



CDS Indices Primer

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Section 1 – Credit Default Swaps

This first section of our CDS indices primer introduces CDS by focusing (mostly) on single name contracts. It is designed mainly for those new to the instrument/market or credit asset class and is particularly geared towards the CDS index novice seeking prerequisite background and context. It does not exhaustively cover the numerous technical details of the CDS market and nor does it discuss in detail the mathematics of CDS pricing. The interested reader is invited to contact us for more detailed information. This section is followed by detailed pieces on CDS indices, index tranches and index options.

Introduction to Credit Default Swaps

Credit Default Swaps (CDS) are derivatives that enable credit risk management to either mitigate or take views on credit risk (the risk of a borrower defaulting on its obligations). CDS first traded as bespoke bi-lateral contracts in the early to mid-1990s, instigated by banks to reduce risks associated with their lending activities. Subsequent decades then saw enormous market growth (particularly over the early 2000s) and standardisation with usage extending to a diverse set of participants:

- CDS are now firmly established as the most liquid and most popular tradable instruments available to manage, or speculate on, credit risk
- CDS are also used as underlying components in the credit options market, the credit linked note market and the wider structured credit landscape
- The size and importance of the market is such that CDS information is also widely used by central banks, regulators and other policy makers in assessing real-time credit conditions

Moreover, CDS are the building blocks of CDS indices¹ (the IHS Markit iTraxx/CDX indices) which have tended to generate notional trading volumes in the trillions of dollars every quarter. Their use in this space extends to index options and tranches on indices.

What is a CDS? It's an OTC derivative that enables the transfer of a particular credit risk exposure from one counterparty to another. In a "single-name" CDS the risk being transferred is the risk of default by a reference entity. A basket or CDS index will refer to multiple entity names and associated Reference Obligations in some specified way. A CDS contract is between two counterparties and typically (almost always) does not directly involve the reference entity or entities. A CDS can be likened to a tradable insurance contract against the default of the reference entity and theoretically (in a Black-Scholes-Merton world) it can be associated with an equity put option on the entities assets.

How does it work? In a CDS contract, the amount of risky exposure (i.e. the amount of "protection" bought and sold) is in reference of a notional amount (as is the case of an interest rate swap, for example). The "Protection Buyer" pays a fixed premium (usually every quarter and akin to an insurance premium) to a "Protection Seller" on that notional. In the case that the reference entity

1. CDS index products are part of the wider IHS Markit credit index ecosystem that also includes tradable bond indices (iBoxx indices that are tracked by a number of large corporate bond ETFs) and related standardised total return swaps (iBoxx TRS, offered by a number of licenced market makers).

defaults i.e. a credit event is triggered, the Protection Seller is obligated to make the Protection Buyer whole again by covering any default related losses and the CDS contract ceases i.e. it is settled. Protection can be bought/sold for varying maturities with the 5yr point on the CDS curve being the most liquid.

Why would one use it? Whilst a natural Protection Buyer may hold the underlying obligation (perhaps seeking the CDS as a hedge to their long cash credit position), many Protection Buyers (and Sellers) will use CDS as tools to express views on specific credit risk that they may not have existing underlying exposure to. They can do this by monetising the mark-to-market changes in the contract as credit risk (encapsulated in CDS spreads) changes. Multi-name CDS such as the indices can be used to express macro views on credit amongst a multitude of other use cases. Please see the CDS Usage sub-section for more on this.

What is the fixed coupon and upfront amount? The fixed premium is actually composed of an upfront amount and a standardised fixed coupon paid on a regular basis over the life of the trade. The upfront amount and the standardised fixed coupon together relate to the CDS spread that would set the present value of the trade to zero at inception. Like any other credit spread, it represents the market's view on the credit-worthiness of the reference entity. The lower the perceived credit-worthiness, the higher the insurance premium and associated par CDS spread. However, since the coupon paid by the Protection Buyer is standardised and fixed at a certain level, the present value of a new CDS (across both legs) will almost always price away from par, hence the need for an upfront amount to offset the off-market PV of the swap².

What else defines CDS? The definitions of what constitutes a credit event in a CDS and whether the CDS is cash or physically settled (including what physical bond can be delivered) will be specified in the terms-of-trade and trade confirmations, in reference to an ISDA Master Agreement, agreed between the two counterparties. Please refer to the Credit Events and Documentation sub-sections for more information.

How big is the market? 2019 ISDA estimates point toward USD 10 trillion of gross notional outstanding on single name and index CDS, every quarter over the last few years. In terms of net (risk taking) notional the quarterly estimated average is still an astounding USD 1.5 trillion. Historically, gross notional was much higher, even above USD 60 trillion in 2007, but central clearing and trade compression has greatly reduced the amount of redundant notional.

Trade mechanics

Terminology essentials (for single name CDS)³

Selling CDS: From a risk perspective, selling a corporate bond CDS means selling protection (and receiving premiums) and is equivalent to owning or being long the bond (“long risk”). This position will generate positive mark-to-market present value changes if reference credit quality improves and credit spreads narrow during the life of the trade⁴.

Buying CDS: Conversely the Protection Buyer (the CDS buyer) has in effect gone short the bond (“short risk” or “short credit”) and will benefit when credit quality deteriorates and spreads rise.

2. Please see the *Pricing and Standardisation* sub-section for more information on this.

3. Please refer to the *Glossary* in the appendix for more information on CDS related terms and definitions.

4. If credit risk is unchanged and there is no credit event, then a protection seller's position will benefit from receiving the premium carry

The swap legs: The two legs of a CDS are known as the “premium leg” (relating to the periodic payments made by the Protection Buyer) and the “contingent leg” (relating to the amount the Protection Seller pays out if a credit event is triggered).

Terms of trade

The following are the key standard terms of trade that define a CDS contract:

- The Reference Entity (the underlying entity on which protection is bought/sold)
- The Reference Obligation (this may not be the actual deliverable instrument at default and its maturity may not equate with that of the CDS contract at trade inception. It represents the lowest seniority of bonds that can be delivered in case of default)
- A Notional Amount (the amount of credit risk bought/sold)
- The Tenor of the trade (with 5 year tenors generally being the most liquid)
- A list of Credit Events (see below)

Credit events

These are events⁵ that will trigger a pay out on the contingent leg and, for example, can include:

- Bankruptcy
- Failure to pay
- Restructuring
- Obligation acceleration
- Obligation Default
- Repudiation/Moratorium
- Governmental intervention

The most common credit events in the corporate space are bankruptcy and failure to pay and although these terms are self-explanatory, specific definitions exist to avoid any ambiguity between parties. Repudiation and moratorium are mostly associated with sovereign issuers that may refuse (or postpone) to make payments due, though they are very rare (as too are obligation accelerations and obligation defaults). Restructuring as a credit event can be a complex matter though simply put, it relates to a change in the terms of an obligation, such as a bond, due to issuer distress – examples include a reduction in coupon or principal. Various conventions are in place for handling restructuring in a CDS contract⁶. Governmental intervention could include a resolution law or regulation passed by a governmental authority which have an impact on the debt issued by the reference entity. This can include, among others, reduction in the notional outstanding or changes to the interest rates of the relevant bonds.

Hard credit events such as bankruptcy and failure to pay (once determined by the Determination Committee⁷ to have taken place) automatically trigger the CDS contract leading to settlement between the two counterparties. Soft credit events such as restructuring (where applicable) require one of the counterparties to trigger the contract (typically, both parties have the option but not the obligation).

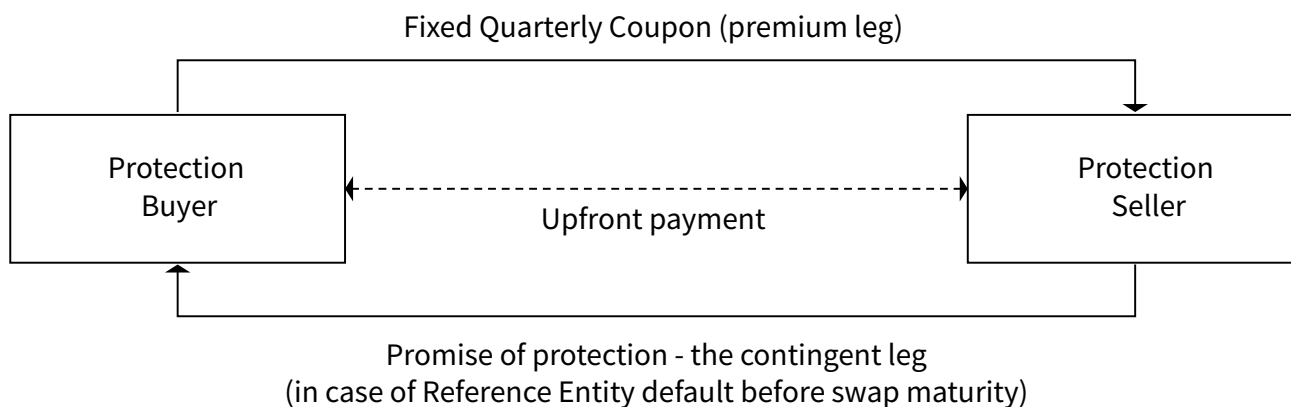
5. Please refer to ISDA definitions and see the *Documentation, Credit Events Procedures and RED Codes* sub-sections for more information on credit events.

6. The Standard North American Contract (SNAC) trades with “No-R” which means restructuring is not considered a credit event, whilst the Standard European Contract (STEC) trades with a convention known as “Mod-Mod R” that specifies what maturity of bond can be delivered under the contract.

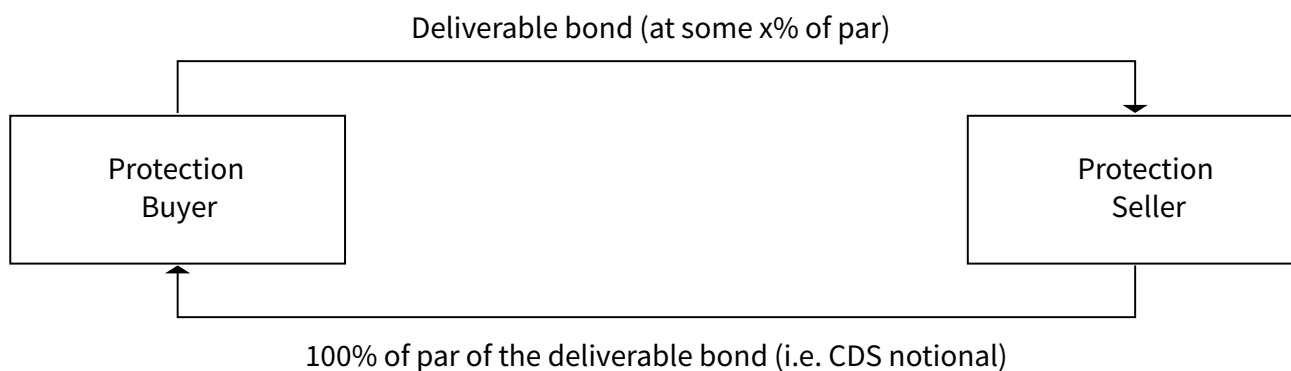
7. Another (non-credit) type of event that can (more administratively) impact a CDS is known as a succession event such as a merger, demerger or spinoff. Succession events are detailed in the ISDA definitions and are also determined by the Determination Committee. Please see the *Documentation, Credit Events Procedures and RED Codes* sub-sections for more information on succession events.

