

# Overview of Common Derivatives Credit Derivatives

**PLI**  
**ABC of Swaps and Other Derivatives  
in 2009**

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*The information set forth herein is summary in nature  
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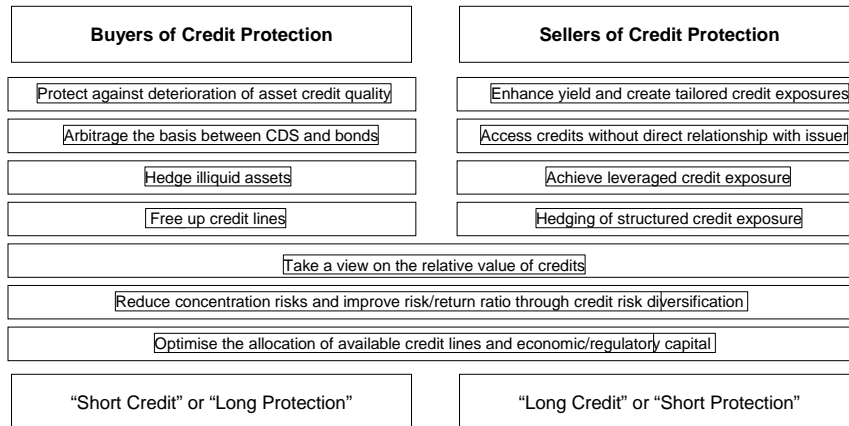
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## Purposes and Functions of Credit Derivatives

- Can replicate, in part, long or short cash positions in corporate bonds or loans (or other financial assets)
- There is no asset transfer
- Allows investors to go short credits, often with some leverage
- Credit derivatives separate out the risk of loss due to default from all of the other risks of funding and owning a bond or loan. Ownership of a financial asset exposes the holder to each of the following risks:
  - **Market risk (interest rate risk and currency risk)**
  - **Liquidity risk**
  - **Credit risk**
- Credit derivatives allow institutions to acquire or dispose of credit risk alone (although the market value of credit derivatives are subject to fluctuation)
- Allows trading of market indexes worldwide
- Can be a building block for other synthetic products

## Transaction Motivations



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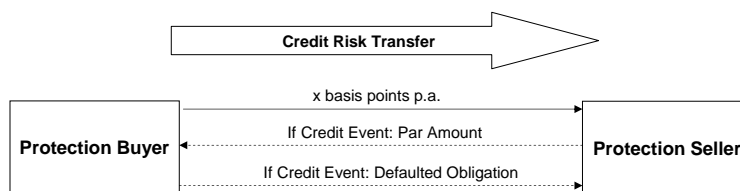
## Credit Default Swap Basics

- Bilateral swap transaction documented under ISDA Master Agreement and Confirmation incorporating the ISDA 2003 Credit Derivative Definitions and May 2003 Guarantee Supplement.
- Basic Structure: Buyer and Seller agree that if a Credit Event occurs during the Term of the Swap, the Seller will purchase a Deliverable Obligation of the Reference Entity from the Buyer at a price of par.
- In consideration, Buyer typically pays on a quarterly basis a fixed amount expressed in b.p. per annum on the CDS notional amount. In some instances, distressed credits involve an upfront premium in addition to a quarterly payment.
- "Reference Entity" – a specified obligor - a corporate, sovereign or other governmental agency; market is developing for ABS Issuers.

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## Credit Default Swap Basics

- “Credit Events” – Typically, a failure to pay by the Reference Entity on an Obligation, Bankruptcy of the Reference Entity, and in some trades, a Restructuring of an Obligation of the Reference Entity.
- An Obligation is typically Borrowed Money of the Reference Entity.
- A Deliverable Obligation is typically a Bond or Loan under which the Reference Entity is an obligor.
- The Term is typically five years, but there are shorter and longer dated trades in the market.



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## Credit Default Swap Basics: Cash Flows

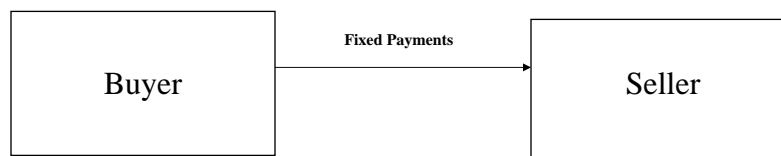
### Prior to the Occurrence of a Default

