CHAPTER III

DERIVATIVE MARKET: AN OVERVIEW

3.1 INTRODUCTION

Many associate the financial market mostly with the equity market. The financial market is, of course, far broader, encompassing bonds, foreign exchange, real estate, commodities, classification of other asset and financial instruments. Of late segment of the market that has fast become its most important one is the derivatives market. The derivatives market has seen the highest growth among all financial market segments in recent years. It has become a central contributor to the vibrant state of the financial system and has emerged as an important factor in the functioning of the real economy. Despite the importance of the derivatives market, many a section of society want to have a comprehensive perspective on its size, structure, role, etc. and on how it works.

Last decade was one of the most eventful decades in the international financial markets, more specifically derivatives market. On one side, just few derivatives disaster stories were enough to bring the entire business of derivatives under limelight, make everyone worry about unknown risks associated with derivatives, and elevate derivatives into mysterious
“something”; while on the other side, there were people who started understanding the derivatives and used the derivatives for hedging and mitigating risks while adding liquidity to the markets.

The derivatives market has recently attracted more attention against the backdrop of the financial crisis, fraud cases and the near failure of some market participants. Although the financial crisis has primarily been caused by structured credit-linked securities that are not derivatives, policy makers and regulators have started thinking about strengthening regulation to increase transparency and safety both for derivatives and other financial instruments. Before discussing the prerequisites for a well-functioning derivatives market, it is useful to consider the fundamentals and characteristics of this market along with the mechanics of trading, its economic and social functions and the dynamics of derivative market functioning with special reference to futures market.

3.2 DERIVATIVES

Derivatives are financial instruments that are mainly used to protect against or to manage risks, and very often also serve arbitrage or investment purposes, providing various advantages compared to securities. Derivatives come in many varieties and can be differentiated by how they are traded, what they refer to, and the product type.
A derivative instrument, broadly, is financial contract whose payoff structure is determined by the value of an underlying commodity, security, interest rate, share price index, exchange rate, and oil price alike. Thus, a derivative instrument derives its value from some underlying variable. A derivative instrument by itself does not constitute ownership. It is, instead, a promise to convey ownership. All derivatives are based on some “cash” products. The underlying basis of a derivative instrument may be any product including

1. Commodities like grain, coffee beans, orange juice, etc.
2. Precious metals like gold and silver
3. Foreign exchange rate
4. Bonds of different types, including medium and long-term negotiable debt securities issued by governments, companies, etc.
5. Short-term debt securities such as T-bills

Derivatives are specialized contracts which are employed for a variety of purposes including reduction of funding costs by borrowers, enhancing the yield on assets, and modifying the payment structure of assets to correspond to the investor’s market view. In the organized derivatives market where derivative products are traded, future market plays a defining role. Futures contracts are traded on exchanges, and they are standardized according to the rules and regulations of the exchange. The exchange determines the exact quality and quantity of the goods to be delivered per contract, when the
contract terminates and the location of the delivery. This standardization facilitates secondary market trading and enhances the liquidity of the market. The parties involved need not concern themselves with the creditworthiness of other players because the exchange itself guarantees the performance of all parties. The seller of a futures contract is said to be in the ‘short’ position and the buyer is said to be in the ‘long’ position. The date at which the parties must complete the transaction is the settlement or delivery date. The price agreed to by two parties is known as the futures price.

3.3 TYPES OF DERIVATIVES

The most commonly used derivatives contracts are forwards, futures and options. Here we take a brief look at various derivatives contracts that have come to be used.

3.3.1 Forward Contracts

A forward contract is an agreement between two parties to buy and sell a commodity or financial asset at certain future time for a certain price. Historically, the forward markets are forerunners of futures markets. A forward contract is a simple derivative that can be contrasted with a spot contract, which is an agreement to buy or sell an asset today. A forward contract is traded in the over-the-counter market usually between two financial institutions or between a financial institution and one of its clients.
One of the parties to a forward contract assumes a long position and agrees to buy the underlying asset on a certain specified future date for a certain specified price. The other party assumes a short position and agrees to sell the asset on the same date for the same price. Forward contracts on foreign exchange are very popular. Most large banks have a "forward desk" within their foreign exchange trading room that is devoted to the trading of forward contracts.

3.3.2 Futures Contracts

Like a forward contract, a futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future for a certain price. Unlike forward contracts, futures contracts are normally traded on an exchange. To make trading possible, the exchange specifies certain standardized features of the contract. As the two parties to the contract do not necessarily know each other, the exchange provides a mechanism that gives the two parties a guarantee that the contract will be honored.

The largest exchanges on which futures contracts are traded are the Chicago Board of Trade (CBOT) and the Chicago Mercantile Exchange (CME). On these and other exchanges throughout the world, a very wide range of commodities and financial assets form the underlying assets in the various contracts. The commodity includes even pork bellies, live cattle, sugar, wool,
lumber, copper, aluminum, gold, and tin. The financial assets include stock indices, currencies, and treasury bonds.

One way in which a futures contract is different from a forward contract is that an exact delivery date is usually not specified. The contract is referred to by its delivery month, and the exchange specifies the period during the month when delivery must be made. For commodities, the delivery period is often the entire month. The holder of the short position has the right to choose the time during the delivery period when it will make delivery. Usually, contracts with several different delivery months are traded at any one time. The exchange specifies the amount of the asset to be delivered for one contract and how the futures price is to be quoted. In the case of a commodity, the exchange also specifies the product quality and the delivery location.

