Credit Event Auction Primer

This primer is provided for informational purposes only. Each auction is governed by the Auction Settlement Terms posted on www.isda.org/credit. For any questions about this primer, please contact either cea@markit.com or cef@creditex.com.

Note: This primer was updated in Feb 2010 to reflect recent changes which are now permanent regarding the carrying over of touching/crossing markets from the initial submissions to the limit orders.

Introduction

The credit markets have experienced a wave of continuous global innovation since the advent of credit default swaps. Indeed, single-name credit default swaps have continually been improving to make the product as useful and liquid as the market can make them.

One of the key innovations over the past few years is the advent of a new settlement mechanism for credit default swaps to replace the traditional physical settlement. This document examines the motivations for the market to develop and use credit event auctions, and details the auction process.

Why Credit Event Auctions?

When credit default swaps (CDS) were first developed, the intended use was to hedge cash debt positions with the derivative. With that in mind, the settlement method developed to settle credit events was what is known as 'physical settlement'. After a default, the protection buyer delivers the defaulted asset and receives in return the due amount outstanding from the defaulted entity.

As time passed, CDS became the tool of choice to take a view on credit. This was facilitated by derivatives trading not being limited by supply (all you need is a willing counterparty) and market standardization - instead of having to pick from hundreds of Ford bonds, you had one CDS curve traded across the market.

As the CDS market developed into a primary indicator of an entity's creditworthiness, default swaps evolved from being a hedging tool to the primary credit trading tool. As a result, at some point early this decade, the volume of CDS trades began to outstrip the volume of bonds outstanding - there were more CDS traded on a credit than the outstanding bond issuance of that credit. For investors with only the derivative position, physical settlement is not appealing. Protection buyers would have to go to the open market to source bonds, and protection sellers would be left with cash positions after the auction. This is particularly undesirable for those holding index and/or index tranche positions, where the notional for a given credit might be quite small (a $100m position in CDX HY corresponds to $1m per credit), and they are unlikely to hold a cash position in the defaulted entity.

Furthermore, with the CDS outstanding greater by multiples than the volume of bonds issued, the bonds would have to be "recycled" a number of times through the market to settle all the CDS trades. Investors recognizing this would rush to source bonds, artificially raising the price of the bonds higher than the expected recovery value, and increasing the volatility of the bonds post-default, which is undesirable for a number of reasons.

Cash settlement was widely regarded to be the best alternative, but unlike the basic mechanism already in place for CDS contracts, a mechanism was required to set a transparent, trustworthy price the whole market could use.

The answer the market came up with was credit event auctions. The initial auctions were based on a mechanism developed by the auction administrators – Markit and Creditex - and dealers in Europe to fix a weekly price for the 3 main iTraxx indices in Europe. These auctions involved only cash settlement. After Delphi filed for bankruptcy, the process was extended to incorporate the trading of bonds so that everyone was physically settling, but only on their net open position, thereby vastly reducing the amount of bond trades required to settle the CDS trades. The process has been further developed to what it is today – an open, transparent process which gives everyone the opportunity to participate, and which allows investors the option to cash or effectively physically settle.

Another benefit of the auction is the setting of a market-wide price. The use of the same price to settle all trades across the market eliminates basis risk for investors. For example an investor with hedged positions, e.g. index vs single-name, or tranche vs index, may have physically settled at different times, and sourced/sold bonds at different times to settle their trades (admittedly if they settled their shorts first they could just deliver the bonds they received here into their long protection trades). Particularly with the heightened volatility post a default due to investors scrambling to buy bonds, they may have traded bonds at different prices and settled their credit derivative trades at different levels. This would have changed the economics of their position, even though the investor was flat and theoretically not exposed to any further profit or loss.

Finally, for loans the motivation to run auctions is even greater, given the complicated and involved process for settling loan trades.

Cash vs. Physical Settlement in the Auction

As described above, investors can choose between cash and what is effectively physical settlement in the auction. This option is made possible by the ability to trade bonds or loans in the auction.

All of the actual CDS/LCDS trades in the auction are cash settled. The physical settlement segment is made up by trading the underlying cash obligation so that the net payment to a protection buyer adds up to par (note the term 'par' in this document refers not to the face value, but the actual principal balance outstanding for the bonds/loans in question), and they also get the equivalent par amount of obligations off of their books.

As an example, consider a $10m long protection investor. Assuming a 40% recovery rate, they would be compensated 60% of par ($6m in this case), and sell $10m par of bonds/loans. As the bond/loan trades in the auctions take place at the final price, they receive $4m for the bonds/loans, in total receiving $10m, and pass off $10m par of bonds/loans to a buyer in the auction.

Protection sellers would make requests to buy bonds/loans in the auction (as normally they would be delivered bonds/loans in physical settlement).