Cash flow diagrams

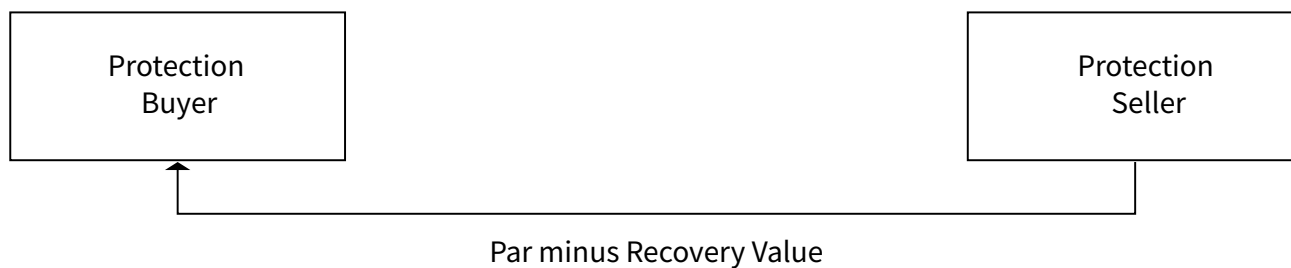
Cash flows from trade inception until maturity (or before a default)



Cash flows upon default under physical settlement



Cash flows upon default under cash settlement



Pricing and standardisation

As with other derivatives CDS are valued by discounting future cash flows but for CDS the cash flows are also weighted by the probability that they will occur. If a credit event occurs then the premium leg cash flows will cease and the contingent leg will offer a payoff but since the default is uncertain, valuation requires some assessment of the probability of default (and loss given default).

Pre-standardisation

Before 2009 almost all single-name CDS contracts were quoted and traded on par-spreads. The par-spread applied to the premium leg, on a running basis, is the spread that equalises the present

values of the premium and contingent legs as of trade inception (giving the contract a zero NPV on trade date):

$$\text{PV premium leg} = \text{PV contingent leg}$$

Therefore, the par-spread reflects the default-probability-weighted expected loss on the contract and is a function of the default probability, the recovery value, the maturity of the CDS and discount rates⁸. In this pre-standardisation era for CDS had a buyer seeking protection received and accepted a quote of 141 basis points from a market maker then the trade coupon (the fixed premium paid every quarter) would simply be 141 bps. A week later had they put on another trade referencing the same credit entity the coupon would have been a different number depending on market movements regarding the entity's credit worthiness.

Difficulties with varying non-standard coupons

Although straightforward, this convention led to some undesirable consequences such as difficulties when hedging exposures with offsetting trades. In our example above, say the spread moved from 141 to 400 bps after some time and the buyer of the CDS (having benefited from spread widening) wanted to lock in profits. They could put on an offsetting trade by selling protection at 400 bps. They would have zero exposure to default risk via the two trades and would be receiving a net coupon of 259 basis points (400-141) until maturity or until a credit event occurs. However, if a credit event were to occur then with both contracts triggering the 259 basis point annuity would disappear. The amount of realised profits attained would vary depending on when the credit event occurred (with sooner credit events being more punishing for the protection seller). Alternatively, the buyer could have unwound the CDS position with the market-maker counterparty and received a cash amount representing the MTM PV of the trade. This however, would just pass the problem of coupon mismatches on to the market maker as they would need to fund and pay the cash amount (to buy protection from the client at 141 bps) and then hedge the client's unwind (by selling protection) with a market standard zero-NPV CDS at prevailing spreads. If a credit event were to suddenly occur, they would have paid the unwind cash to the client but not yet received any of the coupon from the hedge protection sold. The market maker would be exposed to what is known as jump-to-default risk.

Standardisation

In 2009, the CDS market adopted new contract specifications to deal with the issues described above. Standardisation that aimed to make CDS contracts more fungible and in order to aid compression, increase liquidity and promote clearing. These changes coincided with (and were intertwined with) the Big and Small Bangs (see the *Credit Events Procedures sub-section*).

April 2009 saw the Standard North American Contract (SNAC) come into effect and by June the same year the Standard European Contract (STEC) was launched. Almost all CDS contracts now adhered to the following new conventions:

- Standard fixed coupons
- Standard maturity dates
- Standard coupon payment dates
- Accrued interest

8. CDS are unfunded and are often considered a pure credit risk product but they do have some (second order) sensitivity to interest rates via discounting. IHS Markit's CDS pricing service provides CDS data (including recovery rates and risk sensitivities such as Credit DV01, RPV01 and IR DV01) to aid clients with price discovery, risk and valuations Please contact sales@ihsmarkit.com for more information.

Fixed coupons, upfront amounts and quoted spreads

Trading with fixed coupons⁹ instead of the par-spread implies an exchange of an upfront amount (UF) at the beginning of the trade, derived as the present value of the CDS given the fixed coupon and the par-spread as follows:

$$UF \approx (\text{Fixed Coupon} - \text{Par Spread}) \times \text{RPV01}$$

The upfront amount can be positive or negative for any of the parties depending on whether the par spread is higher or lower than the fixed coupon. Here RPV01 means risky present value of 1 basis point or the value of the “risky-annuity” and is the sum of the discount factors weighted by survival probabilities¹⁰. The risky annuity refers to the premium leg i.e. the coupon leg, such that the present value of a coupon leg with coupon, c , is just $c \times \text{RPV01}$.

With the advent of fixed coupons, CDS are now mostly quoted in conventional-spread or in price terms. The quoted conventional spread, q , relates the UF amount from above to a RPV01^* computed using the ISDA Standard CDS Model that makes certain assumptions about credit and interest rate yield curves. This conventional spread is given by the following relationship:

$$\text{RPV01} \times (\text{Fixed Coupon} - \text{Par Spread}) \approx UF \approx \text{RPV01}^* \times (\text{Fixed Coupon} - \text{Conventional Spread})$$

Here it is assumed that RPV01 is the value of the risky-annuity as determined by the quoting market maker¹¹ when computing the upfront amount from their point of view. If one knows the upfront amount and the fixed coupon then the relevant spread can be backed out.¹²

Standard maturities, coupon dates and rolls - taking a cue from the CDS indices

Standardisation has also established yearly maturity dates with 5 years being the most liquid and standard quarterly coupon dates¹³ on the 20th of March, June, September and December (commonly referred to as “credit IMM” dates as they fall close to the 3rd Wednesday of these months). At the end of 2015 it also became convention for single-name CDS to roll into a new “on-the-run” contract on a semi-annual basis every March and September.

These changes brought the single name CDS market more into line with the CDS indices market that had adopted these standards even earlier. Other changes include the use of a full first coupon (if the trade was initiated between IMM dates) and the payment of pro-rata accrued coupon up until a credit event (i.e. the coupon accrued between the previous coupon payment date and the Event Determination Date).

Expected recovery

Estimated recovery is also key part of valuing a CDS contract, as it represents the value post-default, and therefore impacts expected cash flows. For investment grade names, recovery is generally assumed to be 40% (as the probability of default is low, the recovery rate is at best an estimate). For distressed names however, where the probability of default is higher, recovery tends to be more precisely defined.

9. SNAC fixed coupons are 100 and 500 bps and SEC coupons span a range of values from 25 to 1000 bps.

10. Another related risk measure is called the Credit DV01 and that is calculated as difference between the current market value of a CDS and a re-calculated MV by parallel shifting the credit curve up by 1 bp.

11. RPV01 is likely using the full credit term structure and a particular discount curve chosen by the quoting bank whereas, RPV01^* uses a flat CDS curve anchored at the 5yr point and discount rates as defined by ISDA on www.cdsmodel.com.

12. The IHS Markit CDS converter uses the ISDA Standard Model to convert UF values to conventional spreads and vice-versa.

13. Typically, CDS assume Modified-Following business day conventions.

Documentation

The ISDA Master Agreement

The ISDA Master Agreement (1992, updated in 2002) published by the International Swaps and Derivatives Association is the governing document enabling OTC derivative transactions such as CDS. The master agreement outlines the contractual relationship between counterparties and covers themes such as contract formation, disputes, closing out of contracts, netting and payments. Once the master agreement is established between two counterparties it can be referred to across a number of trades and associated confirmations, as opposed to counterparties having to fully write out exhaustive contract terms each time there is a trade.

The ISDA Credit Derivatives Definitions

In addition to the master agreement, ISDA provides a set of definitions for each type of derivative. The ISDA Credit Derivatives Definitions (2003, supplemented in 2009 and updated in 2014 with associated transition protocols) provide market standard definitions for CDS transactions. Further amendments to the ISDA Credit Derivatives Definitions can be added by way of Supplements. Market participants sign up via 'ISDA Protocols' for the Supplements to be applicable to the relevant ISDA Definitions.

The 2003 ISDA Credit Derivatives Definitions

The 2003 definitions included articles covering general trade terms (such as definitions of dates in transactions) as well as credit specific terms (such as defining settlement and credit events). They also covered other items such as provisions for novating contracts. There have been number of Supplements to the 2003 ISDA Credit Derivatives Definitions, some of which have also been incorporated in the revised 2014 ISDA Credit Derivatives Definitions.

The 2014 ISDA Credit Derivatives Definitions

The 2014 updates were spurred by the credit event experiences gained over the Global Financial Crisis and European Sovereign Debt Crisis and were designed to make the definitions more robust. The key changes including the formalising of a Standard Reference Obligation, the adding of Government Intervention for non-US financials as new credit event (related to government-initiated bail-ins) and the clearing up of ambiguity around succession events. The Supplements to the 2014 ISDA Credit Derivatives Definitions include:

- 2014 Sovereign No Asset Package Delivery Supplement
- 2014 CoCo Supplement
- 2019 Narrowly Tailored Credit Event Supplement

Market Structure

Clearing

In the years following the Global Financial Crisis there has also been a continued push for centralised clearing of CDS to reduce uncertainty around counterparty risk and to increase transparency. Without clearing, the CDS market would be an opaque and systemic-risk prone web of exposures across multiple bi-lateral counterparties. However, via intermediary clearing and its

hub-and-spoke model, a well-funded central counterparty (a CCP) can act as the counterparty for all trades with all collateral flowing through them thus reducing the amount of inter-dealer positions and associated counterparty risks.

Standardisation and central clearing (in place now for most standard CDS and CDS index contracts) has facilitated the netting or novation of excess and redundant CDS positions, resulting in compression of total notional amount outstanding. This has benefited dealers and other participants as it has led to lower margin requirements and capital charges.

Standard Reference Obligation (SRO)

The concept of Standard Reference Obligation (SRO) was introduced in the 2014 ISDA Credit Derivatives Definitions. As mentioned earlier, a given reference entity can have multiple deliverable obligations. This could potentially give rise to cases where CDS transactions on the same terms apart from the Reference Obligations may not perfectly offset each other. In a clearing context, the reference obligations used by the CCPs may be different from those used in bilateral CDS transactions, potentially causing a basis risk between cleared and uncleared trades, or between trades cleared in different CCPs. The SRO concept addresses these issues where an SRO is published, by applying a standardized Reference Obligation across all CDS transactions that apply the SRO. IHS Markit's Reference Entity Database (RED) service provides a list of SROs currently applicable for the respective reference entities.

RED codes

A corporate company may have several legal entities associated with it and so CDS market participants need to be able to identify and confirm the specific legal entity on which protection is being traded.

