INTRODUCTION OF THE TOPIC

This chapter aims to give an understanding and perspective of Modern Portfolio Theory. The background gives a historical view within the topic. Further, author presents the theoretical framework of portfolio theories which is back born of this thesis.

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1.1 INTRODUCTION

Needs of human being not limited, every day list of desire is becomes longer and longer. So it becomes necessary for all to find different investment alternatives to fulfill desire of their family. There are number of investment alternatives available for the investors, just they need to find a option match with his or her risk tolerance level.

As we all know, investment in financial assets such as the stocks of companies listed in organized stock markets is one of the most important issues of finance. Moreover the concept of the risk related to the investment on stock markets has widely permeated the financial community so that everyone knows the necessity of analyzing risk in investment analysis and finding ways and methods of dealing with it.

So that we need to know basics of modern portfolio theory which best describes risk and return relationship.

1.2 THEORETICAL FRAMEWORK OF MPT

The Modern Portfolio Theory (MPT) was developed by Harry Markowitz. He assumed that most investors want to be cautious when investing and that they want to take the smallest possible risk in order to obtain the highest possible return, optimizing return to the risk ratio. MPT advocates that it is not enough just to look at the expected risk and return of one particular stock. By investing in number of stock, an investor can obtain the benefits of diversification, a reduction in the volatility or risk of the whole portfolio (Markowitz, 1959)

One of the most important and influential economic theories dealing with finance and investment, MPT was developed by Harry Markowitz and published under the title "Portfolio Selection" in the 1952 Journal of Finance. MPT says that it is not enough to look at the expected risk and return of one particular stock. By investing in more than one stock, an investor can reap the benefits of diversification chief among them, a
reduction in the riskiness of the portfolio. MPT quantifies the benefits of diversification, also known as not putting all of your eggs in one basket.

MPT is the philosophical opposite of traditional asset picking. It is the creation of economists, who try to understand the market as a whole, rather than looking for what that makes each investment opportunity unique.

A little over forty years ago, a University of Chicago graduate student in economics, while in search of a dissertation topic, ran into a stockbroker who suggested that he study the stock market. Harry Markowitz took that advice and developed a theory that became a foundation of financial economics and revolutionized investment practice. His work earned him a share of 1990 Nobel Prize in Economics. A basic premise of economics is that, due to the scarcity of resources, all economic decisions are made in the face of trade-offs. Markowitz identified the trade-off facing the investor: risk versus expected return. The investment decision is not merely which securities to own, but how to divide the investor's wealth amongst securities. This is the problem of “Portfolio Selection;” hence the title of Markowitz’s seminal article published in the March 1952 issue of the Journal of Finance. In that article and subsequent works, Markowitz extends the techniques of linear programming to develop the critical line algorithm.

The critical line algorithm identifies all feasible portfolios that minimize risk (as measured by variance or standard deviation) for a given level of expected return and maximize expected return for a given level of risk. When graphed in standard deviation versus expected return space, these portfolios form the efficient frontier. The efficient frontier represents the trade-off between risk and expected return faced by an investor when forming his portfolio. Most of the efficient frontier represents well diversified portfolios. This is because diversification is a powerful means of achieving risk reduction.

Markowitz developed mean-variance analysis in the context of selecting a portfolio of common stocks. Over the last two decades, mean-variance analysis has been increasingly applied to asset allocation. Asset allocation is the selection of a portfolio of investments where each component is an asset class rather than an individual security. In many
respects, asset allocation is a more suitable application of mean-variance analysis than is stock portfolio selection. Mean-variance analysis requires not only knowledge of the expected return and standard deviation on each asset, but also the correlation of returns for each and every pair of assets. Whereas a stock portfolio selection problem might involve hundreds of stocks (and hence thousands of correlations), an asset allocation problem typically involves a handful of asset classes (for example stocks, bonds, cash, real estate, and gold). Furthermore, the opportunity to reduce total portfolio risk comes from the lack of correlation across assets. Since stocks generally move together, the benefits of diversification within a stock portfolio are limited. In contrast, the correlation across asset classes is usually low and in some cases negative. Hence, mean-variance is a powerful tool in asset allocation for uncovering large risk reduction opportunities through diversification.