3.3.3 Options Contracts

Options are traded both on exchanges and in the over-the-counter market. There are two basic types of options. A call option gives the holder the right to buy the underlying asset by a certain date for a certain price. A put option gives the holder the right to sell the underlying asset by a certain date for a certain price. The price in the contract is known as the exercise price or strike price; the date in the contract is known as the expiration date or maturity date. American options can be exercised at any time up to the expiration date. European options can be exercised only on the expiration date. Most of the
options that are traded on exchanges are American. In the exchange-traded equity options market, one contract is usually an agreement to buy or sell 100 shares. European options are generally easier to analyze than American options, and some of the properties of an American option are frequently deduced from those of its European counterpart.

It should be emphasized that an option gives the holder the right to do something. The holders do not necessarily have to exercise this right. This is what distinguishes options from forwards and futures, where the holder is obligated to buy or sell the underlying asset. It should be noted that it costs nothing to enter into a forward or futures contract, whereas there is a cost for acquiring an option.

3.4 EMERGENCE OF FINANCIAL DERIVATIVES

Derivative products initially emerged as hedging devices against fluctuations in common prices, and commodity-linked derivatives remained the sole form of such products for almost three hundred years. Financial derivatives came into limelight in the post-1970s due to growing instability in the financial markets. However, since their emergence, financial derivatives products have become very popular and in 1990’s, overtaking the commodity derivatives they accounted for about two-thirds of total transaction in derivative market. In recent years, the market for financial derivatives has grown tremendously in terms of variety of instruments available, their complexity and
also in terms of turnover. In the class of equity derivatives world over, futures and options on stock indices have gained more popularity than on individual stocks, especially among institutional investors, who are the major users of index-linked derivatives. Even small investors find the usefulness of derivatives became of the existence of a high correlation between the popular indexes with various portfolios. The lower cost associated with index derivatives than derivative products based on individual securities is another reason for their growing use.

3.5 PLAYERS IN DERIVATIVE MARKETS

Derivatives markets have been outstandingly successful. The main reason is that they have attracted many different types of traders and have a great deal of liquidity. When an investor wants to take one side of a contract, there is usually no problem in finding someone who is prepared to take the other side.

Three broad categories of traders can be identified among the players in the market: hedgers, speculators, and arbitrageurs. Hedgers use futures, forwards, and options to reduce the risk that they face from potential future movements in a market variable. Speculators use them to bet on the future direction of a market variable. Arbitrageurs take offsetting positions in two or more instruments to lock in a profit.
3.5.1 Hedgers

Hedging is the prime reason which has led to the emergence of derivatives. The availability of derivatives allows one to undertake many activities at a considerably lower risk. Hedgers, therefore, are important components of the derivatives markets. Hedgers are the traders who wish to eliminate the risk associated with the price of an asset and they may take a long position or short position on a commodity to lock in existing profits. The main purpose is to reduce the volatility of a portfolio, by reducing the risk. Nevertheless, while a forward contract requires no payment, an option contract involves an initial cost. In the event of call is not exercised, the premium paid for it becomes a net loss while if it is exercised, the profit resulting from the call exercise compensates the cost.

3.5.2 Speculators

Hedgers are the people who wish to avoid the price risk; while speculators are those who are willing to take such risk. These are the people who take positions in the market and assume risks, to profit from fluctuations in prices. In fact, the speculators consume information, make forecasts about the prices and put their money in these forecasts. In this process, they feed information into prices and hence contribute to market efficiency. By taking positions, they are betting that a price would go up or they are betting that it would go down. Depending on their perceptions, they may take long or short
positions on futures or options or may hold spread positions. Derivatives make speculation easy with least investment. In the absence of the derivatives, speculative activity would become very difficult as it might require huge funds to be invested.

Speculators in the derivatives market may be categorized as scalpers, day traders and position traders. Scalpers attempt to profit from small changes in the contract price. Day traders speculate on the price movements during single trading day, thus open and close positions many times a day but do not carry any position at the end of the day. Obviously, they monitor the prices continuously and generally attempt to make profit from just a few ticks per trade. On the other hand, the position traders attempt to gain from price fluctuations by keeping their positions open for longer durations - may be for a few days, weeks or even months. They use fundamental analysis, technical analysis and other information available to them to form their opinions on the likely price movements (Vohra and Bagri 2008).

### 3.5.3 Arbitrageurs

Arbitrageurs attempt to earn risk-free profits by exploiting market imperfections. An arbitrageur profits by trading a given commodity or other items that sell for different prices in different markets. Thus, arbitrage involves making riskless profit by simultaneously entering into transactions in two or more markets. If a certain share is quoted at a lower rate on the NSE and at a
higher rate on the BSE, an arbitrageur would make profit by buying the share at NSE and simultaneously selling it at BSE. This type of arbitrage is “arbitrage over space”. If an arbitrageur feels that the futures are being quoted at a high level considering the cost of carry, the arbitrageur would buy securities underlying today and sell the future in market maturing in a month or two hence. Similarly, since futures and options with various expiration dates are traded in the market, there are likely to be several arbitrage opportunities in trading. Thus, if a trader believes that the price differential between the futures contracts on the same underlying asset with differing maturities is more or less than what the arbitrageur perceives them to be, then appropriate positions in them may be taken to make profits.