IHS Markit's Reference Entity Database (RED) is the market standard that confirms the legal relationship between reference entities that trade in the credit default swap market and their associated reference obligations, known as "pairs". Each entity is identified with a unique 6-digit alphanumeric code, and a 9-digit code identifies the pair. RED codes are widely used by CDS market participants to electronically match and confirm CDS transactions. The RED "preferred reference obligation" is the default reference obligation for CDS trades based on liquidity criteria.

The CDS RED service also makes it possible to record the corporate history of a reference entity across corporate actions, CDS succession events and credit events.

Credit event procedures

In addition to contract standardisation (SNAC and STEC), 2009 also introduced new frameworks for handling credit events and for working out cash flows on the default leg. These came via a series of ISDA supplements to the 2003 definitions and associated CDS protocols known as the (global and North America contract centric) Big Bang (April 2009) and the (more Europe centric) Small Bang (July 2009). The key changes included:

- The establishment of Determination Committees (comprised of dealers and buy side institutions)
- The hardwiring of auctions into CDS documentation
- Incorporating rolling lookback windows for contract effective dates

On request, the regional Determination Committee will decide whether and what type of credit or succession event has taken place. It will also determine the date of the event and make rulings on auction requirements. Auctions, administered by Creditex and IHS Markit will then determine a single, binding, common recovery value for all contracts. Before the hardwiring of auctions, artificial inflation of recovery prices was a potential risk, especially under physical CDS settlement where delivery requirements created excess demand for deliverable bonds. This effect was exacerbated in situations where CDS notional against an issuer outweighed the physical amount of bonds outstanding in the market from that same issuer. The credit auction mechanism provides an efficient and transparent means for resolving both physical and cash settled contract payoffs post a credit event.

Prior to the introduction of rolling lookback windows, protection in a CDS contract became effective on a T+1 basis. This meant that two offsetting CDS, otherwise identical but traded, say, a week apart, would not truly offset the credit event risk. The period between (these old method) effective dates would equate to a stub risk across the two positions - one contract would offer protection for that period but the other would not. If say a few weeks after the second trade was put on, a credit event is determined to have taken place during that stub week then only the first contract would trigger (and not the second) therefore making the hedge incomplete. In order to make contracts more fungible and netting more feasible, rolling lookback provisions were instituted whereby all contracts have a rolling 60 day (90 days for succession events) lookback effective date. Trade dates have become largely irrelevant now that every open position, on any given day, has the same effective date for protection i.e. today less 60 days¹⁴.

CDS usage

Types of CDS

The different types of basic CDS contracts that can be traded include:

- Standard CDS where protection is bought or sold on senior or subordinated debt, issued by corporate or sovereign reference entities
- LCDS which are loan-only CDS where protection is bought or sold on leveraged loans issued by the reference entities. These are higher in the capital structure (and usually with higher recovery rates) than standard CDS
- MCDS where the reference entity is a municipality, and the reference obligation a municipal bond.
- ABCDS which are CDS on structured securities (Asset Backed Securities typically)

Use cases

There are numerous use cases for CDS and CDS indices with applications ranging from risk hedging, view taking and the building of structured positions:

- **Isolating & Hedging Credit Risk:** CDS enable the mitigation of credit risk exposure generated from owning bonds or being a lender in a loan arrangement – the prototypical use cases for CDS. CDS allow one to isolate and take a pure view on credit risk, either long or short, on a single name credit risk (that may also be hard to find in cash space) or on a number of names via baskets or the CDS indices

14. For CDS index contracts the lookback effective date is tied to the last index series roll date. Please see the Credit Indices sub-section in this primer for more on credit event handling related to the CDS indices.

- **Tactical Credit Exposure Adjustments:** without CDS, bond managers would be very constrained when it comes to shifting their credit exposures. They would need to buy and sell bonds but this would entail the transfer of other types of risk in addition to credit, such as interest rate, liquidity and currency risk, for example. Furthermore, in those situations where the view on the credit might be short term, the buying or selling of actual bonds is a less efficient way to express the view than compared to using CDS as a tactical overlay
- **Shorting Credit Risk:** it is often easier to short credit risk by buying protection on CDS rather than physically shorting cash bonds
- **Cost of Capital & Counterparty Risk Management:** CDS and the credit risk transfer they enable, allows capital or credit exposure constrained businesses (banks for example) to free up capacity to facilitate doing more business. CDS and CDS data are also used extensively by banks in derivative counterparty risk management, such as in CVA trading
- **Loan Hedging:** For LCDS, counterparties can assign credit risk of bank loans without requiring consent of lender (assigning bank loans often requires borrower consent/notification), therefore LCDS reduce bank exposure to credit risk without disturbing client relationships
- **Replication:** CDS can be used to synthetically replicate bond or bond portfolio exposures (often, in conjunction with other instruments such as interest rate swaps and futures)
- **Relative Value Trading:** e.g. trading Investment Grade versus High Yield, the CDS-bond basis, CDS index skew and index dispersion (singles name CDS versus the indices) or credit versus equity
- **Expressing Macro Credit Views:** CDS indices allow one to easily express broad credit market views
- **Curve Trading:** CDS and CDS indices of different maturities can be used to take views on the shape of the credit curve via, for example, steepeners or flatteners
- **Options/Volatility Trading:** CDS options (typically options on CDS indices) can be used to construct directional plays, yield enhancement positions via options carry, or other types of volatility strategies including those that trade implied versus realised volatility
- **Risk Factor Investing:** factor based strategies such as carry, trend and value can be constructed in credit space using CDS
- **Index Tranche Trading:** Tranched index trading allow one to tailor exposure to specific segments of the index loss distribution. Tranche trading in general is closely related to Synthetic CDOs as well as correlation trading
- **“First (or nth) to Default” Baskets:** These bespoke products can trade as swaps or as notes where upon the first (or nth) default the contract terminates and the contingent payoff is made
- **Credit Linked Notes:** CLNs are funded credit derivative with an embedded CDS component that synthetically replicate a corporate bond (used in some cases by those who cannot trade swaps)

The background of the slide features a complex financial chart. It includes a grid of horizontal and vertical lines, with a prominent dashed orange line curving upwards from the bottom left. Overlaid on this are several candlestick-style bars in yellow and blue, representing price movements. The overall color palette is dominated by teal, green, and orange tones.

Section 2 – CDS Indices

What is a CDS index?

An index measures a basket of securities that are defined by specified characteristics. A CDS index is an index whose underlying reference obligations are credit default swap instruments. The names in the index are selected based on their liquidity, respective business sectors, and geographical location, and depend on the rules governing the index. Tradable CDS indices allow investors to take a view on certain portions of the credit markets. Standardized CDS indices are created and administered by IHS Markit and include the CDX and iTraxx indices. CDS indices are among the most liquid instruments in the credit markets, enabling investors to efficiently access key market segments at low cost.

Brief history

Synthetic CDS indices originated in 2002, when JP Morgan launched the JECI and HYDI indices, which were later joined by Morgan Stanley's Synthetic TRACERS. In 2003, both firms merged their indices to form the consolidated TRAC-X indices. During the same period, the index provider iBoxx also launched synthetic indices. While TRAC-X indices consisted of US names, iBoxx was active in the non-US credit derivatives market. In 2004, TRAC-X and iBoxx CDS indices merged to form the CDX indices in North America and the iTraxx indices in Europe and Asia. After being the administrator for CDX and calculation agent for iTraxx, IHS Markit (then 'Markit') acquired both families of indices in November 2007, and now owns the iTraxx and CDX indices, along with iTraxx SovX, and MCDX Indices for derivatives, and the iBoxx indices for cash bonds.

Benefits

CDS indices have grown to become the most liquid instruments in the credit markets. During times of market stress their trading volumes tend to increase yet their cost of trading remains competitive relative to other credit-based instruments. In fact, the CDS indices are often the most efficient instrument to trade during market volatility. Due to their market significance, the CDS indices are routinely referenced to gauge credit market sentiment. Benefits of using CDS indices include:

- **Tradability:** CDS indices can be traded and priced more easily than a basket of cash bond indices or single name CDS. Being standardized, they also bring more liquidity to the trading process
- **Liquidity:** Notional volumes traded in the CDS indices are significantly greater than other instruments in the credit markets, and also drive more liquidity in the single name CDS market
- **Operational Efficiency:** The CDS indices trade on standardized terms, benefiting from well-established legal documentation, electronic straight-through processing via Swap Execution Facilities ("SEFs") and benefit from trading within a Clearing House framework
- **Transaction Costs:** The indices are cost efficient means to trade portions of the market
- **Industry Support:** CDS indices are supported by all major dealer banks, buy-side investment firms, and third parties (for example, IHS Markit offers transaction processing and valuations services)
- **Transparency:** Rules, constituents, parameters (such as the fixed coupon) etc. are all available publicly
- **Ease of portfolio trading:** An index allows investors to gain exposure to a portfolio of instruments through a single trade

See "CDS usage" in Section 1 for a description of the most common use cases for the CDS indices.

Participants

The CDS indices exist in a diverse ecosystem of market participants. The following are some of the key participants in the CDS index landscape:

- **IHS Markit** – IHS Markit owns and operates the indices: including licensing, marketing, administration, and calculation. IHS Markit publishes rules, index annexes and other relevant documents on the CDS indices on its public website
- **Licensed Participants** – These participants include banks that trade indices on their own behalf and provide liquidity for their clients, as well as licensed Clearing Houses and Swap Execution Facilities
 - **Dealers** – act as market makers in the CDS indices, providing market access and liquidity to their clients
 - **Clearing Houses** – provide central clearing of trading in the CDS indices, thereby eliminating counterparty risk, which reduces operational costs
 - **Swap Execution Facilities** – trading platforms providing CDS index pricing and trade execution capability
 - **Third parties** – Third parties have made trading CDS indices easier by integrating them into their platform. For example, OSSTRA (formerly MarkitSERV) provides trade processing support by facilitating buy-side and sell-side firms to communicate and confirm trade details with counterparties electronically.
- **Institutional Investors** – Investors can hedge their positions, or express views on a specific market segment via CDS indices. For example, asset managers, hedge funds, insurance companies and pension funds can trade the indices to go long or short their relevant credit exposure.
- **ISDA** – IHS Markit and various banks have worked with ISDA to create globally approved legal documentation for the CDS indices.

Key characteristics

Appendix 1 presents a roadmap of the major CDS indices, the number of entities included in each index, roll dates, maturities available to trade, and other details for each index. The following table highlights key features of the CDX and iTraxx indices, which are the most widely used credit derivative indices.

Differences between iTraxx and CDX

	iTraxx	CDX
Region	Europe, Asia and Australia	North America and Emerging Markets
Credit Events	Bankruptcy, Failure to Pay, Modified Restructuring	Bankruptcy, Failure to Pay
Currency	Europe – EUR, USD Japan – JPY Asia ex-Japan – USD Australia – USD	USD, EUR

Reference Entities	iTraxx Europe – 125	
	iTraxx Crossover – 75	
	iTraxx Asia ex-Japan – 40	CDX.NA.IG – 125
	iTraxx Japan – 40	CDX.NA.HY – 100
	iTraxx Australia – 25	CDX.EM – 18
	iTraxx MSCI ESG Screened Europe – Variable	

Coupon Payments

Payments from the protection buyer to protection seller are made on a quarterly basis (March 20, June 20, September 20, December 20) and accrue on an Actual/360 day count.¹⁵ As mentioned in Section 1, the coupon accrual conventions follow the ISDA 2014 conventions. If an investor trades a CDS index between two payment dates, the protection buyer will still be responsible for paying the full first coupon to the protection seller at the upcoming payment date. Therefore, when the trade is first placed the protection buyer will be compensated for the coupon accrual to-date.

