After going through the chapter student shall be able to understand:

- Credit Default Swaps
- Collateralized Debt Obligations (CDOs)
- Pricing of Credit Derivative Instruments

‘Credit Derivatives’ is the sum of two words i.e. Credit + Derivatives. As we know that derivative implies value deriving from an underlying, and this underlying can be anything as we have discussed earlier i.e. stock, share, currency, interest etc.

Initially started in 1996 due to the need of the banking institutions to hedge their exposure of lending portfolios, today it is one of the most structured financial products.

Plainly speaking, the financial products are subject to following two types of risks:

(a) Market Risk: Due to adverse movement of the stock market, interest rates and foreign exchange rates.

(b) Credit Risk: Also called counter party or default risk, this risk involves non-fulfillment of obligation by the counter party.

While, financial derivatives can be used to hedge the market risk, credit derivatives emerged out to mitigate the credit risk. Accordingly, the credit derivative is a mechanism whereby the risk is transferred from the risk averse investor to those who wish to assume the risk.

Although there are number of credit derivative products but in this chapter, we shall discuss two types of credit Derivatives ‘Collaterised Debt Obligation’ and ‘Credit Default Swap’.
1. COLLATERALIZED DEBT OBLIGATIONS (CDOs)

Collateralized Debt Obligations (CDOs) are an advancement of securitization discussed in the paper of Strategic Financial Management. While in securitization, the securities issued by SPV are backed by the loans and receivables, the CDOs are backed by pool of bonds, asset backed securities, REITs, and other CDOs. Accordingly, it covers both Collateralized Bond Obligations (CBOs) and Collateralized Loan Obligations (CLOs).

1.1 Types of CDOs

The various types of CDOs are as follows:

(a) **Cash Flow Collateralized Debt Obligations (Cash CDOs):** Cash CDO is a type of CDO which is backed by cash market debt or securities which normally have low risk weight. This structure mainly relies on the collateral’s risk weight and collateral’s ability to generate sufficient cash to pay off the securities issued by SPV.

(b) **Synthetic Collateralized Debt Obligations:** It is similar to Cash Flow CDOs but with the difference that instead of transferring of ownerships of collateral to SPV (a separate legal entity), synthetic CDOs are structured in such a manner that credit risk is transferred by the originator without actual transfer of assets.

Normally the structure resembles the hedge funds where in the value of portfolio of CDO is dependent upon the value of collateralized instruments and market value of CDOs depends on the portfolio manager’s ability to generate adequate cash and meeting the cash flow obligations (principal and interest) in timely manner.

While in cash CDO, the collateral assets are moved away from Balance Sheet, in synthetic CDO there is no actual transfer of assets instead economic effect is transferred.

This effect of transferring economic risk is achieved by creating provision for Credit Default Swap (CDS) or by issue of Credit Linked Notes (CLN), a form of liability.

Accordingly, this structure is mainly used to hedge the risk rather than balance sheet funding. Further, for banks, this structure also allows the customer’s relations to be unaffected. This was started mainly by banks who want to hedge the credit risk but not interested in taking administrative burden of sale of assets through securitization.

Technically, speaking synthetic CDO obtain regulatory capital relief benefits vis-à-vis cash CDOs. Further, they are more popular in European market due to the reason of less legal documentation requirements. Synthetic CDOs can also be categorized as follows:

(a) **Unfunded:** - It will be comprised of CDs only.

(b) **Fully Funded:** - It will be through issue of Credit Linked Notes (CLN).

(c) **Partially Funded:** - It will be partially through issue of CLN and partially through CDs.
(c) **Arbitrage CDOs**: Basically, in Arbitrage CDOs, the issuer captures the spread between the return realized collateral underlying the CDO and cost of borrowing to purchase these collaterals. In addition to this, the issuer also collects the fee for the management of CDOs. This arbitrage arises due to acquisition of relatively high yielding securities with large spread from open market.

### 1.2 Risk involved in CDOs

CDOs are structured products and just like other financial products are also subject to various types of Risk.

The main types of risk associated with investment in CDOs are as follows:

1. **Default Risk**: Also called ‘credit risk’, it emanates from the default of underlying party to the instruments. The prime sufferers of these types of risks are equity or junior tranche in the waterfall.

2. **Interest Rate Risk**: Also called Basis risk and mainly arises due to different basis of interest rates. For example, asset may be based on floating interest rate but the liability may be based on fixed interest rates. Though this type of risk is quite difficult to manage fully but commonly used techniques such as swaps, caps, floors, collars etc. can be used to mitigate the interest rate risk.

3. **Liquidity Risk**: Another major type of risk by which CDOs are affected is liquidity risks as there may be mismatch in coupon receipts and payments.

4. **Prepayment Risk**: This risk results from unscheduled or unexpected repayment of principal amount underlying the security. Generally, this risk arises in case assets are subject to fixed rate of interest and the debtors have a call option. Since, in case of falling interest rates they may pay back the money.

5. **Reinvestment Risk**: This risk is generic in nature as the CDO manager may not find adequate opportunity to reinvest the proceeds when allowed for substitutions.

6. **Foreign Exchange Risk**: Sometimes CDOs are comprised of debts and loans from countries other than the country of issue. In such a case, in addition to above mentioned risks, CDOs are also subject to the foreign exchange rate risk as discussed in the paper Strategic Financial Management.

### 2. CREDIT DEFAULT SWAP (CDS)

It is a combination of following 3 words:

- **Credit**: Loan given
- **Default**: Non payment
- **Swap**: Exchange of Liability or Risk
Accordingly, CDS can be defined as an insurance (not in stricter sense) against the risk of default on a debt which may be debentures, bonds etc.

