturally long convexity as they seek to buy at low levels and take profits after rallies. They may seek to hedge via payers and payer spreads, generate carry via short vol strategies (selling straddles) and enhance yield by selling receivers against their portfolio.

CDS Option Basics

In this section, we review some of the basics behind CDS options:

* Option mechanics
* Option types and the views they express
* Trading CDS options
* Calculating P&L and breakevens
* Option expiration / impact of credit events on expiry
* Evaluating the richness/cheapness of credit options
* Volatility skew

Option mechanics

CDS option contracts are over-the-counter (OTC) contracts, representing a bilateral contract between the investor and a dealer. Similar to the index market, activity in the option market tends to be concentrated in the on-the-run indices. Dealers tend to actively quote option expiries out to six months, but it can be possible to trade expiries as far out as 12 months.

Option prices are quoted in cents, or basis points upfront. For example, if an investor buys a $100mm option at 35 cents, the investors would need to pay $100mm \* 35bp = $350,000 in upfront premium for the option.

Credit options are European contracts, ie, they can only be exercised on the expiry date (third Wednesday of each month). If an option is exercised, it is physically settled. The exercise window for CDX.IG and CDX.HY options is 9am to 11am EST. The window for iTraxx (Main, Crossover, SenFin) is 9am to 4pm GMT. We discuss option expiration in more detail later in the article.

Option types and the views they express

Similar to option markets in other asset classes, a credit option gives the holder the right but not the obligation to buy or sell protection on an index at a predetermined strike level.

The terminology for CDX.IG and iTraxx options is adapted from the interest rate swaption market. A payer gives the holder the right to buy protection (‘**pay** premium’) on the index. They are ‘puts’ on credit risk (bearish). A receiver gives the holder the right to sell protection (‘**receive** premium’) on the index. They are ‘calls’ on credit risk (bullish).

The terminology for CDX.HY options, on the other hand, is adapted from equity options. Puts and calls give the right to sell (bearish) and buy (bullish) the index, respectively. This convention is due to the fact that the CDX.HY index trades in price terms as opposed to the other indices, which trade in spread terms. The rest of this article focuses on options on indices that are quoted in spread; we discuss CDX.HY options separately in the appendix.

Payer options

A payer gives the option buyer the right to buy protection (‘pay premium’) at a specific spread level and time in the future. A payer is in the money if spreads are wider than the strike at expiry. We show the payoff profile of a payer option at expiry in Figure 2.

The maximum amount a payer buyer can lose is the upfront premium paid for the option. This feature can make buying payers an attractive alternative to buying index protection, as shorting the index exposes the investor to losses from potential spread tightening, which when combined with the negative carry of the index position could exceed the option premium. The trade-off is that the option buyer does not benefit from the option unless spreads widen enough to compensate for the option premium spent.

A payer seller collects a cash premium for writing the option that is retained if the option expires out of the money. In return, the seller is exposed to spread widening without the comparable upside available in the spot market in the event of a tightening.

Receiver options

A receiver gives the option buyer the right to sell protection (‘receive premium’) on an index at a specific spread level and time in the future. A receiver is in the money if spreads are tighter than the strike at expiry. We show the payoff profile of a receiver option at expiry in Figure 3.

The maximum amount a receiver buyer can lose is the upfront premium paid for the option. This feature can make buying receivers an attractive alternative to selling index protection, as going long the index exposes the investor to losses from potential spread widening that could outweigh the positive carry of the index position. The trade-off is that the option buyer does not benefit from the option unless spreads tighten sufficiently to compensate for the option premium spent.

A receiver seller collects a cash premium for writing the option that is retained if the option expires out of the money. In return, the seller is exposed to spread tightening without the comparable upside available in the spot market in the event of a widening. This is the simplest way to get paid to be short the market.

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| Figure 2  Sample payoff profile of a payer option |  | Figure 3  Sample payoff profile of a receiver option |
|  |  |  |
| Source: Barclays Research |  | Source: Barclays Research |

Trading CDS options

As mentioned previously, CDS options are traded OTC based on price runs, typically sent out via Bloomberg messages by the CDS option market makers.

We show a sample CDS option run in Figure 4 for CDX.IG options, with a legend on the left-hand side to help identify each item in the run (each item is identified using a subscript). CDS option premiums are quoted in bp of notional (cents) on an upfront basis. For example, in the option run shown, an investor who wants to buy a 75bp strike payer option has to pay 24.6bp of notional upfront in premium, while an investor seeking to sell a 75bp strike payer option can get 22.2bp of notional (the premiums for payer options are shown in item 7 in the sample CDS run, while the premiums for receiver options are shown in item 9).

There are two important aspects to note in terms of CDS options runs. First, CDS options are priced assuming a spot (or ‘reference’) level for the underlying index (item 2 in the CDS run), typically set to be equal to the mid-market spread level at the time the CDS option run was sent out by the market maker. An investor seeking to trade a CDS option should thus ask for a refresh of the price for the current spread level of the underlying index.

Second, CDS options are, by default, assumed to be traded with ‘delta exchange’, meaning that an investor who buys a payer option at the same time sells protection in the underlying to the dealer, for a notional equal to the delta of the CDS option (item 8 in the CDS run shows the payer delta), with a quoted spread equal to the reference spread. Delta refers to the sensitivity of the option price to changes in the underlying index. Credit options are quoted ‘with delta’ because market makers prefer to delta-hedge their options exposure. An investor who does not want to perform a delta exchange simply has to inform the market maker when inquiring about a quote. The ‘no-delta’ quote will depend on where the market maker can execute the index hedge in the marketplace.

There are few other things to point out in the CDS run. The forward DV01 (item 5) is the DV01 of the index at expiry and is used to calculate approximate P&L, as we discuss in the next section. Implied volatility (item 10) and the implied daily move in bp per day (item 11) are used to evaluate the richness/cheapness of options, and these will be discussed in greater detail as well.

|  |  |
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|  | Figure 4  Sample CDS option run |
| 1: Underlying index  2: Reference spread level  3: Expiry date  4: Implied forward  5: DV01 at expiry  6: Option strikes  7: Payer prices bid/offer in cents (bp upfront)\*  8: Payer delta  9: Receiver prices in cents (bp upfront)\*  10: Implied volatility  11: Implied daily move in bp |  |
| \*Note: It is common to refer to option prices in “cents” – where you divide the price by 10000 and then multiply it by the notional to get the amount of premium to pay; in reality, it can be thought of as “bp of notional premium upfront”. Source: Barclays Research |

Calculating P&L and breakevens

The P&L for a CDS index option can be calculated in two ways: an intuitive approach which is accurate as long as the spot and strike levels are not too different, and an operational and correct approach which takes into account the actual contract specifications. For scenario calculations, etc, the intuitive approach is the most useful, whereas for actual P&L calculations, the operational approach should be applied.

P&L calculation – intuitive approach

The payoff at expiry of a receiver or payer is computed using the strike, spread and duration of the underlying. Using the option run from Figure 4, we can run through an example. Assume an investor buys an October IG26 payer with a strike price of 80bp. From the run in Figure 4, we can see that the 80bp strike payer option is offered at 17.8bp. If the index is trading at 90bp at option expiry, the option will be 10bp in the money (90bp spread at expiry minus the 80bp strike price). To calculate the P&L of the in-the-money payer, we take the difference between spot and strike, which we know is 10bp, multiply it by the duration of the index on October expiry (4.52), and subtract the premium paid for the option (17.8bp). In our example, the P&L would be:

(90bp-80bp) \* 4.52 – 17.8bp = 27.4bp

More generically, the P&L calculation is as follows:



Here, S is the spot level, K is the strike, D is the duration of the cash flow, and P is the option premium.

P&L calculation – operational approach

Whereas the approach above makes intuitive sense and is broadly correct, it ignores the fact that the duration of the index changes as the spread level changes, and more generally that CDS indices are traded on upfront terms. As a result, the more precise way to calculate the P&L is to calculate the value of the index in points upfront at both the spot level and the strike level, and then to take the difference. This is consistent with how standard CDS contracts trade today. CDS indices are quoted as a running flat premium but trade with a fixed coupon and exchange of upfront payments.

