CHAPTER 1
INTRODUCTION

Part (A)

1.1 Financial Derivatives in India
   1.1.1 Meaning & Concept of Financial Derivative
   1.1.2 Need of Financial Derivatives
   1.1.3 Importance of Financial Derivatives
   1.1.4 Role of Financial Derivatives
   1.1.5 Types of Financial Derivatives
   1.1.6 Uses of Financial Derivatives
   1.1.7 Growth of Financial Derivatives Market in India
   1.1.8 International Derivatives Market
   1.1.9 Regulatory Framework for Derivatives

Part (B)

1.2 Literature Review

Part (C)

1.3 Research Methodology
   1.3.1 Overview
   1.3.2 Identification of Problem
   1.3.3 Objectives of the Study
   1.3.4 Hypothesis of the Study
   1.3.5 Research Design
   1.3.6 Research Period
   1.3.7 Sampling
   1.3.8 Data collection
   1.3.9 Data analysis and interpretation
   1.3.10 Scope of the Study
   1.3.11 Limitations of the study
1. INTRODUCTION (PART A)

1.1 Financial Derivatives in India

A financial market is an investment platform which provides the opportunity to increase the investment returns. The objective of every investor is to maximize their returns considering minimum risk of their investment. Various instruments, practices and strategies have been developed in the recent past in order to achieve these high returns with minimum risk.

The financial market entered into a new phase of global integration and liberalization with privatization in India. This integration of the Indian capital market brings out two facts, i.e. increase of cash flow in the country because of opening of the investment boundaries and on the other hand, increased financial risk due to frequent changes in the interest rates, currency exchange rates and stock prices.

There is a requirement to introduce new financial instruments which can help in controlling the risk. To handle the problem of fluctuating market price a new instrument in the form of derivatives immersed during the 20th century, in India.¹

A variety of investment alternatives have flooded the Indian stock market since the turn of the 21st century and derivatives are one of them which became quite popular.

1.1.1 Meaning and Concept of Financial Derivatives

Literal meaning of derivatives is that something which is derived. Now the question arises as to what is derived? From what it is derived? Simple one line answer is that value/price is derived from any underlying asset. There is no independent value of financial derivatives and its value depends on the underlying asset. The underlying assets may be securities, commodities, bullion, currency, livestock or anything else. Derivatives encompass, firstly, the trade in financial instruments or other goods at a certain point in the future, known as forward transactions or futures, and secondly, the trade in financial instruments or other goods based on a condition to be realized at a certain future point in time, known as conditioned forward transaction or options.

Definition of Financial Derivatives

Derivatives have been defined as: a) “a security derived from a debt instrument, stock, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security; b) “a contract which derives its value from the prices, or index of prices, of underlying securities”.

There are two types of derivatives, commodity derivatives and financial derivatives. Firstly derivatives originated as a tool for managing risk in commodities markets in ancient time and the underlying asset are a commodity in commodity derivatives. It can be agricultural commodity or precious metals like gold, silver, etc. The term financial derivatives denote a variety of financial instruments including stocks, bonds, treasury bills, interest rate, foreign currencies and other hybrid securities.

---

2 Section 2(ac) of Securities Contract Regulation Act (SCRA) 1956
Financial derivatives include futures, forwards, options, swaps, etc. Futures contracts are the most important form of derivatives, which are in existence long before the term ‘derivatives’ was coined. Financial derivatives can also be derived from a combination of cash market instruments or other financial derivatives instruments. In fact, most of the financial derivatives are not new instruments rather they are merely combinations of older generation derivatives and/or standard cash market instruments.

Derivatives are innovative financial instruments which play an important role in the development of Indian Security Markets. There are two important derivatives instruments, which are known as futures and options. The value of these instruments is derived from the value of an underlying asset.

The price of derivatives is based on the price of the underlying asset, like price of butter is based on the price of milk. It’s an instrument to minimizing the risk of price fluctuation in the stock market.

By John C. Hull “Derivatives have been very successful innovations in capital markets. Three main types of traders can be identified: hedgers, speculators, and arbitrageurs. Hedgers are in the position where they face risk associated with the price of an asset. They use derivatives to reduce or eliminate this risk. Speculators wish to bet on future movements in the price of an asset. They use derivatives to get extra leverage. Arbitrageurs are in business to take advantage of a discrepancy between prices in two different markets.”  

---

3 John C Hull, Options, 2009, Futures, and Other Derivatives (7th Edition), Pearson Printing Hall, Pg. 16.
1.1.2 Need for Financial Derivatives

It is difficult to trace out origin of futures trading since it is not clearly established as to where and when the first forward market came into existence. Historically, it is evident that futures markets were developed after the development of forward markets. It is believed that the forward trading was in existence during the 12th century in England and France. Forward trading in rice was started in the 17th century in Japan, known as Cho-at-Mai a kind (rice trade-on-book) concentrated around Dojima in Osaka, later in the trade in rice grew with a high degree of standardization. In 1730, this market got official recognition from the Tokugawa Shogurate. As such, the Dojima rice market became the first futures market in the sense that it was registered on organized exchanges with the standardized trading norms.

During 1889, the butter and eggs dealers of Chicago Produce Exchange joined hands for futures trading in the Chicago Mercantile Exchange for futures trading. The exchange provided a futures market for many commodities, including pork bellies (1961), live cattle (1964), live hogs (1966), and feeder cattle (1971). The International Monetary Market was formed as a division of the Chicago Mercantile Exchange in 1972 for futures trading in foreign currencies. In 1982, it introduced a futures contract on the S&P 500 Stock Index. Many other exchanges throughout the world now trade futures contracts. During 1980’s, markets developed for options in foreign exchange, options on stock indices, option on individual stock and options on futures contracts.

The basic cause of forward trading was to check the price risk. In a past long time were taken to transport goods from producer to seller and seller to customers, which had created the gap and created losses due to price risk. To avoid such risk, forward contracts were coming into existence, to make these contracts; standardized in terms
of quantity, quality and place of delivery relating to food grains. In the nineteenth century, this activity was centered in Chicago, which was the main food grain marketing center in the United States. In this way, the modern futures contracts first came into existence with the establishment of the Chicago Board of Trade (CBOT) in the year 1848, and today, it is the largest futures market of the world. In 1865, the CBOT framed the general rules for such trading which later on became a trend setter for so many other markets.

Financial derivatives have been in operation for long, but they have become a major force in the financial markets, in the early 1970s. The basic reason behind this development was the failure of Brettonwood System and the fixed exchange rate regime was broken down. As a result, the new exchange rate regime, i.e., floating rate (flexible) system based upon market forces came into existence. There is a pressure or demand and supply gap on different currencies, due to that the exchange rates were constantly changing. As a result, the business firms faced a new risk, known as currency or foreign exchange risk. Accordingly, a new financial instrument was developed to overcome this risk in the new financial environment.

Another important reason for the instability in the financial market was a fluctuation in the short-term interests. This was mainly due to that most of the government at that time tried to manage foreign exchange fluctuations through short-term interest rates and by maintaining money supply targets, but which were contrary to each other. Further, the increased instability of short-term interest rates created an adverse impact on long-term interest rates, and hence, instability in bond prices, because they are largely determined by long-term interest rates. The result is that it created another risk, named interest rate risk, for both the issuers and the investors of debt instruments.
Interest rate fluctuations had not only created instability in bond prices, but also in other long-term assets such as, company stocks and stocks. Stock prices are determined on the basis of expected present values of future dividend payments discounted at the appropriate discount rate. Discount rates are usually based on long-term interest rates in the market. So, increased instability in the long-term interest rates caused enhanced fluctuations in the stock prices in the stock markets. Further volatility in stock prices is reflected in the volatility in stock market indices which causes a systematic risk or market risk.

In the early 1970s, it is witnessed that the financial markets were highly unstable; as a result, so many financial derivatives have been emerged as the means to manage the different types of risks stated above, and also for taking advantage of it. Hence, the first financial futures market was the International Monetary Market, established in 1972 by the Chicago Mercantile Exchange, which was followed by the London International Financial Futures Exchange in 1982. A forward/futures contract in commodities is regulated by, Forwards Contracts (Regulation) Act, 1952, in all over India. As per this the Forward Markets Commission (FMC) continues to have jurisdiction over commodity forward/futures contracts. The derivatives trading were introduced in 2001 in India, under the Securities Contracts (Regulation) Act, 1956 (SCRA). Consequently, regulation of derivatives came under the preview of the Securities Exchange Board of India (SEBI). There are separate regulatory authorities to regulate commodity and security market in India, which helps in smooth running of derivatives trading.

