**Derivatives – One class of Financial Instruments**

The “derivatives” are financial instruments which derive their value from some underlying assets. The underlying assets could be equities (shares), debt (bonds, T-bills, and notes), currencies, and even indices of these assets, such as Nifty 50 Index. Derivatives derive their names from their respective underlying asset.

**Basic Derivatives**

**• Forwards**

**• Futures**

**• Options**

**• Swaps**

**1. Forwards**

A **forward** is a contract between two parties to buy or sell an asset at a certain future date at a price predetermined on the date of the contract. The future date is the “expiry date” and the predetermined price is the “Forward Price”. It may be noted that Forwards are private contracts and their terms are decided by the parties concerned. It is a commitment by both the parties to engage in a transaction at a later date with the price set in advance. Thus it is different from a spot market contract, where immediate payment and transfer of asset take place. The party that agrees to buy the asset on a future date is referred to as a long investor and is said to have a long position. Similarly the party that agrees to sell the asset in a future date is referred to as a short investor and is said to have a short position. Forward contracts are traded in Over the Counter (OTC) market and not in stock exchanges. OTC market is a private market where individuals/institutions can trade through negotiations on a one to one basis. When a forward contract expires, there are two alternate arrangements possible to settle the obligation of the parties: physical settlement and cash settlement.

***Default risk in forward contracts***

Regardless of whether the contract is for physical or cash settlement, there exists a potential of default by one party, i.e. failure to honour his commitment under the contract. It could be either the buyer or the seller. This results in the other party suffering a loss (counter party / credit risk). The main reason behind such risk is the absence of any mediator between the parties, who could have undertaken the task of ensuring that both the parties fulfill their obligations arising out of the contract.

**2. Futures**

Like a forward contract, a futures contract is an agreement between two parties in which the buyer agrees to buy an underlying asset from the seller, at a future date at a predetermined price agreed upon at the time of the agreement. However, unlike a forward contract, a futures contract is not a private transaction but gets traded on a recognized stock exchange. In addition, a futures contract is standardized by the exchange. All the terms, other than the price, are set by the stock exchange (rather than by individual parties as in the case of a forward contract). Also, both buyer and seller of the futures contracts are protected against the counter party risk by an entity called the The Futures Exchange / Clearing Corporation. The Futures Exchange provides this guarantee to ensure that the buyer or the seller of a futures contract does not suffer as a result of the counter party defaulting on its obligation. To be able to guarantee the fulfillment of the obligations under the contract, The Futures Exchange collects Initial Margin based on the price volatility of the underlying financial assets and also a variable margin to meet the daily loss arising from marking to market the open positions. Such security margin may be in the form of cash or other financial assets from both the parties. Also, since the futures contracts are traded on the stock exchanges, the parties have the flexibility of closing out the contract prior to the maturity by squaring off the transactions in the market. Futures contracts are available for equity (Index based), commodity, bonds, forex, interest rates, etc.

**Currency Futures**

First introduced in 1972 in International money market Chicago and then in London International Financial Futures Exchange, SIMEX, Tokyo International Financial Futures Exchange. Standard sizes & prices are quoted in USD.125,000 per contract of EURO, CHF etc, 62,500 for GBP and 1.25mio for JPY. Min Tick size is 0.01% or 0.0001 per unit of currency. If exchange rate moves one pip (point in percentage), profit or loss is = 0.0001 X contracted amount.

**Example**

Suppose we are Long IN EURO 1 MIO at 1 EURO = USD 0.9450. View is EURO may weaken against USD. If EURO falls in Cash market to 0.9400 we would have lost USD 5000. i.e. 1,000,000 X (0.9450-0.9400) had we not hedged. To hedge risk, we sell EURO futures at EURO = 0.9500. If future settles at 0.9445 we make a profit of USD 5500 = [1,000,000 X (0.9500-0.9445)] Commodity futures are traded on MCX, NCDEX, while stock indices are traded in BSE and NSE. Trading in Bonds futures and T bills futures is yet to take off.

**3. Options**

Like forwards and futures, options are derivative instruments that provide the opportunity to buy or sell an underlying asset at a future date. An option is a derivative contract between a buyer and a seller, where one party (option writer / seller) gives to the other (option holder / buyer) the right, but not the obligation, to buy from (or sell to) the option writer, the underlying asset on a specific day at the predetermined price. In return for giving the option, the party giving the option collects a payment from the option buyer. This payment collected is called the “premium” or price of the option. Unlike forwards and futures contracts, options require a cash payment (called the premium) upfront from the option buyer to the option seller. Options can be traded either on the stock exchange or in over the counter (OTC) markets. Options traded on the exchanges are backed by the Clearing Corporation thereby minimizing the risk arising due to default by the counter parties involved. Options traded in the OTC market however are not backed by the Clearing Corporation.

**Call option**

A call option is an option giving the right to the buyer (also known as holder) of the option to buy the underlying asset on a specific day at an agreed upon price, but not the obligation to do so. It is the seller who gives this right to the buyer of the option. This predetermined price at which the buyer has the right to buy the asset is known as the strike price of the contract (call option strike price). Since the buyer of the call option has the right (but no obligation) to buy the underlying asset, he will exercise his right to buy theunderlying asset if and only if the price of the underlying asset in the market is more than the strike price on the expiry date of the contract. The buyer of the call option does not have an obligation to buy if he does not want to.