Index documentation

Indices roll every six months in March and September. At each roll, a new series of the CDS index is created with updated constituents. Though previous series continue trading, liquidity tends to concentrate in the most recent on-the-run series. Further, liquidity is greatest in the 5-year tenor contract. For example, CDX Investment Grade Series 36 will begin trading on September 20, 2021. Then, most investors looking to maintain their credit exposure with the CDS indices will roll their position into the new series. The fixed tenors of the CDS indices enable investors to extend the duration of their position at each index roll, thereby maintaining consistent duration.

Furthermore, IHS Markit supports the indices by providing index annexes across all indices and index series on the CDS indices public website, as well as standard term supplements, trading confirmation documents and entity matrices to support trading.

The roll consists of a series of steps which are administered by IHS Markit. Timelines for the rolls of CDX and iTraxx are given as examples in Appendix 2.

The complete index rules, annexes, standard term supplements and confirmation documents can be found on Markit’s website:

CDX - <http://www.markit.com/Documentation/Product/CDX>

iTraxx - <http://www.markit.com/Documentation/Product/ITraxx>

¹⁵ Except for CDX.EM, where, if the master transaction relates to an Index with an effective date prior to September 20, 2009, the payments are semi-annual on June 20 and December 20 of the year; otherwise, coupon payments are on March 20, June 20, September 20 and December 20 of the year, similar to other CDX indices.

Section 3 – Trading CDS Indices



Trading overview

Trading Conventions

Indices trade either on spread or price. This convention mimics the cash market where some bonds trade on yields, and others on price. The CDS indices convention matches that of the underlying cash instruments.

Spread	CDX IG, iTraxx (Asia ex-Japan, Australia, Europe, Japan, MSCI ESG Screened Europe)
Price	CDX (HY, EM)

Intuitively, if an index has a fixed coupon of 100 basis points (bps) and the current spread is 140 bps, it is positive for the protection buyer (they are paying 100 bps for something that is currently worth 140 bps). The price is inversely related to spread so the price of the index at a spread of 90 bps is lower than the price at a spread of 60 bps, and as the protection buyer is short the credit, a drop in price is positive for the protection buyer.

Where can I trade?

CDS Indices are over-the-counter (OTC) products and can be traded with licensed participants providing liquidity. The vast majority of CDS indices are centrally cleared, thereby reducing counterparty risk, and are also available to trade on major Swap Execution Facilities (“SEFs”).

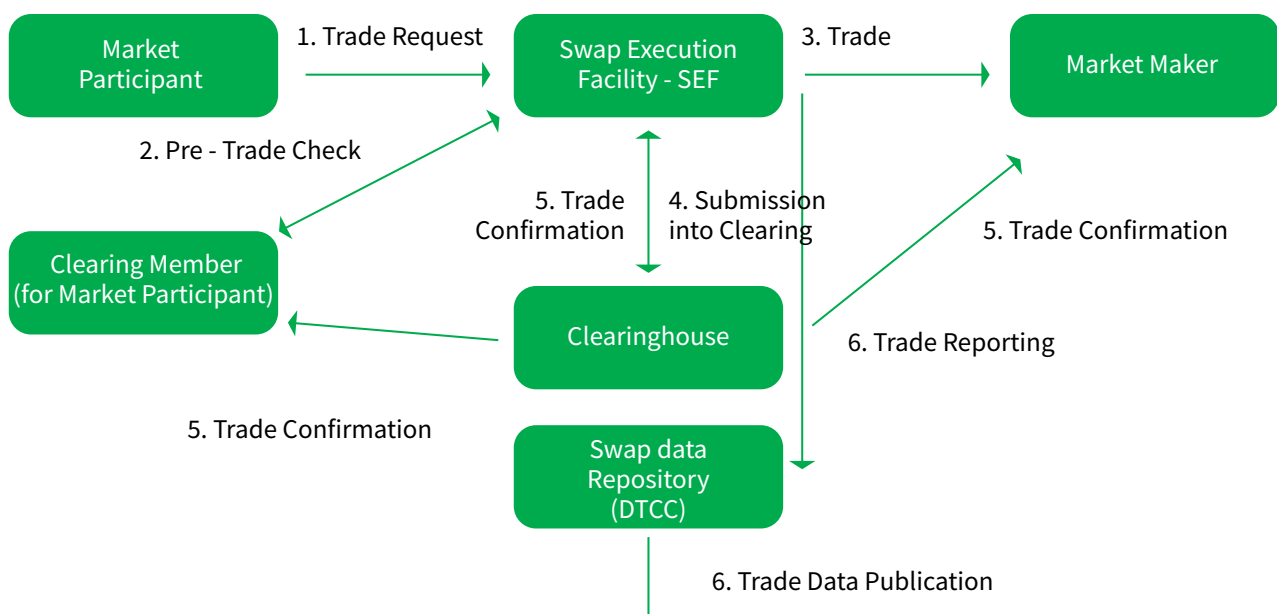
A list of licensed participants providing liquidity for the US indices is available on:

<http://www.ihsmarkit.com/Documentation/Product/CDX>

A list of licensed participants providing liquidity for the European and Asian indices is available on:

<http://www.ihsmarkit.com/Documentation/Product/iTraxx>

Trade flow example (Client to Dealer trade)



How do I trade?

Buying protection and selling protection on the indices can be compared to taking a short position and long position, respectively, on the credit risk component of a portfolio of bonds. Specifically, since the underlying components of the CDS indices are credit default swap contracts, a buyer of credit protection is said to be short credit risk. The protection buyer then pays the fixed index coupon, which is equivalent to an insurance premium for the credit protection. The index protection buyer position can be summarized as follows:

Fixed Rate Payer = Protection Buyer = Short credit risk

Conversely, the index protection seller receives the fixed index coupon in exchange for their promise to pay out credit losses on any credit events that occur to issuers within the index basket and is therefore long credit risk. The index protection seller is assuming the credit risk of the underlying market in exchange for the coupon payments they receive for offering the position. The index protection seller position can be summarized as follows:

Fixed Rate Receiver = Protection Seller = Long credit risk

The indices trade with a fixed coupon that is paid quarterly. Upfront and unwind MTM payments are made at initiation and close of the trade respectively to reflect the change in price of the index. From a protection buyer's perspective, the mark-to-market position would increase with a widening in index spreads. The indices are quoted on a clean basis, meaning that accruals are not taken into account for pricing purposes.

Trade-life cycle example

Trade details:

Index = CDX.NA.HY.S35 5Y

Roll Date = 28th September 2020

Trade Date = 10th November 2020

Coupon Accrual Start Date = 21st September 2020

Price = \$107.61

Fixed coupon = 500 bps.

Spread = 332.80 bps

Investment:

Investor A buys \$10,000,000 notional protection on the index on 10th November 2020, when the spread was 332.80 bps and the corresponding price was \$107.61.

Upfront Payment by investor A (on 10th November 2020):

The investor makes an upfront payment to account for the movement in spreads from roll date to trade date. When an investor buys protection with a spread above the coupon, they will owe an upfront payment to account for the difference. When the spread is below the fixed coupon, the protection buyer will receive an upfront payment, since they will make payments based on the higher fixed coupon for the life of the contract.

Upfront payment = (notional) * ((par – traded price) / par)

$$= (10,000,000) * ((100 - 107.61) / 100)$$

$$= -\$761,000$$

The upfront payment in this case is negative, indicating the protection buyer (investor A) receives the upfront payment.

Accrued Interest received by investor A:

The investor will receive the accrued interest up to trade date (as the investor will have to pay the full coupon on coupon payment date – this simplifies operations as all protection buyers make the same payment on the same date).

$$\text{Accrued Interest} = (\text{notional}) * (\text{coupon}) * (\text{Trade Date} - \text{Coupon Accrual Start Date}/360)$$

$$= (10,000,000) * (.05) * (50/360)$$

$$= \$69,444.44$$

Therefore, the **net initial inflow** for investor A would be:

$$\text{Net inflow} = 761,000 + 69,444.44$$

$$= \$830,444.44$$

Quarterly Fixed Coupon Payment (on 21st December 2020)

Coupon Payment Date = 21st December 2020

Coupon Accrual Start Date = 21st September 2020

Investor A pays the fixed coupon.

$$\text{Coupon Payment} = (\text{notional}) * (\text{coupon}) * (\text{Coupon Payment Date} - \text{Coupon Accrual Start Date}/360)$$

$$= (10,000,000) * (.05) * (91/360)$$

$$= \$126,388.89$$

Investor A closes the trade on 8th February 2021

Trade Close Out Date = 8th February 2021

Last Coupon Date = 21st December 2021

Price = 109.60

Spread = 283.37 bps

Investor A pays to unwind the trade based on the mark-to-market (MTM) along with the accrued interest up to trade close out date (8th February 2021):

$$\text{Unwind MTM} = (\text{notional}) * ((\text{par} - \text{traded price}) / \text{par})$$

$$= (10,000,000) * (100 - 109.60)/100$$

$$= - \$960,000$$

$$\begin{aligned}
\text{Accrued Interest} &= (\text{notional}) * (\text{coupon}) * (\text{Trade Close Out Date} - \text{Last Coupon Date}/360) \\
&= (10,000,000) * (.05) * (49/360) \\
&= \$68,055.56
\end{aligned}$$

$$\begin{aligned}
\text{Net cashflow} &= \text{Unwind MTM} - \text{Accrued Interest} \\
&= - \$960,000 - \$68,055.56 \\
&= - \$1,280,055.56
\end{aligned}$$

The net cashflow in this case is negative, indicating the protection buyer (investor A) makes a payment to close out the trade.

Credit events

As described in Section 1, Credit Events result in the triggering of the CDS contract. As a consequence, a payout occurs from the seller of protection on the index to the buyer of protection. The list of possible Credit Events are highlighted Section 1 and the table in Section 2 above.

Following a Credit Event in a constituent of the CDS index, a new version of the index is published which assigns a zero percent weight on the relevant entity. The notional amount on the index trade is reduced by the weight of the name in the index. Assuming 100 names in the index and one default, with an outstanding \$10 million index position the new version of the index will contain 99 names and have a revised notional of \$9.9 million rather than \$10 million.

The new version of the index only starts trading from the day following the auction date of the index constituent impacted by the credit event. This means that from the date the ISDA Determinations Committee determines the credit event has occurred i.e. the Event Determination Date to the auction date of the entity, the index trades with the impacted entity in the index. However, in case of restructuring credit events, the new version of the index starts trading from the day following the Event Determination Date. Restructuring credit events result in the impacted entity “spinning-out” of the index resulting in the investor holding a position on the new index version and a single-name CDS contract on the restructured entity.

Below is a detailed example of the cash flows when a credit event occurs in one of the index constituents.

Index reversion example

Index details:

Index = CDX.NA.HY.S34 5Y

Roll Date = 20th March 2020

Fixed coupon = 500 bps

Investment:

Investor A has a protection buyer position of \$10,000,000 notional on CDX.NA.HY.S34 Version 1 5Y before the credit event occurred.