Table 1.1 elaborates the chronological development of financial derivatives in the Indian Security Market.
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1952</td>
<td>Progress Date of Financial Derivatives</td>
</tr>
<tr>
<td>2</td>
<td>1953</td>
<td>Enactment of the forward contracts (Regulation) Act.</td>
</tr>
<tr>
<td>3</td>
<td>1956</td>
<td>Setting up of the forward market commission.</td>
</tr>
<tr>
<td>4</td>
<td>1969</td>
<td>Enactment of SCRA</td>
</tr>
<tr>
<td>5</td>
<td>1972</td>
<td>Prohibition of all forms of forward trading under section 16 of SCRA.</td>
</tr>
<tr>
<td>6</td>
<td>1980</td>
<td>Informal carry forward trades between two settlement cycles began.</td>
</tr>
<tr>
<td>7</td>
<td>1983</td>
<td>Khuso Committee recommends reintroduction of futures in most commodities</td>
</tr>
<tr>
<td>8</td>
<td>1992</td>
<td>Govt. amends bye-laws of exchange of Bombay, Calcutta and Ahmedabad and introduced carry forward trading in specified stocks.</td>
</tr>
<tr>
<td>9</td>
<td>1993</td>
<td>Enactment of the SEBI Act.</td>
</tr>
<tr>
<td>10</td>
<td>1994</td>
<td>SEBI Prohibits carries forward transactions.</td>
</tr>
<tr>
<td>11</td>
<td>1995</td>
<td>Kabra Committee recommends futures trading in 9 commodities.</td>
</tr>
<tr>
<td>12</td>
<td>14th Dec. 1995</td>
<td>Patel Committee recommends revised carry forward system.</td>
</tr>
<tr>
<td>13</td>
<td>1996</td>
<td>NSE asked SEBI for permission to trade index futures</td>
</tr>
<tr>
<td>14</td>
<td>18th Nov. 1996</td>
<td>Revised system restarted on BSE.</td>
</tr>
<tr>
<td>15</td>
<td>11th May 1998</td>
<td>SEBI setup LC Gupta committee to draft a framework for</td>
</tr>
<tr>
<td>Date</td>
<td>Event Description</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>1st June 1999</td>
<td>The LC Gupta committee submitted a report.</td>
<td></td>
</tr>
<tr>
<td>7th July 1999</td>
<td>Interest rate swaps/forward rate</td>
<td></td>
</tr>
<tr>
<td>24th May 2000</td>
<td>RBI gave permission to OT agreements allowed at BSE for interest rate Swap/forward rate agreements</td>
<td></td>
</tr>
<tr>
<td>25th May 2000</td>
<td>SIMEX chose Nifty for trading futures and options on an Indian index</td>
<td></td>
</tr>
<tr>
<td>9th June 2000</td>
<td>SEBI gave permission to NSE &amp; BSE to do index futures trading</td>
<td></td>
</tr>
<tr>
<td>12th June 2000</td>
<td>Equity derivatives introduced at BSE</td>
<td></td>
</tr>
<tr>
<td>31st Aug. 2000</td>
<td>Commencement of derivatives trading (index futures) at NSE</td>
<td></td>
</tr>
<tr>
<td>1st June 2001</td>
<td>Commencement of trading futures &amp; options on Nifty at SIMEX</td>
<td></td>
</tr>
<tr>
<td>1-Jun</td>
<td>Index option launched at BSE</td>
<td></td>
</tr>
<tr>
<td>1-Jul</td>
<td>Trading on equity index options at NSE</td>
<td></td>
</tr>
<tr>
<td>9th July 2001</td>
<td>Trading in stock options at NSE</td>
<td></td>
</tr>
<tr>
<td>1-Jul</td>
<td>Stock options launched at BSE</td>
<td></td>
</tr>
<tr>
<td>1st Nov. 2001</td>
<td>Commencement of trading in options on individual securities</td>
<td></td>
</tr>
<tr>
<td>Nov. 2001</td>
<td>Stock futures launched at BSE</td>
<td></td>
</tr>
<tr>
<td>9th Nov. 2001</td>
<td>Commencement of trading in futures on individual security</td>
<td></td>
</tr>
<tr>
<td>3-Jun</td>
<td>Trading of Single stock futures at BSE</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Date</td>
<td>Event</td>
</tr>
<tr>
<td>-----</td>
<td>------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>32</td>
<td>Aug. 2003</td>
<td>Trading of Interest rate futures at NSE</td>
</tr>
<tr>
<td>33</td>
<td>13th Sep. 2004</td>
<td>Launch of futures &amp; options in CNX IT index</td>
</tr>
<tr>
<td>34</td>
<td>5-Jun</td>
<td>Weekly options of BSE</td>
</tr>
<tr>
<td>35</td>
<td>Dec. 2006</td>
<td>Launch of futures &amp; options in Bank Nifty index</td>
</tr>
<tr>
<td>36</td>
<td>7-Jun</td>
<td>'Derivatives Exchange of the Year by Asia risk magazine</td>
</tr>
<tr>
<td>37</td>
<td>Oct. 2007</td>
<td>NSE launches derivatives on Nifty Junior &amp; CNX 100</td>
</tr>
<tr>
<td>38</td>
<td>1st Jan. 2008</td>
<td>NSE launches derivatives on Nifty Midcap -50</td>
</tr>
<tr>
<td>39</td>
<td>1st Jan. 2008</td>
<td>Trading of Chhota (Mini) Sensex at BSE</td>
</tr>
<tr>
<td>40</td>
<td>3rd March 2009</td>
<td>Trading of mini index futures &amp; options at NSE</td>
</tr>
<tr>
<td>41</td>
<td>29th Aug. 2008</td>
<td>Long term options contracts on S&amp;P CNX Nifty index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F&amp;O on setoral indices (BSE TECK, BSE FMCG, BSE Metal, BSE Bankex &amp; BSE oil &amp; gas)</td>
</tr>
<tr>
<td>42</td>
<td>Aug. 2008</td>
<td>Trading of currency futures at NSE</td>
</tr>
<tr>
<td>43</td>
<td>1st Oct. 2008</td>
<td>Launch of interest rate futures</td>
</tr>
<tr>
<td>44</td>
<td>10th Dec. 2008</td>
<td>Currency derivatives introduced at BSE</td>
</tr>
<tr>
<td>45</td>
<td>Aug. 2009</td>
<td>S&amp;P CNX Defty futures &amp; options at NSE</td>
</tr>
<tr>
<td>46</td>
<td>7th Aug. 2009</td>
<td>Launch of interest rate futures at NSE</td>
</tr>
<tr>
<td>47</td>
<td>18th Dec. 2009</td>
<td>BSE-USE form alliance to develop currency &amp; interest rate derivatives markets</td>
</tr>
<tr>
<td>48</td>
<td>Feb. 2010</td>
<td>BSE's new derivatives rate to lower transaction costs for all</td>
</tr>
<tr>
<td>49</td>
<td>Apr. 2010</td>
<td>Launch of currency futures on additional currency pairs at NSE</td>
</tr>
<tr>
<td>50</td>
<td>10-Jul</td>
<td>Financial derivatives exchange award of the year by NSE</td>
</tr>
<tr>
<td>51</td>
<td>Oct. 2010</td>
<td>Commenced trading of S&amp;P CNX Nifty futures on CME at NSE</td>
</tr>
<tr>
<td>52</td>
<td>Oct. 2010</td>
<td>Introduction of European style stock option at NSE</td>
</tr>
<tr>
<td>53</td>
<td>11-Jul</td>
<td>Introduction of Currency options on USD INR by NSE</td>
</tr>
<tr>
<td>54</td>
<td>Aug. 2011</td>
<td>Commencement of 91 days GOI trading Bill futures by NSE</td>
</tr>
<tr>
<td>55</td>
<td>29th Aug. 2011</td>
<td>Launch of derivatives on Global Indices at NSE</td>
</tr>
<tr>
<td>56</td>
<td>Sep. 2011</td>
<td>Launch of derivatives on CNX PSE &amp; CNX infrastructure Indices at NSE</td>
</tr>
<tr>
<td>57</td>
<td>30th March, 2012</td>
<td>BSE launched trading in BRICSMART indices derivatives</td>
</tr>
<tr>
<td>58</td>
<td>29th Nov., 2013</td>
<td>BSE launched currency Derivatives Segment</td>
</tr>
</tbody>
</table>

Source: Compiled from NSE & BSE Website.

### 1.1.3 Importance of Financial Derivatives

“A derivatives can be defined as a financial instrument whose value depends on (or devise from) the value of other, more basic, underlying variables. Very often the variables underlying derivatives are the prices of trade assets. A stock option, for example, is derivatives whose value is dependent on the price of a stock. However,
derivatives can be dependent on almost any variable, from the price of hogs to the amount of snow falling at a certain ski resort.\(^4\)

**It is a Contract:** Derivatives are defined as the futures contract between two parties. It means there must be a contract-binding on the underlying parties and the same to be fulfilled in the future. The period for futures contracts may be short or long, depending upon the nature of contract, for example, short term interest rate futures and long term interest rate futures contract.

**Derives Value from Underlying Asset:** The value of derivatives instruments have derived, from the values of other underlying assets, such as agricultural commodities, metals, financial assets, intangible assets, etc. Value of derivatives depends upon the value of the underlying instrument and which changes as per the changes in the underlying assets, and sometimes, it may be nil or zero. Hence, they are closely related.

**Specified Obligation:** All the parties under derivatives contracts have specified obligation under the derivatives contract. The obligation of the counter parties would be different as per the type of the instrument of derivatives.

**Direct or Exchange Traded:** The derivatives contracts can be undertaken directly by the two parties or through the particular stock exchange like financial futures contracts. The exchange-traded derivatives are quite liquid and have low transaction costs in comparison to tailor-made contracts.

**Related to Notional Amount:** The size of the derivatives contract depends upon its notional amount. On the basis of notional amount the payoff amount is to be

calculated. For example, in the future contract, the potential profit/loss both may be different from the value of the underlying stocks, because the payoff of derivatives products differs from the payoff that their notional amount might suggest.

**Delivery of the Underlying Asset not involved:** Derivatives contracts are just like fake contracts as the delivery of the underlying asset is not involved; generally they are offsetting the position themselves. There is, therefore, no one can make a claim for the quantity of underlying assets.

**May be Used as Deferred Delivery:** Derivatives are also known as deferred payment instrument. It means that it is easier for the investors to take a short or long position in derivatives in comparison to other assets or securities. Further, it is possible to combine them to match specific, i.e., they are more easily amenable to financial engineering.

**Secondary Market Instruments:** Secondary market is a place where Derivatives can easily be traded and which also helps in mobilizing the fresh capital by investors of all types. There are some instruments like, warrants and convertibles are exceptional in this respect.

**Exposure to Risk:** As the derivatives products are for the future and the future is always uncertain. Although in the market, the standardized, general and exchange-traded derivatives are being increasingly evolved, however, still there are so many privately negotiated customized, over-the-counter (OTC) traded derivatives are in existence. Various types of risks are involved in derivatives trading like, trading parties to operational risk, counter-party risk and legal risk. There has also been uncertainty about the regulatory status of such derivatives.
**Off Balance Sheet Item:** Derivatives are generally off balance sheet nature, which is used as to clear up the balance sheet.

### 1.1.4 Role of Financial Derivatives

Financial derivatives play an important role in the growth of the stock market. The following functions are performed by derivatives market, which helps in developing of the stock market:

**Discovery of Price:** There is an always fears in the mind of investor regarding fluctuation in the stock prices. As the financial derivatives instruments are contracted for future and to calculate the future price there is a requirement of continuous watch about the information from around the world. It also requires a high degree of transparency. The price of derivatives based on the flow of information. On the one side this information helps in finding out the price of current market and on the other side the price of the current market will influence the future market, which helps in determining future price as well as the current price.

**Risk Transfer:** The derivatives market helps to transfer risk from those who have them, but may not like them to those who have an appetite for them. There are various traders in the financial derivatives market like hedgers, speculators and arbitrageurs.

**Link to Cash Markets:** Cash market provides a base to derivatives markets. As the value of derivatives is derived from the underlying assets, and the underlying assets are existing in the cash market, so there is a link in both.

**Check on the Speculation:** Financial derivatives are exchange traded contracts which traded in a controlled environment. Due to that it transfers the speculation in a
regulated market. A regulated and controlled security market helps in managing, monitoring, and surveillance of the trading activities of speculators, which helps investors to control over stock price fluctuations.

**Increases Savings and Investments:** A financial derivatives help in creating security market more efficient and provides liquidity to the market, which encourage investors to make investment in the stock market. The transfer of risk enables market participants to expand their volume of activity.

### 1.1.5 Types of Financial Derivatives

The most commonly used derivatives contracts are forwards, futures and options.

**Forwards Contracts:** A forward contract is a customized contract between two parties, where one party agrees to sell and another party agrees to purchase a specific asset, at a specified price and for a specified period of time and the settlement will take place in the future on a specific date in the future at today’s pre-agreed price. These contracts are traded through over-the-counter market not by stock exchange traded and are non-standardized contracts, as not traded through stock exchanges.

**Futures Contracts:** Suppose a farmer produces rice and he expects to have an excellent yield on rice; but he worries about the future price fall of that commodity. How can he protect himself from falling price of rice in the future? He may enter into a contract on today with any party who wants to buy rice at a specified future date at a price determined today itself. In the whole process the farmer will deliver rice to the party and receive the agreed price and the other party will take delivery of rice and pay to the farmer. In this illustration, there is no exchange of money and the contract
is binding on both the parties. Hence, futures contracts are forward contracts traded only on organized exchanges and are in standardized contract-size. The farmer has protected himself against the risk by selling rice futures and this action is called short hedging while on the other hand, the other party also protects against-risk by buying rice futures is called long hedge.

**Options Contracts:** As the name indicates options means the buyer has the option to execute the contract or not to execute the contract but the seller has no such type of option, they have to execute the contract. This is also a specified contract between two parties for a specified period at a specified price and for a specified period. Versatility is the main importance of option contracts.

Options is a financial instrument with the advantage of only upside without a downside, as the maximum loss is only up to the premium amount on the situation of out of the money and at-the money options. Out of the money is a condition when the strike price is more than the current price in case of a call options and reverse in put options. There are various strategies which help in gaining the popularity of option contract. Options strategy like protective put, covered call, straddle, etc., helps to protect the investor’s portfolio against the fall in its price. All the options strategies are helping in controlling the overall portfolio risk.

### 1.1.6 Uses of Financial Derivatives

Generally derivatives are used as risk management tools. Here is the brief description of their uses.
**Risk Aversion Tools:** One of the most important services provided by the derivatives is to transfer and manage the risk in an efficient manner with the help of various strategies of options and futures contracts. To manage highly volatile financial market derivatives contracts worked as a risk minimizing tool by taking hedging, speculating and arbitraging position in the market.

**Prediction of Futures Prices:** Investors are always would like to predict about the future stock price, so that they can make an investment at the right time and get maximum return. Derivatives work as a barometers to predict the price of the future stock market as well as a spot market. They also help in collecting and spreading information regarding the different futures markets trading of various commodities and securities. These help the society to discover true symmetry prices in the markets.