For small differences in spread levels, such as in our previous example, the P&L will be virtually the same under both calculation methods. However, for a more precise assessment of the P&L, the following formula should be used:



Here, S is the spot level, F is the fixed coupon, K is the strike, P is the option premium and DS and DK are the durations calculated assuming a spread level of S and K, respectively.

We note that had the two duration measures been identical, the P&L calculation would be exactly the same as in the intuitive approach.

The intuition behind the formula is as follows: the first part inside the bracket is the amount of money to pay upfront for buying protection at current market rates, whereas the second part is the amount of money to pay upfront for someone who owns a payer option with strike K. The difference, if positive, is the profit made on the option.

Calculating breakevens

Breakevens for option strategies are calculated by equating the payoff of the option at expiry with its premium. Using our previous example, the payer would need to earn back the 17.8bp in premium paid upfront. To calculate how much spread widening would be required to offset the premium paid, as an approximation, we divide the premium by the forward duration of the index at expiry (17.8bp/4.52), which is 3.94bp. The underlying index spread would have to be 3.94bp wide of the strike for the payer to breakeven. In other words, in our previous example, the option breaks even at an index spread level of 83.94bp. If the index level at expiry is higher than this, then the option P&L will be positive. If it is tighter, then the P&L will be negative.

Comparison with underlying index

Buying protection on the CDX.IG index is an alternative to buying the 80bp strike October expiry payer. An investor can buy protection on the index and pay the current spot level of 71bp annually (as an approximation – the carry is 100bp but “pull to par” exerts and influence). This would cost the investor 14bp in terms of negative carry from now until option expiry (our example assumes that there are 70 days between now and option expiry, so the negative carry of the index position would be: 71bp \* (70/360) = 14bp). Therefore, to break even on the index trade, the index has to widen by 3.1bp by the expiry date. We calculate the breakeven spread move by taking the negative carry and dividing it by the forward index duration (14bp/4.52 = 3.1bp). This corresponds to an index level of 74.1bp.

On the other hand, it would take less than a 1bp move tighter in the index for the losses on the index short to match the payer option’s potential maximum loss of 17.8bp at expiry. We calculate this by taking the difference between the payer premium and negative carry on the index (17.8bp – 14bp = 3.8bp) and then dividing by the forward duration of the index (3.8bp/4.52 = 0.84bp). We show the payoff of the option and index trades at expiry in Figure 5.

Investors should compare the higher option breakeven (83.94bp versus 74.1bp) to the benefit of having a better downside profile with the option in case of more than 0.84bp of tightening in the index. Market participants must incorporate their views on the likelihood of such a tightening and their own sensitivity to the profit or loss in various scenarios.

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|  | Figure 5  Payoff profile of buying a payer option versus buying index protection |
|  |  |
| Source: Barclays Research |

A closer look at option expiration

As mentioned earlier, credit options can only be exercised on the expiry date (third Wednesday of each month). The exercise window for CDX.IG and CDX.HY options is 9am to 11am EST, while the window for iTraxx Main, Crossover, and Senior Financial is 9am to 4pm GMT.

At option expiry, the holder of the option must explicitly elect to exercise the option; there is no automatic exercise. If an option is exercised, it is physically settled. In other words, an investor that is long a payer (receiver), and elects to exercise, will enter into a buy (sell) of index protection at the strike price. The investor can effectively cash-settle the option by arranging to unwind the index position with the dealer.

Understanding the impact of credit events on expiry

One common cause of confusion about CDS options is the impact of credit events. A credit event does not cancel out the index option contract, and for ’hard’ credit events (Bankruptcy and Failure to Pay where CDS settles automatically) the mechanics are relatively straightforward. However, restructuring credit events are slightly more involved, and we discuss these in further detail in the appendix. For ‘hard’ credit events, the option contract remains in effect until the original expiration date, at which time the following occurs:

* If the CDS auction for the credit event has not yet occurred, the option can be exercised as usual (this is because the underlying index is still trading with the defaulted credit).
* If the CDS auction has already occurred, the option is exercised into the new version of the index, and the losses from the defaulted credit are settled as well. If the option is not exercised, there are no payouts for a credit event.

Let’s consider an example. An investor buys a Crossover payer with a strike price of 350bp. Between the time the investor purchases the payer and the option expiration date, one of the constituents of Crossover defaults, and an auction is held. Recovery for the defaulted credit is 25 cents. A new version of Crossover starts trading (with the 74 remaining credits), and at expiry, this new version of the index is trading at 340bp.

If the index was trading wider than the strike of 350bp at expiry, the option would be exercised regardless of the amount received from the default. But since the index is trading inside of the strike price at expiry, we need to assess the impact of the defaulted credit. If the payer is exercised, the holder of the payer would be entitled to:

**1/# of constituents \* (1-recovery)**

In our Crossover example, this would be: 1/75 \* (1-0.25) = 100bp

The investor would receive 100bp from the default loss, but at the same time would incur a loss from the index position (since the strike is wider than the index spread at expiry). To approximate the loss from the index position, we use the following:

**(Spot – Strike) \* duration \* index factor**

For our example, this would be (340bp – 350bp) \* 4.5 \* (74/75) = -44.4bp

The investor would gain 100bp from the default loss from the defaulted credit but would lose 44.4bp because the strike of the payer option is below the spot price of the index. Net, the investor would earn 55.6bp from exercising the payer, even if at the surface the option is out of the money.

Evaluating the richness/cheapness of credit options

For investors seeking to invest in options, it is important to think about ways to gauge the relative richness/cheapness of CDS options. We highlight three ways to do this below. Common to the three approaches is that we seek to align different ways to think about the implied volatility from CDS options (see the box below) to equivalent historical observations of spread behaviour.

|  |  |
| --- | --- |
|  | Implied volatility defined  The underlying model used to price CDS options assume that spreads are volatile and follow a process in which spread changes are lognormally distributed. The price of an option can be thought of as the total cost incurred in replicating the payoff of the option, and this (once strike and spot levels and expiry are given) depends on the spread volatility. Given an option price, we can thus calculate the implied volatility in a model that prices this option correctly, and we interpret the implied volatility as the perceived future volatility of the credit index which justifies the price paid for the option. |

Implied versus realised volatility – volatility risk premium

Market participants typically compare implied and realised volatility levels. The goal of this is to compare the future volatility priced into the options to the actual realised volatility. As we do not know the future volatility, it is common practice to compare implied volatility (say 3mth ATM volatility) to 1mth realised volatility (or any other horizon). For example, right now for iTraxx Main, 3mth ATM implied volatility is 52%, while the realised volatility over the past month has been 39%, meaning that implied volatility for the next three months is 13% higher than the last month of realised volatility; therefore, there is a volatility risk premium of 13% (see Figure 16 in the section where we discuss the CDS Index Option Dashboard).

Implied versus realised daily spread moves

Another way to compare implied and realised volatility is to calculate the implied daily move in the index (using an approximation) and compare it with actual daily spread changes. For example, the 3mth implied volatility of 52% for iTraxx Main implies a daily move of 2.2bp in spread terms (the implied daily move is approximated as: index spread \* implied volatility / sqrt(252)). Actual daily intraday spread changes in the past two weeks have been 1.9bp on average. This means that the option market currently implies a daily move that is 0.3bp higher than what has actually been realised recently (see **Figure 22** in the section where we discuss the CDS Index Option Dashboard).

Implied versus realised spread ranges

Lastly, it is possible to calculate the breakeven range for a straddle position, which involves selling (or buying) an ATM receiver and payer concurrently (please see the Common Trades section for more details on this strategy). For example, at current levels for iTraxx Main, a 3mth straddle has a break-even spread range of 52bp to 79bp, or a 27.5bp range. This break-even range can then be compared to both the historical spread levels and the historical frequency at which spreads have widened or tightened 13.75bp over a three month period (see **Figure 17** in the section where we discuss the CDS Index Option Dashboard).