Credit event:

Impacted entity: Whiting Petroleum Corporation

Credit event type: Bankruptcy

Index constituent weight: 1%

Event Determination Date: 1st April 2020

Auction Date: 6th May 2020

Auction Recovery: 7%

New version effective date: 7th May 2020

Last coupon date: 20th March 2020

Next coupon date: 22nd June 2020

Mechanics:

Following the credit event, Investor A is due to receive a payout on the impacted entity in the index. This payout is received after the auction date and a new version of the index starts trading from the day following the auction date. As noted earlier, in the period from the Event Determination Date up until the auction date, CDX.NA.HY S34 Version 1 is still the active index version even though it has the defaulted constituent in it. From the day following the auction date, CDX.NA.HY S34 Version 2 becomes the active index version and investor A's notional is reduced to \$9.9 million.

Payout to protection buyer:

The protection buyer receives a payout equal to the loss on the index contract after adjusting for coupon accruals since the Event Determination Date.

$$\begin{aligned}\text{Loss} &= (1 - \text{Auction Recovery}) * \text{Index Constituent weight} * \text{Notional} \\ &= (100\% - 7\%) * 1\% * 10,000,000 \\ &= \$93,000\end{aligned}$$

Since the next coupon date falls after the auction date when the new index version starts trading, investor A will be paying a coupon based on the reduced notional of \$9.9 million for the entire last coupon period. However, the protection seller must be compensated for the risk from the last coupon date up until the Event Determination Date. This is calculated as a rebate to the protection seller:

$$\begin{aligned}\text{Rebate} &= (\text{Event Determination Date} - \text{Last Coupon Date})/360 * \text{Fixed Coupon} * \text{Index Constituent weight} * \text{Notional} \\ &= (11/360) * 500 \text{ bps} * \$10,000,000 * 1\% \\ &= \$152.78\end{aligned}$$

This rebate is deducted from the loss to arrive at the final payout to the protection buyer:

$$\begin{aligned}\text{Final payout} &= \text{Loss} - \text{Rebate} \\ &= 93000 - 152.78 \\ &= \$92,8472.22\end{aligned}$$

Thus, Investor A receives a payout of \$92,8472.22 for the credit event on Whiting Petroleum Corporation. Further, Investor A now has a protection buyer position of \$9,900,000 notional on CDX.NA.HY.S34 Version 2 5Y which assigns a zero weighting to Whiting Petroleum Corporation.

Section 4 – Tranches



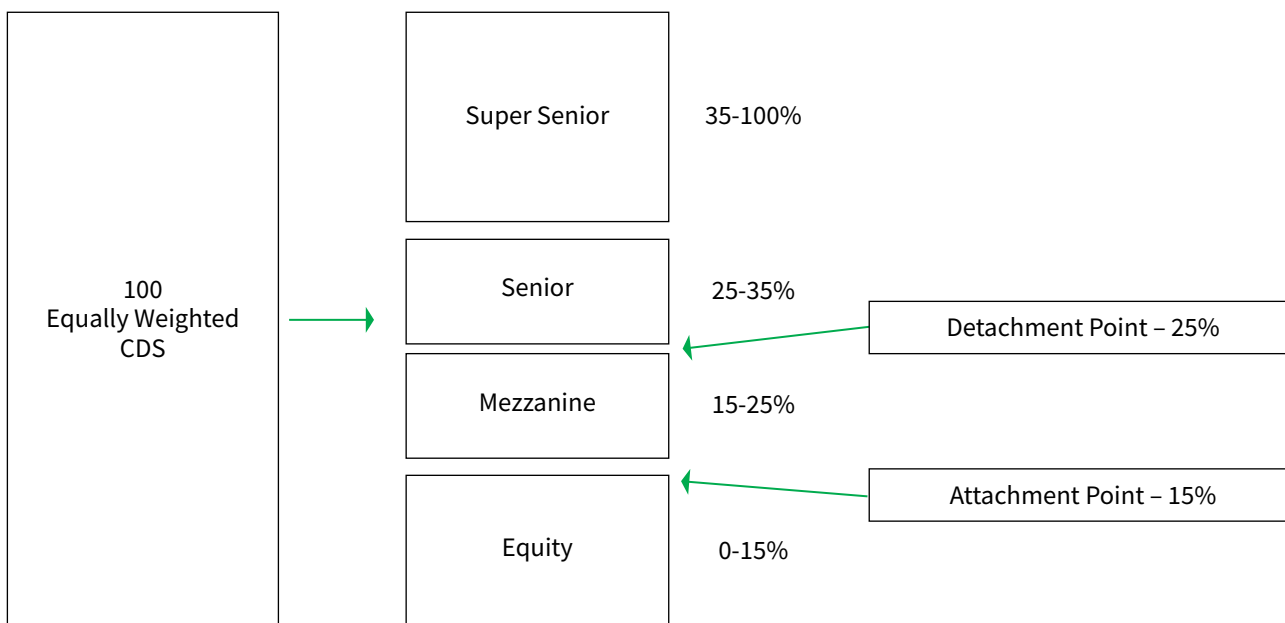
Overview

Some of the CDS indices are also available in a tranching format, which allows investors to gain exposure on a particular portion of the index loss distribution. Tranches are defined by attachment and detachment points for the index loss distribution. Credit events affect the tranches according to the seniority of the tranche in the loss distribution. This means that when credit events occur, losses are first absorbed by the lower level tranches in the index up to the detachment point, before moving to next senior tranche.

It is important to note that the attachment and detachment points refer to the loss amounts taking into account the Loss Given Default (LGD) of the constituents impacted by the credit events. Unlike an index, wherein a credit event results in a reduction in the index factor by the weight of the impacted index constituent, the tranche detachment point is reduced by the LGD of the impacted constituent.

Another major difference compared to the indices is that tranches only roll once a year during September. Further information on tranche roll date and trade conventions are provided in the Appendix.

Example of the CDX.NA.HY tranches:



CDS index tranches are liquid instruments that, among other use cases, facilitate correlation trading. Correlation in this context refers to the probability of default of one reference entity in relation to others. The estimation of implied correlation among the CDS index constituents requires complex mathematical modelling and is used to determine the value of the tranche. Generally speaking, a higher correlation implies a higher likelihood of defaults happening around the same time and thereby increasing the value of the tranche. Conversely, a lower correlation implies a lower likelihood of defaults happening around the same time and thereby decreasing the value of the tranche. Theoretically, when there is a high correlation between the index constituents, the value of the tranche tends towards the sum of the values of the underlying index constituents. On the contrary, a lower correlation implies the value of the tranche tending towards the value of the index constituent with the highest probability of default.

Tranche trade mechanics:

The protection buyer of a tranche makes quarterly coupon payments to the protection seller and receives a payment in case there is a credit event in the underlying index that impacts the tranche in question. After June 22nd 2009, tranches mimic indices with an upfront at the trade date, the seller paying the buyer the accrued up to trade date, and the buyer paying full coupon at next payment date. So no matter when a trade is entered, the coupon legs always accrue from the same date and make unwinds, transfers and collapses very easy.

Coupon payments (500bps or 100bps per annum) are made until the notional amount of the tranche gets fully written down due to a series of credit events or until maturity whichever is earlier. Payments are made by the protection seller as long as the losses are greater than the attachment point and less than the detachment point for that tranche. The premium payments are made on the reduced notional after each credit event. Once the total loss reaches the detachment point, that tranche notional is fully written down.

Tranche trading example:

We will use the equity tranche of CDX.NA.HY Series 33 to understand the cash flows. We will also use the credit event on Dean Foods Co as an example to understand how the tranche mechanics change post credit event. Like Indices, the new version (ex-defaulted entity) trades after the credit event auction.

Index details:

100 equally-weighted names

Tranches: 0-15, 15-25, 25-35, 35-100

Investment:

Investor B bought protection on the 0-15% tranche with a notional of \$15 million. Investor B will make quarterly coupon payments to the protection seller and receives a payment in case there is a credit event in the underlying index.

Dean Foods Co Defaults:

Auction Recovery rate = 9.25%

Loss Given Default (LGD) = 100% - 9.25% = 90.75%

Payment received by Investor B from the protection seller:

Implied Loss = LGD * Weighting
= .9075 * .01
= .009075

Cash Inflow = (Notional * Implied Loss) / Tranche Size
= (15,000,000 * .009075) /.15
= \$907,500

Tranche Adjustment

The 0-15% tranche is adjusted for the reduced notional (based on implied loss) and for the number of remaining names in the index, using a factor of 0.99. The CDX.NA.HY Index Version 2 tranches will have new attachment and detachment points.

Equity tranche

Actual AP = 0%

$$\begin{aligned}\text{Actual DP} &= (\text{Current DP} - \text{Implied Loss}) / \text{Index Factor} \\ &= (15\% - .009075) / .99 \\ &= 14.2348\%\end{aligned}$$

As a result, the attachment and detachment points of the other tranches will also change, except the detachment point of the Super Senior tranche, which will remain at 100%.

Notional Adjustment

The implied loss of .9075% is fully absorbed by the equity tranche, so the original notional of the other tranches is unaffected. However, the other tranches have a smaller cushion protecting them against further losses, except that of the super senior tranche for which notional is adjusted for the recovery. The notional of the super senior tranche is reduced because the recovered amount on the defaulted entity can no longer be lost. The detachment point doesn't change, but the notional is adjusted for the recovery rate. **The loss goes to the equity tranche, and the recovery to the super senior tranche.**

Equity tranche notional post default

$$\begin{aligned}&= \text{Current Notional} - (\text{Weighting} * \text{LGD} * \text{Quoted Notional}) / \text{Actual Tranche Size} \\ &= 15,000,000 - (.01 * .9075 * 15) / (.15 - 0) \\ &= \$14,092,500\end{aligned}$$

Super senior tranche notional post default

$$\begin{aligned}&= \text{Current Notional} - (\text{Weighting} * \text{Recovery} * \text{Quoted Notional}) / \text{Actual Tranche Size} \\ &= 65,000,000 - (.01 * .0925 * 65) / (1-.35) \\ &= \$64,907,500\end{aligned}$$

Tranches and notional on CDX.NA.HY Series 33 Version 2:

Tranche	Quoted AP	Quoted DP	Actual AP	Actual DP	Quoted Notional (in \$mn)	Actual Notional (in \$mn)
Equity tranche	0%	15%	0%	14.235%	15	14.0925
Mezzanine tranche	15%	25%	14%	24.336%	10	10
Senior tranche	25%	35%	24%	34.437%	10	10
Super senior tranche	35%	100%	34%	100.000%	65	64.9075

Once the cumulative loss exceeds 15% due to a series of credit events, the notional on the equity tranche gets fully written down and further loss are taken by the mezzanine tranche. Further, once the notional on the equity, mezzanine and senior tranches are fully written down, subsequent credit events result in a reduction of the super senior tranche notional by the weight of the entity. This is because there is no longer a cushion protecting the super senior tranche and therefore it has to take the losses along with the recovery.

Super senior tranche notional (post credit events after notional of all other tranches is written down)

$$= \text{Current Notional} - (\text{Weighting} * (\text{LGD} + \text{Recovery}) * \text{Quoted Notional}) / \text{Actual Tranche Size}$$

$$= \text{Current Notional} - (\text{Weighting} * \text{Quoted Notional}) / \text{Actual Tranche Size}$$

Like indices, iTraxx/CDX tranches also offer a standardized trading structure. IHS Markit provides legal documentation in the form of Standard Terms Supplement and Confirmation. Further, electronic confirmation services are available through MarkitSERV. IHS Markit also offers the most comprehensive pricing service for on-the-run and off-the-run tranches, providing bid, ask, and mid upfronts and spreads, as well as base correlations.