Until the 1970’s a bank savings account as a risk-free asset combined with a stock portfolio would be a great investment and the strategy that financial management advisors would recommend.

The difference from now and then is the access to a broader variety of asset classes and more available information. From the information perspective it is also easier to combine these different assets into complex portfolio strategies. One has to understand that each asset must be judged on its contribution when it comes to risk and return, but the combination of a couple of stocks can provide a different risk and return for the portfolio in overall. (Bodie, Kane & Marcus, 2004).

If the investor were to create the perfect investment, attributes to include would be high return coupled with no risk. The reality is as Elton and Gruber (1997) states, this kind of investment is almost impossible to find. Not amazingly, individuals spend a lot of time developing methods and theories that come close to the "perfect investment". But none is as popular, or as powerful, as the MPT.

It is important that industry professionals understand how to use that available theory to design portfolios that best align with a client’s wishes and risk tolerances. It is also important that financial advisors understand what drives portfolio risk and return and how these forces can be manipulated for the maximum benefit. The MPT provides a solid
theoretical foundation for building portfolios that are robust and closely aligned with an investors stated risk and return preferences.

MPT holds that diversification of assets may increase returns at given risk levels or at least provide the same results at a reduced risk level. Applications of the theory use volatility of returns implied by market price fluctuations as the composite of risks. It is most certainly the dominant theory in portfolio strategies. It is a theory on how risk-averse investors can construct portfolios in order to optimize market risk for expected returns, emphasizing that risk is an inherent part of higher reward.

The concept for investors when combining a less-risky portfolio is diversification according to Bodie et al. (2004). The adage “don’t put all your eggs in the same basket” is easy to say but more difficult to actually perform in reality. The importance for diversification is of great value, and as a proof of this Harry Markowitz won the Nobel Prize in economics for his research within this field (Markowitz, 1991).

When Markowitz and Sharpe et al needed a definition of risk, they chose to define risk as volatility, the greater the volatility of the portfolio, measured either in terms of standard deviation or beta, the greater the risk.

How did these researchers know that volatility was a good measure of risk? They didn't, nor did they do any research to find out. The observation was made that the share market, which is generally thought to be more risky than cash investments, had the highest volatility. The principle was adopted generally without further evidence that volatility was a good way to measure risk.

Economists find this definition of risk compelling, because it is based on an assumption that makes perfect logical sense, that investors should be risk adverse, and that in today's well informed, sophisticated markets everyone acts perfectly rationally and takes no risk that is not justified by a bounty of evidence in support.

But the question is still there, why this measure of risk rather than securities analysis as espoused by Graham and Dodd, examining the virtues of each company by a good look at
their financial strength, earnings, debt, sales success or many other measures that management use?

One doesn't have to get too far in examining the theory to find big gaps in the logic. Investors are very concerned by downside volatility, but how many object when their portfolio moves up? Volatility is a measure that regards upside movement as equally bad as movement to the downside. What about inflation and the terrible toll it extracts on non-growth assets? Finally, speculative stocks which are extremely volatile do not fit into this mold as they certainly do not give superior returns, as a diversified group or otherwise. Right from the start this definition of risk seemed unrealistic.

The single index model (Sharpe, 1964) is implemented when one tries to estimate a correlation matrix, conduct efficient market tests or equilibrium tests (Elton et al., 2003). This is a simplified approach to portfolio formulation. Sharpe’s single model is discussed by a direct adaptation from Elton et al., (2003).

For most investors, the risk they take when they buy a stock is that the return will be lower than expected. In other words, it is the deviation from the average return. Each stock has its own standard deviation from the mean, which MPT calls "risk".