**Enhance Liquidity:** Derivatives are based on a margin trading system where only a certain percentage of the total amount of the contract is required to pay as margin. Due to the margin trading system investors, speculators, hedgers etc. are interested to take a position in the derivatives market, which boost liquidity and diminish transaction costs in the markets of underlying assets.

**Assist Investors:** The derivatives assist the investors, traders and managers of large pools of funds to devise such strategies so that they may make a proper asset allocation increase their yields and achieve other investment goals.

**Integration of Price Structure:** It has been witnessed from the derivatives trading in the market that the derivatives have control over price fluctuations, cuddle the price spread, integrate price structure at different points of time and remove excesses and shortages in the markets.
**Enhance the Growth of Financial Markets:** Growth of financial market depends on the availability of effective trading instruments, which encourage the competitive trading in the markets. Various operators are interested in doing trading in the stock market because it facilitates to hedge or speculate the risk by using derivatives instruments. Derivatives instruments attract young investors, experts and other connoisseurs who will help in the growth of financial markets.

**Bring Faultlessness in the Stock Market:** Investors are interested to get faultless returns on the investment. Faultless return means to control return, and controlled return refers that return which is better off than others, which they can get by taking various strategies of futures and options contracts.

### 1.1.7 Growth of Financial Derivatives Market in India

Hedging and speculation are important tools to control over price fluctuation. Hedging is a tool to control losses by taking simultaneously opposite position, with a holding position. To protect against the loss of falling market one can take put option or short call option, which helps in controlling over the future risk. Table 1.2 elaborates the growth of financial derivatives trading in Indian Security Market from the period of introduction.

Table 1.2 & Figure 1.1 represent the business growth of the NSE Derivatives segment as the National Stock Exchange represents the whole stock market in India by holding the major portion of the stock market.
<table>
<thead>
<tr>
<th>Year</th>
<th>Index Futures</th>
<th>Stock Futures</th>
<th>Index Options</th>
<th>Stock Options</th>
<th>Total</th>
<th>Average Daily Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of contracts</td>
<td>Turnover (Rs. Cr.)</td>
<td>No. of contracts</td>
<td>Turnover (Rs. Cr.)</td>
<td>No. of contracts</td>
<td>Turnover (Rs. Cr.)</td>
</tr>
<tr>
<td>2014-15</td>
<td>21866521</td>
<td>781940.7</td>
<td>48415080</td>
<td>1789644</td>
<td>15873478</td>
<td>5696734</td>
</tr>
<tr>
<td>2013-14</td>
<td>105270529</td>
<td>3085296</td>
<td>170414186</td>
<td>4949282</td>
<td>928565175</td>
<td>5696734</td>
</tr>
<tr>
<td>2012-13</td>
<td>96100385</td>
<td>2527131</td>
<td>147711691</td>
<td>4223872</td>
<td>158344617</td>
<td>22781574</td>
</tr>
<tr>
<td>2011-12</td>
<td>146188740</td>
<td>3577998</td>
<td>158344617</td>
<td>4074671</td>
<td>864017736</td>
<td>22720032</td>
</tr>
<tr>
<td>2010-11</td>
<td>165023653</td>
<td>4356755</td>
<td>186041459</td>
<td>5495757</td>
<td>650638557</td>
<td>18365366</td>
</tr>
<tr>
<td>2009-09</td>
<td>178306889</td>
<td>3820667</td>
<td>145591240</td>
<td>5195247</td>
<td>341379523</td>
<td>13925970</td>
</tr>
<tr>
<td>2008-09</td>
<td>210428103</td>
<td>3570111</td>
<td>221577980</td>
<td>3479642</td>
<td>212088444</td>
<td>2292268</td>
</tr>
<tr>
<td>2007-08</td>
<td>156598579</td>
<td>3820667</td>
<td>203587952</td>
<td>7548563</td>
<td>55366038</td>
<td>1362111</td>
</tr>
<tr>
<td>2006-07</td>
<td>81487424</td>
<td>2539574</td>
<td>104955401</td>
<td>3830967</td>
<td>25157438</td>
<td>791906</td>
</tr>
<tr>
<td>2005-06</td>
<td>58537886</td>
<td>1513755</td>
<td>80905493</td>
<td>2791697</td>
<td>12935116</td>
<td>338469</td>
</tr>
<tr>
<td>2004-05</td>
<td>21635449</td>
<td>772147</td>
<td>47043066</td>
<td>1484056</td>
<td>3293558</td>
<td>121943</td>
</tr>
<tr>
<td>2003-04</td>
<td>17191668</td>
<td>554446</td>
<td>32368842</td>
<td>1305939</td>
<td>1732414</td>
<td>52816</td>
</tr>
<tr>
<td>2002-03</td>
<td>2126763</td>
<td>43952</td>
<td>10676843</td>
<td>286533</td>
<td>442241</td>
<td>9246</td>
</tr>
<tr>
<td>2001-02</td>
<td>1025588</td>
<td>21483</td>
<td>1957856</td>
<td>51515</td>
<td>175900</td>
<td>3765</td>
</tr>
<tr>
<td>2000-01</td>
<td>90580</td>
<td>2365</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: NSE India Website.
Strategy is a plan for achieving the predetermined goal and the main purpose of the futures market is to minimize the risk in the existing stock market. Due to the uncertainty in stock price, there is a need to take a hedging position. Hedging is a strategy of minimizing the risk against the already holding position in the stock market. Long and short hedging facilities are available in futures contracts. Every investor would like to manage risk as the investment is for future periods and future is always indefinite. By taking financial derivatives instruments like Index Futures & Options, Stock Futures & Options etc., investors can reduce the risk of uncertainty. These instruments help investors in creating an effective portfolio.

“It is this liquidity that makes derivatives attractive to the rogue traders. Doubling strategies can be adopted only in very liquid markets and derivatives tend to the bill excellently. Second, derivatives provide an enormous amount of leverage. It is
possible to take a large derivatives position with a relatively small initial investment."\textsuperscript{5}

Derivatives have both good and bad characters; it depends on the portfolio manager how to use derivatives products and gets maximum benefits. In 2009 ISDA Derivatives Usage Survey, reports that 94\%\textsuperscript{6} of the world’s largest using derivatives to manage business and macroeconomic risks and currency derivatives and interest rate derivatives are mostly used by developed companies economies.

RBI states that there should be a prudent system to control the risk involved in derivatives. Top level management should have appropriate oversight and adequate risk management process that integrates prudent risk limits, sound measurement procedures and information systems, continuous risk monitoring and frequent management reporting; and comprehensive internal controls and audit procedures(RBI).\textsuperscript{7}

In the development of an economy, financial sectors play a major role. After the economic reform 1991 i.e. privatization and globalization, facilitate industrial revolution and restructuring, which required more capital and new instruments of investment. Investment is related to risk, and that risk can be minimized with the help of derivatives instruments. Most of the financial institution is using financial derivatives as a risk management tool and providing lower cost of financial services to their customers.

\textsuperscript{5} Jayanath Rama Verma, 2008, Derivatives and Risk Management, Tata Mcgraw Hill, Pg.1.9.
\textsuperscript{6} http://www.isda.org/researchnotes/pdf/ISDA-Research-Notes2.pdf
\textsuperscript{7} http://www.rbi.org.in/Scripts/bs_viewcontent.aspx?id=457
Derivatives contracts also involve certain types of risk like market risk, operational risk, credit risk, liquidity risk, and legal risk, etc. Out of these risks credit risk and market risk directly related to the market price movements. Market risk is the inverse change in the stock price.

Due to the variability in the stock price there is required to identify and measuring the risk and find out the most suitable method to mitigate that risk. Financial derivatives are available to control over such types of risk with hedging strategy. Credit risk is related to default in making payment, which can be controlled by mark-to-market process in futures markets, and with the proper internal control system. Various regulatory frameworks are also available to control over risk like notional or volume limit, stop loss limit, gap or maturity band limit.

“Despite the obvious risks that individual stock futures pose to the safety and integrity of the capital market of the country, they have been introduced in a hurry in our country. In my opinion, it was not a wise thing for us to have introduced individual stock futures. All those who had mourned the death of Badla are very happy that a similar product is now available for them to play their games, which means all were not in favor of launching individual stock future. There is a question arise whether the introduction of derivatives products helps in controlling over the risk (volatility) in the stock market actually or they are only fake.”

Derivatives contracts don’t have their own value or they are not independent, as the value is derived from an underlying asset. But the risk involved in the investment in an underlying asset can be hedged with the derivatives instruments.

---

The using of derivatives instruments can be good luck for those who executed properly as of liquidity and relatively lower cost, but bad luck for those who are unaware and not executed properly because of their complex properties.

The derivatives instruments work as a professional to manage risk, but free cost. These instruments also help increasing the efficiency of underlying assets by using various strategies of options and futures contracts and by spreading information about future price.

“The idea that the financial products known as derivatives pose a danger to the financial system is nothing new. Commentators have been pointing this out for years. Most famously, Warren Buffett referred to derivatives as "time bombs" and financial "weapons of mass destruction." Recently a complex derivatives trade caused over $5 billion in losses at J.P. Morgan.”

The Factors Motivating the Expansion of Financial Derivatives in India

- Increased fluctuations in security prices in financial market and to control such fluctuations trading in derivatives are increased.
- Globalization of Indian economy and integration with international financial market, motivate investors to make investment in Derivatives markets.
- Improvement in security trading techniques and effective information and communication system helps in increasing the trading volume of Derivatives.
- An electronic trading system helps in declining the cost of derivatives trading, which helps in generating revenue to the security market.

---

Various risk management tools, professional or expertise, services help in controlling and managing risk in securities market trading, which is good for derivatives trading.

Requirement of margin amount only is also an important factor behind the increasing trading volume of financial derivatives.

1.1.8 International Derivatives Market

The growth of derivatives all over the world during the year 2013 can be estimated by following statistical data, based on the number of contracts traded and/or cleared at 84 exchanges worldwide:

**TABLE 1.3: Global Futures and Options Volume**

<table>
<thead>
<tr>
<th></th>
<th>Jan-Dec 2012</th>
<th>Jan-Dec 2013</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future</td>
<td>11,072,105,368</td>
<td>12,217,755,153</td>
<td>10.3%</td>
</tr>
<tr>
<td>Option</td>
<td>10,118,012,082</td>
<td>9,425,664,621</td>
<td>-6.8%</td>
</tr>
<tr>
<td>Total</td>
<td>21,190,117,450</td>
<td>21,643,419,774</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Table 1.3 & Figure 1.2 discloses data concerning the global futures and options volume. The global futures and options volume table disclose the fact that globally, futures contract trading volume exceeds that of options contracts trading volume in the year 2013 but in India, as is revealed from the Table trading volume of F&O segment, the trading volume of option index is more than the future index. Globally future volume has increased by 10.3%, but option volume is negatively increasing by -6.8%. The overall increase in the total derivatives segment is 2.1% from the year 2012 to 2013.

**Global Futures and Options Volume by Category**

Based on the number of contracts traded and/or cleared at 84 exchanges worldwide:
## TABLE 1.4: Global Futures and Options Volume by Category

<table>
<thead>
<tr>
<th>Categories</th>
<th>Jan-Dec 2012</th>
<th>Jan-Dec 2013</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Equity</td>
<td>6,469,512,853</td>
<td>6,401,526,238</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Equity Index</td>
<td>6,048,270,302</td>
<td>5,370,863,386</td>
<td>-11.2%</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>2,931,840,769</td>
<td>3,330,719,902</td>
<td>13.6%</td>
</tr>
<tr>
<td>Currency</td>
<td>2,434,253,088</td>
<td>2,491,136,321</td>
<td>2.3%</td>
</tr>
<tr>
<td>Energy</td>
<td>925,590,232</td>
<td>1,265,568,992</td>
<td>36.7%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1,254,415,510</td>
<td>1,213,244,969</td>
<td>-3.3%</td>
</tr>
<tr>
<td>Non-Precious Metals</td>
<td>554,249,054</td>
<td>646,318,570</td>
<td>16.6%</td>
</tr>
<tr>
<td>Other</td>
<td>252,686,977</td>
<td>493,359,639</td>
<td>95.2%</td>
</tr>
<tr>
<td>Precious Metals</td>
<td>319,298,665</td>
<td>430,681,757</td>
<td>34.9%</td>
</tr>
<tr>
<td>Total</td>
<td>21,190,117,450</td>
<td>21,643,419,774</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Note: Other includes contracts based on commodity indices, credit fertilizer, housing, inflation, lumber, plastics and weather.

