

Risk Management of Derivatives in BSE

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Abstract

Risk management is one of the most important functions of financial manager today not only in financing, banking and insurance companies but also corporate world at large. In today's competitive environment a company/organization which is very attentive towards risk management becomes able to survive in the market. There are many methods and tools which can be used to cope up with the risk management. This paper is focused on derivative market at Bombay Stock Exchange.

Key Words: *Derivative, Risk, Options, Futures, Swap*

1.1 INTRODUCTION

A country is termed prosperous if its economy is doing well. There are a large number of influencing factors which determines the prosperity of the economy, like Per-capita income of people, GDP, Imports & Exports, Forex Reserves, etc. In short it can be told that Financial Market is an important contributor to the economy. In this financial market, capital market plays a significant role. The capital market always replicates the power and ability of the investors and their faith in the market. Earlier the capital market was shy. But market deregulations, growth in global trade and technological development have revolutionized the financial market place. A by-product of this revolution is increased market volatility, which has led to a corresponding increase in risk management products. This demand is reflected in the growth of financial derivatives and derivatives market. But, question arises, are these derivatives risk free? As world's one of the greatest investor once said, "Risk is a part of God's game, alike for man and nation" Thus it can be said that these risk management instruments are not risk free. This indicates the essence of risk management of derivatives.

1.2 RATIONALE

In this world of uncertainty risk management has an immense importance for corporate. Financial derivatives which are introduced with a prime objective of hedging risk, when used for speculative purposes resulted with increased risk. Thus, risk management of financial derivatives is a major area of concern. In case of an exchange, as exchange plays the role of counterparty for both buyer and seller, it is more exposed to counter party risk and all other risk associated with the financial derivatives. This leads to the essence of risk management of derivatives in exchanges. The various tools used by the exchanges for risk management includes margins,

position limits, and various rules and regulations laid down by the regulatory authority for derivative trading. All these process of risk management is done by wholly computerized process and with specific software. The inclusion of latest technology has made the risk management process more reliable. The risk management of derivatives not only secures Stock Exchanges, but also creates confidence in the minds of the investors. This enhances more investments in the derivatives market, which leads to business prosperity. Thus the most of the exchanges have their risk management procedure for risk management of derivatives.

1.3. OBJECTIVES

The following are the objectives of this study:-

1. To study the risk associated with derivative market and derivative trading.
2. To study the risk management tools used in Bombay Stock Exchange Limited for mitigating these risks.
3. To study the software used for margining system.
4. To do comparative analysis of the risk management process of BSE with that of NSE
5. To give suggestion and recommendations for improvement in risk management process of derivatives in BSE.

1.4 RESEARCH METHODOLOGY

1.4.1 SCOPE:

The scope of this project is confined to the study of risk management of derivatives in BSE, about the margining system. The software used for this purpose, details about the process and tools of risk management and various problems faced by them.

1.4.2 SOURCES OF DATA:

The data has been collected from both primary and secondary sources. The primary data are collected by interviewing brokers and some officials of BSE. Some data are collected from personnel of the various departments in BSE, like Product and Strategy Department, Bank of India Shareholding Limited. (Clearing house of BSE). The secondary data consists of books and journals provided by BSE, SEBI circulars and Guidelines. This also contains the data of derivative segment of NSE, which was collected from the website of NSE.

1.4.3 TOOLS AND TECHNIQUES

The data so collected were classified and tabulated for analysis and interpretation. The tools and techniques used in this project are all computerized programming. The data are programmed in software like visual basic, MATLAB, etc, to find the implied volatility and price scan range.

Finally all these implied volatility and price scan range are processed in PC – SPAN (software for calculation of margin) to find out the margin requirement of different participants of the derivative market. The turnover of derivatives segment of BSE and NSE is drawn in graphs to compare these two markets.

1.4.4 LIMITATION

Some of the limitations that are faced during the project are;

1. The information collected is limited by the authenticity and accuracy of information provided by the interviewees. The data collected from the websites are limited. Certain information was not disclosed to maintain the secrecy of the exchange.
2. The time predefined for this project was 8 weeks, which is very short for covering such a big project.

2.1 COMPANY PROFILE

Bombay Stock Exchange Limited is the oldest stock exchange of Asia and one of the oldest in World with a rich heritage. As the first stock exchange in India, the Bombay Stock Exchange Limited is considered to have played a very important role in the development of country's capital market. The BSE is the largest stock exchange of 24 exchanges in India, with over 6000 listed companies. It is also the fifth largest exchange in the world with a market capitalization of \$466 billion. The Bombay Stock Exchange Limited uses BSE SENSEX, an index of 30 large, developed BSE stocks. This index gives a measure of overall performance of BSE and is tracked worldwide.