The risk in a portfolio of diverse individual stocks will be less than the risk inherent in holding any one of the individual stocks (provided the risks of the various stocks are not directly related). Consider a portfolio that holds two risky stocks: one that pays off when it rains and another that pays off when it doesn't rain. A portfolio that contains both assets will always pay off, regardless of whether it rains or shines. Adding one risky asset to another can reduce the overall risk of an all-weather portfolio.

The objective of every investor is to maximize his returns and minimize his risk. Diversification is the method adopted to reduce the risk. It essentially results in the construction of portfolios. The proper goal of construction of portfolios would be to generate a portfolio that provides the highest return and lowest risk. Such a portfolio would be an optimal portfolio. The process of finding the optimal portfolio is described as portfolio selection.
The conceptual framework and analytical tools for determining the optimal portfolio in disciplined and objective manner have been provided by Harry Markowitz in his pioneering work on portfolio analysis described in his 1952 “JOURNAL OF FINANCE” article and subsequent book in 1959. His method of portfolio selection is come to be known as Markowitz model. In fact, Markowitz work marked the beginning of what is today the Modern Portfolio Theory.

1.2.1 Feasible set of Portfolios

With limited number of securities an investor can create a very large number of portfolios by combining these securities in different proportions. These constitute the feasible set of portfolios in which the investor can possibly invest. This is also known as the portfolio opportunity set.

Each portfolio in the opportunity set is characterized by an expected return and a measure of risk, viz., and variance of the returns. Not every portfolio in the portfolio opportunity set is of interest to an investor. In an opportunity set some portfolios will be dominant over the others. A portfolio will dominate the other if it has either a lower variance and the same expected return as the other, or a higher return and the same variance as the other. Portfolios that are dominated by the others are called as insufficient portfolios. An investor would not be interested in all the portfolios in the opportunity set. He would be interested only in the efficient portfolios.

Assumptions underlying Markowitz Theory

Portfolio theory in the shape of Markowitz Theory makes the following assumptions concerning the investment market and investors behavior within those markets. We summaries these assumptions below:¹

1. Investors seek to maximize the expected return of total wealth.

2. All investors have the same expected single period investment horizon.

¹ Markowitz H. (1952) “portfolio Selection”, The journal of finance, Volume 7, No 1 pp 77- 91
3. All investors are risk-adverse, that is they will only accept greater risk if they are compensated with a higher expected return.

4. Investors base their investment decisions on the expected return and risk (i.e. the standard deviation of assets historical returns).

5. All markets are perfectly efficient (e.g. no taxes and no transaction cost).

1.2.2 Risk and expected return

MPT assumes that investors are risk averse, meaning that given two portfolios that offer the same expected return, investors will prefer the less risky one. Thus, an investor will take on increased risk only if compensated by higher expected returns. Conversely, an investor who wants higher expected returns must accept more risk. The exact trade-off will be the same for all investors, but different investors will evaluate the trade-off differently based on individual risk aversion characteristics.

In a view advocated by Damodaran, risk includes not only "downside risk" but also "upside risk" (returns that exceed expectations). Some regard a calculation of the standard deviation of the historical returns or average returns of a specific investment as providing some historical measure of risk. Financial risk may be market-dependent, determined by numerous market factors, or operational, resulting from fraudulent behaviour.

In finance, diversification means reducing risk by investing in a variety of assets. If the asset values do not move up and down in perfect synchrony, a diversified portfolio will have less risk than the weighted average risk of its constituent assets, and often less risk than the least risky of its constituents. Therefore, any risk-averse investor will diversify to at least some extent, with more risk-averse investors diversifying more completely than less risk-averse investors.

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3 Sullivan, arthur; Steven M. Sheffrin (2009). Economics: Principles in action
Diversification is one of two general techniques for reducing investment risk. The other is hedging. Diversification relies on the lack of a tight positive relationship among the assets' returns, and works even when correlations are near zero or somewhat positive. Hedging relies on negative correlation among assets, or shorting assets with positive correlation.

In general:

- Expected return:

  \[ E(R_p) = \sum W_i(R_i) \]

  where \( R_p \) is the return on the portfolio, \( R_i \) is the return on asset \( i \) and \( w_i \) is the weighting of component asset \( i \) (that is, the share of asset \( i \) in the portfolio).