FIGURE 1.3: Global Futures and Options Volume by Category

Table 1.4 & Figure 1.3 discloses data concerning the global futures and options volume by category wise for the period 2012 an 2013. There is positively increasing in the trading volume of derivatives for the categories like interest rate, currency, energy, non-precious metals, precious metals, and others. But for individual equity, equity index and for agriculture the trading volume has declined during 2013 in comparison to 2012.
### TABLE 1.5: Ranked by Number of Contracts Traded

(Top 10 Derivatives Exchanges in the World during the year 2013)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Exchange</th>
<th>Jan-Dec 2013 Volume</th>
<th>Annual % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CME Group</td>
<td>3,161,476,638</td>
<td>9.2</td>
</tr>
<tr>
<td>2</td>
<td>Intercontinental Exchange</td>
<td>2,807,970,132</td>
<td>14.7</td>
</tr>
<tr>
<td>3</td>
<td>Eurex</td>
<td>2,190,548,148</td>
<td>-4.4</td>
</tr>
<tr>
<td>4</td>
<td>National Stock Exchange of India</td>
<td>2,135,637,457</td>
<td>6.2</td>
</tr>
<tr>
<td>5</td>
<td>BM&amp;F Bovespa</td>
<td>1,603,600,651</td>
<td>-2.0</td>
</tr>
<tr>
<td>6</td>
<td>CBOE Holdings</td>
<td>1,187,642,669</td>
<td>4.7</td>
</tr>
<tr>
<td>7</td>
<td>Nasdaq OMX</td>
<td>1,142,955,206</td>
<td>2.5</td>
</tr>
<tr>
<td>8</td>
<td>Moscow Exchange</td>
<td>1,134,477,258</td>
<td>6.8</td>
</tr>
<tr>
<td>9</td>
<td>Korea Exchange</td>
<td>820,664,621</td>
<td>-55.3</td>
</tr>
<tr>
<td>10</td>
<td>Multi Commodity Exchange of India</td>
<td>794,001,650</td>
<td>-17.3</td>
</tr>
</tbody>
</table>

Source: Future Industry Organization Survey 2013
FIGURE 1.4: Top 10 Derivatives Exchanges In The World During The Year 2013

Source: Based on Table 1.5

Table 1.5 and Figure 1.4 explained various stock exchanges related to their trading volume during the year 2013 and ranked them accordingly. India’s National Stock Exchange is one of top ten exchanges of the world in terms of number of contracts traded. It ranks as fourth largest exchange in terms of number of contracts traded; CME Group is at the top among all the Exchange. NSE has moved up the in the ranking in 2013 as it was on the fifth rank in the world during 2012, 2011 and 2010 in derivatives trading.

1.1.9 Regulatory Framework for Derivatives\(^\text{10}\)

The regulatory framework for derivatives have mention by Security Exchange Board

of India in their chapter 3, which explained regulatory objectives, major issues concerning the regulatory framework etc. to regulate derivatives markets.

**Regulatory Objectives**

The Committee believes that regulation should be designed to achieve specific, well-defined goals. It is inclined towards positive regulation designed to encourage healthy activity and behavior. It has been guided by the following objectives:

**Investor Protection:** Attention needs to be given to provide protection to the investors.

**Fairness and Transparency:** The trading rules should ensure that trading is conducted in a fair and transparent manner. Experience in other countries shows that in many cases, derivatives brokers/dealers failed to disclose the potential risk to the clients. In this context, sales practices adopted by dealers for derivatives would require specific regulation. In some of the most widely reported mishaps in the derivatives market elsewhere, the underlying reason was an inadequate internal control system at the user-firm itself so that overall exposure was not controlled and the use of derivatives was for speculation rather than for risk hedging. These experiences provide useful lessons for us for designing regulations.

**Safeguard for Client's Moneys:** Moneys and securities deposited by clients with the trading members should not only be kept in a separate clients' account, but should also not be attachable for meeting the broker's own debts. It should be ensured that trading by dealers on own account is totally segregated from that for clients.

**Competent and Honest Service:** The eligibility criteria for trading members should
be designed to encourage competent and qualified personnel so that investors/clients are served well. This makes it necessary to prescribe qualifications for derivatives brokers/dealers and the sales persons appointed by them in terms of a knowledge base.

**Market Integrity:** The trading system should ensure that the market's integrity is safeguarded by minimizing the possibility of defaults. This requires framing appropriate rules about capital adequacy, margins, clearing corporation, etc.

**Quality of Markets:** The concept of "Quality of Markets" goes well beyond market integrity and aims at enhancing important market qualities, such as cost-efficiency, price-continuity, and price-discovery. This is a much broader objective than market integrity.

**Innovation:** While curbing any undesirable tendencies, the regulatory framework should not stifle innovation, which is the source of all economic progress, more so because financial derivatives represent a new rapidly developing area, aided by advancements in information technology.

Of course, the ultimate objective of regulation of financial markets has to be to promote the more efficient functioning of markets on the "real" side of the economy, i.e. economic efficiency. Leaving aside those who use derivatives for hedging of risk to which they are exposed, the other participants in derivatives trading are attracted by the speculative opportunities which such trading offers due to inherently high leverage. For this reason, the risk involved for derivatives traders and speculators is high. This is indicated by some of the widely publicized mishaps in other countries.

Hence, the regulatory frame for derivatives trading, in all its aspects, has to be much
stricter than what exists for cash trading. The scope of regulation should cover derivatives exchanges, derivatives traders, brokers and salespersons, derivatives contracts or products, derivatives trading rules and derivatives clearing mechanism. The Committee envisages that this sharing of regulatory responsibility is so designed as to maximize regulatory effectiveness and to minimize regulatory costs.

**Major Issues Concerning Regulatory Framework**

The Committee's attention had been drawn to several important issues in connection with derivatives trading. The Committee has considered such issues, some of which have a direct bearing on the design of the regulatory framework. They are listed below:

- Should a derivatives exchange be organized as independent and separate from an existing stock exchange?
- What exactly should be the division of regulatory responsibility, including both framing and enforcing the regulations, between SEBI and the derivatives exchange?
- How should we ensure that the derivatives exchange will effectively fulfill its regulatory responsibility?
- What criteria should SEBI adopt for granting permission for derivatives trading to an exchange?
- What conditions should the clearing mechanism for derivatives trading satisfy in view of high leverage involved?
- What new regulations or changes in existing regulations will have to be
introduced by SEBI for derivatives trading?

Should Derivatives Trading be Conducted in a Separate Exchange?

A major issue raised before the Committee for its decision was whether regulations should mandate the creation of a separate exchange for derivatives trading, or allow an existing stock exchange to conduct such trading. The Committee has examined various aspects of the problem. It has also reviewed the position prevailing in other countries. Exchange-traded financial derivatives originated in the USA and were subsequently introduced in many other countries. Organizational and regulatory arrangements are not the same in all countries. Interestingly, in the U.S.A., for reasons of history and regulatory structure, futures trading in financial instruments, including currency, bonds and equities, were started in the early 1970s, under the auspices of commodity futures markets rather than under securities exchanges where the underlying bonds and equities were being traded. This may have happened partly because currency futures, which had nothing to do with securities markets, were the first to emerge among financial derivatives in the U.S.A. and partly because derivatives were not "securities" under U.S. laws. Cash trading in securities and options on securities were under the Securities and Exchange Commission (SEC) while futures trading were under the Commodities Futures Trading Commission (CFTC). In other countries, the arrangements have varied.

The Committee examined the relative merits of allowing derivatives trading to be conducted by an existing stock exchange vis-a-vis a separate exchange for derivatives. The arguments for each are summarized below.

Arguments for Allowing Existing Stock Exchanges to Start Futures Trading: The
most widely argument in this regard is the advantage of synergies arising from the pooling of costs of expensive information technology networks and the sharing of expertise required for running a modern exchange. Setting-up a separate derivatives exchange will involve high costs and require more time.

The recent trend in other countries seems to be towards bringing futures and cash trading under coordinated supervision. The lack of coordination was recognized as an important problem in the U.S.A. in the aftermath of the October 1987 market crash. Exchange-level supervisory coordination between futures and cash markets is greatly facilitated if both are parts of the same exchange.

**Arguments for Setting-up Separate Futures Exchange:** The trading rules and entry requirements for futures trading would have to be different from those for cash trading. The possibility of collusion among traders for market manipulation seems to be greater if cash and futures trading are conducted in the same exchange. A separate exchange will start with a clean slate and would not have to restrict the entry to the existing members only, but the entry will be thrown open to all potential eligible players.

**Recommendation**

From the purely regulatory angle, a separate exchange for futures trading seems to be a neater arrangement. However, considering the constraints in infrastructure facilities, the existing stock exchanges having cash trading may also be permitted to trade derivatives provided they meet the minimum eligibility conditions as indicated below:

a) The trading should take place through an online screen-based trading system, which also has a disaster recovery site. The per-half-hour capacity of the
computers and the network should be at least 4 to 5 times of the anticipated peak load in any half hour, or of the actual peak load seen in any half-hour during the preceding six months. This shall be reviewed from time to time on the basis of experience.

b) The clearing of the derivatives market should be done by an independent clearing corporation, which satisfies the conditions listed in a later chapter of this report.

c) The exchange must have an online surveillance capability which monitors positions, prices and volumes in real-time so as to deter market manipulation. Price and position limits should be used for improving market quality.

d) Information about trades, quantities, and quotes should be disseminated by the exchange in real-time over at least two information vending networks which are accessible to investors in the country.

e) The Exchange should have at least 50 members to start derivatives trading.

f) If derivatives trading are to take place at an existing cash market, it should be done in a separate segment with a separate membership; i.e., all members of the existing cash market would not automatically become members of the derivatives market.

g) The derivatives market should have a separate governing council, which shall not have representation of trading/clearing members of the derivatives Exchange beyond whatever percentage SEBI may prescribe after reviewing the working of the present governance system of exchanges.
h) The Chairman of the Governing Council of the Derivatives Division/Exchange shall be a member of the Governing Council. If the Chairman is a Broker/Dealer, then, he shall not carry on any Broking or Dealing Business on any Exchange during his tenure as Chairman.

i) The exchange should have arbitration and investor grievances redressal mechanism operative from all the four areas/regions of the country.

j) The exchange should have an adequate inspection capability.

k) No trading/clearing member should be allowed simultaneously to be on the governing council of both the derivatives market and the cash market.

1. INTRODUCTION (PART B)

1.2 Literature Review

Financial market of a country signifies the financial strength of an economy. A good financial health of a country helps in enhancing the cash flow and creates capital, which contributes to develop a country. After privatization and globalization, financial market has entered into a new segment of global integration and liberalization with lots of new and innovative financial instruments. The stock market is unpredictable as the prices are changed very frequently. During the year 2001, India had launched a risk minimizing tool and that was Derivatives. The idea behind
announcing derivatives trading in India was to control over the fluctuations in the stock and commodity prices. It also facilitates in increasing the trading volume in the stock market and cash flows in India.

A review of literature is an overview of the already available published data, which helps researchers in conducting further research. It’s a process of summarizing and classifying the data in such a manner through which comparative analysis of previous research study can be performed. This research is going to find out the impact of introduction of financial derivatives on the spot market volatility. In this regards enormous studies have been conducted by various researchers of the world.