It may be noted that the existence of well-functioning derivatives markets alters the flow of information into the prices. This is because, in a purely cash market, speculators feed information into the spot prices. In contrast, the presence of a derivatives market ensures that a major part of the transformation of information into prices, due to lower transactions costs involved in derivative a market, and then it gets transmitted to the spot markets. It is here that the arbitrageurs provide a link between the derivatives market and the cash market by synchronizing the prices in the two markets. Thus, through their actions, the arbitrageurs provide a critical link between the cash and derivatives markets.
3.6 SIGNIFICANCE OF DERIVATIVE MARKET

The derivatives market performs a number of economic functions; they are

1. **Price Discovery:** 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 the derivative contracts. Thus derivatives help in discovery of future as well as current prices.

2. **Risk Transfer:** Due to the inherent link of derivatives market with the underlying cash market, witnesses higher trading volumes because of participations by more players who would not have otherwise participated for lack of an arrangement to transfer risk.

3. **Controlled Speculative Trading:** Speculative trades shift to a more controlled environment due to the existence of derivatives market. In the absence of an organized derivatives market, speculators trade in the underlying cash markets and margining, monitoring and surveillance of the activities of various participants become extremely difficult in derivative markets.

4. **Financial Architecture:** An important incidental benefit that flows from derivatives trading is that it acts as a catalyst for new
entrepreneurial activity. The derivative has a history of attracting many bright, creative, well-educated people with an entrepreneurial attitude. They often energize others to create new business, new products and new employment opportunities, the benefit of which is immense.

5. **Enhancing Volume of Activity**: Derivatives market help to increase savings and investment in the long run and transfer of risk enables the market participants to expand their volume of activity.

### 3.7 INTERNATIONAL DERIVATIVES MARKETS

A comparison of the derivatives markets, over the last few years, among various countries, gives rise to an interesting pattern. The exchanges of the developed markets have shown robust growth and maintained their leadership position over the last five years; at the same time, emerging market exchanges have gained a position of eminence with strong growth trends. It is evident from the data presented in Tables 3.1 and 3.2 given below that the Indian market has emerged fourth along with markets in Korea, Spain and Israel, but only in case of single stock option contracts traded Indian market stood at 11th position.
### TABLE 3.1

**Top Five Exchanges in Terms of Stock Index Option Contracts Traded**

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Number of Contracts traded in 2010*</th>
<th>Number of Contracts traded in 2002</th>
<th>Percentage Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea Exchange</td>
<td>3,28,94,31,136</td>
<td>1,88,98,23,786</td>
<td>74.06%</td>
</tr>
<tr>
<td>National Stock Exchange India</td>
<td>47,90,89,032</td>
<td>3,14,478</td>
<td>152244.21%</td>
</tr>
<tr>
<td>EUREX</td>
<td>31,89,01,284</td>
<td>9,02,66,672</td>
<td>253.29%</td>
</tr>
<tr>
<td>Chicago Board Options Exchange</td>
<td>25,04,66,478</td>
<td>9,43,83,544</td>
<td>165.37%</td>
</tr>
<tr>
<td>TAIFEX</td>
<td>8,88,98,258</td>
<td>15,66,446</td>
<td>5575.16%</td>
</tr>
</tbody>
</table>


### TABLE 3.2

**Top Five Exchanges in Terms of Stock Option Contracts Traded**

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Number of Contracts traded in 2010*</th>
<th>Number of Contracts traded in 2002</th>
<th>Percentage Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago Board Options Exchange</td>
<td>78,10,56,384</td>
<td>17,31,89,719</td>
<td>350.98%</td>
</tr>
<tr>
<td>BM&amp;FBOVESPA</td>
<td>75,06,13,492</td>
<td>8,97,40,269</td>
<td>736.43%</td>
</tr>
<tr>
<td>International Securities Exchange</td>
<td>67,83,16,805</td>
<td>15,22,71,279</td>
<td>345.47%</td>
</tr>
<tr>
<td>NASDAQ OMX PHLX</td>
<td>49,89,53,730</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EUREX</td>
<td>26,32,72,756</td>
<td>14,33,10,653</td>
<td>83.71%</td>
</tr>
<tr>
<td>National Stock Exchange India#</td>
<td>2,56,22,014</td>
<td>27,73,524</td>
<td>823.81%</td>
</tr>
</tbody>
</table>

3.8 DERIVATIVES MARKET IN INDIA

The derivatives market is a new market design of the Indian equity market, which plays a vital role in disseminating information and offsetting undesirable price risks. It ensures the cheapest trading facilities to the investors and shareholders. The development of markets for derivatives was initially not possible in view of prohibition in the Securities Contracts (Regulation) Act, 1956 (SCRA). The preamble to Act itself spoke of prohibiting options trading. Section 20 of the Act explicitly prohibited all options in securities. Under this Act, by a notification in 1969, Government prohibited all forward trading in securities in order to curb unhealthy practices and to prevent undesirable transactions. The introduction of trading in derivatives required withdrawal of these prohibitions (Narain 2003).