- Portfolio return variance:

  \[
  \sigma_p^2 = \sum w_i^2 \sigma_i^2 + \sum \sum w_i w_j \sigma_i \sigma_j \rho_{ij}
  \]

  Where \( \rho_{ij} \) is the correlation coefficient between the returns on assets \( i \) and \( j \). Alternatively the expression can be written as:

  \[ \rho_{ij} = 1 \text{ for } i=j. \]

  Portfolio return volatility = Standard Deviation

**Portfolio return** =

\[ w_A E(R_A) + w_B E(R_B) + w_C E(R_C) \]

**1.2.3 Efficient set of Portfolios**

To understand the concept of efficient portfolios, let us consider various combinations of securities and designate them as portfolios 1 to \( n \) the expected returns of
these portfolios may be worked out. The risk of these portfolios may be estimated by measuring the variance of the portfolio returns.

The concept of efficient sets can be illustrated with the help of a graph. The expected returns and the variance can be depicted on a XY graph, measuring the expected returns on the Y-axis and the variance on the X-axis. The figure below depicts such a graph.

As a single point in the risk-return space would represent each possible portfolio in the opportunity set or the feasible set of portfolio enclosed within the two axes of the graph. The shaded area in the graph represents the set of all possible portfolios that can be constructed from a given set of securities. This opportunity set of portfolios takes a concave shape because it consists of portfolios containing securities that are less than perfectly correlated with each other.

Figure : 1 opportunity set of portfolios
Let us closely examine the diagram above. Consider portfolios F and E. Both the portfolios have the same expected return but portfolio E has less risk. Hence portfolio E would be preferred to portfolio F. Now consider portfolios C and E. Both have the same risk, but portfolio E offers more return for the same risk. Hence portfolio E would be preferred to portfolio C. Thus for any point in the risk-return space, an investor would like to move as far as possible in the direction of increasing returns and also as far as possible in the direction of decreasing risk. Effectively, he would be moving towards the left in search of decreasing risk and upwards in search of increasing returns.

Let us consider portfolios C and A. Portfolio C would be preferred to portfolio A because it offers less risk for the same level of return. In the opportunity set of portfolios represented in the diagram, portfolio C has the lowest risk compared to all other portfolios. Here portfolio C in this diagram represents the Global Minimum Variance Portfolio.

Comparing portfolios A and B, we find that portfolio B is preferable to portfolio A because it offers higher return for the same level of risk. In this diagram, point B represents the portfolio with the highest expected return among all the portfolios in the feasible set.

Thus we find that portfolios lying in the North West boundary of the shaded area are more efficient than all the portfolios in the interior of the shaded area. This boundary of the shaded area is called the Efficient Frontier because it contains all the efficient portfolios in the opportunity set. The set of portfolios lying between the global minimum variance portfolio and the maximum return portfolio on the efficient frontier represents the efficient set of portfolios. The efficient frontier is shown separately in Fig.
The efficient frontier is a concave curve in the risk-return space that extends from the minimum variance portfolio to the maximum return portfolio.

1.2.4 Selection of Optimal Portfolio

The portfolio selection problem is really the process of delineating the efficient portfolios and then selecting the best portfolio from the set.

Rational investors will obviously prefer to invest in the efficient portfolios. The particular portfolio that an individual investor will select from the efficient frontier will depend on that investor's degree of aversion to risk. A highly risk averse investor will hold a portfolio on the lower left hand segment of the efficient frontier, while an investor who is not too risk averse will hold one on the upper portion of the efficient frontier.

The selection of the optimal portfolio thus depends on the investor's risk aversion, or conversely on his risk tolerance. This can be graphically represented through a series of risk return utility curves or indifference curves. The indifference curves of an investor are shown in Fig. Each curve represents different combinations of risk and return all of
which are equally satisfactory to the concerned investor. The investor is indifferent between the successive points in the curve. Each successive curve moving upwards to the left represents a higher level of satisfaction or utility. The investor's goal would be to maximize his utility by moving up to the higher utility curve. The optimal portfolio for an investor would be the one at the point of tangency between the efficient frontier and his risk-return utility or indifference curve.

