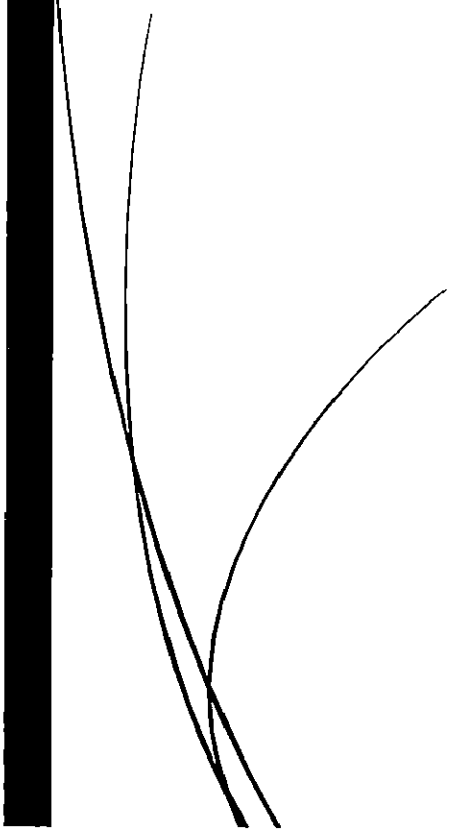
Chapter-2

Derivatives: Conceptual Framework



CHAPTER – II

DERIVATIVES: CONCEPTUAL FRAMEWORK

2.1 Introduction

The Globalization and financial liberalization started in the 1990's in India. During this period, the Indian Capital Market experienced a major transformation structural changes and its practical functions because of the free flow of capital in ever increasing volume which opened the doors to more speculation, the formation of the new instrument like derivatives and improvement of old financial devices as a part of capital market reforms.

The capital market reforms helped in designing new investment opportunities, improving efficiency in dissemination of information, better transparency in operations and prohibiting unfair trade practices. Highly integrated financial markets also help to individuals and investors to assort their portfolio risk.

Risks are many; one of these risks is financial risk, which is caused by changes in stock market prices. By a high degree of volatility, the financial markets are noticeable. Therefore, it is essential for the corporate client, to keep their operating profit by shifting some unbearable financial risk to those who are interested to bear and manage it. Risk management is required due to high volatility in the present financial market. The enlarged integration of domestic market with the international market as well as the increased volatility in financial markets has fuelled the development of derivatives market.

For large number of individuals and institutions, it is important to manage risk. A process where we invest, take on risk and in exchange earn a compensatory return is the most basic aspect of business. The success of this process depends on the management of risk return trade-off. Risk management is a good concept but the difficulty is often measuring risk. There is a great saying "what gets measured get managed". To alter this saying, "What cannot be measured cannot be manage". Therefore risk management always requires some measures of risk. In general

perspective, risk refers to how much the price of the security changes for a given change in some factor's. (Robert M. Conroy, 2003, p.1)

Derivatives can be used as hedging instrument in all environments that generate risk. Price risk, which arises due to fluctuations in asset prices, can be hedged by using appropriate derivative instruments. By locking in a certain price derivatives remove price risk for the future purchase or sale of an underlying asset whose price fluctuate frequently. Physical commodities, foreign currencies, financial securities such as shares, bonds and stock indices may be the underlying assets. Hence, different derivatives such as commodity derivatives, stock derivatives, currency derivatives, index derivatives and interest rate derivatives etc. have developed.

Presently, all over the world, derivatives' trading has become an important economic activity. In India, the development and commencement of trading in derivatives is of recent origin.

Globally, two major categories of derivatives traded are commodity derivatives and financial derivatives. Besides, Forwards, futures, options and swaps are the different types of derivatives, which are available in the derivatives market. The market participants are less aware of derivatives while derivatives trading are quite active. There is a lack of understanding about the complexity of derivatives structure and their trading practices among the people. In fact, there is more misunderstanding than proper understanding about the role of derivatives in the economic system.

However, there are some positive and negatives views related to derivatives. In positive view, derivatives as useful instruments are having a positive impact on the economy and it's functioning; on the other hand derivatives trading as an undesirable activity with negative impact on economic efficiency. Some other views, derivatives are lauded as useful tools of risk management; on the other, derivatives are condemned as "weapons of mass destruction' (Warren Buffet) in the economic system.

Derivatives' trading provides opportunity for speculative profit to interested parties while it is a hedging instrument. Hedgers and speculators are two wheels of a vehicle. They operate side-by-side supporting each other's requirements and activities in the derivatives market. The derivatives markets become active and dynamic because of

For example, Bombay Stock Exchange Share Index, called Sensex, is a derivative whose value (index for a particular day) depends upon the prices of underlying 30 shares. The weighted average of the closing prices of 30 shares is the Sensex. If the price of all these shares increases or decreases, the Sensex will also increase or decrease. So, the Sensex derives its value from the market prices of these 30 shares. The Sensex fluctuates in line with the fluctuation in prices of these shares. Now, if an investor holds any share, whether, included or not in the Sensex, he runs the risk of fluctuations in the price of that share in line with the change in Sensex. However, he can reduce his risk by taking an offsetting position in the Sensex derivatives (Sensex options or Sensex futures).

2.3 Debate Over Derivatives Introduction

As mentioned earlier there was a debate over these derivative products introduction in India. Debate on non-introduction of these derivatives can be classified into two arguments. One non-introduction argument was raised by strong broker associations, which concerned their right and fear that these products will replace Badla. Since, Badla was a mix of the cash and the future settlements grown natively, it offered an avoidance means through long settlements for large brokers tend to be active market players. Seeing its popularity, which served as a channel for employment of unaccounted assets of businessmen, speculators deployed their funds in a profitable way. Another argument of non-introduction comes from several stakeholders in the financial system viz. Banks and financial institutions, which put forth the argument of speculative nature of these products which lead to instance of market crashes in the past, which cannot be ignored. Introduction argument was from the regulator i.e. SEBI, NSE, and other newly sophisticated financial institutions enthusiasm in view of fact that India must accommodate the internationally established and proficient type of derivatives trading as these instruments would enable the investors to hedge their risks against market fluctuations. Let us move to Gupta Committee report and where it stands and where it stands in this debate.