In addition to individual stocks the Bombay Stock Exchange Limited also a market for derivatives, which was first introduced in India. Listed derivatives on the exchange include stock futures and options, Index futures and options and weekly options. The Bombay Stock exchange is also actively involved with the development of retail debt market. The Exchange has a nationwide reach with its presence in 417 cities and towns of India. The systems and processes of the exchange are designed to safeguard market integrity and enhance transparency in the operations. The Exchange provides an efficient and transparent market for trading in equity, debt and derivative instruments. The BSE provides online trading with the BSE's Online trading System (BOLT), which is a proprietary system of the exchange and is BS 7799-2-2002 certified. The Surveillance and Clearing Settlement function of the Exchange are ISO 9001:2000 certified.

3.1 DERIVATIVES

Risk is a characteristic feature of all commodity and capital markets. Over time, variations in the prices of agricultural and non-agricultural commodities occur as a result of interaction of demand

and supply forces. The last two decades have witnessed a many-fold increase in the volume of international trade and business due to the ever growing wave of globalization and liberalization sweeping across the world. As a result, financial markets have experienced rapid variations in interest and exchange rates, stock market prices thus exposing the corporate world to a state of growing financial risk.

Increased financial risk causes losses to an otherwise profitable organization. This underlines the importance of risk management to hedge against uncertainty. Derivatives provide an effective solution to the problem of risk caused by uncertainty and volatility in underlying asset. Derivatives are risk management tools that help an organization to effectively transfer risk. Derivatives are instruments which have no independent value. Their value depends upon the underlying asset. The underlying asset may be financial or non-financial. The term “derivative” can be defined as a financial contract whose value is derived from the value of an underlying asset. Section 2(ac) of Securities Contract (Regulation) Act, (SCRA), 1956 defines derivatives as,

- a) “a security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or a contract for difference or any other form of securities;
- b) “a contract which derives its value from the prices, or index of prices, of underlying securities”.

The underlying asset may be a stock, bond, a foreign currency, commodity or even another derivative security. Derivative securities can be used by individuals, corporations, and financial institutions to hedge an exposure to risk.

3.2 DERIVATIVE PRODUCTS

Derivative contracts have several variants. The most common variants are forwards, futures, options and swaps. Various derivatives contracts are described below,

3.2.1 FORWARDS

A forward contract is a customized contract between two entities, where settlement takes place on a specific date in the future at today’s pre-agreed price. A forward contract is an agreement between two parties to buy or sell an asset at a specific point of time in future and the price which is paid /received by the parties is decided at the time of entering the contract.

3.2.2 FUTURE

A future contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Future contracts are standardized forward contracts. Future contracts are traded in exchanges and exchange sets the standardized terms in term of quantity, quality, price quotation, date and delivery date (in case of commodities).

3.2.3 OPTIONS

An option contract, as the name suggests, is in some sense an optional contract. An option is the right, but not the obligation, to buy or sell something at a stated date at a stated price. Options are of two types;

- **CALL OPTIONS:** A call option gives the buyer of the option the right, but not the obligation to buy a given quantity of the underlying asset, at a given price and on or before a given date.
- **PUT OPTION:** Put options give the buyer the right, but the obligation to sell a given quantity of underlying asset at a given price on before a given date.

Options can also be European options and American options. This classification is based on the exercise of the options. European options can be exercised at the maturity date of the option. On the other hand, American options can be exercised at any time up to and including the maturity date.

3.2.4 WARRANTS

Options generally have lives of up-to one year. Long dated options are called as warrants and generally traded over-the-counter.

3.2.5 LEAPS

Long-Term-Equity-Anticipated Securities are options having a maturity of more than three years or in other words options having a maturity of more than three years are termed as LEAPS.

3.2.6 BASKETS

Basket options are options on portfolio of underlying assets. Equity index options are a form of basket options

3.2.7 SWAPS

A swap means a barter or exchange. Thus, a swap is an agreement between two parties to exchange stream of cash flows over a period of time in future. The two commonly used swaps are,

- i) **INTEREST RATE SWAPS:** Swaps which entail swapping only the interest related cash flows between the parties in the same currency.
- ii) **CURRENCY SWAPS:** These entail swapping both principal and interest between two parities, with cash flows in one direction being in different currency than those in the opposite

direction.