![Figure no: 3 Indifference curve](image)

This is shown in Fig. The point O' represents the optimal portfolio. Markowitz used the technique of quadratic programming to identify the efficient portfolios. Using the expected return and risk of each security under consideration and the covariance estimates for each pair of securities, he calculated risk and return for all possible portfolios. Then, for any specific value of expected portfolio return, he determined the least risk portfolio using quadratic programming. With another value of expected portfolio return, a similar procedure again gives the minimum risk portfolio. The process is repeated with different values of expected return, the resulting minimum risk portfolios constitute the set of efficient portfolio.
1.2.5 Correlation

In the world of finance, Correlations are a statistical measure of how two securities move in relation to each other. Correlations are used in advanced portfolio management.

“Correlation is computed into what is known as the correlation coefficient, which ranges between -1 and +1. Perfect positive correlation (a correlation co-efficient of +1) implies that as one security moves, either up or down, the other security will move in lockstep, in the same direction. Alternatively, perfect negative correlation means that if one security moves in either direction the security that is perfectly negatively correlated will move by an equal amount in the opposite direction. If the correlation is 0, the movements of the securities are said to have no correlation; they are completely random.”

**Perfect Positive Correlation:** In a positive correlation, as the values of one of the variables increase, the values of the second variable also increase. Likewise, as the value of one of the variables decreases, the value of the other variable also decreases: The example of income and education is a: positive correlation. People with higher incomes also tend -to have more years of education.. People with fewer years of education tend to have lower income.

Thus, when the security returns are perfectly positively correlated, diversification provides only risk averaging and no risk reduction because -the portfolio risk cannot be reduced below the individual security risk. Hence, diversification is not a productive activity' when security returns are perfectly positively correlated.

**Perfect Negative Correlation:** In a negative correlation, as the values of one of the variables increase, the values of the second variable decrease. Likewise, as the value of one of the variables decreases, the value of the other variable increases.

This is still a correlation. It is like an "inverse" correlation The word "negative" is a label that shows the direction of the correlation.

**Zero Correlation:** A score of 0 means fifth there is no correlation (the weakest measure).
The portfolio standard deviation is less than the standard deviations of individual securities in the portfolio. Thus, when security returns are uncorrelated, diversification reduces risk and is a productive activity.

1.2.6 Main concepts

Mainly Markowitz has focused on three criteria in modern portfolio theory. These are as under.

- **Optimum portfolio**: author will construct an optimum portfolio to get maximum return and that would be compared against NSE Nifty index.

- **Correlation**: Markowitz has clarified that if we invest in negatively related assets we can reduce our risk up to certain extent as well if we will invest in positively correlated assets it will going to increase your risk.

Figure no: 4 main outcomes of Markowitz portfolio theory

In the thesis author covered all these concepts of Markowitz.
**Diversification**: In finance ‘Diversification’ means allocating your fund or investment in different wide spread assets which will ultimately decrease your portfolio risk.

### 1.3 SHARPE INDEX MODEL

#### 1.3.1 Introduction

William Sharpe has developed a simplified variant of Markowitz model that reduces substantially its data and computational requirements. It is known as Single index model or One-factor analysis.

#### 1.3.2 Single Index Model

This model assumes that co-movement between stocks is due to change or movement in the market index. Casual observation of the stock prices over a period of time reveals that most of the stock prices move with the market index. When the Sensex increases, stock prices also tend to increase and vice-versa. This indicates that some underlying factors affect the market index as well as the stock prices. Stock prices are related to the market index and this relationship could be used to estimate the return on stock. Towards this purpose, the following equation can be used:

\[
R_i = \alpha_i + \beta_i R_m + \epsilon_i 
\]