Additional information is available in the Appendix.



Section 5 – Swaptions

Overview

In recent years, there has also been significant growth in the CDS Index Options market. CDS Index Options, or Swaptions, are contracts that promise the holder of the Swaption contract the right to enter into a CDS index position at option expiry at the specified strike level. Similar to options in other asset classes, CDS Index Options can be used express a view or to hedge volatility in the underlying CDS indices. Like CDS Indices, CDS Index Options are OTC products and are centrally cleared.

CDS index options are European style only and can either be Payer or Receiver options. A payer option allows the option holder to enter into a fixed rate payer (protection buyer) position in the underlying CDS index at the agreed strike level. Likewise, a receiver option gives the option holder the right to enter into a fixed rate receiver (protection seller) position in the underlying CDS index at the agreed strike level.

Payer options are comparable to put options, and receiver options are comparable to call options. The standard option strategies such as calendar spreads, straddles, strangles etc. can be constructed using CDS Index Options. Similarly, the option 'Greeks' (Delta, Gamma, Vega and Theta) used to measure the underlying risk are applicable for CDS Index Options as well. The option premiums partly depend on the option strikes with respect to the underlying index spread/price.

Like CDS indices, CDS Index Options can be quoted in spread or price terms. For an option that is quoted on spread terms the below classification applies:

Spread Option	In-the-money	At-the-money	Out-of-the-money
Payer options	strike < index spread	strike = index spread	strike > index spread
Receiver options	strike > index spread	strike = index spread	strike < index spread

For an option that is quoted on price terms the below classification applies:

Price Option	In-the-money	At-the-money	Out-of-the-money
Payer options	strike > index price	strike = index price	strike < index price
Receiver options	strike < index price	strike = index price	strike > index price

CDS Index Option mechanics

CDS Index Options generally trade in shorter option maturities ranging from 1-month to about 12-months. The liquid options are on the on-the-run index series, but some options may be exercised on the off-the-run series, especially the ones with longer maturity. Typically, the options are on the 5Y tenor of the underlying index.

Another key feature of CDS Index Options is that option expiry is always on the third Wednesday of the month. For instance, a 2M option issued on 02-Jan-2020 will have an expiry date of 19-Feb-2020. An upfront amount is paid by the option buyer at the start of the option contract as the option premium, and no other cash flows are exchanged during the life of the contract.

Credit events

It is important to note that the CDS Index Option contracts do not undergo any changes when there are credit events in the underlying CDS index. This means that the options continue to reference the original index version the option was issued on. If the option holder decides to exercise the option, then the option holder will receive/pay (depending on payer or receiver option) the auction recovery amounts on the constituents impacted by the credit events.

Additional information on quoting and trading conventions is available in Appendix 4.

CDS Index Option trade example

We will use a receiver option on CDX.NA.HY 5Y Series 33 to understand the cash flows. Further, we will also use the credit event on Dean Foods Co as an example to understand how the credit event impacts the option exercise. Options on CDX.NA.HY index are conventionally quoted in price terms.

Index details:

5Y tenor, 100 equally weighted names

Investment:

Investor B bought a receiver option on 01-Oct-2019 with the following characteristics:

Option type: Price option, European style

Term: 3M

Option expiry date: 18-Dec-2019 (third Wednesday)

Option Strike: 107% (Clean Price)

Option premium: 30.65 bps

Underlying index: CDX.NA.HY 5Y Series 33 Version 1

Underlying index clean price as of 01-Oct-2019: 106.4767%

Notional: \$100 million

Initial cash flow would involve payment of the option premium to buy the receiver option:

$$\text{Initial Cash Outflow} = \text{Option premium} * \text{Notional} = 30.65 \text{ bps} * 100,000,000 = \$306,500$$

This gives Investor B the right to enter into a protection seller position on the underlying index at the option strike price of 107%. The option strike prices are clean prices, so the actual upfront amount paid or received to enter into the index position will take into account the accrued coupon amount as well.

Dean Foods Co Defaults:

Auction date: 10-Dec-2020

Auction Recovery rate = 9.25%

Loss Given Default (LGD) = 100% - 9.25% = 90.75%

Following the credit event, the new index version CDX.NA.HY Series 33 Version 2 starts trading from the day following the Auction date. However, the option continues to be quoted referencing the original index version the option was issued on. Therefore, if the option-holder decides to sell the option before its expiry date, she would be able to do so without being impacted by the credit event.

On option expiry date:

Underlying CDX.NA.HY 5Y Series 33 Version 2 clean price as of 18-Dec-2019 is 109.4164. Since the option was issued on Version 1, the strike price needs to be adjusted for the credit event on Dean Foods Co. The adjusted strike price can be calculated as:

$$\begin{aligned}\text{Adjusted Strike Price} &= 1 - \frac{(1 - \text{Original Strike Price}) * (\text{Original IF}) - (1 - R) * \text{Weight}}{(\text{New IF})} \\ &= 1 - \frac{(1 - 1.07) * (1) - (1 - 0.0925) * 0.01}{.99} \\ &= 1.079874 \\ &= 107.9874\%\end{aligned}$$

Since the adjusted strike price is less than the current index price of 109.4164, investor B can benefit from exercising the option. The option can be exercised the day following the option expiry date, and the cash flow for exercising the option will be:

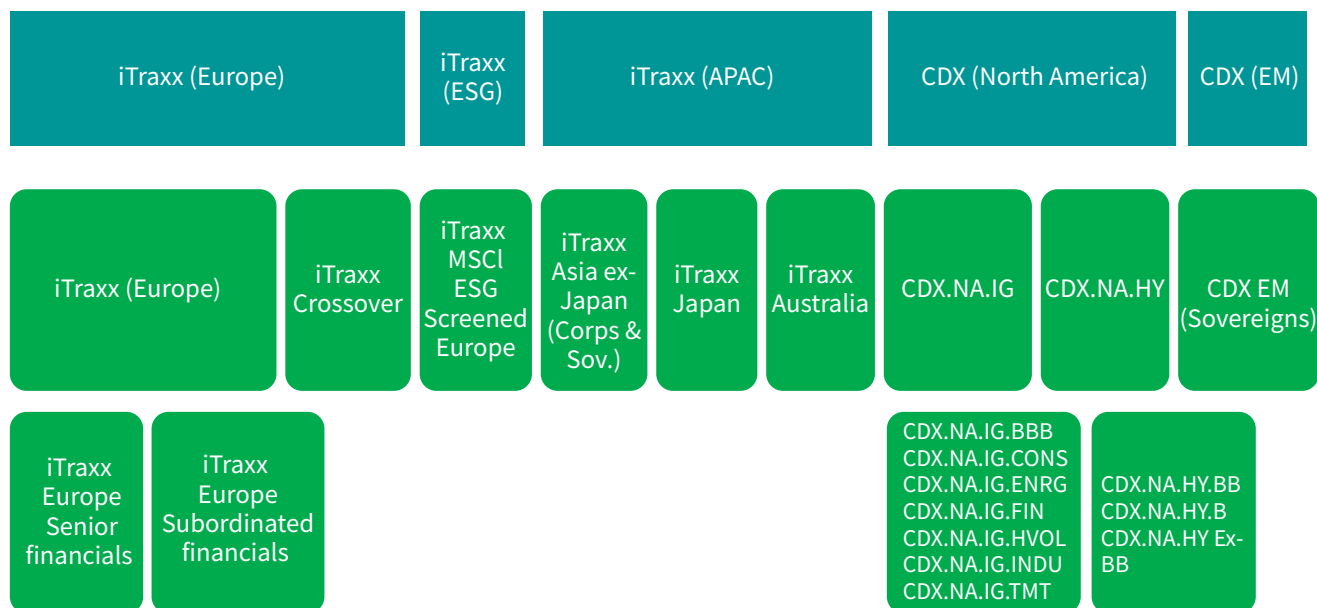
$$\begin{aligned}\text{Cash Flow} &= (1 - \text{Adjusted Strike Price} - \text{Accrued}) * \text{Index Factor} * \text{Notional} \\ &= (1 - 1.079874 - .012639) * .99 * 100,000,000 \\ &= - \$ 9,158,787\end{aligned}$$

Therefore, Investor B will have to pay an upfront amount of \$9,158,787 to enter into a protection seller position upon option expiry.

Appendix 1: Roadmap to Credit Indices

iTraxx and CDX indices provide the market standards for investing, trading and hedging in the credit markets.

IHS Markit CDS Index offering



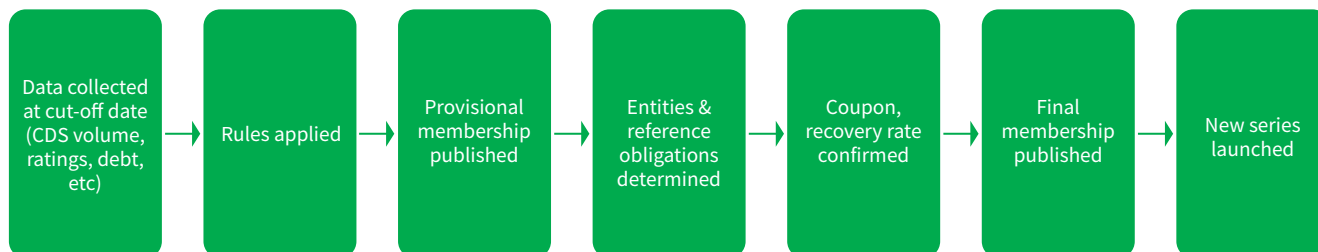
Product descriptions

Index	# of Entities	Fixed Coupon (bps)	Currency	Quoting convention	Recovery Rates (%)	Roll Dates	Tenors
CDX.EM	18	100	USD	Price	40	20th March/Sept	5Y, 10Y
CDX.NA.HY	100	500	USD	Price	40	27th March/Sept	3Y, 5Y, 7Y, 10Y
CDX.NA.IG	125	100	USD	Spread	40	20th March/Sept	1Y, 2Y, 3Y, 5Y, 7Y, 10Y
iTraxx Asia ex-Japan	40	100	USD	Spread	35	20th March/Sept	5Y
iTraxx Australia	25	100	USD	Spread	40	20th March/Sept	5Y
iTraxx Crossover	75	500	EUR	Spread	40	20th March/Sept	3Y, 5Y, 7Y, 10Y
iTraxx Europe	125	100	EUR	Spread	40	20th March/Sept	1Y, 3Y, 5Y, 7Y, 10Y
iTraxx Europe Senior Financials	30	100	EUR	Spread	40	20th March/Sept	5Y, 10Y
iTraxx Europe Subordinated Financials	30	100	EUR	Spread	20	20th March/Sept	5Y, 10Y
iTraxx Japan	40	100	JPY	Spread	35	20th March/Sept	5Y
iTraxx MSCI ESG Screened Europe	Variable	100	EUR	Spread	40	20th March/Sept	5Y

Valuation

IHS Markit offers a variety of services around trading of CDS index products. IHS Markit Quotes and Intraday offer intra-day levels, and IHS Markit Portfolio Valuations provide buyside firms daily valuations using IHS Markit’s extensive dataset. For information on CDS index pricing , please contact the IHS Markit CDS Pricing group at cdssupport@ihsmarkit.com.