SEBI that accepted the recommendations of Gupta Committee report on May 11, 1998 in board meeting released the contents of the report in June 1998. To sum up report in one sentence, it says that there should be phased introduction of derivatives trading in India beginning with 'stock index futures'. However, in details report

mentions that from its conducted market survey with various bodies concerned directly and indirectly with stock trading viz. brokers, banks, financial institutions, mutual fund institutions, foreign institutional investors etc., it observed that there are limited products in the market for hedging and at hand needs extensive derivatives products counting to equity, interest rate and currency derivative products. Based on its study and observations, committee proposes the 'stock index futures' as the most preferred product followed by 'stock index options' and options on individual stocks were the third in the order of preference. Let us look at the words from committee report on SSF (Single Stock Futures), "Individual stock futures, was favored much less. It is relevant to note that the U.S.A. does not permit individual stock futures. Only one or two countries in the world are known to have futures on individual stacks. Stock Index Futures are internationally the most popular forms of equity derivative". In addition, it also mentions that 3 month Futures as the most preferred product and in terms of the category of Options, American Options were preferred over European Options.

In accordance, while approving the recommendations of Gupta Committee and for an effective implementation of the same, SEBI setup a committee on "Risk Containment Measures in the Indian Stock Index Futures" under the chairmanship of J.R. Verma in June, 1998. Later, amendments in Securities Act and introductions of index futures followed. But the concern relating to the economic desirability of these securities and their impact on the underlying markets has continued to presume importance, especially after transition in the direction of SSF.

2.4 A Brief History of Derivatives Market in India

Futures trading started in 1875 by the Bombay Cotton Trade Association and India had one of the world's largest futures Industry by the early 1900s. Derivatives trading shifted to informal forwards markets, after the government banned on cash settlement and options trading in 1952. Now, government policy has changed, allowing for an increased role for market-based pricing and less suspicion of derivatives trading. In the early 2000s, the ban on futures trading of many commodities was lifted and national electronic commodity exchanges were created.

In the equity markets, a system of trading called "badla" involving some elements of forward trading had been in existence for decades. However, the system led to a

number of undesirable practices, it was prohibited off and on till the Securities and Exchange Board of India (SEBI) banned it for good in 2001. A series of reforms of the stock market between 1993 and 1996 paved the way for the development of exchange-traded equity derivatives markets in India. In 1993, the government created the NSE in collaboration with state-owned financial institutions. NSE improved the efficiency and transparency of the stock markets by offering a fully automated screen-based trading system and real-time price dissemination. In 1995, a prohibition on trading options was lifted. In 1996, the NSE sent a proposal to SEBI for listing exchange-traded derivatives. The report of the Gupta Committee, set up by SEBI, recommended a phased introduction of derivative products, and bi-level regulation (i.e., self-regulation by exchanges with SEBI providing a supervisory and advisory role). Another report, by the Verma Committee in 1998, worked out various operational details such as the margining systems. In 1999, the Securities Contracts (Regulation) Act of 1956, or SCRA, was amended so that derivatives could be declared "securities". This allowed the regulatory framework for trading securities to be extended to derivatives. The Act considers derivatives to be legal and valid, but only if they are traded on exchanges. Finally, a 30 years ban on forward trading was also lifted in 1999.

2.5 Types of Derivatives

The kinds of derivatives depend on the type of underlying asset. The derivatives may be commodity or financial assets. Broadly derivatives can be classified into two categories one is commodities or other is financial derivatives. Commodity derivatives, underlying asset can be commodities like wheat, gold, silver, jute, coffee etc., whereas underlying assets of financial derivatives are stocks, currencies, bonds and other interest rates bearing securities etc.

Futures contracts in commodities are available at different commodities exchanges in India i.e., futures in pepper are available at Kochi, while futures in Potatoes are available at Hapur. Coffee Futures Exchange India Ltd. has been established in December 1997 in Bangalore.

MCX[1], NMCX[2], NCDEX[3] are offering several different future contracts like agricultural commodities, oils and metals on the other hand Financial derivatives are

transacted at different exchanges all over the world. In India, NSE (National Stock Exchange) and BSE (Bombay Stock Exchange) are traded in future contracts.

2.6 Derivatives Instruments

Forward, Futures, Options and Swaps are the fundamental derivatives instruments. However, there are some other type of derivatives instruments, which are known as complex derivatives instrument such as Exotic, Swaptions and Leaps etc. Interest rates are also complex derivatives instrument.

2.6(a) Forward Contracts:

An agreement to buy or sell an asset for an encoded, fixed price, at a certain time or date in the future is known as a forward contract. The only difference between a normal sport transaction and a forward transaction is the time span between the contract and its fulfillment. A spot contract is an immediate, present contract while a forward is a later date or future contract that is just being finalized today. Forward contracts are generally trade on commodities. It is traded on over the counter. It is first negotiated without monetary transaction. Money only changes hands on the contract of maturity.

In a forward contract, if you hold a long position i.e. you have agreed to buy the underlying commodity at the agreed price, your payoff will be the differential between the forward price (F) and the spot rate (S) at that point in the future (F-S). On the other hand, with a short position (agreement to sell), your payoff will be the differential between the spot price of the commodity then and the futures price that you have agreed on (S-F).

Hence, can be concluded that a forward contract is an agreement to buy or sell an asset at a certain future time or a predetermined price. It can be difference with a spot contract, which is an agreement to buy or sell an asset today. It is traded in the Over-the-Counter market usually between two financial institutions or between a financial institution and one of its clients. On foreign exchange, forward contracts are very popular.