Numerous readings contributed different outcomes regarding the impact of introduction of the financial derivatives on the spot market volatility. The empirical analysis of some studies explored that the stock market volatility has been reduced after the introduction of financial derivatives, as they are providing hedging facility against the risk in the stock market due to price fluctuation, which helps in enhancing the liquidity in the stock market and reduces informational asymmetries in the market. On the other hand, some results showed the increased in volatility and some suggested that there is no impact of introduction of financial derivatives on the volatility of the stock market. This creates a confusion regarding increasing or decreasing volatility in the stock market due to the introduction of derivatives trading. So, there is a requirement to stretch an overview of the literature review.

To understand it properly the literature review has been divided into three sections. The first section contains all those studies which gave evidence in support of a decrease in volatility of stock market due to the introduction of derivatives trading. The second section elucidated those studies, which suggested that increased in the
volatility of stock market due to the introduction of derivatives trading. Third section contains all those studies which are neutral with respects to introduction of financial derivatives.

SECTION I- Decrease in Stock Market Volatility due to the Introduction of Derivatives Trading

Dr. Premalata Shenbagaraman (2003). Analysis has been done in this research to understand the impact of index futures and index options contracts trading on the volatility of underlying stock index in India, during the period 5th Oct. 1995 to 31st Dec. 2002. The research is based on two Indexes i.e. CNX Nifty and CNX Nifty Futures. GARCH (1, 1) and EGARCH model has been used to achieve the objectives of the research. The result highlights that derivatives help in improving the liquidity of the stock market and reducing informational asymmetries in the stock market. At the same time the results also show that derivative do not help in destabilizing the underlying market.

M. T. Raju and Kiran Karande (2003). Both regulators and market participants prefer less volatility to more volatility as it provides more safety returns. This research is conducted to evaluate the impact of derivatives trading on the price fluctuation of the stock market. An effort is made here to understand the price discovery function of the derivatives market during the period June 2000 to October 2002. GARCH (1, 1) model results show that the futures market helps in price discovery of the spot market and the volatility of the spot market has come down after the introduction of stock index futures.

Golaka C Nath (2003). This research has been conducted in India for the period 1999
to 2003, to analyze the Impact of derivatives trading on the volatility of the cash market in India. Two benchmark indices: S&P CNX Nifty and S&P CNX Nifty Junior along with few selected stocks were considered for the study. GARCH (1, 1) volatility model indicates that the volatility of underlying stocks has been reduced after the introduction of derivatives trading.

**Ash Narayan Sah, Dr. G. Omkarnath (2005).** This paper studies the effect of the financial derivatives trading on the price fluctuation of S&P Nifty Index and BSE Sensex Index with the help of ARCH/GARCH model. The observational proof gave the blended result in regards to the effect of instability of the presentation of derivatives. The outcomes made clear that introduction of futures and options have put a mixed impact on the volatility of the stock market, as clear from GARCH (1, 1) model. It was additionally observed that the introduction of derivatives on the S&P Nifty decline in volatility while BSE Sensex exhibited a rise in volatility. EGARCH model indicates a fall in volatility in case of all indices.

**Snehal Bandivadekar and Saurabh Ghosh (2005).** This paper helps in finding out the impact of the introduction of index futures on the spot market volatility on both S&P CNX Nifty and BSE Sensex. Daily closing price data for the period January 1997 to March 2003 has been considered for this study. The ARCH/GARCH volatility model shows that after the introduction of index futures, spot market volatility has declined. This research suggests that after introduction of derivatives, the volatility of the stock market has declined.

**Sibani Prasad Sarangi & Uma Shankar Patnaik (2006).** This paper provides a theoretical background and empirical evidence of the impact of futures and options trading on the spot market volatility in India. Closing price and opening prices for S &
P CNX Nifty, Nifty Junior and S & P 500 index has been collected from January 1, 1997 until March 31, 2005 to achieve the objectives of the research. The present study uses a family of GARCH techniques to access the impact of derivatives on the spot market volatility. The result of the study shows that there is no impact of derivatives trading on the volatility of the stock market.

**Dr. Hiren M Maniar (2007).** The target of this paper has been to investigate the outcome of introduction of derivatives trading on the underlying security markets in India, in terms of stability, liquidity and price information for the period April 2001 to March 2006. The result of this study shows that the introduction of derivatives does not destabilize the underlying market. The derivatives tends to improve the liquidity and in formattiveness of markets. The models of conditional volatility GARCH, EGARCH and GJR have been used to study the impact of financial derivatives on underlying assets. The result showed that the uncertainty has been decreased and liquidity of the stock market has been increased because of the derivatives instruments in the security market.

**K. Kiran Kumar & Chiranjit Mukhopadhyay (2007).** The aim of this study was to find out the impact of Nifty Index Futures trading on the volatility of the underlying NSE Nifty Index. Various empirical methods were used to analyze the daily closing price data, like CUSUM, Bayesian analysis, F-test, and GARCH family model. CUSUM pilot and Bayesian analysis confirmed that the volatility has been shifted after the introduction of Index Futures. The classical F-Test (Variance-Ratio test) also indicated that the spot market volatility has changed, as the inauguration of Index Futures trading. ARMA-GARCH model indicates that the structure of spot market volatility has been changed due to the efficiency of information floatation. But, there
is no impact on the underlying mean level of the returns and marginal volatility of the spot market.

**Steven Shuye Wang, Wei Li (2008).** This study tries to find out the impact of the Hong Kong Hang Seng China Enterprise Stock Index (H-stock Index) futures index on the speculating activities in the underlying equities or not and also their impact on the volatility and volume of the underlying stocks. It was found that the introduction of the H-stock index options increase the level of well-versed trading and provides an opportunity for the market participants. Derivatives trading increase the efficiency of the spot stock market by providing cheaper stock trading facilities, which in turn signifies that the futures and options trading activities help in decreasing the volatility of the stock prices. The result shows that derivatives trading do not change the liquidity of H-stock constituent stocks.

**Christiane Goodfellow and Christian A. Salm (2008).** This study helps in analyzing the impact of derivatives trading in the Polish Stock Market with the help of GARCH & GJR GARCH implied volatility model. Overall, the empirical evidence suggests that the introduction of derivatives trading had a stabilizing effect on the stock market. The result shows that the investors of derivatives market are better informed and they're efficient to trade in the stock market after the introduction of derivatives trading.

**Bhaumiky, M. Karanasosy and A. Kartsaklas (2008).** This paper investigates the issue of chronological ordering of the range-based volatility and volume in the Indian stock market during the period 1995-2007. The period of the study has been divided into two parts, i.e. pre derivatives period and post derivatives period. This study examined the volume traded before and after the introduction of futures and options.
trading. The finding suggests that the impact of both the number of trades and the value of stocks traded is negative on the volatility of the stock price; the results indicate that introduction of futures trading leads to a decrease in spot stock market volatility. This study also indicates that the expirations of equity based derivatives have considerable impact on the value of stocks traded on expirations days.

**Ravi Agarwal, Shiva Kumar, Wasif Mukhtar, Hemanth Abar (2009).** This study investigates the impact of derivatives trading on the instability of the spot market. Two models have been used to draw a conclusion, first to find out the significant difference in the movement of Nifty and Nifty Junior Index Prices and the second was to find out the impact of Nifty Future on the volatility of Nifty Index price. The result shows that there is no impact of NIFTY Futures index on the volatility of NIFTY Spot Index.

**Dr. Gurcharan Singh, Salony Kansal (2010).** This paper inspects the effect of financial derivatives trading on the volatility of Indian stock market by taking NSE S& P CNX Nifty index and the period covered under the study varies from 1995-1996 to 2008-09. The research explored that a derivatives trading helps in reducing the volatility and the supporting explanation for it that derivatives provides a favorable environment for trading by providing a hedging facility, which results in increasing trading volume. Increasing trading volume followed greater liquidity and which is reflected in the prices of the underlying market and the market become more stable.

**Dr. Shailesh Rastogi (2011).** This study puts emphasis on the trading of interest rate future in India, as this was a big financial step towards the global integration. The study revealed the fact that the interest rate future puts a positive impact on the
volatility of interest rate in India during the period January, 1 2005 to July 31 2010.

**Manmohan Mall, B. B. Pradhan (2011).** The point of this paper is to dissect the time varying properties of volatility of India’s stock index futures market, amid the period June 2000 to May 2011. The paper investigated that the level of volatility of stock market significantly affected due to the introduction of bad news in the market like global financial meltdown and financial crises in the US. Derivatives provide hedging facilities against such risk and helps policy maker to control over volatility in the stock market.

**Dr. K. Srinivasan, Dr. Jain Mathew, Miss. Aditi Davidson (2012).** This paper examines the effect on the spot stock market volatility due to the introduction of futures market in India for the period from January 1, 1995 to December 31, 2011, of S&P CNX Nifty, S&P CNX Nifty Junior and S&P CNX 500. To measure the volatility of the stock market, the GARCH (1, 1) Model under Maximum Likelihood Estimation and Chow Break Point were used by examining Z-statistic and Log Likelihood Ratio. Notwithstanding that, stock market instability was examined by utilizing day of the week impact which existed in prefectures period and not display in the post-derivatives period. The result shows that there is a significant decrease in the domestic market volatility due to the introduction of derivatives trading. This indicates that the index futures play a significant role in decreasing the volatility of the stock market and in turn also contribute to increase in the stock market efficiency.

**Dhananjay Sahu (2012).** This paper investigates the effect of derivatives on spot stock market instability. Daily closing price returns of 73 organizations have been considered for the period April 01, 1998 to March 31. For research purpose, the instability GARCH (1, 1) model has been utilized. The general consequence of the
study demonstrates that derivatives trading decrease the spot market instability.

**Girish, GP (2012).** The principle target of this study is to inspect the impact of derivatives trading on stock market unpredictability. The period considered for the study between 01-01-1996 and 27-10-2005 with day by day shutting costs of S&P CNX Nifty given by NSE, India. GARCH (1, 1) model has been utilized to catch the way of instability over the long run and unpredictability grouping marvel of the information. It has been observed that there is no huge change in the volatility of the S&P CNX Nifty Index, yet the structure of volatility has changed to some degree. The aftereffect of the study offers bits of knowledge to Regulators and Policy creators about instability and consequently helping them in making important approaches, particularly while presenting new derivatives instruments in financial markets in years to come.

**Helmut Wagner and Eva Matanovic (2012).** The study focused on finding out the impact of derivatives trading on the volatility of the underlying assets for the period January 1, 1970 to May 1, 2009, for DAX future trading. The outcome demonstrated that volatility has been diminished because of the presentation of DAX future trading. ARCH/GARCH has been applied for the study.

**Sumbul Kabir & Sana Ikram (2012).** In this study, the author has analyzed the derivatives impact on the Indian Capital Market, amid the period 1st April, 2000 to 31st March, 2010, and utilized the usual way of finding out correlation and regression between Index Future and S&P CNX Nifty. For this purpose, the relationship between two variables, i.e. Index Future and S&P CNX Nifty and some other sectoral records, i.e. Future Index Bank Nifty, Future Index CNX100, Future Index Junior Nifty, Future Index Nifty, Future Index Midcap50, Futures Index Mini Nifty had been
analyzed. Examination demonstrated that the Index future is having a significant
effect and contribution of index future in the movement of the S&P CNX Nifty.
However the coefficient of connection is a high level of positive relationship,
demonstrating that the impact is exceptionally solid.

**Namita Rajput, Ruhi Kakkar, Geetanjali Batra, Meenakshi Gupta (2012).** The
aim of this paper is to analyze the relationship between the futures market and the
spot market of S&P CNX Nifty and evaluate the price discovery function of future
market in relation to the spot market. The period considered for the study was January
2003 to March 2011 and the Cointegration tests and Vector Error Correction Models
(VECM), Variance Decomposition Analysis (VDA) and Granger causality is
employed to ascertain the long and short-term dynamics of the selected spot market
and the futures market. From the results of the study it was found that price was
discovered in the spot market as the futures price series had a greater speed of
adjustment.