Example: An European Call option holder of XYZ Steels at a strike price of Rs.395 with a premium of Rs.7 will exercise the option if the market price on the day of expiry is above Rs.395. Suppose the market price is Rs.439.00. He will earn then a profit of Rs.37.00 per share (net of the premium paid, but excluding the charges such as transfer fees / brokerages), i.e., Rs.439 - Rs.402.00 (Rs.395+Rs.7.00) by exercising the call option of buying the shares from the option writer at Rs.395 (the strike price) and selling the so acquired shares in the market at Rs.439.00. As this call is in the money, the intrinsic value is +ve at 44.

**Put option**

A put option is a contract giving the right to the buyer of the option to sell the underlying asset on a specific day at an agreed upon price, but not the obligation to do so. It is the seller (also known as writer) who grants this right to the buyer of the option. The person who has the right to sell the underlying asset is known as the “buyer of the put option”. This predetermined price at which the buyer has the right to sell the asset is known as the strike price of the contract (put option strike price). Since the buyer of the put option has the right (but not the obligation) to sell the underlying asset, he will exercise his right to sell the underlying asset if and only if the price of the underlying asset in the market is less than the strike price on the expiry date of the contract. The buyer of the put option does not have the obligation to sell if he does not want to.

Example: An European Put option holder on PQR Bank at a strike price of Rs.400 with a premium of Rs.8 will exercise the option if the market price on the day of expiry is below Rs.400.00. If the market price is Rs.375.00, he will earn then a profit of Rs.17.00 per share (net of the premium paid, but excluding the charges such as transfer fees / brokerages), i.e., {(400.00 – Rs.375.00)-8.00} by buying the PQR Bank shares from the market at Rs.375.00 and exercising the Put option of selling the so acquired shares to the option writer at Rs.400 (the strike price).

**‘Straddle’**

It is an option strategy in which the investor holds both a call and put position with the same strike price and expiration date.

**Interest rate options**

**Cap:** Option products which protect lenders / investors from raising interest rates.

**Floor:** Option products which protect lenders / investors from falling interest rates.

**Types of options**

Options can be divided into two different categories depending upon the primary exercise styles associated with options. These categories are:

***American options*:** American options are options that can be exercised on any day on or before the expiry date. They can be exercised by the buyer on any day on or before the final settlement date or the expiry date.

***European Options*:** European options are options that can be exercised only on the expiration date.

**Moneyness of an Option**

“Moneyness” of an option indicates whether an option is worth exercising or not i.e. if the option is exercised by the buyer of the option whether he will receive money or not. The premium paid is not taken into consideration while calculating moneyness of an Option, since the premium once paid is a sunk cost and the profitability from exercising the option does not depend on the amount of the premium paid. The following table defines the moneyness of an option.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Situation** | **Call** | **Put** |
| **1** | In-the-money option | Spot price >Strike price | Spot price <Strike price |
| **2** | At-the- money option | Spot price = Strike price | Spot price = Strike price |
| **3** | Out- of-the-money option | Spot price < Strike price | Spot price > Strike price |

**4. Swaps**

Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used swaps are interest rate swaps and currency swaps.

1. Interest rate swaps: These involve swapping only the interest related cash flows between the parties in the same currency. It is a transaction in which one party pays a fixed rate of interest and the counter party pays floating rate of interest on an agreed notional principal. Example Paying 9% fixed interest semi-annual and receiving MIBOR + 0.075% annual.
2. Currency swaps: These entail swapping both principal and interest between the parties, with the cash flows in one direction being in a different currency than those in the opposite direction.

**5. Forward Rate Agreement – FRA**

FRA is a contract between two parties to settle the interest differentials on a notional principal on a future settlement date for a specified future period.

Example

A Corporate wants to borrow Rs. 1 crore for 6 months starting from 3 months from today. Co feels that interest rate may go up in 3 months and hence want to lock in a rate right today for future borrowing commitment. It enters into a 3 v 9 FRA with a counter party for a notional amount of Rs.1 crore. Counter party quotes 6.25/6.50 for a 3 v 9 FRA, the corporate buys the FRA at 6.50% which effectively means it locks itself for 6.50% for the above future borrowing commitment.

If on the settlement date the bench mark interest rate settles at 7.00% (the corporate’s view has come true), the seller of FRA pays to the buyer the interest differential of 0.5% (7-6.5) on the notional principal of Rs.1 crore for the period of 6 months discounted at 7%. The amount receivable by the corporate is calculated as under:

(1, 00, 00,000x0.50%x181)/365 x [1/ (1+0.07x181/365)] =Rs.23963

If on the other hand Bench mark interest rate on settlement date has fallen down to 6.00% the corporate has to pay to the counter party the interest differential of 0.5% for six months discounted at 6.00%. The amount payable by the corporate is (1, 00, 00,000x0.50%x181) /365 x [1/(1+0.06x181/365)] =Rs.24078

**Conclusions**

• Derivatives have high leverage or gearing. With small outlay of funds we can deal in high volumes.

• Pricing and trading in derivatives are very complex and thorough understanding is a pre requisite before one can venture intodealing with derivatives.

• Derivatives enable price discovery, improve the liquidity of the underlying asset and are thus effective hedging instruments.

Source : SIRC newsletter