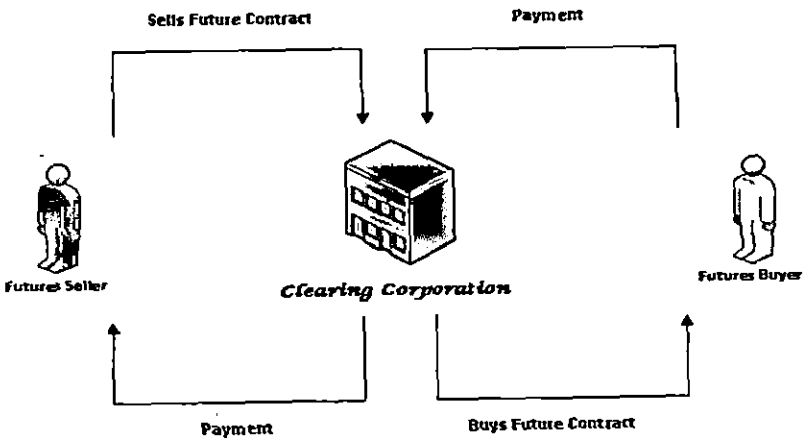
2.6(b) Futures Contracts:

Futures contracts of derivatives are very similar to forward contracts, the main differences are, forward contracts are traded OTC[4], whereas future contracts are traded on an exchange. Futures are also an agreement to buy or sell commodities at a predetermined price at certain time in the future. The term future includes all things like foreign exchange futures and stock index futures as well. Being traded on exchanges, the futures of the customization that are available on forwards, but on the other hand, as exchanges play clearing house in the transaction, futures have relatively lower credit risk.

The exchange specifies fixed standardized features of the contract. It is not necessary; both the parties know each other, a mechanism which is provided by the exchange, gives the two parties a guarantee that the contract will be honored.

The fundamental flow of a transaction between three parties, namely Buyer, Seller and Clearing Corporation is showed in the chart below:

Chart 2.1: Flow of Futures Transaction



Source: Researcher's own compilation through EDBM workbook. P11.

Hence, a futures contract, which is called simply futures, is an agreement to buy or sell a confirmed quantity of a commodity or a financial asset at a certain price at a specified futures date.

The parties in a future contract fix the terms of the transaction and lock in the price at which the transaction will be settled between them at future date. The futures contract

show to be providing for the physical delivery of the asset, while; in practice most of them are settled by offsetting futures contract. If a party is unable to settle a particular futures contract himself then the exchange will be settled it at a predetermined price and the difference is payable by or to the party. A future contract is not only use for actually delivery but also the hedging for future risk or speculation. In some cases, the physical asset does not exist at all. For example in case of Stock Index Futures, the Index is the weighted average price and cannot be delivered. Such futures must be settled in cash only.

Futures contract only traded at the organized exchanges. Some of them where futures are traded are Chicago Board of Trade, Tokyo Stock Exchange and London International Financial Futures Exchange (LIFFE) etc. The counter-party guarantee provides by the exchange through its clearinghouse and different types of margins system. Futures contracts are marked to market at the end of each trading day. Therefore, these are depending on intervening cash flows for unfavorable or favorable price movement. According to SEBI guidelines, the participating parties have to deposit an initial cash margin as well as that difference in traded price and actual price on daily basis, regarding trading in Stock Index Futures. At the end of the settlement period, the difference between the traded prices is settled by cash payment. In a future contract, no carry forward is allowed beyond the settlement period. Futures and Options regulations, 2000 issued by National Stock Exchange (NSE), which are applicable for both futures and options to the derivatives contract traded at NSE.

2.6(c) Options Contracts:

Options are an agreement, which gives the right but not the obligation to the buyer or seller to buy or sell the underlying assets at a certain price and at a specified date. Generally Options are two types. One is call options and another one is put options. A call option gives the right to the buyer but not the obligation to buy an underlying asset by a certain price at a specified date. A put option gives the right but not the obligation to the seller to sell the underlying asset by a certain price at a certain date. The certain price in the options contract is known as strike price or exercise price. If the prices are expected to move up in future, call option may be purchased by an investor, which would give the right to buy a share for a certain price at a certain date. If the prices rises above the strike price, the investor can exercise his right to buy the

share at the predetermine price. Thus, he would be able to avoid the risk, which arises due to upward movement in share prices. On the other hand, if the market price of the share does not rise above the strike price before the expiration date, the holder has a freedom not to exercise his right because there is no gain. Hence, the holder of the option has a freedom to exercise or not to exercise of the right. The seller of the option has the obligation to perform as per the agreement, if the buyer exercised the right provided by the option.

An investor may buy a put option when the share prices are expected to fall in futures, which give him the right to sell a share for a certain price at a certain date. If the share price fall down below the strike price, as expected, before the maturity, the investor may buy the shares from the market at lower price and exercises his right to sell the share at the higher exercise price, thus he can make a profit by expected price movement in future.

Amount, which is paid by the purchaser to the seller during the option contract is known as option premium. It depends upon the expiration period and the price movement of the underlying asset in future. If the buyer of the option is not to exercise his right, the premium paid by him becomes a loss while; it is the profit to the seller of the option.

Options are traded both on exchanges and in the over-the counter market. American options can be exercised at any time up to the expiration date. European options can be exercised only on the expiration date itself. Most of the options that are traded on exchanges are American.

2.6(d) Swaps:

A Swap is an agreement between two parties to exchange future cash flows. It is a private agreement between two parties or companies to exchange their cash flows according to pre-arranged formula. Financial institution generally arranges swaps. The parties to the swap agreement are known as counter party.

The two commonly used swaps are i) Interest rate swap which entail swapping only the interest related cash flows between the parties in the same currency. It is also known as coupon swap. ii) 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 the cash flows in the opposite direction.

2.6(e) Exotic Option:

An option that differs from common American or European Options in terms of the underlying asset or the calculation of how or when the investor receives a certain payoff. These options are more complex than options that trade on an exchange, and generally trade over the counter.

For example, one type of exotic option is known as a chooser option. This instrument allows an investor to choose whether the Options is a put or call at a certain point during the option's life. Because this type of option can change over the holding period, it is not found on a regular exchange, which is why it is classified as an exotic option.

Other types of exotic options include: barrier options, Asian options, digital options and compound options, among others.