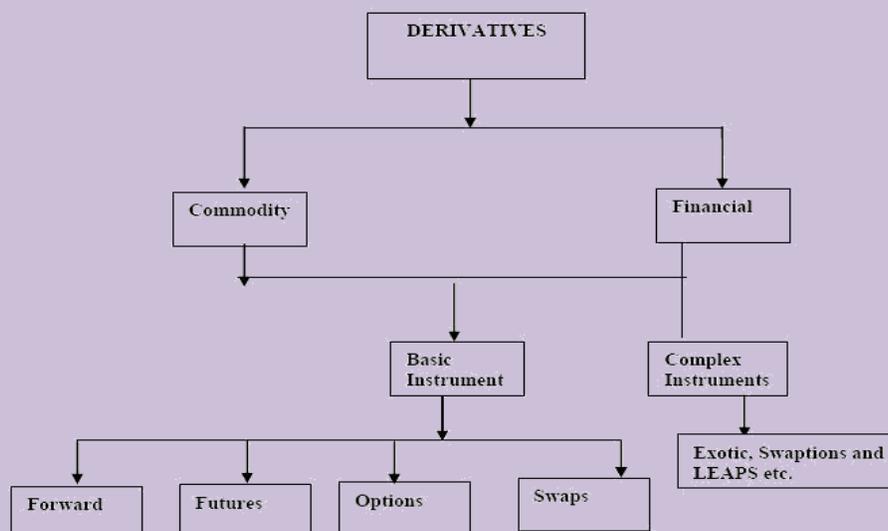
3.3 PARTICIPANTS IN DERIVATIVE MARKET

The reason for which derivatives are so attractive is that they have attracted different types of investors and have a great deal of liquidity. When an investor wants to take one side of a contract, there is usually no problem in finding someone that is prepared to take the other side. Three broad kinds of participants can be found in derivatives market, namely, hedgers, speculators and arbitrageurs.

3.4 CLASSIFICATION OF DERIVATIVES

Broadly derivatives can be classified into two categories, commodity derivatives and financial derivatives. In case of commodity derivatives, the underlying asset can be commodities like wheat, gold, silver etc; whereas in case of financial derivatives the underlying assets are stocks, currencies, bonds and other interest bearing securities etc. A figure below shows the classification of derivatives,

Figure-1: Classification of Derivatives



Basing on the type of market, derivative market is of two types, exchange-traded derivatives market and over-the-counter derivative market. In the exchange-traded derivatives, the derivatives which are standardized in nature are traded. The trading of the derivatives is well regulated by the exchanges. The over-the-counter market is an important derivative market and has larger volume of trade than the exchange-traded market. It is a telephone- and computer-linked network of dealers. Traders are done over the phone and are usually between two financial institutions or between a financial institution and one of its clients. Telephone conversations in the OTC market are usually taped. If there is a dispute about what was agreed, the tapes are replayed to resolve the issue. A key advantage of over-the-counter market is that all the products

are customized. Market participants are free to negotiate any mutually alternative deal. A disadvantage is that there is usually credit risk in an over-the-counter trade. The over-the-counter market is not regulated by any regulatory body and hence poses a huge counterparty risk.

4.1 NSE'S DERIVATIVE SEGMENT

The National Stock Exchange accounts almost 99% of the Indian derivatives market in terms of turnover, volume etc. Its equity derivatives market is most boosted one and in turnover it is a major stock exchange. All products in equity derivative segment i.e. Index Futures and Options and Stock Futures and Options have marked a tremendous growth over the last decade. The graph below shows the average yearly turnover in each equity derivative products and average daily turnover of derivative segment of NSE.

4.2 RISK MANAGEMENT PROCESS

Market integration, liberalization, globalization and technical advancement has resulted with an increased competition in the market and the corporate are hence exposed to risk. Thus a proper and unbiased assessment of risk is a prerequisite for a sound management process. Moreover, with the advancement of communication system and technology, the markets over the world are getting interconnected. Thus making an effective risk management system is the need of the hour. Risk management is the process in which risk is minimized with the application of certain tools. The risk management process essentially comprises of certain steps, such as, identification, assessment, prioritization, followed by coordinated and economical application of resources to minimize, monitor and control it. These steps are described below,

4.2.1 IDENTIFICATION

The risk management process starts with the identification of the factors which are exposed to risk. It is always of primary concerns to identify the factors which are more vulnerable and weak points in the system.

4.2.2 ASSESSMENT

After identifying the risk exposure points, it then to be assessed, i.e. to what extent it is susceptible to that particular risk that has to be measured. Assessment of risk helps in knowing the extent of vulnerability of a particular factor which is risk exposed.

4.2.3 PRIORITIZATION

The next step of risk management process is the prioritization of factors which are more vulnerable. The assessment of risk results in identifying the factors which are more risk exposed and then these factors are prioritized from risk management point of view.

4.2.4 APPLICATION OF RESOURCES TO MINIMIZE RISK

After identifying the most vulnerable factor, the management team applies economic resources to minimizing the risk. This is the most important stage of risk management as any wrong step can result a more susceptible situation.

4.2.4 MONITOR

The final step of risk management is monitoring the risk management process. Simply applying the resources to minimize the risk is not the last step of risk management, as it is needed to analyze the success of the risk management process. For this reason the entire process is monitored and if anything goes wrong, it is rectified.