Appendix 2: Index Roll Timeline



Timelines are published via the iTraxx News and CDX News pages at least three weeks before the roll dates.

CDX - <https://www.ihsmarkit.com/NewsInformation/GetNews/CDX>

iTraxx - <https://www.ihsmarkit.com/NewsInformation/GetNews/iTraxx>

Appendix 3: Roadmap to Tranches

Index Tranches Availability

Below are the standard attachment and detachment points along with the standard coupon conventions for CDS Index Tranches that are currently available:

Index / Tranche	CDX.NA.IG		CDX.NA.HY		iTraxx Europe		iTraxx Crossover	
	Tranche (%)	Coupon (bps)	Tranche (%)	Coupon (bps)	Tranche (%)	Coupon (bps)	Tranche (%)	Coupon (bps)
Equity	0 - 3	100	0 - 15	500	0 - 3	100	0 - 10	500
Mezzanine	3 - 7	100	15 - 25	500	3 - 6	100	10 - 20	500
Senior	7 - 15	100	25 - 35	500	6 - 12	100	20 - 35	500
Super Senior	15 - 100	100	35 - 100	500	12 - 100	100	35 - 100	500

Tranches roll only once a year during the September roll, and tranche roll dates are four business days following the respective index roll date (T+4). The assumed recovery rates are the same as those of the underlying indices. Standard maturities for the above tranches are 3Y, 5Y, 7Y and 10Y.

IHS Markit CDS Pricing Service provides robust CDS index tranche pricing data.

Appendix 4: Swaptions

CDS Index Option Conventions

Below are the standard conventions with regard to Swaption contracts on each of the below underlying CDS indices:

Swaption	Quoting Convention	Strike Level Units	Standard Strike Increments	Option Premium Units
CDX.NA.IG	Spread	Basis points	2.5 bps	Basis points
CDX.NA.HY	Price	Percentage points	0.5%	Basis points
iTraxx Europe	Spread	Basis points	12.5 bps	Basis points
iTraxx Crossover	Spread	Basis points	2.5 bps	Basis points

IHS Markit CDS Pricing Service provides robust CDS index options pricing data.

Appendix 5: iTraxx/CDX Benchmark Indices

IHS Markit also publishes daily total and excess return index levels for iTraxx/CDX indices. The total and excess return indices track the daily returns of a long or short position in the on-the-run iTraxx/CDX index series. The indices semi-annually roll into the new on-the-run series and also take into account quarterly coupon payments, credit events, and transaction costs. The total return indices reflect the mark to market returns of the underlying CDS index plus the applicable overnight rate on the funded cash position. The excess return indices reflect the mark to market returns on the underlying CDS index only.

In addition, IHS Markit also publishes iTraxx/CDX benchmark indices that track specific strategies constructed using CDS indices, Swaptions, or Tranches. These indices blend two or more CDS index products to reflect diversified exposure to different segments of the underlying CDS market. The strategy indices can be a manifestation of specific investor preferences such as risk-adjusted returns using factors, weighted index exposure, leveraged returns, volatility-based returns etc.

The underlying pricing used in the iTraxx/CDX Benchmark Indices is sourced from IHS Markit CDS Pricing Service. The iTraxx/CDX Benchmark Indices are compliant with the UK Benchmarks Regulation and administered under IHS Markit Benchmark Administration UK (IMBA UK).

The iTraxx/CDX Benchmark Indices are used for benchmarking, risk and performance reporting, total return swaps, credit linked notes and exchange traded products.

For further information, please contact indices@ihsmarkit.com.

Appendix 6: Credit Derivatives Glossary

ABCDs – A CDS where the underlying is an Asset Backed Security.

Asset Swap Spread – An asset swap involves a swap of a fixed rate in return for a floating rate. The fixed rate is derived from an asset. The floating rate is composed of a spread over LIBOR (or another floating benchmark). The asset swap spread (gross spread) is derived by valuing a bond's cash

flows via the swap curve's implied zero rates. This gross spread is the basis point amount added to the swap curve, which causes a bond's computed value to equal the market price of the bond. It is comparable to a CDS spread in that it is interest rate insensitive.

Basel III – The third and latest instalment of global regulatory standards on bank capital adequacy and liquidity agreed by the members of the [Basel Committee on Banking Supervision](#) developed in response to the deficiencies in financial regulation revealed by the financial crisis. Basel III strengthens bank capital requirements and introduces new regulatory requirements on bank liquidity and bank leverage.

Basis – In finance, the basis represents the difference between two instruments. In the world of credit derivatives, the basis may refer to the difference between the CDS and the reference obligation (calculated as the Par Spread minus the bond's Asset Swap Spread or Z-spread). Other potential basis metrics are:

- Restructuring basis: the difference in the cost of protection between a contract trading with or without restructuring (mostly prevalent in North America).
- Quanto basis: the difference in the cost of protection for the same entity trading in different currencies (applies principally to sovereign credits).
- Tier basis: the difference between the cost of protection for different tiers of debt for the same entity.

Basis Point – 1/100th of 1%. 100 basis points = 1%. A common term in fixed income and credit derivative markets.

Basket CDS – A CDS where a group of reference entities are specified in one contract. There are several types of basket CDS including first or Nth-to-default swaps (where settlement is triggered when the first or Nth entity defaults).

Big Bang Protocol – On April 8 2009, the Big Bang Protocol went into effect, hardwiring the auction mechanism and creating Determinations Committees (DC) with the responsibility to declare whether a credit or succession event has occurred. The Protocol also introduced the concept of rolling effective dates with “lookback” periods defining credit event and succession event protection (T-60 days for credit events, and T- 90 days for succession events). Simultaneously, with the global contract changes, North American corporate single names started trading with fixed coupons (50 or 100 bp) and a full first accrual period.

Calculation Agent – The party responsible for determining when a credit event or succession event has occurred, and for calculating the amount of payment required by the Protection Seller.

CDS Spread – Also called a premium. The amount paid by the Protection Buyer to the Protection Seller, typically denominated in basis points and paid quarterly. For example, if the spread for Acme Inc. is 200 basis points, the Protection Buyer will pay the Protection Seller 200 basis points multiplied by the notional of the trade annually (typically paid quarterly, on an ‘actual number of days per period/360’ basis).

CDX – CDS indices focused on the Americas. Investment Grade, High Yield, and Emerging Markets.

Conventional Spreads – These spreads represent the translation of fixed coupon and upfront payment into a single number. Investment grade names are expected to be quoted using this convention as they may have either the 100 or the 500 bps coupon associated with them, depending on the dealer's preference.

Credit Default Swap (CDS) – A credit derivative transaction in which two parties enter into an agreement, whereby one party (the Protection Buyer) pays the other party (the Protection Seller) periodic payments for the specified life of the agreement. The Protection Seller makes no payment unless a credit event relating to a predetermined reference asset occurs. If such an event occurs, it triggers the Protection Seller’s settlement obligation, which can be either cash or physical.

Credit Event Auction – Industry standard mechanism designed to ease the settlement of credit derivative trades following a credit event. The auction process determines the cash settlement price of a CDS, with the compensation received by the protection buyer based on the final agreed-upon auction price. Markit and Creditex have jointly acted as administrators of credit auctions since their inception in June 2005.

Credit Swaptions – aka Credit Options – Allow the investor to either buy protection (for payer swaptions) or sell protection (for receiver swaptions) at a pre-agreed strike for a single credit or an index. Payer Swaptions can be further classified as Knock-Outs or Non-Knock Outs depending on whether the option ceases to exist following a credit event ahead of the option maturity.

Coupons – aka ‘deal spread’ – Since the release of ISDA’s protocols for the standardization of the credit markets, the most common coupon strikes have been 100bps and 500bps, though exceptions may apply.

Credit Event – This is the event-triggering settlement under the CDS contract. The DCs determine whether a credit event has occurred, and whether an auction should take place to settle trades. Since the original ISDA Agreement in 1999, six categories of Credit Events have been defined:

- Bankruptcy – Although the ISDA 2003 Definitions refer to different ways a bankruptcy can occur, the experience has been that the reference entity has filed for relief under bankruptcy law (or equivalent law).
- Failure to pay – The reference entity fails to make interest or principal payments when due, after the grace period expires (if grace period is applicable in the trading documentation).
- Debt restructuring – The configuration of debt obligations is changed in such a way that the credit holder is unfavorably affected (maturity extended and/or coupon reduced). For more details, see the definition for Restructuring Credit Event further below.
- Obligation default, obligation acceleration, and repudiation/moratorium – The 2003 ISDA definitions define these three credit events, but they are very rare.
- Governmental Intervention – A resolution law or regulation passed by a governmental authority which impacts the debt issued by the reference entity. This can include, among others, reduction in the notional outstanding or changes to the interest rates of the relevant bonds.

Credit Spread Curve – The curve display of the credit spread for a unique reference entity/tier/currency/doc-clause combination over different nodes or tenors.

Derivative – A broad term describing financial instruments that “derive” their value from an underlying asset or benchmark. Many derivatives are designed to transfer some form of risk from one party to another. Included in this broad definition would be: Futures, Options (including caps and floors), Swaps (including CDS and interest rate swaps), Forwards and hybrids of the above.

DTCC – Depository Trust & Clearing Corporation provides clearance, settlement and information services for equities, corporate and municipal bonds, government and mortgage-backed securities

and over-the-counter derivatives. The CDS matching and confirmation service provides automated, real-time matching and confirmation for standard single reference entity CDS (including North American, European, Asian corporate credits, and sovereign credits), as well as CDS indices.

DV01 – aka Risky Duration – The change in the mark-to-market value of a CDS trade for a 1bp parallel shift in CDS spreads. Though Risky Duration and Risky Annuity are often used interchangeably, the two measures yield changes that are very close only for CDS spreads trading at par. For larger spread movements away from par, this assumption becomes increasingly inaccurate.

Gross Notional – Gross notional values are the sum of CDS contracts bought (or equivalently sold) for all contracts in aggregate, by sector or for single reference entities displayed. Aggregate gross notional value and contract data provided are calculated on a per-trade basis.

Hazard Rate – The conditional probability of default in Period n for a particular entity given this entity has survived until the beginning of Period n. Hazard rates are 'backed out' of a CDS spread curve and 'bootstrapped' to create a term structure of Hazard rates. This term structure of Hazard rates is then translated into a term structure of Survival Probabilities and a term structure of Non-conditional Default Probabilities. The former is used to weigh the premium (or 'fee') leg of the CDS, while the latter is used to weigh the protection (or 'contingent') payment leg. The PV of each leg is discounted to find the MTM value of a CDS contract.

IHS Markit RED™ – IHS Markit's Reference Entity Database. IHS Markit RED is the industry standard identifier for reference entities and reference obligations in the credit derivative market.

Index Price – In standard quotation, CDX.NA.HY and CDX.EM indices are quoted on a price basis.

Index Roll – Process which, for the Markit iTraxx and Markit CDX suite of indices, takes place twice a year in March and September to create a new index series. The previous index becomes off-the-run, and the new index is the new on-the-run series.

Index Spread – In standard quotation, CDX.NA.IG, iTraxx and MCDX indices are quoted on a spread basis. Converting the price to spread and vice versa can be achieved via the 'Converter' (<https://source.markit.com>) or can be approximated using the dollar value of 1 basis point (DV01) and multiplying that by the difference between the deal spread and the quoted spread.