**Buyer:** Makes fixed periodic payments to Seller

#### Variations

- Trades on a non-investment grade rated Reference Entity may include a fixed up-front payment in addition to periodic fixed payments to compensate Seller for higher risk of a Credit Event occurring early in the Term of the Swap
- Fixed up-front payment only, similar to an option
- Rate resets quarterly based on then-current spreads

**Seller:** If a Credit Event does not occur during the term of the Swap, Seller makes no payments to Buyer

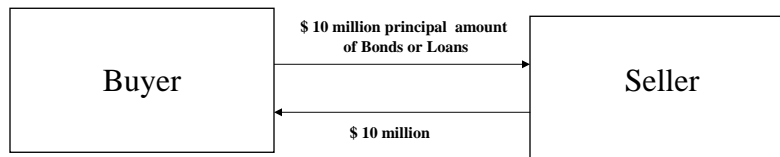


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## Credit Default Swap Basics: Cash Flows

### After the Occurrence of a Credit Event (Physically Settled Swap)

- Fixed Amounts payable by the Buyer cease to accrue as of the Event Determination Date – the date notice and publicly available evidence of a Credit Event are delivered by Buyer or Seller.
- Physical Settlement: Buyer selects \$10 million principal amount of Deliverable Obligations of the Reference Entity to be delivered to Seller. These obligations must satisfy certain agreed upon requirements – typically a senior obligation without risk to principal, freely tradable bonds or Rule 144A bonds, or loans, whether freely assignable or assignable subject to consent. The Seller pays \$10 million to the Buyer in exchange for the obligations delivered by the Buyer.



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## Credit Default Swap Basics: Cash Flows

### After the Occurrence of a Credit Event (Cash Settled Swap)

- Cash Settlement Amount equals swap notional amount times the higher of:
  - (A) 100% - Final Price, and
  - (B) zero
- Final Price is the market price, expressed as a percentage of par, determined by dealer quotes on a designated obligation of the Reference Entity (chosen either at the inception of the transaction or by the Buyer in the same manner as the Buyer chooses a Deliverable Obligation in a physically settled swap)



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## Hedging Credit Exposure

- Credit derivatives are commonly used by banks and other financial institutions to hedge credit exposure.
- For example, a bank with a \$100 million loan to XYZ Co. may seek to reduce its exposure either because it has too much exposure to XYZ, it has concerns about the creditworthiness of XYZ or both.
- The bank has two options—it can sell all or a portion of the loan or it can buy a credit default swap on XYZ in an amount equal to all or a portion of its exposure. The price of the loan and the default swap are largely dependent on the creditworthiness of XYZ and the liquidity of loan and CDS trading on XYZ.
- Banks can also use credit derivative index trades to hedge their portfolios. As discussed later in the presentation, a CDS index trade is a bundle of 100 to 125 single name CDS transactions that trade as a unit. By buying protection, a bank can hedge its exposure to a segment of the credit market, for example investment grade credits, or increase and diversify its exposure by selling a CDS index and taking on credit risk to a segment of the credit market.

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## Credit Spreads on CDS

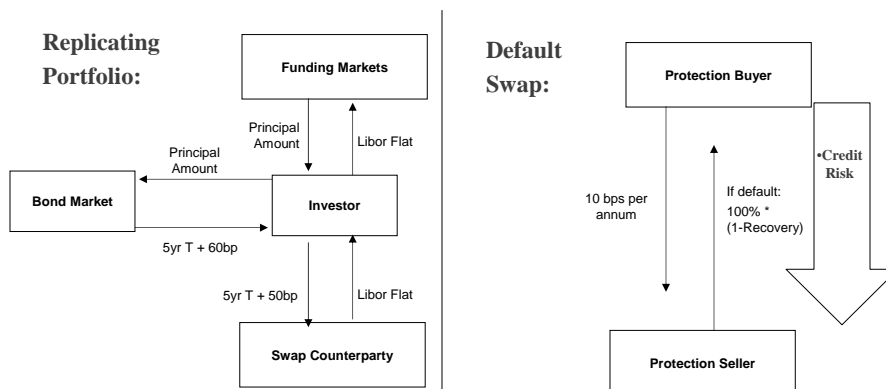
- The value or price of a CDS is based in the perceived creditworthiness of the Reference Credit.
- The price of a CDS is referred to as the Credit Spread, the number of basis points a purchaser has to pay to the seller periodically over the term of the trade (or up front for more distressed credits).
- The Credit Spread reflects the spread over a benchmark interest rate, typically LIBOR. A strong Reference Credit may be trading currently at 40 basis points while a weaker Reference Credit may be trading a 300 basis points or more.
- Over the term of a CDS, the value of the trade changes as the credit spread of the Reference Credit changes. As the creditworthiness of a Reference Credit improves, the Credit Spread will narrow and as the credit worthiness deteriorates, the Credit Spread will widen.
- Market participants trade in and out of CDS on a Reference Credit based on movements in Credit Spreads, either to capture gains or minimize losses.