Under this arrangement, one party (called buyer) needing protection against the default pays a periodic premium to another party (called seller), who in turn assumes the default risk. Hence, in case default takes place then there will be settlement and in case no default takes place no cash flow will accrue to the buyer alike option contract and agreement is terminated. Although it resembles the options but since element of choice is not there it more resembles the swap arrangements.

Amount of premium mainly depends on the price of underlying and especially when the credit risk is more.

### 2.1 Main Features of CDS

The main features of CDS are as follows:

1. CDS is a non-standardized private contract between the buyer and seller. Therefore, it is covered in the category of Forward Contracts.
2. They are normally not traded on any exchange and hence remains free from the regulations of Governing Body.
3. The International Swap and Derivative Association (ISAD) publishes the guidelines and general rules used normally to carry out CDS contracts.
4. CDS can be purchased from third party to protect itself from default of borrowers.
5. Similarly, an individual investor who is buying bonds from a company can purchase CDS to protect his investment from insolvency of that company. Thus, this increases the level of confidence of investor in Bonds purchased.
6. The cost or premium of CDS has a positive relationship with risk attached with loans. Therefore, higher the risk attached to Bonds or loans, higher will be premium or cost of CDS.
7. If an investor buys a CDS without being exposed to credit risk of the underlying bond issuer, it is called “naked CDS”.

### 2.2 Uses of Credit Default Swap

Following are the main purposes for which CDS can be used.

(a) **Hedging** - Main purpose of using CDS is to neutralize or reduce a risk to which CDS is exposed to. Thus, by buying CDS, risk can be passed on to CDS seller or writer.

(b) **Arbitrage** - It involves buying a CDS and entering into an asset swap. For example, a fixed coupon payment of a bond is swapped against a floating interest stream.
(c) Speculation- CDS can also be used to make profit by exploiting price changes. For example, a CDS writer assumed risk of default, will gain from contract if credit risk does not materialize during the tenure of contract or if compensation received exceeds potential payout.

2.3 Parties to CDS

In a CDS at least three parties are involved which are as follows:

i. The initial borrowers- It is also called a ‘reference entity’, i.e. the entities which are owing a loan or bond obligations.

ii. Buyer- It is also called ‘investor’ i.e. the buyer of protection. The buyer will make regular payment to the seller for the protection from default or credit event of reference entity.

iii. Seller- It is also called ‘writer’ of the CDS and makes payment to buyer in the event of credit event of reference entity. It receives a regular pay off from the buyer of CDS.

Example-
Suppose BB Corp. buys CDS from SS Bank for the Bonds amounting $ 10 million of Danger Corp. In such a case, the BB Corp. will become the buyer, SS Bank becomes seller and Danger Corp. becomes the reference entity. BB Corp. will make regular payment to SS Bank of the premium and if Danger Corp. defaults on its debts, the BB Corp. will receive one time payment and CDS contract is terminated.

2.4 Settlement of CDS

Broadly, following are two main ways of settlement of CDS:

(i) Physical Settlement – This is the traditional method of settlement. It involves the delivery of Bonds or debts of the reference entity by the buyer to the seller and seller pays the buyer the par value.

For example, as mentioned above suppose Danger Corp. defaults then SS Bank will pay $ 10 Million to BB Corp. and BB Corp will deliver $10 Million face value of Bonds to SS Bank.

(ii) Cash Settlement- Under this arrangement seller pays the buyer the difference between par value and the market price of a debt (whatever may be the market value) of the reference entity. Continuing the above example suppose, the market value of Bonds is 30%, as market is of belief that bond holder will receive 30% of the money owed in case company goes into liquidation. Thus, the SS Bank shall pay BB Corp. $ 10 Million - $3 million (100% - 30%) = $ 7 Million.

To make Cash settlement even more transparent, the credit event auction was developed. Credit event auction set a price for all market participants that choose to cash settlement.
2.5 CDS in India

In India, RBI has come out with guidelines on CDS in corporate bonds in 2011 which was revised in 2013.

As per the guidelines, CDS players have been divided into following two categories:

(a) **Market Makers:** These are comprised of commercial banks, primary dealers (PDS) and non-banking financial companies (NBFCs). They can buy or sell without any underlying position in the bond i.e. Naked CDS.

(b) **Users:** These are comprised of mutual funds (MFs), Insurance Companies, Housing Finance Companies, Provident Funds, Listed Companies and Foreign Institutional Investors (FIIs). They can use CDS only as a hedge tool to offset the risk of an underlying position, and are not allowed to sell CDS other than to exit the existing long positions.

**Note:** For detailed guidelines, students can visit RBI’s website.

3. PRICING OF CREDIT DERIVATIVE INSTRUMENTS

Broadly following are two theories for pricing CDS:

(1) **Probability Model:** This model is based on the present value of a series of cash flows weighted by their respective probability of non-default. This model is based on following four inputs.

   (a) Issue Premium
   (b) Recovery Rate
   (c) Credit Curve for reference entity and
   (d) Inter banking offering rates e.g. LIBOR, MIBOR etc.

(2) **No Arbitrage Model:** This approach was advocated by Duffie as well as Hull-White. This model is based on following assumptions:

   (a) There is zero cost of unwinding the fixed leg of the swap on default.
   (b) There is no risk free arbitrage.

While Duffie used LIBOR as the risk-free rate, Hull and White used US Treasuries as the risk free rate. As per this model, price is derived by calculating the asset swap spread of a bond.