**M. Mete Doganay, Nildag Basak Ceylan, Ekin Tokat, Ramazan Aktas (2013).**
The aim of this study is to investigate the impact of future trading on the volatility
pattern in the Turkish stock market. In this paper, the EGARCH model, which
considers the asymmetric effects used, to analyze the effect of futures trading on the
volatility of ISE 30 index spot returns. The outcome demonstrates that the volatility of
spot market has been reduced after the execution of future market.

**Namita Rajput, Ruhi Kakkar, Geetanjali Batra (2013).** This paper concentrates on
the effect of index future on the spot market volatility on S&P CNX Nifty for the
period June, 2000 to March 2012. The volatility of the stock market has been
examined with the help of Bivariate E-GARCH model. The results demonstrate that
the volatility spillover between spot and derivatives markets is uni-directional from spot to future. This study clarified those derivatives trading help for policy maker, hedgers and speculator for bringing choice with the risk management instrument.

**K. Bhagya Lakshmi (2014).** The main goals of the study were to discover the relationship between Nifty Index Future and S&P CNX Nifty and to inspect the execution of financial derivatives in the Indian Capital Market for the period April 2000 to Feb 2013. The observational test clarified that both financial derivatives market and capital market are identified with one another and give moment response as the development in one accord. It was likewise discovered that financial derivatives aides in controlling the financial risk and managing to develop the economy.

### SECTION II- Increase in Stock Market Volatility due to the Introduction of Derivatives Trading

**Antonios Antoniou A, Phil Holmes Aab (1995).** This study explored the relationship between information and volatility. FTSE-100 Stock Index Future and Spot Index have been considered for the study to find out the impact of information flow on the volatility of the stock market. GARCH family model of volatility has been implied in the study. The results of the study have indicated that the introduction of future trading has enhanced the speed and eminence of information flowing to the spot stock market and that led to increasing speculation, which is followed by increasing volatility in the spot market.

**Kang, Sang Hoon & Yoon, Seong-Min (2007).** This study explored the answers for
the questions whether the index futures trading helps to improve information efficiency and reducing the volatility of the Asian stock markets. GARCH, GJR-GARCH and APGARCH models have been applied to study the impact of index future introduction in five Asian spot market, i.e. TOPIX (Japan), KOSPI 200 (Korea), the KLCI (Malaysia), Straits Times (Singapore) and TAIEX. The empirical result shows that the speculative activities have increased due to the introduction of Index Future and that led to increase in the volatility of spot stock market.

Nidal Rashid Sabri (2008). The study explored the impact of derivatives on the price and volume of the underlying stock of AMF stock price index (Arab Stock Market) for the period 1994 to 2006. The study reveals the fact that after the introduction of derivatives trading there is an increase in both trading volume and stock price fluctuations of the Arab stock markets. The result shows that both trading volume and stock price volatility are correlated with each other.

Sumon Kumar Bhaumik and Suchismita Bose (2009). This study explored the impact of the of derivatives trading in National Stock Exchange on the spot stock market during the period June 2000 to September 2006. The results of the study show that the volatility and trading volume of the stock market significantly increased after the introduction of derivatives trading due to the expiration day effect of the derivatives trading.

Mr. Hiren M Maniar , Dr. Rajesh Bhatt (2009). This paper emphasizes on the studies about the effect of expiration day of the Index futures and Options on the trading volume of the S&P CNX Nifty Index, variance and the price of the underlying stocks. GARCH model was used to analyze the expiration day effect for the period January 2003 through September 2006. The results of the study show that the
volatility of the stock market increased after the introduction of derivatives trading due to the expiration day effects of the derivatives contracts.

**Dr. Khurshid Ali, Mr. Irshad Ahmad Malik (2013).** This paper evaluates the impact of index futures contracts trading in the Indian stock market during the period April 1995 to December 2006. The whole period of the study has been divided into two segments, i.e. pre and post derivatives periods. The comparative analysis of pre and post derivatives period suggests that the volatility of the CNX Nifty has increased after the introduction of index futures.

**SECTION III- Neutral or not Sure in Change in the Stock Market Volatility Due to the Introduction of Derivatives Trading**

**T. Mallikarjunappa and Afsal E. M. (2008).** The author explored the volatility behavior of the stock market after the introduction of derivatives trading into the S&P CNX Nifty Index. Daily closing price data during the period 5\(^{th}\) October 1995 to 30\(^{th}\) June 2006 have been collected from the CNX Nifty Index, Nifty Index Futures, Nifty Junior Index and S&P 500 Index. The GARCH model results that the performance of Nifty Index has improved during the post-derivatives period and also generated good returns for the investors. On the other hand index (Nifty Junior) on which no derivatives trading was available, observed lower returns. The examination shows that the stock market volatility remains unchanged even after the introduction of derivatives.

**William Arrata, Alejandro Bernales and Virginie Coudert.** This Study was based on the finding out the evolution and the potential effects of the three main categories
of derivatives: equity options, commodity futures, and credit default swaps (CDS). This study explained derivatives instruments as a hedging instrument to protect against the future price fluctuation. The result of the study showed that equity option helps in improving market efficiency by decreasing transaction cost and decreased market risk by reducing the levels of asymmetric information to the agents. It was also found out that the commodity future will protect the producer against price fluctuation in the future and against inflation in the long run. Another result explained that CDSs protect lenders against borrower defaults. But the study has not given any information about the impact of derivatives trading on the volatility of the stock market or the case is not clear regarding volatility.

**K. N. Badhani, Harish Bisht, Ajay Kumar Chauhan (2008).** This paper assesses the role of financial derivatives over the structural changes in the volatility of stock prices. The study has been conducted over 32 companies of NSE for the period 1995 to 2007. By using cumulative-sum-of-squares (CUSUM), the result shows that there is no impact of derivatives trading on increase or decrease of volatility of the stock prices.

**Weerawut Treerattrakul (2009).** This paper investigates the impact of stock option introduction on underlying stock characteristics in Hong Kong market from 1995 to 2008. The empirical results of this study suggest that the stock options introduction causes negative price impact on underlying stocks immediately one day after stock options listing. The impact is permanent for at least thirty days after stock options introduction date. However, on an average, stock option listing does not cause any significant change in the volatility of underlying stock return and trading volume.

**Ekkehart Boehmer, Sudheer Chava, Heather E. Tookes (2010).** This study has
been conducted on the listing firms of the NYSE to find out the impact of individual equity options, publicly traded corporate bonds and credit default swap (CDS) contracts on the quality of the stock during the period 2003-2007. The finding of the study reveals that the prices and liquidity are mostly applicable for the listed companies in the stock exchanges. On the other hand, CDS contracts have put negative impact on the liquidity and efficiency of the stock market. The impact of having a publicly traded bond market gives the mixed results.

Ruchika Gahlot, Saroj K. Datta, Sheeba Kapil (2010). This study has been conducted to examine the impact of derivatives trading on stock market volatility for which CNX Nifty Index and 10 individual companies (five companies with available derivatives contracts and other five on which no derivatives are available) for the period April 1, 2002 to March 31, 2005. A GARCH (1, 1) volatility model result shows that there is no significant change in the volatility of CNX Nifty Index for post-derivatives period. However, the structure of volatility is changing. GARCH (1, 1) model for individual companies shows mixed results.

Chee Mun Fei, Kam Mei Kuan, Lai Yew Kean, Poh Eng Ming, Tan Hoay Shan (2011). This research has been conducted on 300 Malaysian non-financial firms during the period 2007 to 2009. Interest rate derivatives, foreign currency derivatives and commodity derivatives have used to investigate the effect of using derivatives on the value of the firm in the Malaysia market. To find out the results, ordinary least squares (OLS) and panel data technique have been used. The empirical analysis proves that the usage of derivatives does not help in improving the firm’s value. Commodity and currency derivatives are not significantly related to the firm’s value. Interest rate derivatives are partially significant to the firm’s value; however the
relationship is negative.

**Suhasini Subramanian (2012).** This study evaluates the Impact of the Index Futures on Volatility and Noise Trading. The study has been based on theoretical approaches and empirical evidence for the period 2001 to 2011. The paper did not find any evidence regarding the decrease in the spot market volatility due to the index futures in the stock market.

**Erifili Mano (2013).** The purpose of this study is to find out the role of the derivatives trading on the reduction of systematic risk of the financial sectors. The European listed banks consisting of the EU-15 countries and Switzerland have to be considered to get the results and the period of the research was 1998 till 2012. Volatility regression model has been used to analyze the data. The results of the study suggested ambiguous as on the one hand empirical evidence showed that credit derivatives helps in reducing the systemic risk of the financial system. On the other hand, results indicated that there is no impact of derivatives on idiosyncratic risk.

**Mr.Krunal K Bhuvaa and Dr. Vijay H Vyasb (2013).** This paper analyzed empirically the expiration day effect of stock derivatives on underlying securities by using the S&P 500 market index. The study has been conducted during the period of January 2012 to December 2012 and t-test has been used for the analysis. The results show that there is no significant effect of the expiration day derivatives trading on the volatility and returns of the spot stock markets.

On the basis of reviews of numerous past research work it is very difficult to say about the impact of derivatives trading on the efficiency and volatility of the stock market. Most of the researchers on the basis of their empirical analysis concluded that
derivatives trading played a vital role in the growth of the stock market.

Derivatives trading enhancing the speed of market response due to which the efficiency of the stock market has increased and decreased the pricing volatility of the stock market. It also helps in increasing the liquidity of the stock market and reducing information asymmetries in the market.

Most of the researchers examined the price discovery function of derivatives trading and they concluded that derivatives helps in the discovery of price on the spot market and which further helps in reduction of volatility in the stock market. The Price discovery function of derivatives market helps in decreasing the uncertainty in the mind of investors, which motivate them to invest and helps in enhancing the liquidity of the stock market. Derivatives are a cheaper investment instrument and it's also better informed to the investors, so they efficiently trade in this market.

The derivatives are to be treated as an encouraging instrument as having the hedging feature. It also helps policy makers and regulators to control over volatility with hedging facility. Critics are always presented with an innovative idea.

Some researcher found the negative impact of derivatives trading on the stock market efficiency. In this connection they upheld the reasons like future trading have enhanced the pace and nature of information streaming into the spot market and prompted speculation which is trailed by increasing volatility of the spot stock market.

Some researcher, viewed that trading volume and volatility of the stock market are positively correlated; as the trading volume has been increased due to the derivatives trading, the volatility has also increased. The expiration day effect of derivatives
trading is also the reason for enhanced the volatility of the stock market. It is also finding out by some authors that Options trading makes the average stock price decrease and stock price variance increases.

Some of the studies concluded that there is no impact of derivatives trading on the volatility of spot stock market. As they represented that it is not only the derivatives trading that increased the fluctuation in the stock market but also other macroeconomic variables which enhance the stock market volatility. But still this is a critical issue for discussion and significant topic for the researcher as the stock market plays an awful role in the growth of an economy.

The results for various studies considered and discussed in this review paper are fundamentally different due to the following reasons:

- The time period of most of studies is not the same, so the results are different.
- The market conditions are different and hence the results are different as well.
- Another important factor is that different variables like option indexes, futures index, individual futures contracts and individual options contracts have been used in all the studies, which make their results, vary.
- The studies have used various methodologies like t-test, ARCH, GARCH, EGARCH, and TGARCH which may produce different results.
1 INTRODUCTION (PART C)

1.3 Research Methodology

A financial market is a place which provides a place for investment and helps in enhancing the income in terms of return. The main aim of financial market is to create cash flow in the market, so that individuals can take investment decision without any fear. Every investor would like to get the required rate of return with minimum risk. To attain the objective of high return with minimum risk, various instruments, practices and strategies have been devised and developed in the recent past.

