

Derivatives

D – Derivative

**D**

**A**

A **financial instrument** whose value is derived from the value of an underlying asset

A – Underlying Asset, or simply called the ‘underlying’—a fundamental asset.

For example, a Stock, Bond, Currency, Commodity, and Interest Rate, etc.

The value of D changes as A changes.

Credit Derivatives

Options

Forwards

**Main Types of Derivatives**

Swaps

Futures

|  |  |
| --- | --- |
| **Over the Counter (OTC)** | **Exchange Traded** |
| Instruments are Customized | Instruments are Standardized |
| Counterparty can be another corporate entity | The exchange is the counterparty |
| Mark-to-Market is not done; cash is only exchanged at contract expiry | Mark-to-Market Everyday (profit/loss is calculated and settled on a daily basis) |
| Low Liquidity | High Liquidity |
| High Counter-party Risk | No Counter-party Risk |
| A dealer market with no central trading location | Centralized trading location backed by a clearinghouse |
| Unregulated or Minimally Regulated Market | Regulated Market |
| No Active Secondary Market | Active Secondary Market |
| Instruments: Swaps, Exotics, Forwards. | Instruments: Futures, Options |

**Derivatives**

Linear

Non-linear

**Forwards/ Futures (D)**

**Options, Credit Derivatives**

Swaps, Exotics

**(D2)**

**Forwards are contracts** whereby parties are committed:

* To buy (sell)
* An underlying asset
* At some future date (maturity) and
* At a delivery price (forward price) set in advance

When contract is initiated: **No cash flow** is made between the parties and no cash flow occurs till maturity.

**Forward price** is such that PV of the contract is zero.

Characteristics of Forwards:

* Customized
* Subject to default risk
* Difficult to close out
* Carry low liquidity and
* Used by hedgers who intend to hold the position till maturity

Short: The party which has agreed to sell the underlying asset in the future. It wants to hedge the risk of a price decrease.

Long: The party which has agreed to buy the underlying asset in the future. It wants to hedge the risk of a price increase.

**Type of Positions**

##### Who uses Forward Contracts?

Large institutions with existing risk—typically corporations, government units, or non-profit organizations use Forward Contracts.

##### Dealers often include:

* Banks
* Non-bank financial institutions, for example the securities brokers
* Usually balance long and short position with opposite end users
* Bid/ask spread compensation for administrative costs, default, and price risk
* Dealers also enter into contracts with other dealers to hedge risk

**Definition**

* A futures contract is an agreement between two parties in which one party—the buyer—agrees to buy from another party, i.e., the seller, an underlying asset or other derivative, at a future date and at a price agreed on today.

**Characteristics of Futures**

**Standardization:** Futures contracts have standardized contract terms:

* + Futures contracts specify the quality and quantity of goods that can be delivered, delivery time, and the manner of delivery.
	+ Uniformity promotes market liquidity.

**Backed by a Clearinghouse:** Each exchange has a clearinghouse:

* It guarantees that traders will honor their obligations.
* It acts as a buyer to every seller, and as a seller to every buyer, and vice versa.
* Futures contracts like forward contract have no value at the origination.
* Since futures contract are mark-to-market daily, they differ from forward contract, as futures do not accrue value over the term of the contract; hence, the value of future contract will always be zero.
* The value of futures contract diverges from zero only during the trading hours, between the times at which the account is **Marked-to-Market (MTM):**

##### Value of futures contract = current futures price – previous mark to market price

* If the future price increases, the value of long position also increases, and at the end of the MTM period, the value is set back to zero by the marked-to-market.
* A swap is an agreement to exchange cash flows at specified future dates according to certain specified rules.
* Type of swaps:
* Interest Rate Swaps and
* Currency Swaps.
* Traded mostly OTC, these are customized to suit the needs of the parties to the contract.
* These are subject to default risk.

##### Netting – Exchanging only the net amount owed from one party to the other. Netting payments decrease default risk.

* **A swap has zero value at the initiation of the contract.**
* Swaps can be used to convert the nature of your assets or liabilities (Fixed/Floating).

Swap

Fixed = 4%

A

Floating =

LIBOR

B

Interest =

LIBOR

Loan

Bank

* Price and value of a swap is similar to the forward contracts, having a value of zero to both the parties at the initiation of the contract and as the prices change, value to either party increases, or decreases over the period of the contract.
* Interest rate Swaps do not require the actual exchange of the notional amount of the contract.
* **Currency Swaps requires the exchange of principal** in the respective currencies on initiation and termination of the contract.
* Settlement/Payment Date: Each date the party makes payments is the settlement/payment date.
* Settlement Period: This is the time between Settlement Dates.
* Termination Date: The final payment date is the termination date.
* Tenor: The original maturity of the swap is tenor.
* Ways to terminate the contract before maturity:

**Mutual Termination**

Cash payment made by the party with negative value of the contract (owes) to the counterparty; the latter’s approval is required.

**Offsetting contract**

Enter into another swap with opposite position to the original swap to offset the existing positions.

**Resale of Swap to another party**

Sell swap to another party. This is an uncommon method.

Counterparty’s approval is required.

Options

Call

Put

Long Call

Short Call

Long Put

Short Put

The obligation to Sell the underlying

The right to Sell the underlying

The obligation to Buy the underlying

The right to Buy the underlying





Long options have rights

Short options have obligations

Sell

Put

Buy

Call

* Seller of an option is also called option writer.
* Option Premium: This is the price that the owner of an option should pay to acquire those rights from the seller.

Option premium is higher

Can be exercised at any time before, or on expiration

Option premium is lower

Can be exercised only at the end of its life

American Options

European Options

Options Type

* As the name suggests, Credit Derivatives are mainly used to **hedge Credit Risk.**
* This is a contact between two parties:
* Credit Protection Buyer: Seeks credit protection against a specific credit event and pays a premium; and
* Credit Protection Seller: Provides protection to the former and receives a premium.
* **Credit Spread Option**: The underlying here is the credit spread, i.e., the difference between the bond’s yield and the benchmark default-free bond. So, the credit protection buyer pays the premium to ensure this credit spread.
* **Credit Default Swaps (CDS)**: The credit protection buyer makes regular payments to the protection seller. In return, the protection seller makes a payment when any credit event occurs. It is similar to an insurance contract.
* The protection seller would agree to cover the risk only when the premium can sufficiently cover the risk, based on the estimates from actuarial statistics.
* CDS sellers tend to be poorly diversified, as compared to a general insurance company, given they provide protection against systematic financial risk, which spreads more rapidly and can impact multiple buyers at the same time.



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