A note on volatility skew

Skew is a term that comes up repeatedly when discussing options. It is typically used to refer to the difference in implied volatility of a high-strike option and a low-strike option of the same expiry. Changes in the skew provide an indication of changes in demand for different strike options. For example, when the payer skew steepens (the implied volatility of high-strike payer option has increased relative to that of a low-priced payer option), this is indicative of increased demand for OTM payers (ie, tail-risk hedging). When the payer skew flattens, this is indicative of greater demand for payers that are closer to ATM (generally during times of greater market volatility). The skew indicates the relative richness/cheapness of options relative to those with different strike prices (see Figure 18, Figure 20 and Figure 21 in the section where we discuss the CDS Index Option Dashboard).

Common Trades

Payers and receivers can be traded on an outright basis (buy a payer, sell a receiver, etc.), but they can also be combined with other payers and receivers to create specific risk-reward profiles. For example, an investor can buy a payer and then sell another payer in equal notional that is further OTM. This is referred to as a payer spread. This trade allows the investor to express a moderately bearish view at a lower cost than just buying a payer outright (due to the premium collected from the payer that was sold). In return, the investor is giving up any potential gains in the event of a more significant widening.

The potential combinations of payers and receivers are numerous, and in Figure 6 we summarise some of the more common option trades that are utilised today. For each one, we describe how the trade is structured and the rationale for the trade. Then, in Figure 7, we group the trades by the views they express (bullish, rangebound, bearish) and the type of volatility environment in which they would be appropriate (low, moderate, high). These two tables can be used together to identify which trade structures might be appropriate to express specific points of view.

Following Figure 7, we discuss some of the more popular trades in further detail.

Figure 6

Description of common option trades with payoff profiles at expiry

Source: Barclays Research

Figure 7

**Common option trades for expressing specific views (bullish, rangebound, bearish) in different volatility environments**

|  |  |  |  |
| --- | --- | --- | --- |
|  | BULLISH | RANGEBOUND | BEARISH |
| **HIGH VOLATILITY** | **SELL PAYERS**: Fade the move wider by selling expensive payer option – profit from both dropping vol and tightening spreads in case of a rally.  **BUY BUTTERFLIES**: Centered on tighter spread levels, get paid to express a moderate tightening view while having defined downside in case of spread moves wider or tighter than expected.  **BUY 1x2 RECEIVER SPREAD**: Position for moderate spread tightening, exploiting the high implied vol.  **SELL INDEX PROTECTION, SELL RECEIVERS**: Express a bullish view via indices, exploit high implied volatility in receivers – effectively get paid to take profits at tighter levels.  **BULLISH RISK REVERSAL**: Buy receiver vs. sell payer, long risk trade, exploiting high volatility. | **SELL STRADDLES / STRANGLES**: Get paid to express a rangebound view on the markets.  **SELL BUTTERFLIES**: Get paid to express a rangebound view, but with known downside in case of spreads moving wider or tighter | **SELL RECEIVERS**: Express the view that spreads will not tighten. If exercised, will be short risk at tighter levels.  **BUY BUTTERFLIES**: Centered around wider spread levels, minimise cost of high volatility.  **BUY PAYER SPREAD, SELL RECEIVERS (BEARISH SEAGULL)**: Position for moderate widening, cost-efficient by selling receivers at a high price.  **BUY INDEX PROTECTION, SELL PAYERS**: Cheapen cost of index hedge by selling away upside in case of significant widening.  **BUY PAYER LADDERS**: Moderate spread widening view, sell volatility, exposed to material widening. |
| **MODERATE VOLATILITY** | **BUY BUTTERFLIES**: Centered on tighter spread levels, get paid to express a moderate tightening view while having defined downside in case spread moves wider or tighter than expected.  **BUY RECEIVER SPREADS**: Position for moderate spread tightening without having to pay for moderately high volatility, with defined downside in case of widening. | **BUY BUTTERFLIES**: Centered on current spread levels, get paid to express a rangebound view while having defined downside in case of spread moves wider or tighter. | **BUY BUTTERFLIES**: Centered on wider spread levels, sets up for a move wider in spreads, with limited downside if spreads widen too much or even tighten.  **BUY PAYER SPREADS**: Position for moderate spread widening and have defined downside in case spreads tighten. |
| **LOW  VOLATILITY** | **BUY RECEIVERS**: With volatility low, buy cheap receiver options to position for a tightening with known downside in case of spread widening.  **BUY RECEIVERS, SELL PAYER SPREAD**: Buy cheap options for a tightening, financed by expressing the view that spreads will not widen, with defined downside. | **SELL STRANGLES** on further expiries to benefit from higher premium or wider breakeven.  **SELL ATM STRADDLE, BUY OTM PAYER**: Carry trade while protecting the downside exposure. | **BUY PAYERS**: Good entry to buy cheap hedge against widening at low cost and known downside.  **BUY STRADDLES / STRANGLES**: Pay premium to position for spreads to become volatile and potentially widen. Known downside. |

Source: Barclays Research

Buy a payer spread

|  |  |
| --- | --- |
| **Structure** | Buy a low strike payer, sell a high strike payer |
| **View** | Moderate spread widening (bearish) |
| **Rationale** | Lower cost than buying a payer outright, known downside; in return, the upside is capped |

A payer spread can be an efficient way to hedge against a moderate widening at a lower cost than buying a payer outright. The spread is created by buying a payer and then selling another payer of the same expiry but with a higher strike in equal notional. Payer spreads tend to be more attractive when the skew has steepened (ie, when the implied volatility of the high-strike payer has increased relative to that of the low-strike payer).

Let’s consider an example using iTraxx Main. With the index trading at 65bp, an investor can buy €100mm of the Main 75-90 payer spread expiring in three months for 15bp. The investor buys €100mm of the 75bp strike payer for 27bp and sells €100mm of the 90bp strike payer for 12bp for a net upfront cost of €100mm \* (27bp-12bp) = €150k. Figure 8 shows the payoff profile of the payer spread at expiry. The trade breaks even if Main has widened enough beyond the lower strike to offset the upfront premium paid. Assuming the duration of Main at expiry is 4.6, the index would need to be 15bp/4.6 = 3.3bp wider than the lower strike of 75bp to breakeven (78.3bp), as shown in the payoff profile.

The maximum profit for the payer spread is reached if the index is trading at the higher strike of 90bp or wider at expiry. The maximum profit is the difference between the strikes (90bp – 75bp) \* the duration of 4.6 = 69bp, less the upfront premium of 15bp, which equals 54bp \* €100mm = €540k. The trade can earn a maximum payout ratio of 3.6x the upfront premium paid (54bp/15bp). In return for having a lower upfront cost for the trade (15bp, versus 27bp if just the 75bp strike payer had been purchased), the investor forgoes any potential gains if the index were to widen beyond the higher strike of 90bp at expiry.

For investors who are not looking necessarily to ‘hedge the end of the world’ with buying a deep out-of-the-money payer option to hedge significant widening, payer spreads are attractive, as they provide a way to express a view of moderate spread widening without being exposed to potentially large downside if spreads tighten. In particular, in an environment characterised by many ‘known unknowns’ but with the potential for accommodative central bank headlines, payer spreads are a compelling way of hedging.

|  |  |
| --- | --- |
|  | Figure 8  Payoff profile at expiry of buying a main 75-90bp payer spread |
|  |  |
| Source: Barclays Research |

Buy a payer spread funded by selling a receiver (‘bearish seagull’)

|  |  |
| --- | --- |
| **Structure** | Buy a low strike payer, sell a high strike payer, sell a receiver |
| **View** | Moderate spread widening (bearish), with the view that a significant tightening is unlikely |
| **Rationale** | Offset part of the cost of buying a payer spread; in return, assume the risk that spreads could meaningfully tighten |

A bearish seagull combines a payer spread with selling a receiver. The premium collected from selling the receiver helps offset some of the cost of buying the payer spread. In return for the lower cost, the trade is exposed if the index tightens beyond the strike of the receiver. The trade is appropriate for those looking for a low-cost hedge and that don’t believe a large tightening is likely (or are comfortable potentially getting short the index at the receiver strike).