Where,

- \( R_i \) = expected return on security \( i \)
- \( \alpha_i \) = intercept of the straight line or alpha co-efficient
- \( \beta_i \) = slope of straight line or beta co-efficient
- \( R_m \) = the rate of return on market index
- \( \epsilon_i \) = error term.
According to the equation, the return of a stock can be divided into two components, the return due to the market and the return independent of the market. $\beta_i$ indicates the sensitiveness of the stock return to the changes in the market return. For example, $\beta_i$ of 1.5 means that the stock return is expected to increase by 1.5 % when the market index return increases by 1 % and vice-versa. Likewise, $\beta_i$ of 0.5 expresses that the individual stock return would change by 0.5 per cent when there is a change of 1 per cent in the market return. $\beta_i$ of 1 indicates that the market return and the security return are moving in tandem. The estimates of $\beta_i$ and $\alpha_i$ are obtained from regression analysis.

The single index model is based on the assumption that stocks vary together because of the common movement in the stock market and there are no effects beyond the market (i.e. any fundamental factor effects) that account the stocks co-movement. The expected return, standard deviation and co-variance of the single index model represent the joint movement of securities. The mean return is:

$$R_i = \alpha_i + \beta_i \ R_m + \epsilon_i$$

The variance of security’s return:

$$\sigma^2 = \beta^2_i \ \sigma^2_m + \sigma^2 \epsilon_i$$

The covariance of returns between securities i and j is:

$$\sigma_{ij} = \beta_i \ \beta_j \ \sigma^2_m$$

The variance of the security has two components namely, systematic risk or market risk and unsystematic risk or unique risk. The variance explained by the index is referred to systematic risk. The unexplained variance is called residual variance or unsystematic risk.

**1.4 NATIONAL STOCK EXCHANGE OF INDIA**

**1.4.1 Introduction**

The National Stock Exchange of India Limited (NSE) is a Mumbai-based stock exchange. It is largest stock exchange in India in terms of daily turnover and number of trades, both for equities and derivatives trading. NSE has a market capitalization of
around Rs. 47.01.923 crore (7 August 2009) and is expected to become the biggest stock exchange in India in terms of market capitalization by 2009 end. Though a number of other exchanges exist, NSE and the Bombay Stock Exchange are the two most significant stock exchanges in India and between them are responsible for the vast majority of share transactions. The NSE’s key index is the S&P CNX Nifty, known as the Nifty, an index of fifty major stocks weighted by market capitalization.

NSE is mutually-owned by a set of leading financial institutions, banks, insurance companies and other financial intermediaries in India but its ownership and management operate as separate entities. There are at least 2 foreign investors NYSE Euronext and Goldman Sachs who have taken a stake in the NSE. As of 2006, the NSE VSAT terminals, 2799 in total, cover more than 1500 cities across India.

In October 2007, the equity market capitalization of the companies listed on the NSE was US$ 1.46 trillion, making it the second largest stock exchange in South Asia. NSE is the third largest stock exchange in terms of the number of trades in equities. It is the second fastest growing stock exchange in the world with a recorded growth of 16.6%.

1.4.2 Origins

The National Stock Exchange of India was promoted by leading financial institutions at the behest of the Government of India, and was incorporated in November 1992 as a tax-paying company. In April 1993, it was recognized as a stock exchange under the Securities Contracts (Regulation) Act, 1956. NSE commenced operations in the Wholesale Debt Market (WDM) segment in June 1994. The Capital Market (Equities) segment of the NSE commenced operations in November 1994, while operations in the Derivatives segment commenced in June 2000.

1.4.3 Innovations

NSE has remained in the forefront of modernization of India’s capital and financial markets, and its pioneering efforts include:
• Being the first national, anonymous, electronic limit order book (LOB) exchange to trade securities in India. Since the success of the NSE, existent market and new market structures have followed the NSE model.

• Setting up the first clearing Corporation “National Securities Clearing Corporation Ltd.” in India. NSCCL was a landmark in providing innovation on all spot equity market (and later, derivative market) trades in India.

• Co-promoting and setting up of National Securities Depository Limited, first depository in India.