The first step towards the introduction of derivatives trading in the Indian financial markets was the promulgation of the Securities Laws (Amendment) Ordinance, 1995, which withdrew the prohibition on options in securities. The market for derivatives, however, did not take off, as there was no regulatory framework to govern trading of derivatives. SEBI set up a 24 member committee under the chairmanship of Dr. L.C.Gupta on November 18, 1996 to develop appropriate regulatory framework for derivatives trading in India. The committee submitted its report on March 17, 1998, prescribing necessary pre-conditions for the introduction of derivatives trading in India. The committee
recommended that derivatives should be declared as “securities” so that regulatory framework applicable to trading of “securities” could also govern trading of securities. SEBI also set up a group in June 1998 under the Chairmanship of Prof. J. R. Varma to recommend measures for risk containment in derivatives market in India. The report, which was submitted in October 1998, worked out the operational details of margining system, methodology for charging initial margins, broker net worth, deposit requirement and real-time monitoring requirements.

In December 1999, amendment to Securities Contracts (Regulation) Act was notified, making way for derivatives trading in India. In June 2000, Futures contracts on Nifty and Sensex were launched, followed by Options contracts on Nifty and Sensex (European style). The Options contracts were launched on stocks (American style) and Futures contracts on stocks in June, July and November 2001, respectively. The number of underlying stocks and indexes has increased over the years and presented in Table: 3.3

In the Indian market, the Index option contracts are cash settled European style options. Stock options are also cash settled American style contracts. Interest rate derivatives are based on notional 10-years bonds and 91-days T-bill. All exchange-traded equity derivatives contracts are cash settled contracts.
TABLE 3.3

Futures and Options Traded on NSE & BSE

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>NSE - Stocks</th>
<th>NSE - Index</th>
<th>BSE - Stocks</th>
<th>BSE - Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 - 2002</td>
<td>31</td>
<td>1</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>2002 - 2003</td>
<td>41</td>
<td>1</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>2003 - 2004</td>
<td>53</td>
<td>2</td>
<td>42</td>
<td>1</td>
</tr>
<tr>
<td>2004 - 2005</td>
<td>52</td>
<td>2</td>
<td>46</td>
<td>1</td>
</tr>
<tr>
<td>2005 - 2006</td>
<td>117</td>
<td>3</td>
<td>76</td>
<td>7</td>
</tr>
<tr>
<td>2006 - 2007</td>
<td>155</td>
<td>3</td>
<td>89</td>
<td>7</td>
</tr>
<tr>
<td>2007 - 2008</td>
<td>265</td>
<td>7</td>
<td>126</td>
<td>7</td>
</tr>
<tr>
<td>2008 – 2009</td>
<td>233</td>
<td>9</td>
<td>126</td>
<td>7</td>
</tr>
<tr>
<td>2009 - 2010</td>
<td>190</td>
<td>5</td>
<td>125</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: BSE, NSE
### TABLE 3.4

**Total Derivatives Turnover Since Inception (in Rs. Crore)**

<table>
<thead>
<tr>
<th>Period</th>
<th>NSE</th>
<th>BSE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 - 2002</td>
<td>101,925</td>
<td>1,917</td>
<td>103,842</td>
</tr>
<tr>
<td>2002 - 2003</td>
<td>439,865</td>
<td>2,475</td>
<td>442,340</td>
</tr>
<tr>
<td>2003 - 2004</td>
<td>2,130,447</td>
<td>12,074</td>
<td>2,142,521</td>
</tr>
<tr>
<td>2004 - 2005</td>
<td>2,547,053</td>
<td>16,112</td>
<td>2,563,165</td>
</tr>
<tr>
<td>2005 - 2006</td>
<td>4,824,245</td>
<td>9</td>
<td>4,824,254</td>
</tr>
<tr>
<td>2006 - 2007</td>
<td>7,356,271</td>
<td>59,007</td>
<td>7,415,278</td>
</tr>
<tr>
<td>2007 – 2008</td>
<td>13,090,478</td>
<td>242,308</td>
<td>13,332,786</td>
</tr>
<tr>
<td>2008 – 2009</td>
<td>11,010,482</td>
<td>12,268</td>
<td>11,022,750</td>
</tr>
<tr>
<td>2009 - 2010</td>
<td>17,663,664</td>
<td>242,330</td>
<td>17,905,994</td>
</tr>
</tbody>
</table>

*Source: BSE, NSE.*
Turnover in the derivatives segment, since inception, is presented in Table 3.4. During 2001 - 02, turnover on NSE was Rs. 101,925 Crore and during 2009 – 2010, it was Rs 17,663,664 Crore. Likewise, during 2001 - 2002, turnover on BSE was Rs. 1,917 Crore and during 2007 – 2008, it was Rs. 242.330 Crore. Turnover on BSE increased till 2004 – 2005, but during 2005 - 2006 there was a noticeable decrease in turnover. The turnover on BSE has started increasing since 2006 - 2007. During the financial year 2008, there was decrease in total turnover of derivative segment due to financial crisis. The business growth of F&O segment and the number of contracts traded during the year are presented in Chart 3.1

CHART 3.1

Business Growth of Futures & Options Segment

Source: www.nseindia.com
3.9 INDIA’S EXPERIENCE IN FUTURE & OPTIONS

India’s experience with the launch of equity derivatives market has been extremely positive with the global derivatives market. The derivatives turnover on the NSE has surpassed the equity market turnover. The turnover of derivatives on the NSE increased from Rs. 23,654 million in 2000-01 to Rs. 166,193,220 million in 2009-10. India is one of the most successful developing countries in terms of a vibrant market for exchange-traded derivatives. This reiterates the strengths of the recent developments of India’s securities markets, which are based on nationwide market access, anonymous electronic trading, and a predominantly retail market. There is an increasing belief that the equity derivatives market is playing a major role in shaping price discovery.