Index Skew – Market participants refer, by convention, to the index skew as the difference between the price (or spread) of the CDS index traded in the market and its 'fair value' derived from the index constituents. It is also called the index basis. There are several reasons why actual spreads may differ from fair value, e.g lower liquidity in single name spreads, differences in maturity between on-the-run single names and index contracts, and general credit market demand for protection selling and buying, among others.

ISDA – The International Swaps and Derivatives Association is the global trade association representing participants in the privately negotiated derivatives industry, a business covering swaps and options across all asset classes (interest rate, currency, commodity and energy, credit and equity). ISDA was chartered in 1985.

iTraxx – CDS indices focused on Asian, Australian and European markets.

Jump-to-Default Risk – The risk that a credit defaults suddenly before the market has had time to factor its increased default risk into current spreads.

LCDS – A CDS contract where the underlying instrument is a syndicated loan, senior secured in the capital structure.

LIBOR – London Interbank Offered Rate – An interest rate fixing in the interbank market, representing the rate at which highly-rated banks will lend to one another. Also widely used as a floating rate reference on interest rate and currency swaps, and floating rate notes. LIBOR is calculated daily for a variety of currencies including USD and GBP. The EUR equivalent is EURIBOR and the JPY equivalent is TIBOR.

Long Basis – aka ‘buying the basis’ – A trade that seeks to profit from a widening of the basis (becoming more positive), and can be executed by selling the bond and selling the CDS.

Long Credit – Refers to the position of the CDS Protection Seller who is exposed to the credit risk and who receives periodic payments from the Protection Buyer.

iTraxx LevX – The Markit iTraxx LevX indices are based on European Loan credit derivatives - they are constructed from the universe of European corporates. These indices are no longer trading.

iTraxx SovX – Markit iTraxx SovX Indices are a family of sovereign CDS indices covering countries across the globe. The indices have 5-year and 10-year maturities and the underlying currency is USD. IHS Markit is no longer launching new series of iTraxx SovX indices.

LCDX – Markit LCDX is the North American benchmark for first lien leverage loans CDS. These indices are no longer trading.

MCDX – Markit MCDX index references U.S. municipal credits covering revenue and general obligations. IHS Markit is no longer launching new series of MCDX indices.

VolX – The Markit VolX indices are the benchmark family of indices that track the realized volatility in the European and North American credit derivatives markets.

MCDS – A CDS contract where the underlying is a municipality, and the reference obligation is either a Revenue Liability, a General Obligation Liability, a Moral Obligation Liability or a Full Faith and Credit Liability.

Negative Basis – Occurs when the ASW or Z-Spread of a bond is wider than the CDS spread.

Negative Index Skew – A bullish credit indicator, suggesting that there are more sellers of index protection, than buyers of single name protection.

Net Notional – The sum net protection bought by buyers (or equivalently net protection sold by net sellers). Assuming a recovery of 0, net notional positions generally represent the maximum possible net funds transfers between net sellers of protection and net buyers of protection that could be required upon the occurrence of a credit event relating to particular reference entities. Actual net fund transfers are dependent on the recovery rate for the underlying bonds or other debt instruments.

Notional Principal – The quantity of the underlying asset or benchmark to which the derivative contract applies.

Off-the-Run / On-the-Run – Markit iTraxx and CDX indices ‘roll’ every six months when a new series of the index is created with updated constituents. The previous series continues trading although liquidity is concentrated on the new series. The new series is referred to as being on-the-run, with previous series referred to as being off-the-run.

OTC – Over-The-Counter – Refers to trades negotiated and conducted directly between two parties. This contrasts with trades conducted on exchanges, where the trades are defined by the rules of the particular exchange. CDS are examples of an OTC-traded instrument.

Par Spread – The spread of a CDS contract that ensures the PV of the expected premium payments (fee leg) equal the PV of the expected default payment payments (contingent leg).

Positive Basis – Occurs when the CDS spread is trading wider than the ASW or Z-spread of the bond.

Positive Index Skew – A bearish credit indicator suggesting index protection buyers outweigh sellers of single name protection.

Present Value – An asset valuation method, which maps future cash flows from an asset and discounts the future cash flows by an appropriate discount rate.

Probability of Survival – The probability of an entity not defaulting in period n and subsequent periods. These probabilities are modeled as a function of Hazard Rates and a term structure of survival probabilities is used to weigh the premium (or fee) leg when valuing a CDS transaction quantitatively.

Probability of Default – The probability that an entity defaults in a particular period.

Protection Buyer – This is the party to a CDS contract which pays a premium for protection in case a credit event occurs. The Protection Buyer can also speculate that the cost of protection will rise and profit from selling the CDS contract at a higher price than was paid.

Protection Seller – This is the party to a CDS contract receiving the premium payments, and who is exposed to the credit risk of the reference entity.

Quanto CDS – FX swaps embedded in CDS contracts - quoted on all the major sovereigns in addition to some single name corporate swaps and CDS indices. The buyers and sellers of the quanto swap take opposite views on the correlation between currency and credit risk

Recovery Rate – An estimate of percentage of par value that bondholders will receive after a credit event. CDS for investment grade bonds generally assume a 40% recovery rate when valuing CDS trades. However, CDS for lower rated bonds are more dynamic and often reflect lower estimated recovery rates.

Reference Entity – Refers to the legal entity that is the subject of a CDS contract. The reference entity can be the issuer or the guarantor of the debt.

Reference Obligation – The specific bond (debt obligation) that is referenced in the CDS contract.

Restructuring Credit Event – One of the types of credit events which trigger settlement under the CDS contract. Restructuring is a “soft” event, whereby the loss to the owner of the reference obligation is not obvious. In addition, Restructuring often retains a complex maturity structure, so that debt of different maturities may remain outstanding with significant differences in value. The following are the different types of Restructuring clauses:

- Full Restructuring (CR): This allows the Protection Buyer to deliver bonds of any maturity after restructuring of debt in any form occurs. This type of clause is more prevalent in Asia.
- Modified Restructuring (MR): limits deliverable obligations to bonds with maturities of less than 30 months after a credit event.
- Modified Modified Restructuring (MM): This is a “modified” version of the Modified Restructuring clause whereby deliverable obligations can mature up to 60 months (5 years) following the credit event. This type of clause is more prevalent in Europe.

- **No Restructuring (XR):** This option excludes restructuring altogether from the CDS contract, eliminating the possibility that the Protection Seller suffers a “soft” Credit Event that does not necessarily result in losses to the Protection Buyer. No-R protection typically trades cheaper than Mod-R protection. Following the implementation of SNAC, this clause is mainly traded in North America.

Risky PV01 – aka Risky Annuity – The sum of the discount factors used in CDS valuation weighed by their corresponding survival probabilities. The Risky PV01 or Annuity measures the present value of 1bp risky annuity received or paid until the occurrence of a credit event or the expiration of the contract.

Series – Term which identifies the series of a specific index.

Settlement – What occurs in the case of a credit event. Settlement can be cash or physical delivery, depending on the terms of the contract. Traditionally, CDS specified physical delivery but in the last three years numerous auctions have been held to allow for cash settlement.

Short Basis – aka ‘selling the basis’ – a trade that seeks to profit from a tightening of the basis (becoming more negative), which can be executed by buying the bond and buying a CDS.

Short Credit – This is the credit risk position of the Protection Buyer, who sold the credit risk of a bond to the Protection Seller.

Small Bang Protocol – While the CDS Big Bang authorized the Determinations Committees (DC) to decide whether or not a Restructuring Event took place, the DC rules under the CDS Big Bang specifically prohibited them from authorizing auctions to settle trades for Restructuring Events – consequently, the CDS Small Bang (issued June 20, 2009) addressed the need to incorporate the auction settlement mechanism for Restructuring Events, whereby DCs are able to decide whether or not to hold auctions for specific Maturity Buckets and implement a “Use It or Lose It” date. Simultaneously, since June 20th, 2009, standard European corporate entities started trading with fixed coupons of 25, 100, 500 and 1000, similar to North American corporate entities albeit with additional coupons.

SNAC (Standard North American Corporate Contract) – Defines trades based on the new CDS conventions, with full coupon, subject to the Big Bang Protocol (determination committee, auction hardwiring, lookback period).

STEC (Standard European Corporate Contract) – Defines trades based on the new CDS conventions, with full coupons, subject to the Small Bang Protocol which focuses on restructuring clauses.

Succession Event – An event such as a merger, consolidation, amalgamation, transfer of assets or liabilities, demerger, spin-off or other similar events where one entity succeeds to the obligations of another entity. Rules for succession events are defined in the 2003 ISDA definitions and the Determinations Committees review and determine such events and debt movement and respective impact on the CDS.

Swap – An agreement between two parties to exchange future cash flows or credit risk.

Tenor – Refers to the duration of a CDS contract. Most CDS are written with 5 year terms, and this remains the most liquid and frequently quoted part of the credit curve; however other tenors, such as the 10 year, are becoming more common.

Tier – Refers to one of four levels of debt in the capital structure of the reference entities. Each tier represents a different level of seniority or preference in liquidation or bankruptcy. There will generally be different levels for CDS protection for each of the tiers.

- JRSUBUT2 – Junior Subordinated or Upper Tier 2 Debt (Banks)
- PREF1 – Preference Shares, or Tier 1 Capital (Banks)
- SECDOM – Secured Debt (Corporate/Financial) or Domestic Currency Sovereign Debt (Government)
- SNRFOR – Senior Unsecured Debt (Corporate/Financial), Foreign Currency Sovereign Debt (Government)
- SUBLT2 – Subordinated or Lower Tier 2 Debt (Banks)

Theoretical Spread (Price) – aka ‘Intrinsic Value’ or ‘Fair Spread’ – the spread of an index implied by the underlying index constituents with currency, doc clause, day counts, coupon, coupon frequency, and maturity identical to that of the index.

Tranches – Allow investors to gain exposure on a particular portion of the index loss distribution. Tranches are defined by attachment and detachment points. Defaults affect the tranches according to the seniority of the tranche in the capital structure. For example, the 5Y 3-6% tranche on a portfolio of 125 single names with a 40% recovery would protect the investor up to the sixth default – $1/125 * (1-0.4) = 0.48\%$ loss on one name. By the seventh default ($0.48\% * 7 = 3.36\%$), the investor is no longer protected and will incur principal loss. After the thirteenth default ($0.48\% * 13 = 6.24\%$), the entire principal is lost and no further losses are incurred on this tranche.

Upfront – Refers to the initial (i.e. upfront) lump sum payment made when entering a CDS transaction. Upfront payments tend to apply to transactions where the credit quality of the entity referenced is poor – in other words, where the perceived risk of the entity defaulting is high. It ensures the Protection Seller receives a payment upon trade execution that reflects the riskiness of the contract.

Version – Each index series is identified by a version number. After an index rolls, the initial version will be one. To represent removal of constituents because of credit events and early termination (for LCDX), a new version of the index is published. For example Markit CDX HY 11 v1 was the version of the Markit CDX HY index launched at the roll of September 2008. After the removal of Tribune Company because of bankruptcy, a new version Markit CDX HY 11 v2 was published. After the removal of Nortel Networks Corporation, a new version was published, Markit CDX HY 11 v3.

Z-spread – The basis point value that must be added to the zero coupon curve, such that the security’s discounted cashflows equal the security’s market price. At its simplest, the zero-volatility spread measures the spread to Treasury spot (zero) rates all along the curve.

Further Information

For more in-depth information on CDS index products, please email:

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