2.6(f) LEAPS:

The short form LEAPS means Long-Term Equity Anticipation Securities. These are options having a maturity of up to three years. Long-Term Equity Anticipation Securities are Long-term stock options or index options, with expiration dates up to three years away. LEAPs are very similar to standard options except for the fact that they expire much further in the future. They can be safer than traditional options because it is somewhat easier to predict stock movement over longer periods. Like options, they allow an investor to lock in a fixed price for the underlying security. Therefore, like options, they can be effective for both leverage and insurance purposes. Expiration generally occurs 36 months after purchase, and LEAPs are American style, so they can be exercised at any time before expiration. Strike prices usually range around 25% above or below the price of the underlying stock when the LEAP is first offered.

2.6(g) Swaptions:

Swaptions are options to buy or sell a swap that will become operative at the expiry of the options. Thus a Swaptions is an option on a forward swap. Rather than have calls

and puts, the Swaptions market has receiver Swaptions and payer Swaptions. A receiver Swaptions is an option to receive fixed and pays floating. A payer Swaptions is an option to pay fixed and receives floating.

2.7 Concept of Financial Derivatives

Financial derivatives work as a risk management instruments. A derivative value depends on the price changes in some more essential underlying assets. Now a day, many types of financial derivatives instruments are available in the financial markets. Forward contracts, Futures and Options are the most fundamental instrument among them. When the underlying assets are stocks, bonds, foreign exchange rates and commodities etc., then Stock futures (options), bond futures (options), currency futures (options) and commodity futures (options) etc. are the corresponding risk management instruments.

The contracts of financial derivatives are generally settled in cash. For exchange-traded contracts, it often arises before maturity, as commodity futures. A logical significance is a cash payment of the use of financial derivatives to trade risk independently of ownership of an underlying asset.

Though, some financial derivative contracts, mainly involving foreign currency, are related with transactions in the underlying item. Financial derivatives are used for a number of purposes including risk management, hedging, arbitrage between markets, and speculation.

Financial derivatives are used as a risk management tool of underlying assets. Hedging is the basic strategy in which the traders hold two positions of equal amounts but opposite direction i.e. one in the derivatives markets and the other in the underlying markets, simultaneously. This strategy is based on this assumption that under normal circumstances, prices of underlying assets and their derivatives change roughly in the same direction with basically the same amount; therefore losses can be made up for gains in the derivatives markets; hence, due to the price changes, losses can be reduced by merging the risk.

2.8 Traders in Derivatives Market

Derivatives market attracted many types of participant and have a great deal of liquidity. If any investor wants to take one side of a contract then there is no problem in finding a person who is interested to take the other side contract. Traders can be identified into three broad categories i.e. Hedgers, Speculators and Arbitrageurs.

2.8(a) Hedgers:

Hedgers use derivatives to reduce the risk that they face from potential future movements in a market variable.

Hedgers eliminate the market risk, which is generated due to fluctuations in the prices of certain assets. The hedgers can eliminate the risk, which arises due to adverse movements in prices of the underlying assets. Let us consider an importer who has imported goods from the USA. He is expected to make payments for his imports in US dollars after 3 months. The current market price of 20 US dollar is 64.13. For making the payment, he has to buy US dollar in the foreign currency market after 3 months. The importer is exposed to risk on account of exchange rate fluctuations in foreign currency markets. He is likely to suffer loss in his future purchase of US dollars, if the US dollar price moves up from the current market price of Rs. 64.13. In this situation, the importer enters the derivatives market to hedge his risk. He may enter into a forward contract or a futures contract to buy US dollar or purchase a call option on the US dollar.

2.8(b) Speculators:

The traders who are ready to take a risk form some return are known as speculators. Speculators participate in the market either expecting that the market prices will go up or go down. They can be traded in futures or options. In futures, their possible gain or loss is very high while on the other hand in the case of options loss may be limited and gain may be unlimited. The role of speculators is very important in derivatives market, without which the market probably would not survive.

2.8(c) Arbitrageurs:

The third group of traders in futures, forward and options markets is arbitrageurs. They simultaneously entered into transactions in two or more markets for locking in a

risk less profit. Arbitrageurs are profit seekers. They try to obtain profit from differences in prices of an asset in two different markets. The markets, which offer lower price, they would buy in that market and simultaneously sell in the market, which offers the higher price. They work in the derivatives market to use any inconsistency in the prices of derivative securities. Though, the prospects for arbitrageurs are limited and temporary in most markets, while their behavior would help to equalize in prices of assets across different markets.

2.9 Trading Futures: Futures Payoffs

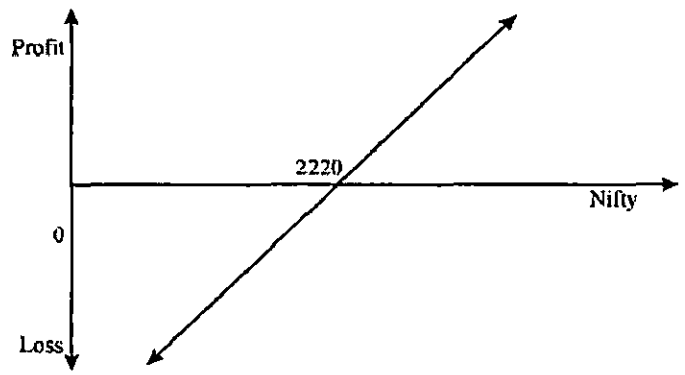
Futures contracts have linear or symmetrical payoffs. It implies that the losses as well as profits for the buyer and the seller of a futures contract are unlimited. These linear payoffs are fascinating as they can be combined with options and the underlying to generate various complex payoffs.

2.9(a) Payoff for Buyer of Futures: Long Futures

The payoff for a person who buys a futures contract is similar to the payoff for a person who holds an asset. He has a potentially unlimited upside as well as a potentially unlimited downside. Take the case of a speculator who buys a two-month Nifty index futures contract when the Nifty stands at 2220.

The underlying asset in this case is the Nifty portfolio. When the index moves up, the long futures position starts making profits, and when the index moves down it starts making losses.