## Unwinding a Credit Derivative Transaction

Termination (“tearing up”)	Assignment (“novation”)	Offset position
<ul style="list-style-type: none"> <li>• Unwind with original counterparty</li> <li>• Settled at MTM value of CDS, no future cashflows</li> <li>• Removes ongoing legal risk</li> </ul>	<ul style="list-style-type: none"> <li>• Another party replaces investor in the contract</li> <li>• Subject to another counterparty consent</li> <li>• Operationally more intensive (“ISDA novation protocol”)</li> </ul>	<ul style="list-style-type: none"> <li>• Independent position with another counterparty</li> <li>• Additional legal risk</li> <li>• More common for dealers looking for better unwind terms</li> </ul>

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## Credit Default Swap Basics: Analogy to Bonds



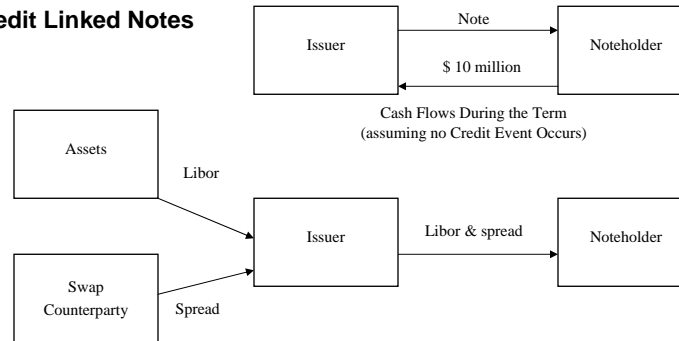
- The contingent payment (if credit event occurs) is  $(1-R)$  times the reference notional, where  $R$  is the recovery rate
- Settlement:
  - Physical: the buyer delivers to the seller defaulted obligation and the seller deliver 100% of the notional to the buyer
  - Cash: the seller deliver notional times  $(100\% - \text{Final Price})$  to the buyer

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## Credit Default Swap Structures

### Cash Flows at Inception

#### Credit Linked Notes



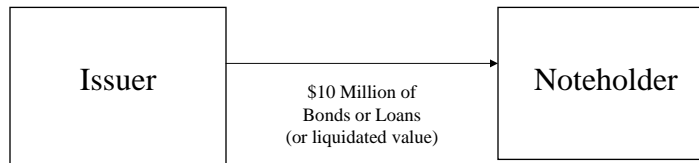
Issuer will pay interest over the Term of the Note and principal upon maturity, subject to the occurrence of a Credit Event. A CLN resembles a credit default swap in which the Seller pays the full notional at the commencement of the transaction, rather than after the occurrence of a Credit Event. A CLN eliminates the Buyer's credit exposure to the Seller that is present in a credit default swap. Counter party credit risk shifts from Seller to Buyer.

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## Credit Default Swap Structures

#### Credit Linked Notes

### Cash Flows after a Credit Event



- Issuer delivers Bonds or Loans of the Reference Entity to the Noteholders
- Alternatively, a Trustee might liquidate the obligations delivered by the Issuer and distribute proceeds to Noteholders; or the Issuer will deliver to the Noteholders an amount in cash equal to the market value of an obligation specified upon issuance or selected by the Issuer in the same manner as the Buyer selects a Deliverable Obligation for the physical settlement of a default swap. The market value is determined on the basis of dealer quotes.
- No other principal payments are made by the Issuer.

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## Index and Portfolio Linked Default Swaps

- In a single trade, the parties enter into a default swap on each Reference Entity in the designated index; for example, the Dow Jones CDX.IG. index is composed of 125 Reference Entities. These trades are similar to entering into 125 credit default swaps at once.
- This product is actively traded by numerous dealers, enabling an investor to go long or short a diversified portfolio of investment grade or high-yield names in a single transaction.
- Indices exist on European and North American credits in both the investment grade and high-yield markets. Sub-indices are also traded in the default swap markets. In addition, there now exist standard indices referencing emerging market corporate and sovereign credits, home equity mortgage and commercial mortgage indices, and indices of preferred CDS and loan CDS.
- Single tranche portfolio swaps are also traded using an index as the reference portfolio. The liquidity of the product has facilitated trading of Index and Tranching Index CDS to capture spread movements as well as hedging credit positions.
- Highly traded product. Very useful for hedging or diversifying a portfolio
- Alternatively, a trade can reference a customized portfolio of credits.
- Settlement: These transactions provide for physical settlement; however, physical settlement has proven difficult in practice. The recent credit events within the indices resulted in ad hoc cash settlement process.