As per Indian Securities Market Review (ISMR) 2009, NSE ranked as the eighth largest derivatives exchange in the world, the second largest exchange in terms of number of contracts traded in single stock futures and the third largest in terms number of contracts traded in the index futures category. The derivatives trading at NSE commenced on June 12, 2000 with futures trading on S&P CNX Nifty Index. Subsequently, the product base has been increased to include trading in options on S&P CNX Nifty Index, futures and options on CNX IT Index, Bank Nifty Index, Nifty Midcap 50 Indices and 190 single stocks were observed as of December 2010. Nifty Junior, CNX 100 and DEFTY indices were discontinued from option trading from July 31, 2009. The various products on
the derivative segment of NSE and their date of launch are shown in the table below.

**TABLE 3.5**

**Products Available for Trading on Derivatives Segment**

<table>
<thead>
<tr>
<th>Products on Derivative Segment</th>
<th>Date of Launch</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P CNX Nifty Futures</td>
<td>June 12, 2000</td>
</tr>
<tr>
<td>S&amp;P CNX Nifty Options</td>
<td>June 4, 2001</td>
</tr>
<tr>
<td>Single Stock Options</td>
<td>July 2, 2001</td>
</tr>
<tr>
<td>Single Stock Futures</td>
<td>November 9, 2001</td>
</tr>
<tr>
<td>Interest Rate Futures</td>
<td>June 24, 2003</td>
</tr>
<tr>
<td>CNX IT Futures &amp; Options</td>
<td>August 29, 2003</td>
</tr>
<tr>
<td>Bank Nifty Futures &amp; Options</td>
<td>June 13, 2005</td>
</tr>
<tr>
<td>CNX Nifty Junior Futures &amp; Options</td>
<td>June 1, 2007</td>
</tr>
<tr>
<td>CNX 100 Futures &amp; Options</td>
<td>June 1, 2007</td>
</tr>
<tr>
<td>Nifty Midcap 50 Futures &amp; Options</td>
<td>October 5, 2007</td>
</tr>
<tr>
<td>Mini Nifty Futures &amp; Options on S&amp;P CNX Nifty</td>
<td>January 1, 2008</td>
</tr>
<tr>
<td>Long term Options on S&amp;P CNX Nifty</td>
<td>March 3, 2008</td>
</tr>
<tr>
<td>S&amp;P CNX Defty Futures and Options</td>
<td>December 10, 2008</td>
</tr>
<tr>
<td>Interest rate Futures</td>
<td>August 31, 2009</td>
</tr>
</tbody>
</table>

*Source: www.nseindia.com*

As per NSE factbook 2010, the total number of contracts traded increased by 3% to 68 crore contracts during 2009-10. Out of the total contracts traded, 50.26% of the contracts were traded on Index options followed by index futures on which 26.25% of the contracts were traded. Number of contracts traded on
stock futures was 21.45%, while 2.06% of the total contracts were traded on stock options as envisaged in Chart 3.2.

**Chart 3.2**

*Product Wise Numbers of Contracts Traded during 2009-2010*

![Pie chart showing product-wise numbers of contracts traded during 2009-2010](source: www.nseindia.com)

3.10 **MECHANICS OF OPTION TRADING**

3.10.1 **Market Design**

Only two exchanges in India have been permitted to trade in derivatives contracts, the NSE and the BSE. Over the years, however, statistics show that the BSE's contribution to the total derivatives turnover in the market has been declining. Hence, the market design enumerated in this section is the derivative segment of NSE (hereafter referred to as the F&O segment).
3.10.2 Trading Mechanism

The derivatives trading system at NSE is called NEAT-F&O system, which provides a fully automated screen-based, anonymous order driven trading system for derivatives on nationwide basis. It provides tremendous flexibility by allowing users to place orders with their own time and price related conditions. Nevertheless, trading in derivatives segment is essentially similar to that of Cash Market segment.

There are four entities in the trading system:

1. **Trading members**: Trading members can trade either on their own account or on behalf of their clients including participants. They are registered as members with NSE and are assigned an exclusive Trading member ID.

2. **Clearing members**: Clearing Members are members of NSCCL. They carry out risk management activities and confirmation/inquiry of trades through the trading system. These clearing members are also trading members and clear trades for themselves and/or others.

3. **Professional clearing members**: A professional clearing member (PCM) is a clearing member who is not a trading member. Typically, banks and custodians become PCMs and clear and settle for their trading members.
4. **Participants**: A participant is a client of trading members like financial institutions. These clients may trade through multiple trading members, but settle their trades through a single clearing member only.

### 3.10.3 Contract Specifications

The index futures and index options contracts traded on NSE are based on S&P CNX Nifty, CNX IT and Bank Nifty, while stock futures and options are based on individual securities. Stock futures and options are available on 190 securities. Interest rate future contracts are available on Notional 91 day T-bill and Notional 10 year bonds (6% coupon bearing and zero coupon bonds). While the index options are European style, stock options are American style.