Chart 2.2 Payoff for a Buyer of Nifty Futures



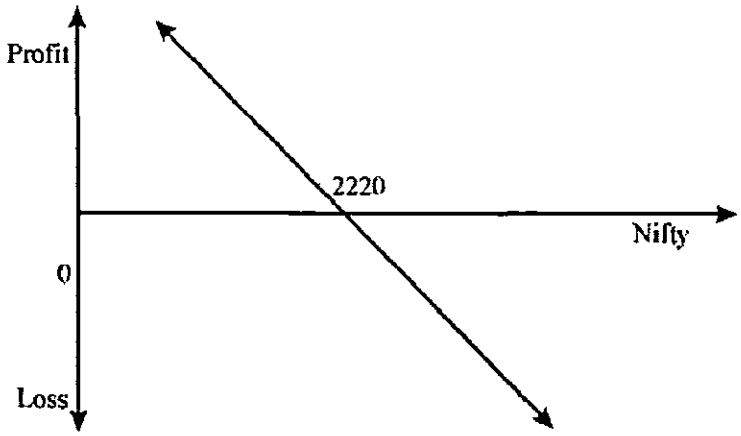
Source: Researcher's own compilation through www.nseindia.com/.../module_ncfm.html

The Chart 2.2 above shows the profits/losses for a long futures position. The investor bought futures when the index was at 2220. If the index goes up, his futures position starts making profit. If the index falls, his futures position starts showing losses.

2.9(b) Payoff for Seller of Futures: Short Futures

The payoff for a person who sells a futures contract is similar to the payoff for a person who shorts an asset. He has a potentially unlimited upside as well as a potentially unlimited downside. Take the case of a speculator who sells a two-month Nifty index futures contract when the Nifty stands at 2220. The underlying asset in this case is the Nifty portfolio. When the index moves down, the short futures position starts making profits, and when the index moves up, it starts making losses.

Chart 2.3: Payoff for a Seller of Nifty Futures



Source: Researcher's own compilation through www.nseindia.com/.../module_ncfm.html

The Chart 2.3 shows the profits/losses for a short futures position. The investor sold futures when the index was at 2220. If the index goes down, his futures position starts making profit. If the index rises, his futures position starts showing losses.

2.10 Trading Options: Option Payoff

There are two sides to every option agreement. On the one side is the option buyer who has acquired a long position (i.e., has purchased the option). On the other side is the option seller who has acquired a short position (i.e., has traded the option). The seller of the option gets a premium from the purchaser of the option. It may be noted that while calculating profit and loss, premium has to be taken into concern. Also, when a buyer makes profit, the seller makes a loss of equal amount and vice versa.

2.10(a) A Long Position in a Call Option

In this approach, the investor has the right to acquire the asset in the future at a fixed strike price i.e., strike price (K) and the option seller have the obligation to sell the asset at the strike price (K). If the settlement price of the asset is exceeding the strike price, then the call option purchaser will exercise his option and acquire the stock at the strike price (K). If the settlement price is lesser than the strike price, the option buyer will not exercise the option as he can acquire the same stock from the market at a price less than the strike price.

2.10(b) A Long Position in a Put Option

In this approach, the investor has got the right to sell the underlying asset in the future at a fixed strike price (K). At the time of maturity, if the settlement price of underlying asset is lesser than the strike price, then the put option owner will exercise his option and sell the asset at the strike price (K). If the settlement price of underlying assets is more than the strike price, the option buyer will not exercise the option because he can sell the same stock in the market at a price higher than the strike price.

2.10(c) A Short Position in a Call Option

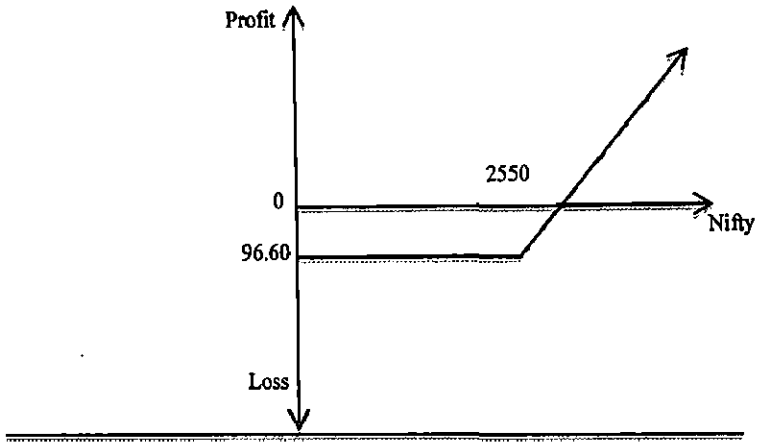
In this approach, if the buyer of the option wants to exercise the option, the option seller has a compulsion to sell the asset at a fixed strike price (K). The buyer of the option will use the option if the spot price at maturity is any value more than strike price (K). If the spot price is less than strike price (K), the buyer of the option will not use option.

2.10(d) A Short Position in a Put Option

In this approach, the option seller has an obligation to buy the asset at a predetermined strike price (K) if the buyer of the option chooses to exercise his/her option. The buyer of the option will exercise his option to sell at (K) if the spot price at maturity is lower than (K). If the spot price is higher than (K), then the option buyer will not exercise his/her option.

In this approach, if the buyer of the option wants to exercise his option, the option seller has a compulsion to buy the asset at a fixed price (K). The buyer of the option will use his option to sell at strike price (K) if the spot price will be lower than the strike price at maturity. If the spot price is more than the strike price, the option buyer will not use his option.