We can use the previous example of buying the Main 75-90 payer spread for 15bp and combine it will selling a 60bp receiver for 12bp for a net upfront cost of 3bp. Figure 9 shows the payoff profile of the trade at expiry. The trade breaks even at 75.7bp at expiry, and earns a maximum profit of 66bp (22x the upfront premium paid) if Main is trading at 90bp or wider. The downside to the trade is that it is exposed if Main is trading inside of 60bp at expiry. But for investors that believe such a tightening is unlikely, the low upfront cost and high payout ratio of the bearish seagull could be attractive.

We think of this structure as an ‘in it for the carry’ trade – if spreads stay broadly rangebound, a small cost may be incurred from the option structure, but the carry earned on other investments offset this. In turn, the portfolio is protected against some degree of widening, while giving up some of the upside if spreads rally meaningfully.

In particular, for investors who are overweight relative to their benchmarks, especially when spreads have reached ‘the tights’, this is an appealing trade format as the hedge against some widening will help the overweight position vs. the benchmark, whereas the potential loss of the option position in a rally should be offset by the overweight position. If spreads are rangebound, the general overweight of the portfolio will earn a larger carry than the benchmark.

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|  | Figure 9  Payoff profile at expiry of buying a main 75-90bp payer spread and selling a 60bp receiver (‘bearish seagull’) |
|  |  |
| Source: Barclays Research |

Buy a receiver ladder

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| --- | --- |
| **Structure** | Buy a receiver, sell a receiver further OTM, sell another receiver even further OTM |
| **View** | Moderate spread tightening, with the view that a significant tightening is unlikely |
| **Rationale** | Cheaper than buying a receiver outright or a receiver spread; relatively wide profitability range; in return, assume the risk that spreads could meaningfully tighten |

A receiver ladder can be a cost-effective way to position bullishly without being exposed to potential index widening. In return for the low cost, the trade assumes the risk that the index experiences a significant tightening. This trade can be particularly attractive when implied volatilities are high (as the trade is net short volatility).

To illustrate the receiver ladder, we can use iTraxx Senior Financial. With the index trading at 86bp, an investor can buy an 85-75-70 receiver ladder expiring in two months for 14bp. The investor buys the 85bp strike receiver for 40bp, sells the 75bp receiver for 16bp, and sells the 70bp receiver for 10bp for a net upfront premium of 14bp. Figure 10 shows the payoff profile of the receiver ladder at expiry. The trade breaks even if the index is trading at 82bp. Note that the ladder has a rather wide range where it makes a profit (63-82bp), but it is exposed to spread moves below 63bp at expiry. For investors that believe such a spread tightening is unlikely, a receiver ladder could be attractive.

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|  | Figure 10  Payoff profile at expiry of buying a SenFin 85-75-70bp receiver ladder |
|  |  |
| Source: Barclays Research |

Selling straddles/strangles

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| --- | --- |
| **Structure** | Sell a payer and receiver at the same strike (straddle) or different strikes (strangle) |
| **View** | Spreads will be rangebound; implied volatility is too high |
| **Rationale** | Collect premium in return for assuming the risk that spreads will not stay inside the range |

Selling a straddle or strangle is a way to generate positive carry (by collecting premium) to express the view that spreads will be rangebound until the option expiration date. Selling a straddle means selling both a payer and receiver in equal notional with the same strike and expiry. Selling a strangle means selling a payer and receiver in equal notional with the same expiry but different strikes. The straddle collects more premium than the strangle but has a smaller breakeven range and a smaller ‘maximum profit’ range.

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| Figure 11  Payoff profile at expiry of selling a CDX.IG 70bp straddle |  | Figure 12  Payoff profile at expiry of selling a CDX.IG 65-75bp strangle |
|  |  |  |
| Source: Barclays Research |  | Source: Barclays Research |

To illustrate the mechanics of a straddle and a strangle, we can use CDX.IG options. With the index trading at 71bp, an investor can sell a 70bp straddle expiring in three months and collect 58bp in premium (40bp from selling the payer and 18bp from selling the receiver). Figure 11 shows the payoff profile of the straddle at expiry. The straddle will be profitable if CDX.IG is between 57.1bp and 82.9bp at expiry. We calculate the breakeven levels by taking the strike of 70bp and then adding/subtracting the premium collected divided by the forward duration of 4.5: 70bp +/- (58bp/4.5) = 57.1bp and 82.9bp.

We can compare the carry and breakeven levels of the straddle with that of a strangle. Let’s say an investor sells a 65-75 strangle and collects 40bp (9bp from selling the 65bp strike receiver and 31bp from selling the 75bp strike payer). Figure 12 shows the payoff profile of the strangle at expiry. While the strangle and the straddle both express a rangebound view on CDX.IG, the strangle collects less premium than the straddle (39bp for the strangle versus 58bp for the straddle), but has a slightly wider breakeven range. In addition, the straddle achieves its maximum profit of 58bp only if CDX.IG is trading at the strike level of 70bp at expiry. In contrast, the strangle achieves its maximum profit of 39bp if CDX.IG is between 65bp and 75bp at expiry (in other words, it has a larger ‘maximum profit’ range). In general, the relative attractiveness of straddles versus strangles will differ depending on an investor’s risk profile.

Credit versus credit trades

In addition to expressing views on a specific index, CDS index options can be used to express a specific relative value view between two markets/indices. For example, assume an investor wants to express the view that Main is too tight relative to Crossover and is likely to underperform in a risk-off episode. The investor could consider buying protection on Main and selling protection on Crossover, but what if the investor was convinced that this compression would only occur if spreads widen (ie, not if spreads tighten)? Then the index trade would not be appropriate as it would leave the investor exposed in the event of a spread-tightening episode. In this case, using options could make sense.

Indeed, the investor could express the view that a selloff would lead to bearish compression between Main and Crossover by buying OTM payers on Main and selling OTM payers on Cross. Figure 13 shows such a trade, with the trade sized to be costless at inception. The trade reflects the view that in a selloff, Main will underperform Crossover, with no view/risk if markets rally. The chart shows the breakeven levels for the trade compared to historical observations of Main and Crossover spreads.

This is just one example of how options can be used to implement specific relative value views across the derivative indices.

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|  | Figure 13  Crossover versus main compression in a widening scenario |
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| Source: Barclays Research |

CDS Index Option Dashboard – up close and personal

Given the OTC nature of CDS options, information about pricing and relative value can be hard to come by. To assist our clients in monitoring the CDS option market, we publish on a weekly basis our CDS Index Option Dashboard, giving insights into the pricing of CDS options – on their own and relative to other CDS and equity indices. There is a great deal of content in the dashboard, and this section serves to describe each individual table and chart.

As a starting point, we introduce several general concepts and definitions in Figure 14.

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| Figure 14  General concepts |
|  |
| Source: Barclays Research |

Individual indices

For each index we show a generic snapshot of the implied and realised volatility in a table (Figure 15), here for iTraxx Main. We show the ‘volatility premium’ (implied vs. realised volatility) as both differences (Impl-Real) and ratios (Impl/Real) in both percentage volatility terms (pct vol) and price volatility terms (price vol). The standard methodology in credit is to look at percentage volatility, but investors from equity may be more familiar with price vol.