At any point of time there are only three contract months available for trading, with 1 month, 2 months and 3 months to expiry. These contracts expire on last Thursday of the expiry month and have a maximum of 3-month expiration cycle. If the last Thursday is a trading holiday, the contracts expire on previous trading day. A new contract is introduced on the next trading day following the expiry of the near month contract. All the derivatives contracts are at present cash settled. The contract specifications for derivatives traded on NSE are summarized in Table 3.6.
**TABLE 3.6**

**Contract Specifications of Derivative Products in NSE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Index Futures</th>
<th>Index Options</th>
<th>Futures on Individual Securities</th>
<th>Options on Individual Securities</th>
<th>Mini Index Futures</th>
<th>Mini Index Options</th>
<th>Long Term Index Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying Instrument</td>
<td>FUTIDX</td>
<td>OPTIDX</td>
<td>5 indices</td>
<td>190 securities</td>
<td>S&amp;P CNX Nifty</td>
<td>S&amp;P CNX Nifty</td>
<td>S&amp;P CNX Nifty</td>
</tr>
<tr>
<td>Underlying Symbol</td>
<td>Symbol of Underlying Index</td>
<td>Symbol of Underlying Index</td>
<td>Symbol of Underlying Security</td>
<td>Symbol of Underlying Security</td>
<td>MINIFTY</td>
<td>MINIFTY</td>
<td>NIFTY</td>
</tr>
<tr>
<td>Option Type</td>
<td>-</td>
<td>CE / PE</td>
<td>-</td>
<td>CE / PE</td>
<td>-</td>
<td>CE / PE</td>
<td>CE / PE</td>
</tr>
<tr>
<td>Strike Price</td>
<td>-</td>
<td>Strike Price</td>
<td>-</td>
<td>Strike Price</td>
<td>-</td>
<td>Strike Price</td>
<td>Strike Price</td>
</tr>
<tr>
<td>Trading Cycle</td>
<td>3 month trading cycle - the near month (one), the next month (two) and the far month (three)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Three quarterly expiries (March, June, Sept &amp; Dec cycle) and next 8 half yearly expiries (Jun, Dec cycle)</td>
</tr>
<tr>
<td>Expiry Day</td>
<td>Last Thursday of the expiry month. If the last Thursday is a trading holiday, then the expiry day is the previous trading day.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strike Price Intervals</td>
<td>-</td>
<td>Depending on underlying price</td>
<td>-</td>
<td>Depending on underlying price</td>
<td>-</td>
<td>Depending on underlying price</td>
<td>Depending on underlying price</td>
</tr>
<tr>
<td>Permitted Lot Size</td>
<td>Underlying specific</td>
<td>Underlying specific</td>
<td>Underlying specific</td>
<td>Underlying specific</td>
<td>20</td>
<td>20</td>
<td>Underlying specific</td>
</tr>
<tr>
<td>Price Steps</td>
<td>Rs.0.05</td>
<td>Rs.0.05</td>
<td>Rs.0.05</td>
<td>Rs.0.05</td>
<td>Rs.0.05</td>
<td>Rs.0.05</td>
<td>Rs.0.05</td>
</tr>
<tr>
<td>Price Bands</td>
<td>Operating range of 10% of the base price</td>
<td>Operating range of 20% of the base price</td>
<td>Operating range of 20% of the base price</td>
<td>Operating range of 10% of the base price</td>
<td>Operating range of 10% of the base price</td>
<td>Operating range of 10% of the base price</td>
<td>Operating range of 10% of the base price</td>
</tr>
</tbody>
</table>
3.10.4 Transaction Charges

The maximum brokerage chargeable by a trading member in relation to trades effected in the contracts admitted to dealing on the F&O segment of NSE is fixed at 2.5% of the contract value in case of index futures and stock futures. In case of index options and stock options it is 2.5% of notional value of the contract [(Strike Price + Premium) X Quantity], exclusive of statutory levies.

The transaction charges payable to the exchange by the trading member for the trades executed by him on the F&O segment are fixed at the rate of Rs. 2 per lakh of turnover (0.002%) subject to a minimum of Rs. 1,00,000 per year. However, for the transactions in the options sub-segment, the transaction charges will be levied on the premium value at the rate of 0.05% (each side) instead of on the strike price as levied earlier.

The trading members contribute to Investor Protection Fund of F&O segment at the rate of Re.1/- per Rs. 100 crore of the traded value (each side) in case of Futures segment and Rs.1/- per Rs. 100 crore of the premium amount (each side) in case of Options segment. The trading members are also required to
pay securities transaction tax (STT) on non-delivery transactions at the rate of 0.017% (payable by the seller) for derivatives w. e. f June 1, 2006.

No transaction charges will be payable in respect of trades done in Interest Rate Futures on the F&O Segment of the Exchange with effect from 1st April 2007 till 31st March 2008. Every Trading Member participating in trading in such Interest Rate Futures at any time during the year 2007-08 shall be required to make a lump sum contribution of Rs.500/- for the whole year as a contribution to the Investor Protection Fund. There was no transaction charges levied on turnover above Rs.10 crores per trading member per day for trades done in NIFTY Junior and CNX 100 in the Futures sub-segment upto September 30, 2007.

3.10.5 Clearing and Settlement

NSCCL undertakes clearing and settlement of all trades executed on the F&O segment of the Exchange. It also acts as legal counterparty to all trades on this segment and guarantees their financial settlement. The Clearing and Settlement process comprises three main activities, viz., Clearing, Settlement and Risk Management.