Investors wishing to cash settle do not make a physical settlement request and simply cash settle their trade.

Hence, the investor's net position after auction settlement is the same as their position after physical settlement. The documentation for the auctions actually ties these together to legally associate physical settlement request trades with the derivative trades such that the two transactions are legally one transaction.

Note physical settlement requests are constrained by the investor's derivative position – the request an investor can make is between zero and the amount of bonds/loans they would trade to fully physical settle their position. As an example a $10m long protection buyer can only submit a sell request between 0 and $10m face value of underlying. They cannot make a buy request as they would never be delivered bonds to settle their trade.

The Auction Process

The auction is comprised of 2 parts. Here the first part is examined.

The inputs into the first part of the auction are:

a) A 2-way market supplied by dealers for the defaulted assets, of a pre-defined maximum spread, and with a pre-defined quotation size associated with it. The spread and quotation sizes are subject to specification prior to each auction and may vary for each auction depending on the liquidity of the defaulted assets.
b) Physical Settlement Requests. These are the requests to buy or sell bonds/loans (at the final price), which as described when combined with the cash settlement of their CDS/LCDS trade adds up to be equivalent to physical settlement.

The dealer markets submitted are used to create an 'initial market midpoint' (IMM) which is used as described below in the second half of the auction to constrain the final price.

The 'initial market midpoint' is set by discarding crossing/touching markets, and taking the 'best half' of the bids and offers and calculating the average. The best half would be, respectively, the highest bids, and the lowest offers. If there are an odd number of submissions, we round up to get the best half (e.g. for 11 submissions, 5.5 is half so we round up to use 6 submissions).

The second step in this section is to sum the buy and sell physical settlement requests, and tally the difference to determine the open interest. This open interest to buy or sell bonds/loans is carried into the second part of the auction.

There is also a possible penalty in place for submissions that are off-market. If a dealer supplies a bid or offer that is the wrong side of the initial market midpoint (e.g. a bid that is higher than the IMM), and the open interest suggests it shouldn't be (e.g. if a bid is higher than the IMM, and the open interest is to sell suggesting the price should go down so they shouldn't be bidding high), then the dealer in question has to pay the quotation amount times the amount that their price differed from the IMM. This amount is termed an 'Adjustment Amount'. This is not paid if the bid or offer in question did not cross with any other offer or bid respectively.

There is a 15 minute window for the inputs described above to be submitted via Creditex's electronic platform.

Within 30 minutes of the end of this first period, Markit will publish on www.creditfixings.com:

a) The initial market midpoint.
b) The size and direction of the open interest.
c) Any Adjustment Amounts.

Following the publication of the initial results, there is a 2-3 hour window in which the market has the opportunity to digest the initial results, and dealers and investors alike can determine if they would like to submit limit orders for the second part of the auction, and at what level they would like to submit. The relevant side of the initial market submissions are carried forward into the second part of the auction as limit orders – though note that crossing or touching markets are carried forward at higher of the initial market submission or the IMM (if open interest is to buy) and lower of the initial market submission or the IMM (if open interest is to sell)[1]

Limit bids / offers are constrained by the 'cap' amount (typically half of the bid-offer spread.) If the open interest is to sell, any limit bid above the IMM plus the cap amount is deemed to be at the IMM plus the cap amount. If the open interest is to buy, any limit offer below the IMM minus the cap amount is deemed to be at the IMM minus the cap amount.

Limit orders differ from physical settlement requests in that they have a firm price associated with the order, in addition to a size and direction (e.g. buy/sell). They are used in the second part of the auction as per:

- If the open interest is to buy, we review the lowest 'sell' limit order submitted and match it to the amount of open interest that is equivalent to the size associated with the limit order. e.g. if the limit order was to sell $20m of bonds/loans, we match it against $20m of open interest. If the open interest was to sell, we use 'buy' limit orders and start at the highest. As the open interest direction is published prior to the second stage, only limit orders of the relevant type are gathered and submitted for the second part of the auction.

- We then take the next lowest order (in the case of buy open interest) and match that. We continue to run through this process until we have matched all the open interest, or run out of limit orders. In the case of the former, **the last limit order used to match against the open interest is the final price.** If we run out of limit orders, then in the case of buy open interest the final price par. In the case of open interest to sell, the final price is zero.

At this point the IMM is reviewed and checked against the price of the last limit order used to match the open interest. If the final limit order is more than the cap amount higher (in case of sell open interest) or lower (in the case of buy open interest) than the IMM, the final price will be set to be the IMM plus or minus the cap respectively. This is to avoid a large limit order being submitted off-market to try and manipulate the results, particularly in the case of a small open interest.