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## Credit Default Swap Structures

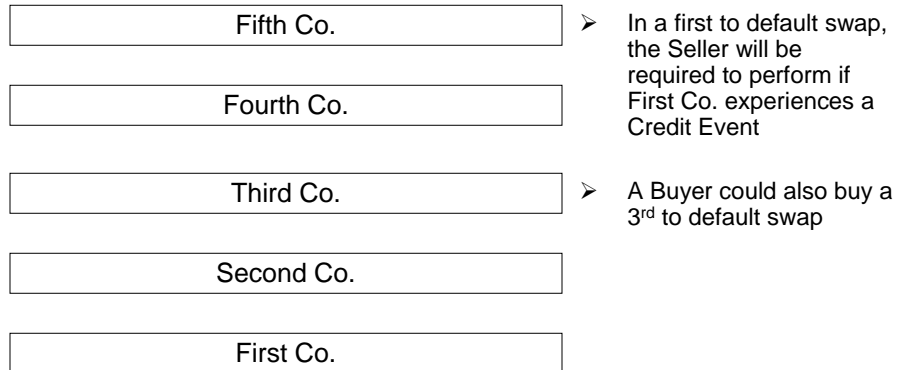
### N<sup>th</sup> to Default

- Similar to a single-name credit default swap; however, there are a number of Reference Entities underlying the swap rather than one. In a first to default swap, the Seller will be obligated to purchase obligations at par of the first Reference Entity that experiences a Credit Event during the term of the swap.
- Alternatively, the parties can agree that the Seller's obligation will be triggered by the second, third... or "n<sup>th</sup>" Reference Entity to experience a Credit Event during the term of the swap.
- **Buyer's Rationale:** Buyer may have exposure to all names in the basket but thinks only one is likely to experience a Credit Event. Pricing is cheaper than purchasing single-name protection on each name in the basket.
- **Seller's Rationale:** Risk return and leverage.
- Pricing is based on probability of Credit Events, assumed recovery rates and correlation of Credit Events occurring with respect to other Reference Entities underlying the swap.

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## Credit Default Swap Structures

### N<sup>th</sup> to Default



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## First or “N<sup>th</sup>” to Default Swap

### Questions:

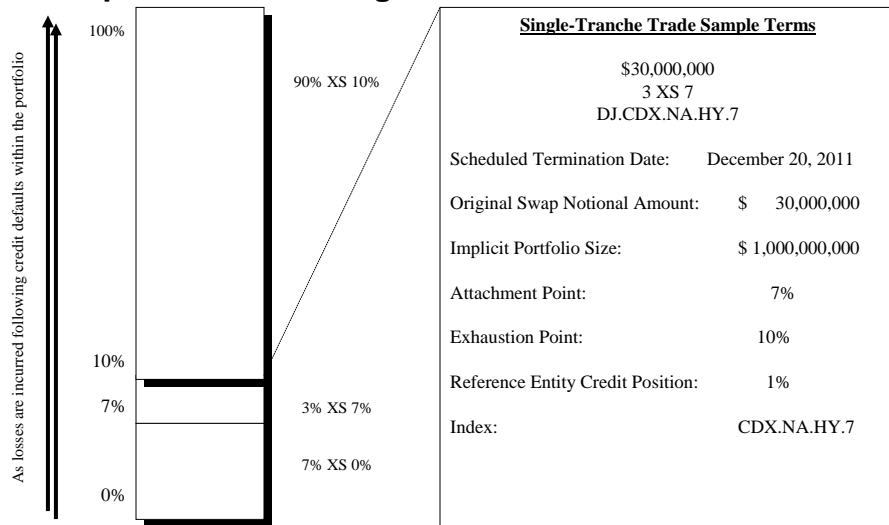
- Does the Seller of first to default protection in a swap with five Reference Entities prefer a diversified or non-diversified pool of Reference Entities?
- What about the Buyer?
- What about the Seller of fifth to default protection?