4.3 RISK ASSOCIATED WITH DERIVATIVES TRADING

The continuing discussion of risks and its management in derivative markets illustrates that there is little agreement on what the risks are and how to control it. One source of confusion is the sheer profusion of names describing the risks arising from derivatives. Besides the “price risk” of losses on derivatives from change in underlying asset values, there is “default risk”, “settlement risk”, and “operational risk”. Last, but certainly not the least, is the specter of “systemic risk” that has captured so much congressional and regulatory attention. All these risks associated with derivatives market are described below,

1 PRICE RISK

2 DEFAULT RISK

3 SYSTEMATIC RISK

5.1 MAJOR FINDINGS

On course of study of the risk management process of derivatives in BSE, the following observations are pointed out. Since the study is focused on equity derivatives only, the findings are concerned only about equity derivatives.

5.1.1 SPAN MARGINING SYSTEM

The SPAN (Standard Portfolio Analysis of Risk) is a portfolio based margining approach for calculation of margin requirement of derivatives. This is an integrated system of margining that reduces margining requirement on derivatives than any other system of margining. The SPAN margining system in BSE is an efficient system of margin calculation. The procedure in which the SPAN is calculated in BSE can be compared to any major exchange of the world and covers almost 99% of risk exposure of the exchange.

5.1.2 PC SPAN®

- o The software used by BSE for margin calculation is PC SPAN®. This software is developed by the Chicago Mercantile Exchange.
- o This software provides adequate information to its user.
- o It is user friendly. It provides the margin on a real time basis. As soon as the data is input to the system, it takes 5 to 7 minutes to calculate the margin requirement.

- o This is efficient software for calculation of SPAN margin and used by almost all stock exchanges of the world.

5.1.3 RISK MANAGEMENT

- o The risk management process for derivatives used by BSE is efficient and effective system.
- o It covers about 99% Vary at any time.
- o This also helps in protecting the market and helps in increasing the market integration.
- o On comparing the risk management process of BSE with that of NSE, it is found that it is almost same. But NSE has an added advantage for the information related services that it provides.
- o BSE provides its data on a graphical format, whereas NSE provides the same on a tabular format, which is easy to understand.

6.1 SUGGESTIONS

Based on the interaction with different broking firms, it is observed that BSE is comparable to NSE in technical terms. However, BSE lacks in providing better services and information to the investors, which leads to poor market position in derivatives.

- o During our interaction with the brokers we come to know that, the services provided by NSE are more reliable than that of BSE. So BSE should try to provide integrated services to its members to improve its derivatives segment.
- o Regarding the risk management procedure, as there is no difference between NSE and BSE, it can be said that, BSE should continue with this process.
- o BSE should improve its monitoring system for better risk management of the exchange.
- o Another major cause for BSE's lost market share is the failure in providing data. BSE can focus on this part in particular. It should also provide data in tabular format rather than graphical format, so that it can be easily understood by the investors.
- o To improve its derivatives segment, BSE has to constantly innovate in terms of services, products and technology, otherwise it cannot compete with NSE.
- o BSE charges more margins for better risk management, which in terms harms its market position. Thus, a reasonable margin should be charged on the members for development of derivatives market and better risk management.

6.2 CONCLUSION

BSE with its distinctive feature has a long, colorful and chequered history. It enjoys a pre-eminent position by having a permanent recognition from the Securities Contract (Regulation) Act, 1956. It can be considered as an essential concomitant of the Indian economy. It is performing all the important functions of an ideal stock exchange by providing a ready and

continuous market with negotiability and safety to investment of investors; redressing their grievance, minimizing risk, and providing a forum to ensure liquidity and attracting capital from the investors, etc.

Despite the efficiency and transparency, BSE still lags behind NSE and faces a stiff competition from it. Particularly, NSE holds about 99% of the derivatives market of India, whereas BSE's position is negligible. This can be attributed to the following reasons. Firstly, lack of detail and timely information of derivative segment and its risk management is one of the main reasons for the falling market share of the BSE's derivatives segment. Secondly, the data files for margin calculation are not precious as NSE has. This is also one of the key obstacles in the development of derivative segment of BSE. When BSE losses NSE gains. Thirdly, the lack of monitoring system for risk management is another problem with BSE. NSE has PRISM as the monitoring system which enables it for better risk management of derivatives.

Coming to risk management of derivatives in BSE, BSE has an efficient and effective risk management system, which can be compared with any of the exchange of the world. The SPAN margining system followed by BSE for margin calculation is one of the most efficient systems of margining. Along with this the regulatory requirement of BSE makes the risk management system stronger and effective.

Though the margin with which BSE lags behind NSE is too much for derivatives market, but a committed effort can help BSE to gain supremacy in this segment. This can be done by making itself more informative, monitoring the risk management process and taking some aggressive steps for the improvement of the derivatives segment. All it needs to do is to take quick and timely decisions for the improvement of the derivatives segment.

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