Note, if the final price is set to be above par, all LCDS trades settle with no payout (i.e. as if recovery was set to be 100%, not above it), but loan trades will be conducted at the final price. Note a final price above par is only ever expected in LCDS auctions and further note the LCDS auction settlement terms do not explicitly refer to what happens if the final price is set above par. This is defined in the 2003 ISDA Credit Derivative Definitions where it states that the minimum payout is always zero in settlement of credit derivative trades, i.e., there will never be a payout from protection buyer to seller as this goes against the spirit of what a credit default swap is trying to achieve.

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1   All crossing or touching markets were originally carried forward at the initial market midpoint level. The change was made in Hellas II and FGIC Auction Settlement Terms and going forward.

Example

Here we run through an example set of inputs and work through the calculation process to reach the final price.

Part 1

In the first part of the auction, dealers submit their initial market submission (a tradable bid-offer market for the obligations in question) and a physical settlement request.

In this example, we have 10 dealers submitting bid/offers on pre-specified reference obligations (for LCDS trades these are specified by Markit's syndicated secured list). They also submit a physical settlement request, a request which may include customer requests made through them.

Note all numbers in this example are fictitious and are not meant to represent actual values that could be expected for any specific upcoming auction.

Initial Market Submissions

All initial market submissions have a maximum bid/offer spread, and associated quotation size determined prior to the auction. In this example the spread is 2%, with a quotation size of $5m. Levels are submitted in increments of 1/8.

Dealer	Bid	Offer
1	56	58
2	56.25	58.25
3	53.25	55.25
4	54	56
5	53.875	55.875
6	55	57
7	54.5	56.5
8	54.875	56.875
9	54.75	56.75
10	55	57

The Initial Market Midpoint (IMM)

We sort the bids in descending order, and the offers in ascending order:

Dealer	Bid
2	56.25
1	56
6	55
10	55
8	54.875
9	54.75
7	54.5
4	54
5	53.875
3	53.25

Dealer	Offer
3	55.25
5	55.875
4	56
7	56.5
9	56.75
8	56.875
6	57
10	57
1	58
2	58.25

Dealers 1 and 2 above have both submitted bids that cross with offers from dealers 3 and 5. All 4 levels submitted are removed from the calculation of the initial market midpoint. With those removed, we can then determine the best half of the remaining bids and offers. These are highlighted in bold in the above table. The average of these is the initial market midpoint and above equals **55.75** (rounded to the nearest 1/8th).

Physical Settlement Requests

Dealer	Buy / Sell	Size ($mm)
1	Buy	4
2	Sell	1
3	Buy	7
4	Buy	12
5	Sell	17
6	Buy	3
7	Sell	8
8	Sell	10
9	Sell	12
10	Buy	10

Simple tallying of the buy and sell amounts give us an open interest of $12mm bonds to sell.

Adjustment Amounts

In the above initial market submissions, dealer 1 and 2's bids were above the initial market midpoint and they both also crossed with another dealer's offer. Further, the open interest was to sell, hence high bids that cross offers, and are high relative to the initial market midpoint pay an adjustment amount. This adjustment amount is calculated by (Bid – IMM) * Notional. Hence the adjustment amounts applicable are -:

Dealer	Bid	IMM	Size	Adjustment Amount
2	56.25	55.75	$5mm	$25,000
1	56	55.75	$5mm	$12,500

Part 2

The remaining part of the auction is matching the open interest and calculating the final price. Given the open interest is to sell, dealers and investors submit limit bids in the second part of the auction.

<u>Limit Bids</u>

The limit bid dataset is limit bids submitted directly in the second part of the auction, allied with the bids carried forward from the initial market submissions:

| Bid Price	Bid Size ($mm)
57	2
55	7
54.75	8
54	11
52	3
55.75	5
55.75	5
55	5
55	5
54.875	5
54.75	5
54.5	5
54	5
53.875	5
53.25	5

Limit Bids submitted directly in second part of auction

Crossing Initial Market bids carried forward at the lower of the initial market submission or the initial market midpoint level (open interest to sell)

Non-crossing Initial Market bids carried forward unchanged

Sorting the limit bids in descending order:

Bid Price	Bid Size
56.75	**2**
55.75	**5**
55.75	**5**
55	7
55	5
55	5
54.875	5
54.75	8
54.75	5
54.5	5
54	11
54	5
53.875	5
53.25	5
52	3
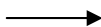
→ Limit bid at 57 is above the IMM (55.75) plus the cap amount (1% - half of 2% bid-ask spread.) Hence, it is deemed to be at the IMM plus the cap amount which equals 56.75.

With an open interest of $12mm, the 3 bids at the top of the table are sufficient to match this open interest, with a limit bid of 55.75 being the level of the last limit bid used to match the open interest – **hence the final price is set at 55.75**.