3.10.5.1 Clearing Mechanism

The first step in clearing process is working out open positions and obligations of clearing (self-clearing/trading-cum-clearing/professional clearing)
members (CMs). The open position of a CM is arrived at by aggregating the open positions of all the trading members (TMs) and all custodial participants (CPs) clearing through him, in the contracts which they have traded. The open position of a TM is arrived at by summing up his proprietary open position and clients' open positions, in the contracts which they have traded. While entering orders on the trading system, TMs identify orders as either proprietary or client. Proprietary positions are calculated on net basis for each contract and that of clients are arrived at by summing together net positions of each individual client. A TM's open position is the sum of proprietary open position, client open long position and client open short position.

3.10.5.1 Settlement Mechanism

All futures and options contracts are cash settled i.e. through exchange of cash. The underlying for index futures/options of the Nifty index cannot be delivered. The settlement amount for a CM is netted across all their TMs/clients, across various settlements. For the purpose of settlement, all CMs are required to open a separate bank account with NSCCL designated clearing banks for F&O segment.
3.10.5.1.1 Settlement of Futures Contracts on Index or Individual Securities

Futures contracts have two types of settlements, the MTM settlement which happens on a continuous basis at the end of each day, and the final settlement which happens on the last trading day of the futures contract.

- **MTM Settlement for Futures:** The positions in futures contracts for each member are marked-to-market to the daily settlement price of the relevant futures contract at the end of each day. The CMs who have suffered a loss are required to pay the mark-to-market (MTM) loss amount in cash which is in turn passed on to the CMs who have made a MTM profit. This is known as daily mark-to-market settlement. CMs are responsible to collect and settle the daily MTM profits/losses incurred by the TMs and their clients clearing and settling through them. Similarly, TMs are responsible to collect/pay losses/profits from/to their clients by the next day. The pay-in and pay-out of the mark-to-market settlement are affected on the day following the trade day (T+1).

- **Final Settlement for Futures:** On the expiry day of the futures contracts, after the close of trading hours, NSCCL marks all positions of a CM to the final settlement price and the resulting profit/loss is settled in cash. Final settlement loss/profit amount is debited/credited to the relevant CM's clearing bank account on the day following expiry day of the contract.
• **Settlement Prices for Futures**: Daily settlement price on a trading day is the closing price of the respective futures contracts on such day. The closing price for a futures contract is currently calculated as the last half an hour weighted average price of the contract in the F&O Segment of NSE. Final settlement price is the closing price of the relevant underlying index/security in the Capital Market segment of NSE, on the last trading day of the Contract. The closing price of the underlying Index/security is currently its last half an hour weighted average value in the Capital Market Segment of NSE.

### 3.10.5.1.2 Settlement of Options Contracts on Index or Individual Securities

Options contracts have three types of settlements, daily premium settlement, interim exercise settlement in the case of option contracts on securities and final settlement.

• **Daily Premium Settlement for Options**: Buyer of an option is obligated to pay the premium towards the options purchased by him. Similarly, the seller of an option is entitled to receive the premium for the option sold by him. The premium payable position and the premium receivable position are netted to compute the net premium payable or receivable amount for
each client for each option contract. The CMs who have a premium payable positions are required to pay the premium amount to NSCCL which is in turn passed on to the members who have a premium receivable position. This is known as daily premium settlement. CMs are also responsible to collect and settle the premium amounts from the TMs and their clients clearing and settling through them. The pay-in and pay-out of the premium settlement is on T+1 day (T=Trade day). The premium payable amount and premium receivable amount are directly credited/debited to the CMs clearing bank account.

- **Interim Exercise Settlement:** Interim exercise settlement takes place only for option contracts on individual securities. An investor can exercise his in-the-money options at any time during trading hours, through his trading member. Interim exercise settlement is effected for such options at the close of the trading hours, on the day of exercise. Valid exercised option contracts are assigned to short positions in the option contract with the same series (i.e. having the same underlying, same expiry date and same strike price), on a random basis, at the client level. The CM who has exercised the option receives the exercise settlement value per unit of the option from the CM who has been assigned the option contract. Exercise settlement value is debited/credited to the relevant CMs clearing bank account on T+1 day (T=exercise date).
• **Final Exercise Settlement:** Final Exercise settlement is effected for option positions at in-the-money strike prices existing at the close of trading hours, on the expiration day of an option contract. All long positions at in-the-money strike prices are automatically assigned to short positions in option contracts with the same series, on a random basis.

For index options contracts, exercise style is European style, while for options contracts on individual securities, exercise style is American style. Final Exercise is Automatic on expiry of the option contracts.

Final settlement loss/profit amount for option contracts on Index is debited/credited to the relevant CMs clearing bank account on T+1 day (T=expiry day). Final settlement loss/ profit amount for option contracts on Individual Securities is debited/credited to the relevant CMs clearing bank account on T+2 day. Open positions, in option contracts, cease to exist after their expiration day.

The pay-in / pay-out of funds for a CM on a day is the net amount across settlements and all TMs/clients, in F&O Segment.
3.11 RISK MANAGEMENT SYSTEM

NSCCL has developed a comprehensive risk containment mechanism for the F&O segment. The salient features of risk containment measures on the F&O segment are:

- The financial soundness of the members is the key to risk management. Therefore, the requirements for membership in terms of capital adequacy (net worth, security deposits) are quite stringent.