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| Figure 15  Snapshot |
|  |
| Source: Barclays Research |

We then show a range of charts illustrating various aspects of implied volatility:

* **Figure 16**: shows time series of 3mth ATM implied vs. 1mth realised volatility, and the evolution of the premium, adding in the spot index on the right axis.
* **Figure 17**: the dark-blue lines show the break-even ranges for a 3mth ATM spot straddle sold at that given point in time. In this example, the break-even range is 52-79bp, meaning that at expiry the index can be between 52 and 79bp and a sold ATM spot straddle would still be profitable. The shaded area shows the ranges observed for the index in the *following* three months, along with the spot index, also lagged by three months. This gives a feel for how ‘choppy’ the index has been, relative to the break-even levels offered by options, *ex ante*.
* **Figure 18**: this chart shows the Payer and Receiver skews – differences of 130% ATMF and 80% ATMF options relative to 100% ATMF, for 3mths expiry options.
* **Figure 19**: this chart shows the term structure of ATMF volatility – the difference between 3mth expiry and 1mth expiry volatility, showing if longer-dated options are ‘more expensive’, in volatility terms, then shorter-dated options.

|  |  |  |
| --- | --- | --- |
| Figure 16  3mth ATM implied and 1mth realised volatility, premium |  | Figure 17  3mth ATM straddle break-even and historical high-low |
|  |  |  |
| Figure 18  Payer (130-100) and receiver (100-80) skew |  | Figure 19  Term structure (3mth-1mth) |
|  |  |  |
| Source for all charts: Barclays Research |  |  |

* **Figure 20**: this chart show the implied volatility skew for 3mth options – ie the implied volatility at different levels of Moneyness. It shows the current skew and the skew from 1wk and 1mth ago.
* **Figure 21**: the dots show historical observations (coloured by 1mth, 3mth and 1yr data) of the spot index vs. Implied ATM (spot) volatility. The dark-blue line is the current 3mth skew – shown as implied volatility vs. actual strikes. This provides a way to gauge how current options are priced across strikes, relative to what the implied volatility for these options has been historically. For example, in the chart shown, for the 80bp strike, current implied volatility is 57%, but the 3mth observations (triangles) show that in the recent period, when spreads were actually 80bp, the volatility for these options was significantly larger, potentially indicating that the skew is ‘too flat’.
* **Figure 22**: This chart shows the realised intraday trading range, calculating the intraday high-lows and taking a 2wk average. This is compared against the implied daily move, an approximation for how much spreads need to move each day for an investor who bought a 3mth ATM straddle, delta-hedging daily. The chart also shows the difference between implied and realised daily ranges. If implied is higher than realised (and assuming realised will not change) in this measure, it is an indication that it is ‘too expensive’ for a market maker to buy these options and delta-hedge them, indicating that implied volatility may be too high.

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| Figure 20  Implied volatility skew – current, 1wk and 1mth ago |  | Figure 21  3mth implied vol skew vs. 1yr 3mth ATM vol vs. spot |
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| Figure 22  Implied and realised (high-low, 2wk running) daily ranges |  | Figure 23  Distribution of daily changes vs. 3mth implied daily move |
|  |  |  |
| Source for all charts: Barclays Research. |  |  |

* **Figure 23**: this chart show the distribution of daily spread changes (absolute, close to close) for the last three and six months, respectively, and also shows the current 3mth implied daily move. This provides a way to think about how likely it is to see spread moves consistently larger/smaller than what are needed for a delta-hedging investor to break even.

Index pairs

For each pair of indices – CDX, iTraxx, Equity – we also show statistics for the relative changes in option valuations along a series of metrics, both in a table (Figure 24) and a series of charts.

In the table, we show, for each index, the spot level (current, 1wk and 1mth ago) alongside changes, as well as 3mth ATMF volatility and the ratios of 3mth implied to 1mth realised. We also show the 3mth realised beta – calculated as a ‘changes on changes’ orthogonal regression using daily data. We compare this to the ‘implied beta’ defined in this way: buy 1x 3mth ATM spot straddle in one index X, and sell a 3mth ATM spot straddle in another index Y to make the trade costless. From now to expiry, for spreads moving wider or tighter, for each 1bp move in index X how much does index Y need to move for the trade to break even? That is the 3mth Implied Beta. This can be approximated as the ratio of Spot x Implied vol in the two indices, although we use more precise calculations in the report.

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|  | Figure 24  Snapshot |
|  |  |
| Source: Barclays Research |

* **Figure 25**: we show the times series of ratios of 3mth implied to 1mth realised volatility for the pair of indices. This gives a feel for how each index is valued relative to the respective realised volatilities and if implied volatility in one market looks higher/lower than expected.
* **Figure 26**: this chart simply shows the 3mth ATM implied volatilities for each index.
* **Figure 27**: this chart shows a time series of realised 3mth betas compared to the ATM implied beta, as defined above. We find this a much more constructive approach to comparing volatilities than looking at the outright volatility numbers as it is much more functional in nature. The intuition behind the chart is that if the implied beta is higher than realised beta, it means that option markets are pricing in that index Y will be more reactive vs. index X than what has been realised, indicating that implied volatility in Y is too high relative to implied volatility in index X.
* **Figure 28**: this chart shows historical observations of the index pair for the last one, three and 12 months, respectively. The ATM Payer/Receiver lines are the combinations of spreads for which a costless long/short trade in payers (receivers, respectively) will break even at expiry. The light-blue box shows the anticipated changes (in one index or the other) required to make the indices trade in line with the past 24 months’ historical relationship as calculated from a orthogonal regression of levels on levels.

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| Figure 25  3mth ATM implied/1mth realised |  | Figure 26  3mth ATM implied |
|  |  |  |
| Figure 27  ATM implied and 3mth realised beta |  | Figure 28  1yr scatter of data and break-evens for ATM payer/receiver |
|  |  |  |
| Source for all charts: Barclays Research |  |  |

Appendix: CDX. HY Options

The terminology for CDX.HY options is similar to that for equity options. Puts and calls are used to implement bearish and bullish views on credit, respectively.

Puts

A put gives the option buyer the right to sell the CDX.HY index (go short the index) at a specific price level and time in the future. A put is in the money if the index price is lower than the strike at expiry. We show the payoff profile of a put option at expiry in Figure 29.

The maximum amount a put buyer can lose is the upfront premium paid for the option. This feature can make buying puts an attractive alternative to selling the CDX.HY index, as shorting the index exposes the investor to losses from potential price increases, which when combined with the negative carry of the index position could exceed the option premium. The trade-off is that the option buyer does not benefit from the option unless the index price declines enough to compensate for the option premium spent.

A put seller collects a cash premium for writing the option that is retained if the option expires out of the money. In return, the seller is exposed to price declines without the comparable upside available in the spot market in the event of a rally.

Calls

A call gives the option buyer the right to buy the CDX.HY index (go long the index) at a specific price level and time in the future. A call is in the money if the index price is higher than the strike at expiry. We show the payoff profile of a call option at expiry in Figure 30.

The maximum amount a call buyer can lose is the upfront premium paid for the option. This feature can make buying calls an attractive alternative to buying the CDX.HY index, as going long the index exposes the investor to losses from potential price declines that could outweigh the positive carry of the index position. The trade-off is that the option buyer does not benefit from the option unless the index price increases enough to compensate for the option premium spent.

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| --- | --- | --- |
| Figure 29  Sample payoff profile of a CDX.HY put option |  | Figure 30  Sample payoff profile of a CDX.HY call option |
|  |  |  |
| Source: Barclays Research |  | Source: Barclays Research |

A call seller collects a cash premium for writing the option that is retained if the option expires out of the money. In return, the seller is exposed to price increases without the comparable upside available in the spot market in the event of a selloff. This is the simplest way to get paid to be short the market.

Trading CDX.HY options

The mechanics of CDX.HY options are similar to those of the payer and receiver options discussed earlier. The two main differences are the strikes and the breakeven calculations.

Strikes

The strikes for CDX.HY options are prices, as opposed to spreads, since the index itself is quoted in price. Figure 31 contains a sample option run for CDX.HY options, with an explanation of each item in the run on the left-hand side (each item is identified using a subscript). The run is similar to the one for CDX.IG shown in Figure 4, except the strikes are in prices (item 6a), and both price and spread are shown for the underlying reference index level (item 2), the implied forward index level (item 4), and the strikes (items 6a and 6b). It is important to note that the spread levels are shown for reference only, namely because the implied volatility in item 10 and the implied daily move in item 11 are both shown in spread terms. However, the strikes in the option contracts are in prices.

|  |  |
| --- | --- |
|  | Figure 31  Sample CDX.HY option run |
| 1: Underlying index  2: Reference spread level  3: Expiry date  4: Implied forward  5: DV01 at expiry  6a: Option strikes in price  6b:Forward spread of strike  7: Payer prices bid/offer in cents (bp upfront)\*  8: Payer delta  9: Receiver prices in cents (bp upfront)\*  10: Implied volatility  11: Implied daily move in bp |  |
| \*Note: It is common to refer to option prices in “cents” – where you divide the price by 10000 and then multiply it by the notional to get the amount of premium to pay; in reality, it can be thought of as “bp of notional premium upfront”. Source: Barclays Research |

Breakeven calculation

The breakeven calculation for CDX.HY options is fairly straightforward. Since the index is quoted in price, we do not have to make any duration adjustments in order to determine what size move in the index is needed to offset the premium paid. For example, let’s say an investor buys a $102 put for 60 cents. The breakeven level for this trade is simply $102 – 60 cents = $101.40, or stated more generically: Strike – Premium = Breakeven Level. If the index is trading at $101.40 at expiry, the holder of the put option would exercise and enter into a short position at $102. The investor would make 60 cents, which is the same as the premium paid for the put. For the breakeven on a call option, you would add the premium to the strike to calculate the breakeven: Strike + Premium = Breakeven Level.