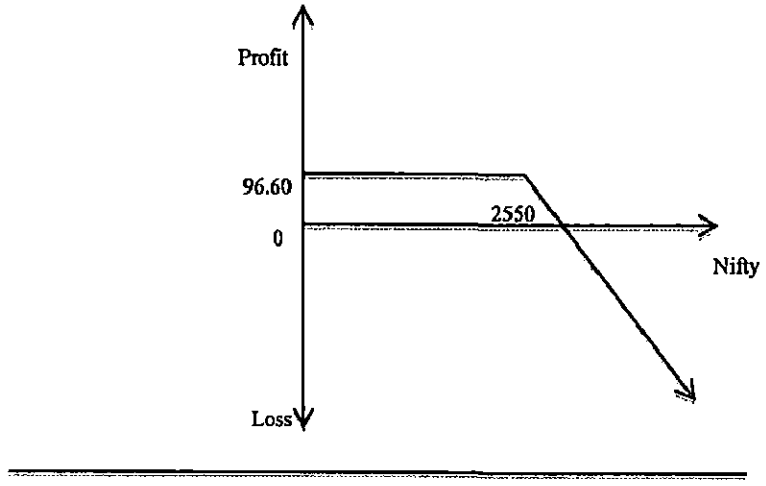
Chart 2.4: Pay-off for a Buyer of a Call Option



Source: Researcher's own compilation through EDBM workbook p.31

The **Chart 2.4** indicates the profits & losses for a buyer of a three-month Nifty 2550 call option. As can be seen, as the spot Nifty grows the call option is in the money. If on the expiration, Nifty closes more than the strike price of 2550, the buyer would exercise his option and profit to the amount of the difference between the Nifty-close and the strike price. The profits possible on this option are possibly unlimited. Though, if Nifty drops below the strike of 2550, the buyer lets the option expire. His losses are limited to the amount of the premium that he paid for obtaining the option.

Chart-2.5: Pay-off for a Seller of a Call Option

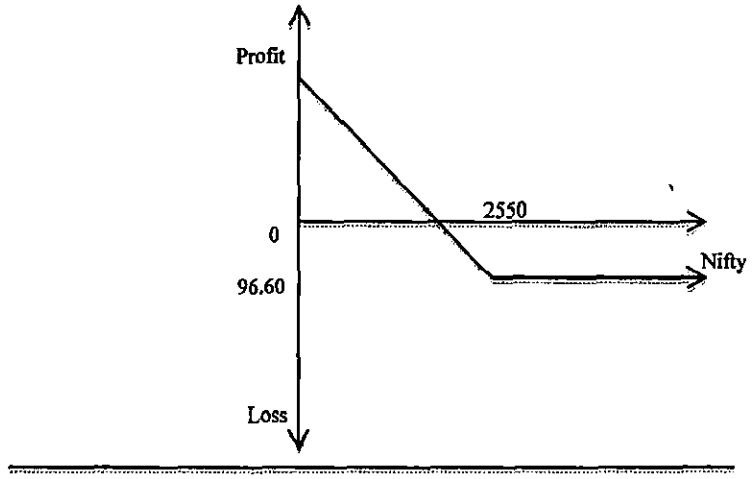


Source: Researcher's own compilation through EDBM workbook p.31

The **Chart 2.5** indicates the profits & losses for a seller of a three-month Nifty 2550 call option. As the spot Nifty grows the call option is in the money and the writer starts making losses. On the expiration day, if the Nifty closes more than the strike of 2550, the buyer would exercise his option on the writer who will bear the loss to the

level of difference between the Nifty close and the strike price. The loss, which can be earned by the writer of the option, is possibly limitless, while highest profit is limited to the level of the upfront option premium charged by him.

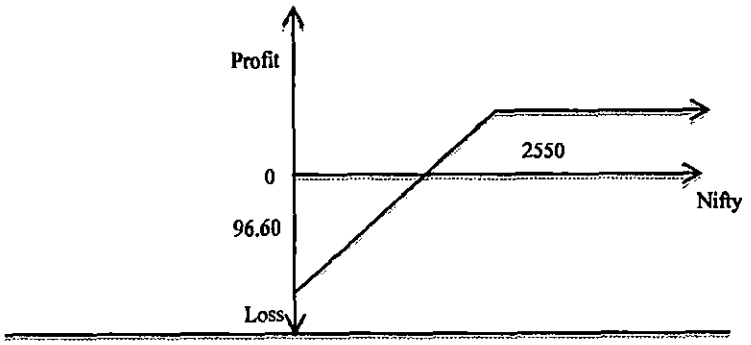
Chart 2.6: Pay-off for a Buyer of a Put Option



Source: Researcher's own compilation through EDBM workbook p.31

The **Chart-2.6** defined the profits & losses for a buyer of a three-month Nifty 2550 put option. As can be seen, as the spot Nifty falls, the put option is in the money. On the expiration day if Nifty closes less than the strike of 2550, the buyer would use his option and profit to the amount of difference between the strike price and Nifty close. The profits likely on this option can be as maximum as the strike price. While, if Nifty grows more than the strike of 2550, he lets the option expire. His losses are limited to the amount of the premium he paid for buying the option.

Chart 2.7: Pay-off for a Seller of a Put Option



Source: Researcher's own compilation through EDBM workbook p.31

The **Chart-2.7** explains the profits & losses for a seller of a three-month Nifty 2550 put option. When the spot Nifty drops, the put option is in the money and the writer

put option. When the spot Nifty drops, the put option is in the money and the writer turns into losses. On the day of expiration, if Nifty closes less than the strike of 2250, the buyer would use his option on the writer who would bear a loss to the amount of the difference between the strike price and Nifty-close. The loss that can be earned by the writer of the option is a highest amount of the strike price while the highest profit is limited to the degree of the option premium charged by him.

2.11 Applications of Financial Derivatives

The derivative market performs a number of economic functions. First, prices in an organized derivatives market reflect the perception of market participants about the future and lead the prices of underlying to the perceived future level. The prices of derivatives converge with the prices of the underlying at the expiration of derivative contract. Thus derivatives help in discovery of future as well as current prices. Second, the derivatives market helps to transfer risks from those who have them but may not like them to those who have appetite for them.

Third, derivatives, due to their inherent nature, are linked to the underlying cash markets. With the introduction of derivatives, the underlying market witnessed higher trading volumes because of participation by more players who would not otherwise participate for lack of an arrangement to transfer risk. Fourth, speculative trades shift to a more controlled environment of derivatives market.

In the absence of an organized derivatives market, speculators trade in the underlying cash markets. Margining, monitoring and surveillance of the activities of various participants become extremely difficult in these kinds of mixed markets. Fifth, an important incidental benefit that flows from derivatives trading is that it acts as a catalyst for new entrepreneurial activity.

The derivatives have a history of attracting many bright, creative, well-educated people with an entrepreneurial attitude. They often energize others to create new businesses, new products and new employment opportunities, the benefits of which are immense. Sixth, derivatives markets help increase savings and investment in the long run. Transfer of risk enables market participants to expand their volume of activity.