1.3.1 Overview

After privatization and globalization, financial market has entered into a new phase of global integration and liberalization. On the one hand integration of the Indian capital market with global market open the boundaries for investment for everyone, which also helps in increasing the cash flow, on the other hand, there has increased in financial risk as the frequent changes in the interest rates, currency exchange rate and stock prices. To minimize the risk due to the fluctuations in stock price there is a requirement to renovate and innovate, new financial instruments, which helps in managing and minimizing the risk up to some level. Every investor would like to manage risk as the investment is for future periods and future is always uncertain. By taking financial derivatives instruments like Index Futures & Options, Stock Futures & Options etc., investors can reduce the risk of uncertainty. These instruments help
investors in creating an effective portfolio.

One view is that derivatives trading increases volatility in the stock market due to more highly leveraged and speculative participants in the futures market. An alternative view is that derivatives trading reduces stock market volatility by providing low cost contingent strategies and enabling investors to minimize portfolio risk by transferring speculators from stock markets to futures markets.

1.3.2 Identification of the Problem

Identification of the problem is the groundwork of any research work. This is the first step in the process of any research work. A broad definition of research is given by Martyn Shuttleworth – “In the broadest sense of the word, the definition of research includes any gathering of data, information and facts for the advancement of knowledge.”

The study of the Impact of Introduction of Financial Derivatives on Growth of Indian Stock Market is the study of how financial derivatives instruments help in reducing risks and helps in developing the stock market in a rapidly changing economy.

The review of literature explained that there have contradictory findings of the study of the impact of derivatives trading on the volatility and growth of the stock market. Some studies discovered that derivatives trading is very harmful to the investors as the risk involved in derivatives contracts is very high. On the other hand literature also suggested that derivatives play a very important role in the growth of the stock

---

market and also helps in minimizing the investment risk with hedging strategies. To solve the contradictory views related to the introduction of derivatives, there is a need to do further research on this critical issue. The present study has dedicated to investigating the role of Index Futures trading on the growth of Indian stock market.

### 1.3.3 Objectives of the Study

The introduction of financial derivatives contracts in Indian stock market has not been very old, but today the total notional trading values in derivatives contracts are ahead of the cash market. Hence it is necessary to find out the answers to the questions like, what is the impact of the introduction of the financial derivatives to the volatility and trading volume, risk and efficiency of stock market. Thus, the study aims at seeking answers to the following sets of research objectives:

1. To find out the fluctuations in the stock prices in the Indian stock market during the period 1st April, 1997 to 31st March, 2014.
2. To find out the relationship between financial derivatives market and cash market.
3. To find out the impact of derivatives trading in reducing the volatility in Indian stock market for pre and post derivatives periods.
4. To analyze whether the introduction of derivatives contracts has reduced the risk and inefficiency with the help of price discovery function, in the Indian stock market or not, during the period of the study.
5. To study the impact of financial derivatives on trading volume of the stock market, pre and post derivatives periods.
1.3.4 Hypothesis of the Study

A hypothesis is a tentative statement that proposes a possible explanation for some phenomenon or event. A useful hypothesis is a testable statement which may include a prediction. It is the proposition or a set of propositions which are set forth as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional conjecture to guide some investigation or accepted as highly probable in light of established fact is known as ‘hypothesis’. Decision - makers often face situations wherein they are interested in testing hypotheses on the basis of available information and then take a decision on the basis of such testing.

Ordinarily, when one talks about hypothesis, one simply means a mere assumption or some supposition to be proved or disproved. But in case of a research, hypothesis is a formal question that he intends to resolve. On the basis of various objectives of the study, the hypothesis has been constructed:

Hypothesis- 1

- **Null Hypothesis (H01):** there is no volatility or price fluctuation in the Indian stock market during the period 1st April, 1997 to 31st March, 2014.
- **Alternative Hypothesis (H1):** there is an existence of volatility or price fluctuation in the Indian stock market during the period 1st April, 1997 to 31st March, 2014.

Hypothesis- 2

- **Null Hypothesis (H02):** there is no relationship between derivatives market and cash stock market.
• Alternative Hypothesis (H₄₂): there is a relationship between derivatives market and cash stock market.

Hypothesis- 3

• Null Hypothesis (H₀₃): there is no impact of derivatives trading on stock market volatility after their introduction.

• Alternative Hypothesis (H₃₃): there is an impact of derivatives trading on stock market volatility after their introduction.

Hypothesis- 4

• Null Hypothesis (H₀₄): Derivatives trading is not helpful in reduction of risk and inefficiency with price discovery function.

• Alternative Hypothesis (H₄₄): Derivatives trading helps in reduction of risk and inefficiency with price discovery function.

Hypothesis- 5

• Null Hypothesis (H₀₅): There is no impact of derivatives trading on the trading volume of the stock market.

• Alternative Hypothesis (H₅₅): There is a significant impact of derivatives trading on the trading volume of the stock market.

1.3.5 Research Design

“A research design is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.”¹²

Research design is a combination of various designs like sampling design,

---

¹² C.R. Kothari (2009), Research Methodology, pg.31.
observational design, statistical design and operational design, which helps in performing the research work in a systematic manner.

As the present study is concerned with describing the impact of introduction of derivatives trading on the underlying assets, it utilizes **Descriptive Research Design** to analyze the same.

Experimental design defines the structure of an experiment, as the research time period is divided into two time periods, i.e. pre and posts derivatives period volatility of the spot market.

This research is also finding out the cause and effect relationship, which is also, comes under experimental research.

**Experimental Research Design** has also used for the study as under it before-and-after with control design has been used, and cause and effect relation between futures and cash market has applied on experimental basis. As to control the impact of various macroeconomic factors on the volatility of stock prices in India.

### 1.3.6 Research Period

The daily closing price of Indexes has considered for finding out the returns for the period 1\textsuperscript{st} April, 1997 through 31\textsuperscript{st} March, 2014, which represent the enough time and data for the study.
1.3.7 Sampling

To achieve the objectives of the research those are mentioned above, the two major stock exchanges, i.e. *National Stock Exchange and Bombay Stock Exchange* have been considered.

NSE and BSE are the most important and popular indicators of the Indian stock market performance. These Indices are a good predictor of the stock market volatility. Stock market return has been calculated from the daily closing prices of the NSE Nifty and BSE Sensex to solve the research problem.

The return series comprises 4235 observations for *BSE Sensex and BSE 200*, of which 1141 observations relate to the period prior to the introduction of futures trading and the remaining 3094 observations to the period after the introduction of futures trading.

In the same manner 4239 observations related to *NSE Nifty and Nifty Junior*, of which 1152 observations related to the pre derivatives introduction and remaining 3087 related to post introduction of derivatives.

For finding out the returns of the time series data daily closing price of indexes has been used. It is necessary to differentiate the volatility in stock market arise due to the introduction of derivatives trading and the other factors which can affect it. For this purpose Nifty Junior and BSE 200 are included in the empirical analysis, on which no derivatives trading available.
CNX Nifty Junior is having the most liquid securities after the CNX Nifty, which consists of 100 most liquid stocks in India. The maintenance of the CNX Nifty and the CNX Nifty Junior are synchronized so that the two indices will always be disjoint sets; i.e. a stock will never appear in both indices at the same time. Hence it is always meaningful to pool the CNX Nifty and the CNX Nifty Junior into a composite 100 stock indexes or portfolio.

The CNX Nifty Junior Index represents about 11.42% of the free float market capitalization of the stocks listed on NSE as on March 31, 2014. The total traded value for the last six months March 2014 of all index constituents is approximately 16.01%\(^{13}\) of the traded value of all stocks on NSE.

BSE 200 is the broad based index comprising of 200 large, well established and financially sound companies across sectors. The selection of companies was primarily been done on the basis of current market capitalization of the listed scrips. Moreover, the market activity of the companies as reflected by the volumes of turnover and certain fundamental factors were considered for the final selection of the 200 companies.\(^{14}\)

### 1.3.8 Data Collection

Data collection has always been a major problem before every researcher and this case is no exception. This is so because every time it seems that the data at hand is either inadequate for carrying the research further or so wide that it becomes difficult

---

\(^{13}\) NSE Website.

\(^{14}\) BSE India Website.
to extract useful data.

The data are from 1st April, 1997 to 31st March, 2014 is to be collected from secondary sources, i.e. www.nseindia.com and www.bseindia.com and other sources like various books, newspapers, journals, & internet.

The whole time period is divided into two sub-time periods. First is pre-derivatives, introduction period that is from 1st April, 1997 to 8th November 2001. Second sub-time period is post-derivatives period from 9th November, 2001 to 31st March 2014.

On 9th June, 2000, derivatives trading had been started in Indian stock market with the introduction of futures contracts. The reason behind adopting post derivatives period after 8th November, 2001, as the full flashed of derivatives trading were started only in November 2001.

After collecting the data from the secondary source, they have been analyzed to find out the impact of financial derivatives on stock market with the help of suitable statistical & econometric model.

To testify the impact of the introduction derivatives trading on the spot market, index futures have been taken as futures are the major portion of derivatives trading in India. In this study, the researcher has tested the impact of introduction of Index Future on the Spot Index volatility for two indices in India i.e. NSE and BSE.

The two indices have again classified as:

**NSE**

The index on which financial derivatives are traded- CNX Nifty Index.

The index on which financial derivatives are not traded- Nifty Junior Index.

**BSE**
The index on which financial derivatives are traded- BSE Sensex Index.

The index on which financial derivatives are not traded- BSE 200 Index.

1.3.9 Data Analysis and Interpretation

The collected data has been empirically analyzed by using *Eviews 7 and Microsoft Excel software.*

Various statistical tools have been used to examine the impact of financial derivatives trading on the cash market volatility and efficiency, like *Log Return, Percentage, Graphs, Diagrams, ADF Test, Correlogram, Jonansen’s Co-integration Test, VECM, Granger Causality Test and ARCH-GARCH* has been used for the study.

The analysis of the data collected has to be done on the basis of the following steps which would help in interpreting and analyzing the data appropriately and easily. The steps are as follows:

A collection of daily closing price data of CNX Nifty and BSE Sensex for the period 1\textsuperscript{st} April, 1997 to 31\textsuperscript{st} March, 2014. Other than this to find out the relationship between Index Spot and Index Future, daily closing price of near month future contract of Nifty Future and Sensex Future has also been collected.

First to calculate the *Log Return* of the closing price series of the data using the Equation 1.3.1.

\[
rt=100 \times \log \left( \frac{P_t}{P_{t-1}} \right) \tag{1.3.1}
\]
Where $P_t$ is the current closing price and $P_{t-1}$ the previous day closing price.

It is necessary to check the stationarity of the time series data before applying any model, for that **Augmented Dickey Fuller Test** (ADF) has been used. The ADF test uses the equation 1.3.2.

**Augmented Dickey Fuller Test**

\[ \Delta y_t = \alpha + \beta_1 t + \beta_2 t^2 + \gamma y_{t-1} + \phi_1 \Delta y_{t-1} + \ldots + \phi_{p-1} \Delta y_{t-p+1} + \varepsilon_t \]  

(1.3.2)

Where:

- $\Delta$ is the first difference operator
- $\alpha$ is a constant
- $\beta_1$ is the coefficient on a time trend
- $\beta_2$ is the coefficient on a squared time trend

This model can be estimated, and testing for a unit root is equivalent to testing that $\gamma = 0$.

In sum, the Augmented Dickey-Fuller Test in Excel test hypothesis is as follows:

- $H_0 : \gamma = 0$
- $H_1 : \gamma < 0$

Where:

- $H_0$ is the null hypothesis (i.e. $y_t$ has a unit-root)
- $H_1$ is the alternate hypothesis (i.e. $y_t$ does not have a unit-root)
Check the series **Descriptive Statistics** of the data, which helped in finding out the Mean, Median, Standard Deviation, Histogram, Skewness, Kurtosis, and Jarque-Bera test has been examined.