Restructuring events and CDS option payoffs

In the main text we covered how CDS options react to ‘hard’ credit events – Failure to Pay and Bankruptcy. For iTraxx indices, Restructuring is a ‘soft’ credit event and owing to the optionality in settling CDS or not ‘triggering’, this creates an additional complexity. We discuss the setup below, noting that since options are traded almost exclusively on on-the-run indices, the likelihood that a CDS option trade would have to deal with a restructuring event is fairly low.

For the index itself, upon a Restructuring event having been declared, the affected single-name portion of an index ‘spins off’ and becomes a single-name CDS in its own right, which can then be triggered by the protection buyer or seller, with the remainder of the index being re-versioned to an index without the affected entity. It is the confluence of this process, mixed with the timing of the option expiry (and decision to exercise or not) and the CDS auction, that we consider below.

In Figure 32 we show the decision tree for the case where an investor buys (or sells) a CDS option, there is a restructuring event declared, and then option expiry occurs *before* the CDS auction. Ignoring that the ‘bucketing’ of the CDS may be different if triggered by the protection seller or buyer, we can consider an example:

* Option is bought.
* Restructuring event is declared.
* The single-name risk of the index trade is triggered.
* Option expiry comes and the option is in the money, and exercised.
* Investor now has index position V2 without the affected entity and the single-name portion.
* Come the CDS auction time, the affected single-name portion is settled depending on whether it was triggered by the buyer or seller of protection.

|  |
| --- |
| Figure 32  Decision tree – restructuring credit events – option expiry *before* the CDS auction |
|  |
| Source: Barclays Research |

Suppose instead that option expiry is after the CDS auction, in which case the decision tree is shown in Figure 33. This is somewhat less complicated, as the decision whether to exercise the option or not is made after the value of the (potentially) triggered single-name CDS trade is known.

|  |
| --- |
| Figure 33  Decision tree – restructuring credit events – option expiry *after* the CDS auction |
|  |
| Source: Barclays Research |

INVESTMENT GRADE AND HIGH YIELD

Steady Ownership in Unsteady Commodities

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In February, with oil below $30, we highlighted the ownership breakdown of investment grade and high yield commodity credits, many of which were facing significant downgrade risk ([Breaking down Commodity Bond Ownership](https://live.barcap.com/go/publications/content?contentPubID=FC2212918&restriction=DEBT), February 12, 2016). At the time, based on the most recent quarterly filings,[[1]](#footnote-1) we found that insurance companies, the largest single buyer of investment grade debt, held a significantly lower share of energy/metals securities than they did of the rest of the market. They held only about 26%, by market value, of investment grade commodity debt, well below their 40% ownership of the broader index. That said, insurance companies owned only about 13% of the high yield market overall, which meant that as some of these securities downgraded to high yield, there was likely to be a substantial amount of forced selling.

Since then, approximately $58bn of commodity-related securities has been downgraded from investment grade to high yield. Using the most recent public fund filings, which now fully account for the downgrades in February and March,[[2]](#footnote-2) we updated our commodity credit ownership breakdown analysis. As a reminder, our ownership categories include insurance companies, investment advisors (any investment funds with public disclosure of holdings – essentially, mutual funds) and other (banks, pensions, hedge funds, distressed funds, and other investors that do not publicly disclose holdings).

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| --- | --- | --- |
| Figure 1  Ownership Breakdown of Investment Grade Energy/Metals Securities versus Overall Market |  | Figure 2  Ownership Breakdown of high Yield Energy/Metals Securities versus Overall Market |
|  |  |  |
| Source: Bloomberg, Barclays Research |  | Source: Bloomberg, Barclays Research |

The public filings suggest that commodity credit ownership has not shifted meaningfully since February (Figures 1 and 2). In investment grade, the elevated share of mutual fund ownership has persisted, increasing 3pp over the past six months. At 20%, this retail share of commodity credit ownership is well above our estimate of retail’s 15% overall market share ([Where Have the Buyers Gone?](https://live.barcap.com/go/publications/content?contentPubID=FC2182889&restriction=DEBT) October 23, 2015). In contrast, insurance owns only 27% of the investment grade commodity credit universe, relative to a 40% overall market share. This deep underweight makes sense: the deterioration in credit quality for many commodity-based issuers has caused a transfer from more traditional buy-and-hold investors, who want to earn a consistent yield over time but minimize default risk, to mark-to-market funds. That said, much of this transfer had already occurred before many of the securities were officially downgraded to high yield.

In high yield, the share of mutual fund ownership has also ticked up, largely at the expense of the “other” category (Figure 2). In our view, this reflects the fact that many of the lower-quality securities that have defaulted since February, which were largely held by distressed funds and other types of private funds, are now out of the index. Indeed, for the energy/ metal securities remaining in high yield, ownership has been fairly consistent with the ownership breakdown of the broader US High Yield Index. Insurance ownership of high yield energy has also increased since February, from about 12% to 14%. We believe this is primarily the result of insurance companies’ continuing to hold a substantial share of fallen angels as they drop to high yield.

Figure 3 shows the breakdown of holdings by credit quality and sheds light on the behavior of insurance companies over the past six months. Ownership in this category has generally increased across ratings buckets, but has jumped most in single Bs (6% in February versus 16% now). Many formerly BBB and BB securities moved directly to single B following ratings agency actions, and while insurance companies have likely sold out of some of these bonds, they appear to have held on to a substantial share. With the post-February rebound in oil, the fundamental pressure on these securities has abated, but they remain particularly vulnerable to forced selling if commodity prices reverse course.

Meanwhile, mutual funds are holding a higher share of the sector in every investment grade category and in BBs than they did six months ago, with a somewhat lower share of single-Bs (due to the increase in insurance ownership) and roughly equal shares in CCC and below (Figure 3). With credit quality lower across the sector, ownership has shifted from buy-and-hold to market-sensitive accounts that have a shorter-term holding period in investment grade. In high yield, with many of the lowest-quality issuers having defaulted out of the index, the ownership share of “other” has declined across almost every ratings bucket.

Figure 3

Absolute Change in Commodity Security Ownership Share by Rating

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Ownership Share as of Feb | | | Share Based on Most Recent Filings | | | Change in Ownership Share | | |
|  | Insurance Company | Investment Advisor | Other | Insurance Company | Investment Advisor | Other | Insurance Company | Investment Advisor | Other |
| AAA/AA | 18.0% | 16.0% | 65.9% | 15.8% | 18.8% | 65.4% | **(2.2%)** | **2.8%** | **(0.5%)** |
| A | 27.8% | 14.5% | 57.7% | 30.2% | 16.8% | 53.1% | **2.4%** | **2.2%** | **(4.6%)** |
| BBB | 27.9% | 17.7% | 54.4% | 29.0% | 20.0% | 51.1% | **1.1%** | **2.3%** | **(3.4%)** |
| BB | 17.9% | 36.0% | 46.1% | 17.1% | 39.6% | 43.2% | **(0.8%)** | **3.7%** | **(2.9%)** |
| B | 6.3% | 43.9% | 49.8% | 15.8% | 41.4% | 42.8% | **9.5%** | **(2.5%)** | **(7.0%)** |
| CCC | 3.6% | 44.3% | 52.1% | 4.7% | 44.1% | 51.2% | **1.0%** | **(0.2%)** | **(0.9%)** |
| CC or Worst | 4.9% | 30.7% | 64.4% | 5.0% | 30.3% | 64.7% | **0.1%** | **(0.5%)** | **0.4%** |

Source: Bloomberg, Barclays Research

Ultimately, the forced selling by insurance companies has been less severe than we expected, and the primary decline in ownership has come from asset managers that do not publicly file holdings. This explains at least part of the year-to-date outperformance of fallen angels relative to the rest of the high yield market. Not wanting to sell at a sharp loss, many buy-and-hold investment grade investors perhaps felt more inclined to hold onto these credits. Furthermore, with WTI oil rebounding sharply from a low of $27/bbl in February to nearly $47/bbl, the fundamental outlook for these securities has improved markedly, allaying concerns about credit losses in the sector and mitigating pressure to sell.