2.12 Significance of Derivatives

In modern world, derivatives trading have much importance. International trades grow up due to globalization. The result is larger volumes of money flow in different currencies in all over the world. Thus, foreign exchange market becomes dynamic. Now it plays a crucial role in the global economic environment.

A floating exchange rate system has adopted by most of the counties of the world, the result is, and constant fluctuation in exchange rates between currencies. The volatility in foreign currency markets negatively affects all participants in global business activities. In foreign currency transaction, currency derivative is a useful instrument in managing the risk.

In the present economic system, all countries are focusing their attention on economic growth and development. Rapid economic growth makes the stock markets dynamic. The stock markets have become the important institutions where large numbers of transactions involved in buying and selling securities by domestic as well as the foreign participants are recorded daily. The stock market volatility exposes the participants to substantial risk. Derivatives, which are based on stocks and stock indices, are relatively useful in justifying the risk in stock market trading and investment.

In present modern scenario, another area of great significance is a commodity trading. Commodities trading include metal and minerals, agricultural commodities, and manufacturing commodities. Commodities trading cannot be contained within national boundaries. The modern sources of communication and transportation have helped to facilitate the flow of commodities across countries in international trade. Commodity trading is now accepted in global market but it increased the volatility in the commodity prices. Commodities derivatives are useful securities to hedge the risk in commodities trading.

Emergence of Multinational corporations (MNCs) and Internationalization expand the size of the business at domestic as well as global market. The large scale of business activities requires more capital investment. Most of the business units prefer commercial borrowing to meet their enhanced capital requirements with the help of domestic as well as global financial market.

In this situation, business enterprises suffer loss if they borrow at fixed interest rate and market interest rate fall; and the unit which borrow at variable interest rate would surer loss when market interest rate rise. In this situation, Derivatives hedge this risk through the interest rate swaps and interest rate futures.

Due to price fluctuation, market participants of currency markets, stock markets, commodity markets and debt markets face considerable risk. All these market are global market. To ensure the stability in the global economic system, these markets should function smoothly and efficiently. Without managing the risk, smooth and efficient functioning is not possible in these markets. Derivatives are tools for hedging the risk in these markets.

2.13 Role of Derivatives in the Indian Capital Market

Financial derivatives have two major roles. These are:

- Speculation
- Hedging

Through the hedging process, derivatives help to exchange the risk of the parties. Usually, it is possible with the help of the underlying asset or a stock that actually exists. The underlying asset provides the opportunity to the one party to shield themselves against a probable risk in the future while the other party also does the same.

In the financial market, derivatives are obtained from existing marketing indices. This allows an individual or a business the opportunity of controlling a very large investment with just a small investment (this is usually called the option premium or margin). Through this channel of investment, traders have the opportunity of hedging themselves against the risk of actually purchasing the future stock using their actual value. (Francis et. al, 2003)

The second attribute about financial attribute is with regard to their role in speculation.

It should be noted that speculative trading is very complex and if one trades poorly, it may lead to huge losses. There are a number of issues that investors need to consider

while doing speculative trading. They need to have oversight on future eventualities moreover they also need to exercise good judgment on possible financial behavior. Additionally, investors must always ensure that their predictions fall in line with the nature of regulation in their operating environment. Room must also be given to events that can occur outside an institution's control. These include hailstorms, earthquakes and the like. These issues all have a large role to play in determining how a certain security will behave or in determining its volatility (Scholes, 1998).

2.14 Risk Involved in Derivatives

Most regular investors look at derivatives as the risky investment vehicle that wiped out California's Orange County government to the tune of $1.5 billion in investments and destroyed England's Barings Bank when an ill-informed trader bet against Japanese markets and lost.

Derivatives are powerful hedging instrument, which can be relatively beneficial if handled correctly. It is fact that you can lose a large amount of money in derivatives trading very quickly, when the event that you though were going to happen failed to occur.

A derivative contract depends upon prices or rates of other financial securities. To manage the risk, investors should be careful on the positions of these financial securities.

Other factors affecting the risk exposure in derivatives is a trend towards participants signing net agreements that require only the net value of all parties' positions to be replaced if there is a default.

Derivatives, in it, are a very risky tool, which is used to manage risk. Future contracts are the riskiest than other derivatives instruments. If you entered in future contract, you are obliged to buy or sell the specific commodity by a specified time and at a certain price. The commodity includes agriculture products, financial products, precious metals etc. that is crops and animals, gold and silver, oil and other energy products, stocks and foreign currencies etc.

Futures contracts and stock option contracts are very similar, but futures contracts are much riskier because you do not have an option to purchase or sell something, you

have an obligation. Hence, if you predict incorrectly, you can lose more than you are paid out of contract. Its prediction is as difficult as to predict the rise and fall of a stock.

Besides the "price risk" of potential losses on derivatives from changes in interest rates, foreign exchange rates, or commodity prices, there is "default risk" (sometimes referred to as "counterparty risk"), "liquidity (or funding) risk," "legal risk," "settlement risk", and "operations risk." Last, but not least, is "systemic risk''—the notion of problems throughout the financial system that seems to be at the heart of many regulatory concerns.

The risks which are generally related with derivatives transactions are price risk, default risk and systemic risk which is the possible for losses on derivative positions stemming from changes in the prices of the underlying assets for instance, interest rates, exchange rates, and commodity prices.

Derivatives can segregate and contemplate existing risks, in that way facilitating their efficient transfer. In fact, it has an ability to segregate specific risk at low transaction cost which makes derivatives such useful risk management tool. Usually, derivatives are used in managing the price risks through hedging.

Default risk is the risk that losses will be incurred due to default by the counterparty. "Credit Risk" and "Counterparty risk" are the synonym term for default risk. The enforceability of the contract is known as "Legal risk" and "Settlement risk" are the term which refer to defaults that occur at a certain point in the life of the contract i.e. date of settlement. These terms just describe different occasions or causes of default.