To find out the Autocorrelation Function & Partial Autocorrelation Function, i.e. **AR** and **MA** with **Correlogram** of the time series have been calculated. To begin the formal analysis and modeling the return series ($r_t$) you can calculate the traditional regressions, for example Autoregressive process, Moving average process or combining both as ARMA process.

An AR (1) process can be expressed as an infinite order MA process through recessive substitution.

$$y_t = \rho y_{t-1} + \varepsilon_t$$

$$= \rho (\rho y_{t-2} + \varepsilon_{t-1}) + \varepsilon_{t-1}$$

$$= \varepsilon_t + \rho \varepsilon_{t-1} + \rho^2 y_{t-2}$$

$$= \varepsilon_t + \rho \varepsilon_{t-1} + \rho^3 \varepsilon_{t-2} \ldots \ldots \rho^k \varepsilon_{t-k} \ldots \ldots \infty$$ \hspace{1cm} (1.3.3)

Similarly MA (1) process can be expressed as an infinite order AR process.

The MA ($\infty$) representation of AR (1) process indicates that if $\rho < 1$, than the impact of the shock will die out exponentially and the process will have a finite memory. On the other hand, if $\rho = 1$ the impact of a shock will never die out and the process will have infinite memory.
To find out the ARCH effect, ARCH test and ARCH LM test have been conducted. ARCH LM is a Lagrange multiplier (LM) test for *Autoregressive Conditional Heteroskedasticity* (ARCH) in the residuals. It tests the null hypothesis that there is no ARCH effect up to order q in the residuals. After we run the usual ARMA model (mean equation), we obtain the residuals.

To test for any ARCH effects the residuals are regressed upon their own values by using 1.3.4 Equation:

\[ \hat{\varepsilon}_t^2 = \hat{\alpha}_0 + \sum_{i=1}^{q} \hat{\alpha}_i \hat{\varepsilon}_{t-i}^2 \]  

(1.3.4)

The null hypothesis of no ARCH effects is rejected if LM > critical values.

At last GARCH test has been conducted to check the existing volatility of the Indian stock market.

**GARCH Model**

The most popular among the models of conditional volatility is the Generalized ARCH or the GARCH (r, m) model proposed by Bollerslev (1986). Theoretically, this model is equivalent to the infinitive order ARCH model (that is why it gets its name the generalized ARCH model). In GARCH (r, m) model the conditional volatility ( \( h_t \) ) is the function of past conditional volatility ( \( h_{t,i} \) ) and past squared innovations in the mean equation (\( \varepsilon_{t-m}^2 \)). The GARCH (1, 1) model is more popular in practice. This model for the stock returns can be presented as follows:

\[ R_t = c + \rho R_{t-1} + \varepsilon_t \]  

(1.3.5)

\[ \varepsilon_t \sim \omega + \alpha \varepsilon_{t-1}^2 + \beta h_{t-1} \]  

(1.3.6)
The unconditional (average) variance from this model is

\[ \sigma^2 = \frac{\omega}{1 - \alpha - \beta} \]  \hspace{1cm} (1.3.7)

\((\alpha + \beta)\) Measures the persistence of volatility. In practice, this usually observed very close to 1, which signifies that the volatility of asset returns is highly persistent. The effect of any shock in volatility dies out at a rate of \((1 - \alpha - \beta)\). If \((\alpha + \beta) \geq 1\) the effect of shock will never die out. The volatility will be defined only if \((\alpha + \beta) < 1\). Therefore, this condition is imposed while estimating the GARCH model. Since the variance cannot be negative, another parameter restriction which is required to be imposed while estimating a GARCH model is the non-negativity of \(\omega, \alpha,\) and \(\beta\) coefficients.

**Granger Causality (Block Exogenity) Test**

In VAR model, the causality can be evaluated by examining the joint significance of lagged coefficients of one variable in the equation of another variable. This kind of significance testing is called the block significance test and it can be performed with the usual F-test or Wald-test used for evaluation of parameter restrictions.

In the context of the bivariate case presented above the causality can be examined by testing the following hypothesis using Wald test.

Hypothesis: 1

: y does not cause x

: y causes x

Hypothesis: 2
Johansen’s Co-integration Test

Johansen’s test is considered to be more powerful among the various tests presently available. This test is available in most of the econometric packages and has virtually supplanted other tests of co-integration including Engle-Granger test. Johansen’s test involves quite complex mathematics; therefore we shall concentrate here on applied aspects of this test rather than the underlying theory.

Let us start with the following VAR model of non-stationary variables $x_i$

$$x_t = A_1x_{t-1} + A_2x_{t-2} + \ldots + A_p x_{t-p} + AD_t + \varepsilon_t \quad (1.3.8)$$

Where $D_t$ includes deterministic elements such as intercept, trend and seasonal dummy.

Research Methodology Used to Achieve the Objectives:

Objective 1-To find out the fluctuations in the stock prices in the Indian stock market during the period 1st April, 1997 to 31st March, 2014.

In order to estimate the fluctuations in the Indian Stock Market, GARCH (1, 1) model has been formulated as follows:

1. S&P CNX Nifty index and BSE Sensex Index have been used to proxy Indian stock
market.

2. The return series has been calculated from closing price series by taking logarithmic differences (as described above) and checked for stationarity using the ADF test.

3. After the series become stationary, using the Box Jenkins methodology, an appropriate mean equation has been formulated.

4. After a mean equation has been formulated as ARMA (1, 1) model, the residuals of the model have been tested for the presence autocorrelation and heteroskedasticity.

5. The ACF & PACF has checked of the residuals using Ljung box Q statistic. The ACF & PACF of the residual series showed insignificant correlation among the error term which justifies that the mean equation is efficient enough to capture the dynamics of the time series.

6. These residuals were then squared & Ljung Box Q statistic has been used again to test the ACF & PACF of the squared residuals for any correlation. The low p value revealed significant correlation confirming the presence of autocorrelation among the error terms.

7. Now error terms have been tested for any ARCH effects using ARCH LM test testing the null hypothesis of no heteroskedasticity. A low p value rejected the null hypothesis of no heteroskedasticity. This indicated the presence of heteroskedasticity in the error terms supporting the use of ARCH/GARCH class models to capture such characteristics.

8. The most suitable GARCH (1, q1 model specification with the help of Akaike and
Schwarz information criterion has to be fitted. AIC was least for GARCH (1,1) model. Hence, the variance equation has been formulated as GARCH (1, 1) model to capture the Indian Stock Market Volatility.

**Objective 2- To find out the relationship between financial derivatives, stock market & cash stock market.**

In order to estimate the relationship between financial derivatives market and cash market Johansen's co-integration test, Vector Error Correction Estimates and Granger Causality Tests has been used as follows:

1. S&P CNX Nifty index, BSE Sensex Index, Nifty Future Index and Sensex Future Index have been used to proxy Indian stock market.

2. Checked for stationarity of closing price data using ADF test, and then convert the time series data in stationary data by converting them into first difference.

3. In the next step, the Co-integration between the stationary variables has been tested by the Johansen’s Trace and Maximum Eigenvalue tests.

4. VECM or vector error correction model has been determined to find out the long run equilibrium relations and lead-lag relationship between derivatives contracts and cash market.

5. At last Granger Causality Tests has been applied to find out the cause of Granger Causality.

**Objective 3- To find out the impact of derivatives trading in reducing volatility in Indian stock market for pre and post derivatives period.**

Dummy variable has been included in the variance equation in the GARCH (1, 1)
model to analyze the impact of derivatives trading in reducing the volatility of Indian stock market. For pre derivatives period dummy variable is to be considered as ‘0’ and for a post derivatives period the dummy variable is used to equal ‘1’.

After that significant level of dummy variable has been checked and if the value of dummy variable is positive at a significant level, this indicates that an increase in the volatility of stock market after the introduction of derivatives or vice versa.

**Objective 4- To analyze whether the introduction of derivatives contracts has reduced the risk and inefficiency with the help of price discovery, in the Indian stock market or not.**

Derivatives were introduced to reduce the risk of price fluctuation and increase efficiency due to price discovery function by increasing the speed of information transmission. For which ARCH (recent news) and GARCH (old new) has been used, a superior ARCH term and a lesser GARCH term in post derivatives period would be the favored result to explain the role of derivatives on price discovery.

But it is not only derivatives trading which has been influenced the volatility of Stock market. There are various macroeconomic variables, which play a significant role for the volatility of the stock market. To control over the impact of other variables, the mean equation for Nifty Index and Sensex Index has been augmented with returns on a non-derivatives indexes, i.e. Nifty Junior Index and BSE 200 Index. The mean equation has been formulated as in Equations 1.3.9 and 1.3.10:

For NSE Nifty:

\[ R_t = c + R_{t-1} + R (\text{Nifty Junior}) + e_t \quad (1.3.9) \]
For BSE Sensex:

\[ R_t = c + R_{t-1} + R (\text{BSE 200}) + e_t \quad (1.3.10) \]

By counting the Nifty junior index and BSE 200 index in the mean equation, the impact of other macro-economic variables have been controlled. This process has been followed by GARCH (1, 1) model for pre and post derivatives period for nifty & sensex. The comparison of ARCH & GARCH terms for the two sub periods has been used to find the impact of derivatives alone on price discovery.

**Objective 5- To study the impact of financial derivatives on trading volume of the stock market, pre and post derivatives period.**

After the introduction of derivatives there has been a significant increase in the number of listed Co’s, number of trades, traded quantity, turnover and market capitalization of NSE & BSE capital market. To achieve this objective data has been collected for the same and trend analysis, and figure presentation has been used to analyze the impact of derivatives trading on the trading volume, turnover and market capitalization of the stock market.

**1.3.10 Scope of the Study**

The scope of Financial Derivatives is definitely a vast field of study. This system includes large areas of the financial instruments which help in minimizing the risk of fluctuating stock market.

The justification of the present study, therefore, is that it is likely to provide an insight into how the financial derivatives increases or decreases trading volume and volatility
of the stock market after their introduction. The significance of the study increases in view of the fact that, presently, it is very important to know whether derivatives contracts help in reducing the risk of price fluctuation and inefficiency of the spot market or not.

The research has based on the study of introduction of Financial Derivatives in India, for which NSE Indexes and BSE Index have been selected. Indexes have been considered for the study as they represent the benchmark of the stock market. Indexes on which derivatives contract available and on which derivatives contracts are not available has been considered for the study.

This study will be beneficial for the investors, industrialists, policy makers, government, research scholars, and academicians as detailed analysis of the various important issues has been done. They would be able to judge the impact of the introduction of derivatives trading on spot market growth and volatility.

The derivatives trading plays an important role in the development of a stock market and for the growth of an economy. The scope of the study is not only limited to the growth of the stock market, but it also helps in minimizing the risk of investing in the stock market. It helps in analyzing the volatility of the stock market, which is an important factor for running or dealing with the stock market.

1.3.11 Limitations of the Study

Though various practical aspects have been covered in the study, but still there are many areas which could not be covered due to various reasons such as non-availability of data. However, efforts were made to complete the research work, maintain certain standards, so the result of the research might prove useful. Still the
researcher suffers dissatisfactions on the account of the following limitations:

- Only secondary data have been used for the study.
- The study can be further extended in many ways. There is further scope of using options contracts in future studies. Only futures contracts have been used to infer the impact of financial derivatives on the growth of the stock market in this research.
- This study is based only on the daily closing price of stock market indexes. Daily opening price with daily closing prices can give better results.
- This study, based only on stock market indexes, further study can be extended on individual companies stocks as well.
- The focus of this study was only on the impact of derivatives trading on the growth of Indian stock market. But the scope of the study can be extended to include other stock markets as well (outside India).
- This study has based only on asymmetries GARCH (1, 1) model which states that volatility acts equally in response to good news & bad news, which is not true. In reality the impact of bad news is more on the volatility as compared to good news. This aspect was out of the scope of this study. So, upcoming researchers can study the asymmetries in volatility using asymmetric GARCH family models like EGARCH, TARCH, and GJR-GARCH etc.