Indeed, upon entering high yield, commodity-based fallen angels have been a sharp outperformer of the index year-to-date, earning roughly 50% in excess returns (Figure 4). Even more notable, fallen angels have strongly outperformed other BBB and BB securities that remained in their respective indices (see the solid gray line in Figure 4). In our view, this indicates that much of the technical selling occurred before the actual downgrade event for many of these securities. The rebound in oil has coincided with an improved global economic outlook, a substantial increase in easing by central banks abroad, and a sharp surge in demand for USD corporates from yield-seeking foreign investors. From a valuation perspective, these positive global technical factors seem to have more than offset any negative technicals from the downgrades. Moreover, the volume of fallen angels ended up being smaller than our initial estimate: if oil prices had remained sub-$40/bbl for longer, we projected more than $100bn of par outstanding to be downgraded to high yield. With fewer securities falling out of investment grade, the pressure to sell out of commodities from insurance companies has been lower than we expected.

|  |  |  |
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| Figure 4  Fallen Angels Have Been Strong Outperformers after Entering High Yield |  | Figure 5  Oil Valuations at Different Points in Time When Oil Was around $45/bbl |
|  |  |  |
| Source: Barclays Research |  | Note: The fixed cohort looks at the selection of bonds that made up the HY Energy Index on August 12, 2016. Source: Bloomberg, Barclays Research |

Significant compositional changes complicate historical comparisons of index-level valuations relative to the price of oil. At first glance, the average OAS of the Barclays US High Yield Energy Index appears tight compared with recent periods when oil was in a similar price range (Figure 5, left side). However, over the course of the year, many of the lowest-quality issuers have defaulted, and a significant slug of high-rated fallen angels has taken their place. Looking at a fixed cohort of securities (as of mid-August), the average OAS is quite wide relative to early 2015 levels, roughly in line with August 2015, and rich relative to early May. With oil at about $47/bbl, the US HY Energy Index seems about fairly valued. Our fundamental energy analyst, Gary Stromberg, maintains a Market Weight rating on the independent energy, midstream, and refining sub-sectors and an Underweight rating on oil field services.

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| --- | --- | --- |
| CDX.IG OTR Market versus Intrinsic (bp) |  | Investment Grade Fund Flows ($bn) |
|  |  |  |
| Source: Barclays Research |  | Source: Lipper/Thomson Reuters, Barclays Research |
| CDX.IG versus VIX |  | CDS-Cash Basis (bp) |
|  |  |  |
| Source: Markit, Barclays Research |  | Note: Basis defined as CDX.IG spread – Corporate Libor OAS.  Source: Barclays Research |

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| --- | --- | --- |
| 2016 High Yield Supply by Sector |  | Top On-the-Run CDX Index Names by Weekly CDS Volume |
|  |  | |  |  |  |  | | --- | --- | --- | --- | |  | **Notional  Outstanding ($bn)** | | **Volume –  Week Ending 8/12/16 ($mn)** | |  | **Gross** | **Net** | **Gross** | | Avon | 9.5 | 0.6 | 451.3 | | J. C. Penney | 8.2 | 0.8 | 207.3 | | First Data | 5.1 | 0.3 | 143.4 | | AK Steel | 10.0 | 0.9 | 104.4 | | Sprint Comm. | 7.7 | 0.6 | 102.8 | | Frontier Comm. | 6.7 | 0.5 | 96.0 | | Genworth | 4.2 | 0.6 | 92.2 | | Community Health | 6.6 | 0.8 | 88.8 | | MBIA Insurance | 12.2 | 0.9 | 84.6 | | Bombardier | 4.6 | 0.3 | 83.6 | |
| Source: Barclays Research |  | Source: DTCC |
| High Yield Average Institutional Trade Volume ($bn) |  | On-the-Run HYCDX versus US High Yield Index (bp) |
|  |  |  |
| Note: Includes both registered and 144A volumes. Source: FINRA TRACE |  | Note: CDX increase partly reflects roll to CDX.HY.25. Source: Barclays Research |
| Flows to High Yield Mutual Funds and ETFs |  | High Yield Index Price Distribution by Par (%) |
|  |  |  |
| Note: Daily reporters only. Source: EPFR |  | Source: Barclays Research |

STRUCTURED CREDIT

CLO Equity Returns Get Squeezed

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With new money market reforms coming into effect in October, prime fund managers continue to shrink portfolio WAM by scaling back on bank CP and CDs and rolling into repo and agency discount notes in anticipation of accelerating institutional investor redemptions. Scarce demand for bank CP and CDs has helped push three-month Libor to just over 80bp, up15bp since early July (see [US Money Markets: Libor: Still rising](https://live.barcap.com/go/publications/content?contentPubID=FC2255142&restriction=DEBT), August 15, 2016).

As Libor has risen, so have swap rates, leading to an increase in yields across all structured credit products, despite recent spread tightening. We still think CLOs and private SLABS look most attractive across the capital stack. Not only do they have higher all-in yields than most other asset classes, but these securities are typically structured with floating-rate coupons benchmarked to 1m or 3m Libor, helping to mitigate interest rate risk should falling demand for bank CP and CDs and a potential Fed rate hike later in 2016 (our economists are calling for a September hike) drive rates higher. CMBS BBBs are yielding more than CLO BBBs; however, investors should recognize the longer duration and higher credit risk in CMBS, in our view.

|  |
| --- |
| Figure 1  Structured Credit Secondary Market Yields |
|  |
| Source: Bloomberg, Barclays Research |

CLO Equity Returns

Although the recent rise in Libor benefits CLO debt investors, it hurts CLO equity returns. Because CLO tranches typically have floating rate notes benchmarked to 3m Libor, the recent rise in Libor will increase the amount of interest owed to CLO debt investors on the next quarterly reset date. However, more than 90% of loans backing CLOs include an interest rate floor also tied to 3m Libor, with the weighted average floor hovering around 100bp since mid-2014 (Figure 2). This means that incoming collateral cash flow to CLOs will not rise meaningfully until Libor increases above 1%. As a result, the residual cash flows to equity will decline with Libor at current levels, making the equity internal rates of return (IRRs) much less attractive (see [CLO equity investors: You have the floor](https://live.barcap.com/go/publications/content?contentPubID=FC2163651&restriction=DEBT), August 7, 2015 ).

|  |  |
| --- | --- |
|  | Figure 2  Percentage of Loans with Libor Floors and Floor Levels |
|  |  |
| Note: The percentage of loans with floors is calculated in weighted by par. Source: S&P LCD, Barclays Research |

Figure 3 shows that the amount of CLO excess spread falls as Libor rises to the weighted average interest rate floor. Once Libor is at or above the weighted average floor, both assets and liability yields will rise in tandem, keeping excess spread at a constant rate. Meanwhile, management and administrative fees, as a percentage of collateral interest income, remain constant while Libor is below the weighted average interest rate floor and decrease as it rises above the floor because fees are based on the collateral balance and not on collateral cash flows. Given that excess spread is at its lowest and fees, as a percentage of collateral cash flow, are at their highest when Libor is hovering around the weighted average interest rate floor, equity returns will be least attractive at this point.