In practice, a firm may be able to accelerate default. For example, once it becomes clear that a firm will ultimately be unable to meet all of its obligations, the firm may elect to enter bankruptcy proceedings now, even though current obligations do not force this step. The firm would only chose this path if it is in the firm's best interest, and hence there may be an optimal default policy.

Default risk has two components: the expected exposure, (the expected replacement cost of the contract minus the expected recovery from the counterparty) and the probability that default will occur.

The aggregation of default risks is known as systemic risk, which is faced by individual firms in using derivatives. The systemic risk of derivatives as common non payment in any set of financial contacts related with default in derivatives. If derivatives contracts are to cause common default in other markets, there must be large defaults in derivative markets. Thus, for systemic problem, major derivatives defaults are essential. Even if systemic risk is simply the aggregation of the underlying risks, because the underlying risks are correlated, one cannot simply sum up them to find the total.

It is possible that financial markets could be hit by a very big disturbance. Such type of disturbance affected the derivative markets and the participants in these markets. During such disturbance the firms suffer common or independent shocks.

If the disturbances were large but temporary many outstanding derivatives would be essentially unaffected because they specify only relatively infrequent payments. Therefore, a temporary disturbance would primarily affect contracts with required settlements during this period.

If the disturbance were large but temporary many outstanding derivatives would be essentially unaffected because they specify only relatively infrequent payments. Therefore, a temporary disturbance would primarily affect contracts with required settlements during this period.

Permanent shock would affect derivatives in the same manner that it affects other instruments. If the underlying price increases, there would be a long positions gain while short positions loss. Since derivative contracts are in zero net supply, the gains exactly equal to losses.

2.15 Futures Terminology

- **Spot price**: The price at which an underlying asset trades in the spot market.
- **Futures price**: The price that is agreed upon at the time of the contract for the delivery of an asset at a specific future date.
- **Contract cycle**: It is the period over which a contract trades. The index futures contracts on the NSE have one-month, two-month and three-month expiry cycles, which expire on the last Thursday of the month. Thus a January expiration

contract expires on the last Thursday of January and a February expiration contract ceases trading on the last Thursday of February. On the Friday following the last Thursday, a new contract having a three-month expiry is introduced for trading.

- **Expiry date**: is the date on which the final settlement of the contract takes place.
- **Contract size**: The amount of asset that has to be delivered under one contract. This is also called as the lot size.
- **Basis:** Basis is defined as the futures price minus the spot price. There will be a different basis for each delivery month for each contract. In a normal market, basis will be positive. This reflects that futures prices normally exceed spot prices.
- **Cost of carry**: Measures the storage cost plus the interest that is paid to finance the asset less the income earned on the asset.
- **Initial margin**: The amount that must be deposited in the margin account at the time a futures contract is first entered into is known as initial margin.
- **Marking-to-market**: In the futures market, at the end of each trading day, the margin account is adjusted to reflect the investor's gain or loss depending upon the futures closing price. This is called marking-to-market.
- **Maintenance margin**: Investors are required to place margins with their trading members before they are allowed to trade. If the balance in the margin account falls below the maintenance margin, the investor receives a margin call and is expected to top up the margin account to the initial margin level before trading commences on the next day.

2.16 Conclusion

Markets always play an essential role in the development of an economy. Now ever, world is becoming a financial village, materialization of international business demands success to have a better coordination among regulators etc.

Due to globalization, liberalization and privatization, the future of Indian markets is expected to be bright. In the future, it will be expected that Indian market is more

vibrant and attain a leading position in the financial world. Information irregularity is expected to reduce at an increasing rate due to increasing role of Information and Communication Technology (ICT). Organized exchanges are to be expected on stop financial shopping malls.

Last decade was the most exciting decade in the international markets because of derivatives. On one hand, due to some horror stories of derivatives, the entire business of derivatives under the limelight and make everyone be bothered about unknown risk which is related with derivatives and promote derivatives into strange 'something'; while on the other hand investors were curious to know about derivatives and started to understanding the derivatives and used it for hedging and justifying risks while adding liquidity to the markets.

Therefore, it is important, to come to know how the derivatives market is functioning and how far the core benefit of price discovery or fair pricing in asset market is actually being aided by the successful derivatives markets.

Derivatives markets have been unusually successful. The main reason behind that is many participants is traded in and has a great deal of liquidity. Futures and options trading helps in hedging the price risk and also provide investment opportunity to speculators. Speculators, who are willing to presume risk for possible return, Future trading helps the farmer which corps to grow. Non-hedging of the risk would increase the volatility of the quarterly earnings; hence, future contract can also help in building a competitive their earning.

Therefore, we can conclude that futures and options perform important functions that cannot be avoid in the modern business world. While, it is true that too much speculative activity in essential commodities would weaken the markets and therefore, such markets are usually regulated as per the legislation of the country. Thus, the next chapter defines the regulatory framework of Indian derivatives market.

END NOTES

1. The Multi Commodity Exchange of India Limited (MCX), India's first listed exchange, is a state-of-the-art, commodity futures exchange that facilitates online trading, and clearing and settlement of commodity futures transactions, thereby providing a platform for risk management. The Exchange, which started operations in November 2003, operates within the regulatory framework of the Forward Contracts (Regulation) Act, 1952. Retrieved from http://www.mcxindia.com/ aboutus/AboutUs.htm on 02.11.2014.

2. National Multi Commodity Exchange of India Ltd.: Founded in 2002, NMCE is India's third largest commodity exchange. It was the first commodity exchange of India to be granted permanent recognition by government in the 2003 retrieved from http://irjbm.org/irjbm2013/November/Paper4.pdf on 12.11.2014.

3. NCDEX was incorporated as public limited company under the Company Act 1956 on April 23, 2003. It is an online multi commodity and professionally managed exchange with an independent Board of Directors not having vested interest in commodity market. Retrieved from http://www.investopedia. com/terms/n/ncdex.asp on 24.11.2014.

4. OTC (Over the Counter) market is a decentralized market, which doesn't have a central physical location, where market participant trade with one another through different communication modes such as the telephone, email and proprietary electronic trading systems etc. retrieved from http://www.investopedia.Com /terms/o/over-the-countermarket.asp on 02.12.2014.