- NSCCL charges an upfront initial margin for all the open positions of a Clearing Member (CM). It specifies the initial margin requirements for each futures/options contract on a daily basis. It follows VaR-based margining computed through SPAN. The CM in turn collects the initial margin from the trading members (TMs) and their respective clients.

- The open positions of the members are marked to market based on contract settlement price for each contract at the end of the day. The difference is settled in cash on a T+1 basis.

- NSCCL’s on-line position monitoring system monitors a CM's open position on a real time basis. Limits are set for each CM based on his effective deposits. The on-line position monitoring system generates alert messages whenever a CM reaches 70 %, 80 %, 90 % and a disablement message at 100 % of the limit. NSCCL monitors the CMs for Initial
Margin violation and Exposure margin violation, while TMs are monitored for Initial Margin violation and position limit violation.

- CMs are provided a trading terminal for the purpose of monitoring the open positions of all the TMs clearing and settling through him. A CM may set limits for a TM clearing and settling through him. NSCCL assists the CM to monitor the intra-day limits set up by a CM and whenever a TM exceeds the limits, it stops that particular TM from further trading.

- A member is alerted of his position to enable him to adjust his exposure or bring in additional capital. Margin violations result in disablement of trading facility for all TMs of a CM in case of a violation by the CM.

- A separate Settlement Guarantee Fund for this segment has been created out of deposits of members.

The most critical component of risk containment mechanism for F&O segment is the margining system and on-line position monitoring. The actual position monitoring and margining is carried out on-line through Parallel Risk Management System (PRISM) using SPAN® (is a registered trademark of the Chicago Mercantile Exchange (CME) used here under license) Standard Portfolio Analysis of Risk) system for the purpose of computation of on-line margins, based on the parameters defined by SEBI.
3.12 NSE - SPAN

The objective of NSE-SPAN is to identify overall risk in a portfolio of all futures and options contracts for each member. The system treats futures and options contracts uniformly, while at the same time recognising the unique exposures associated with options portfolios, like extremely deep out-of-the-money short positions and inter-month risk.

Its over-riding objective is to determine the largest loss that a portfolio might reasonably be expected to suffer from one day to the next day based on 99% VaR methodology.

SPAN considers uniqueness of option portfolios. The following factors affect the value of an option:

i. Underlying market price
ii. Volatility (variability) of underlying instrument
iii. Time to expiration
iv. Interest rate
v. Strike price

As these factors change, the value of options maintained within a portfolio also changes. Thus, SPAN constructs scenarios of probable changes in underlying prices and volatilities in order to identify the largest loss a portfolio
might suffer from one day to the next. It then sets the margin requirement to cover this one-day loss.

The complex calculations (e.g. the pricing of options) in SPAN are executed by NSCCL. The results of these calculations are called risk arrays. Risk arrays, and other necessary data inputs for margin calculation are provided to members daily in a file called the SPAN Risk Parameter file. Members can apply the data contained in the Risk Parameter files, to their specific portfolios of futures and options contracts, to determine their SPAN margin requirements.

Hence, members need not execute a complex option pricing calculation, which is performed by NSCCL. SPAN has the ability to estimate risk for combined futures and options portfolios, and also re-value the same under various scenarios of changing market conditions.

NSCCL generates six risk parameters file for a day taking into account price and volatilities at various time intervals and are provided on the website of the Exchange.

3.13 MARGINS

The margining system for F&O segment is as below:

- **Initial margin:** Margin in the F&O segment is computed by NSCCL upto client level for open positions of CMs/TMs. These are required to be paid up-front on gross basis at individual client level for client positions and on
net basis for proprietary positions. NSCCL collects initial margin for all the open positions of a CM based on the margins computed by NSE-SPAN. A CM is required to ensure collection of adequate initial margin from his TMs up-front. The TM is required to collect adequate initial margins up-front from his clients.

- **Premium Margin**: In addition to Initial Margin, Premium Margin is charged at client level. This margin is required to be paid by a buyer of an option till the premium settlement is complete.

- **Assignment Margin for Options on Securities**: Assignment margin is levied in addition to initial margin and premium margin. It is required to be paid on assigned positions of CMs towards interim and final exercise settlement obligations for option contracts on individual securities, till such obligations are fulfilled. The margin is charged on the net exercise settlement value payable by a CM towards interim and final exercise settlement.

- **Exposure Margins**: Clearing members are subject to exposure margins in addition to initial margins.

- **Client Margins**: NSCCL intimates all members of the margin liability of each of their client. Additionally members are also required to report details of margins collected from clients to NSCCL, which holds in trust client margin monies to the extent reported by the member as having been collected from their respective clients.
3.14 CONCLUSION

The study concludes that the derivatives market and its instruments are very dynamic and have quickly emerged as the most important segment of financial market. The market has a complex operational environment with brokers, exchanges, and industry organization and a federal agency all playing their respective roles. Finally, the regulatory bodies govern the activities of a variety of like arbitragers, speculators, etc. and thus, facilitate option market effectively to fulfill its economic functions of risk allocation. The imperatives for a well-functioning market are efficiency, price discovery and safety. Overall, it is clearly desirable to preserve the environment that has contributed to the impressive development of the derivatives market which performs various important economic functions. However, it is imperative for policy makers to put efforts such that safety, transparency and operational efficiency could be enhanced along proven and successful models helping the global derivatives market to become even safer and more efficient.