## First or “N<sup>th</sup>” to Default Swap Pricing Considerations

- **Correlation**
  - Correlation is the probability that if a Credit Event occurs for one Reference Entity, a Credit Event will occur for another Reference Entity in the portfolio
  - The lower the correlation of the portfolio (a diversified pool), the greater the risk is for the equity or the Seller of first to default protection
  - The higher the correlation of the portfolio (a non-diversified pool), the greater the risk is for the 5<sup>th</sup> to default Seller
- **Recovery Rates**
  - The higher the assumed recovery rates on the debt of a Reference Entity, the lower the premium paid to the Seller
- **Probability of Credit Event**
  - The higher the probability of a Credit Event occurring for each Reference Entity, the higher the premium paid to the Seller

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## Example of DJ.CDX Single-Tranche Trade



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## Single Tranche Portfolio Default Swap

- The swap references a portfolio of credit default swaps.
- As Credit Events occur, losses in the reference portfolio erode the threshold of the swap, in this case a credit derivatives index.
- When the swap's threshold is breached, the notional of the swap and the fixed amount paid by the Buyer begins to amortize proportionately to the losses in the portfolio.
- In the situation that Credit Events fully erode the notional of the swap, the swap terminates.
- In the diagrammed transaction, the Seller's maximum exposure would be \$30 million and the Seller would not be obligated to pay any amount until the aggregate "losses" or cash settlement amounts in the synthetic portfolio exceeded \$60 million.
- The cost of executing a single tranche portfolio default swap is minimal, and execution is simple. These factors are major advantage compared to CDOs.

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## Single Tranche Portfolio Default Swap

- The Buyer delta hedges the swap with default swaps, suffering losses on the protection in has written to the market on the individual swaps.
- The Buyer recovers the value of its credit default swap losses through market value changes in the tranche risk sold to the investor, when losses are below the threshold. Thereafter, the Buyer recovers the credit default swap losses through cash settlement of the portfolio swap.

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## Single Tranche Portfolio Default Swap

### Selection of single-tranche CDO reference portfolio

The first step in structuring a single-tranche CDO transaction is the investors' selection of the credits in the underlying reference portfolio according to their preferences. For example, investors can choose a portfolio of credits different from their current positions, and by selling the protection on those names they achieve further diversification of their overall credit exposure. They can also sell protection on the subset of names in their current portfolio in case they want to overweight certain credits or sectors. Alternatively, investors can designate the whole or a part of their portfolios as the reference pool, and by buying protection they hedge themselves against spread widening and individual defaults.

As a common alternative, investors choose as a reference portfolio a default index, which is based on a diversified set of liquid names in the credit default market, e.g. DJ CDX. The main reason for that choice is the liquidity and diversification of the index. The standard tranches on an index also trade as liquid instruments in the credit derivatives market.

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## Single Tranche Portfolio Default Swap

### Selection of the Subordination Level and Tranche Size

Once a portfolio is selected, investors must choose a subordination level and tranche size. The tranche size and subordination level determine the degree of leverage and the required protection premium. Investors that are primarily concerned about the rating and want to have the tranche rated by rating agencies such as Moody's and S&P, could choose the tranche size and subordination level that would minimize the premium paid for the selected rating. Other investors could choose a subordination level that would provide a total spread equal to some desired return target. This "tranching" of credit portfolio risk can provide any desired risk/return profile.

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## Single Tranche Portfolio Default Swap

### Selection of Credits in the Reference Portfolio

The third distinctive feature of single-tranche CDOs is investors' ability to dynamically manage their investment gain and loss by substituting credits in the portfolio. Because the credit risk of individual credits in the portfolio changes after the initial transaction, investors might wish to substitute certain names. They could, for example, eliminate credits that they perceive as potential credit blowups and substitute them with less risky names. Following each change, the dealer will adjust the premium for the tranche, change the level of subordination, or settle through an upfront payment to offset the impact of the substitution on the market value of the tranche. Substitution rights are especially important for market participants who intend to use single-tranche synthetic CDO structures as an efficient hedging and portfolio-rebalancing tool to manage their existing credit portfolio. In case the portfolio has experienced losses and the subordination below the invested tranches has been decreased, investors can improve the rating of their tranche by raising the subordination level, even if they do not alter the composition of the reference portfolio.

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## Other CDS Transactions

### ➤ Contingent Credit Default Swap

Similar to a standard credit default swap, however, the Floating Rate Buyer Calculation Amount is tied to the mark to market of a reference interest rate, commodity or other derivative. Used by a Buyer to hedge credit exposure to a swap counterparty and by a Seller to create a synthetic swap with the Reference Entity for Seller.

### ➤ Loan CDS

CDS where the only deliverable obligation is a secured loan.

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