|  |  |  |
| --- | --- | --- |
| Figure 3  Equity Cash Flows Are Lowest When Libor Is at the WA Floor |  | Figure 4  CLO Equity Annualized Cash Flows in Various Rate Scenarios |
|  |  |  |
| Source: Barclays Research |  | Source: Intex, Barclays Research |

To illustrate, we use a sample 2014 vintage CLO representing the typical US CLO 2.0 structure and model its cash flows under various rate scenarios. In each scenario, we incorporate standard credit risk assumptions, including a 2% default rate (CDR), 70% recovery, 20% loan prepayment rate (CPR), and a call date of two years from the end of a deal’s reinvestment period. Figure 4 corroborates the aforementioned dynamic, as the equity yield is lowest when Libor is at a WA floor of 1%. If Libor falls to half of current levels (about 40bp), yields will increase considerably as a result of the higher excess spread, with no change in fees as a percentage of collateral interest income. However, equity yields start increasing as Libor rises above the WA floor because of the declining impact of fees on equity returns. Clearly, the recent rise in Libor has been a negative for equity investors in outstanding CLOs but as we have written before, we think that CLO debt tranches offer the most values within the AAA structured credit universe (see [AAA CLOs and Private SLABS Offer Value](https://live.barcap.com/go/publications/content?contentPubID=FC2232768&restriction=DEBT), May 6, 2016). On the new issue side, we think that Libor at current levels could dampen near-term supply because issuers may not view the lower equity returns as sufficient. Alternatively, they may be able to offset part of the rise in Libor by passing the cost along to CLO debt investors in the form of lower yields, especially on the AAA tranches. Either outcome would likely be a positive near-term technical for the space and make CLOs even more attractive, in our view.

Reference Tables

|  |  |  |
| --- | --- | --- |
| Figure 5  ABS Yearly Issuance ($bn) |  | Figure 6  CMBS Yearly Issuance ($bn) |
|  |  |  |
| Source: Barclays Research |  | Source: CMA, Barclays Research |
| Figure 7  Monthly Total Trading Volumes ($bn) |  | Figure 8  IG 3y WAL ABS Spreads (bp) |
|  |  |  |
| Source: FINRA, Barclays Research |  | Source: Barclays Research |
| Figure 9  New Issue CMBS 3.0 Spreads with 12-month Range |  | Figure 10  Freddie K CMBS Spreads with 12-month Range |
|  |  |  |
| Source: Barclays Research |  | Source: Barclays Research |

Figure 11

ABS Spreads

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | 12-month | | |  |  |  |  |  | 12-month | | |
| Rat.,WAL | Benchmark | 8/18 | 1-wk Chg | Avg | High | Low |  | Rat., WAL | Benchmark | 8/18 | 1-wk Chg | Avg | High | Low |
| Prime Auto ABS | | | | | | |  | Credit Card ABS | | | | | | |
| AAA, 1y | EDSF | 15 | -2 | 28 | 39 | 15 |  | AAA, 3y | 1m Libor | 31 | -2 | 40 | 47 | 31 |
| AAA, 2y | Swaps | 20 | -2 | 36 | 49 | 20 |  | AAA, 5y | 1m Libor | 45 | -1 | 51 | 58 | 45 |
| AAA, 3y | Swaps | 30 | -2 | 42 | 52 | 30 |  | AAA, 7y | 1m Libor | 56 | -1 | 62 | 69 | 55 |
| A, 3y | Swaps | 80 | 0 | 88 | 102 | 79 |  | A, 3y | 1m Libor | 56 | -2 | 64 | 70 | 56 |
| BBB, 3y | Swaps | 115 | 0 | 128 | 142 | 115 |  | A, 5y | 1m Libor | 82 | -1 | 86 | 93 | 80 |
| Subprime Auto ABS | | | | | | |  | A, 7y | 1m Libor | 98 | -1 | 102 | 109 | 95 |
| AAA, 1y | EDSF | 48 | 0 | 61 | 80 | 48 |  | BBB, 3y | 1m Libor | 86 | -2 | 94 | 100 | 86 |
| AAA, 2y | Swaps | 53 | 0 | 68 | 90 | 53 |  | BBB, 5y | 1m Libor | 112 | -1 | 116 | 123 | 110 |
| A, 3y | Swaps | 115 | -2 | 166 | 225 | 115 |  | BBB, 7y | 1m Libor | 128 | -1 | 132 | 139 | 125 |
| BBB, 3y | Swaps | 165 | -2 | 236 | 300 | 165 |  | Student Loan ABS | | | | | | |
| Equipment ABS | | | | | | |  | AAA, 1y | 1m Libor | 56 | 0 | 80 | 100 | 56 |
| AAA, 1y | EDSF | 26 | -2 | 40 | 49 | 26 |  | AAA, 3y | 1m Libor | 76 | 0 | 104 | 125 | 76 |
| AAA, 2y | Swaps | 36 | -2 | 50 | 59 | 36 |  | AAA, 5y | 1m Libor | 106 | 0 | 123 | 135 | 105 |
| AAA, 3y | Swaps | 44 | -2 | 58 | 67 | 44 |  | AAA, 7y | 1m Libor | 126 | 0 | 142 | 150 | 125 |

Source: Barclays Research

Figure 12

CMBS Spreads

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 12-month | | |  |  |  |  | 12-month | | |
| Rating | 8/18 | 1-wk Chg. | Avg. | High | Low |  | Rating | 8/18 | 1-wk Chg. | Avg. | High | Low |
| **CMBS 3.0 2015** | | | | | |  | **CMBS 3.0 2013** | | | | | |
| 5y | 70 | 0 | 82 | 97 | 70 |  | 5y | 63 | 0 | 79 | 95 | 63 |
| LCF | 100 | -5 | 130 | 165 | 100 |  | LCF | 85 | 0 | 116 | 154 | 85 |
| AM | 120 | -5 | 159 | 200 | 120 |  | AM | 100 | -10 | 145 | 185 | 100 |
| AA | 140 | -5 | 214 | 285 | 140 |  | AA | 115 | -10 | 179 | 210 | 115 |
| A | 200 | 0 | 325 | 430 | 200 |  | A | 195 | -10 | 263 | 330 | 195 |
| BBB- | 500 | -25 | 584 | 780 | 445 |  | BBB- | 425 | -25 | 487 | 630 | 394 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **CMBS 3.0 2014** | | | | | |  | **Freddie K** | | | | | |
| 5y | 65 | 0 | 81 | 96 | 65 |  | 5y | 51 | 0 | 58 | 70 | 45 |
| LCF | 95 | -2 | 125 | 158 | 95 |  | 7y A2 | 55 | 0 | 66 | 82 | 55 |
| AM | 115 | -5 | 152 | 190 | 115 |  | 10y A2 | 70 | 0 | 80 | 100 | 65 |
| AA | 130 | -10 | 203 | 260 | 130 |  | IO (X1) | 200 | -25 | 249 | 295 | 195 |
| A | 210 | -15 | 295 | 380 | 210 |  | B | 250 | -25 | 336 | 475 | 240 |
| BBB- | 475 | -25 | 544 | 705 | 424 |  | C | 450 | -25 | 513 | 720 | 285 |

Source: Barclays Research

CREDIT RATING CHANGES

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RATING CHANGES – US** | | | | |
| **Sector** | **Issuer/Security** | **From** | **To** | **Date Changed** |
| IG Chemicals | [**CF INDUSTRIES INC**](https://live.barcap.com/go/research/content?contentPubID=FC2255156&restriction=DEBT) | Overweight | **Market Weight** | 15-Aug-2016 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RATING CHANGES – EUROPE** | | | | |
| **Sector** | **Issuer/Security** | **From** | **To** | **Date Changed** |
| HY Consumer & Retail | [**BAKKA 8 3/4 06/15/20**](https://live.barcap.com/go/research/content?contentPubID=FC2255325&restriction=DEBT) | Market Weight | **Overweight** | 16-Aug-2016 |

U.S. CREDIT STRATEGY

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1. Which were as of December 31st, 2015 or September 30th, 2015, depending on the filer [↑](#footnote-ref-1)
2. The reports are as of March 31st and June 30th, 2016, depending on the fund/insurance company [↑](#footnote-ref-2)