1.4.4 Setting up of S&P CNX Nifty.

• NSE pioneered commencement of Internet Trading in February 2000, which led to the wide popularization of the NSE in the broker community.

• Being the first exchange that, in 1996, proposed exchange traded derivatives, particularly on an equity index, in India. After four years of policy and regulatory debate and formulation, the NSE was permitted to start trading equity derivatives.

• Being the first and the only exchange to trade GOLD ETFs (exchange traded funds) in India.

• NSE has also launched the NSE-CNBC-TV18 media centre in association with CNBC-TV18.

• It is the one of the most important stock exchanges in the world.

1.4.5 Markets

Currently, NSE has the following major segments of the capital market:

• Equity
• Futures and Options
• Retail Debt Market
• Wholesale Debt Market
1.4.6 Equities

NSE started trading in the equities segment (capital market segment) on November 3, 1994 and within a short span of 1 year became the largest exchange in India in terms of volumes transacted. Trading volumes in the equity segment have grown rapidly with average daily turnover increasing from Rs. 17 crores during 1994-95 to Rs. 2,253 crores during 2005-2005. During the year 2008-2009, NSE reported a turnover of Rs. 1,569,556 crores in the equities segment. During the year 2009-10, NSE reported a turnover of Rs.3,812,032 crores in the equities segment. The equity segment provides you with an insight into the equities segment of NSE and also provides real-time quotes and statistics of the equities market.

1.4.7 Futures and Options:

The derivatives trading on NSE commenced on June 12, 2000 with futures trading on S&P CNX Nifty index. Subsequently, the product base has been increased to include trading in futures and options on S&P CNX Nifty index, CNX IT index, Bank Nifty index and single securities (188 stocks as stipulated by SEBI) and futures on interest rate. This segment has been considerable growth since inception. In the global market, NSE ranks first(1st) in the world in terms of number of contracts traded in the single stock futures, second (2nd) in Asia in terms of number of contracts in the single stock futures, second (2nd) in Asia in terms of number of contracts traded in equity derivatives instrument.

1.4.8 Retail Debt Market

With the view to encourage wider participation of all classes of investors across the country (including retail investors) in government securities, the government, RBI and SEBI have introduced trading in government securities for retail investors. Trading in this retail debt market segment (RDM) on NSE has been introduced w.e.f. January 16, 2003. Trading shall take place in the existing capital market segment of the exchange.
1.4.9 Wholesale Debt Market

The wholesale market segment deals in fixed income securities and is fast gaining ground in an environment that has largely focused on equities. The wholesale debt market (WDM) segment of the exchange commenced operations on June 30, 1994. This provided the first formal screen-based trading facilities for a variety of debt instruments including government securities, treasury bills and bonds issued by public sector undertakings/corporate/banks like floating rate bonds state government loans units of mutual funds and securitized debt by banks, financial institution, corporate bodies, trusts and others.

NSE became the first stock exchange to get approval for interest rate futures as recommended by SEBI-RBI committee, on 31st August 2009. a future contract based on 7% 10 year GOI bond (NOTIONAL) was launched with quarterly maturities.

1.4.10 The Organization

The National Stock Exchange of India Limited has genesis in the report of the High Powered Study Group on Establishment of New Stock Exchanges. It recommended promotion of a National Stock Exchange by financial institutions (FIs) to provide access to investors from all across the country on an equal footing. Based on the recommendations, NSE was promoted by leading Financial Institutions at the behest of the Government of India and was incorporated in November 1992 as a tax-paying company unlike other stock exchanges in the country.

The National Stock Exchange (NSE) operates a nation-wide, electronic market, offering trading in Capital Market, Derivatives Market and Currency Derivatives segments including equities, equities based derivatives, Currency futures and options, equity based ETFs, Gold ETF and Retail Government Securities. Today NSE network stretches to more than 1,500 locations in the country and supports more than 2, 30,000 terminals.

With more than 10 asset classes in offering, NSE has taken many initiatives to strengthen the securities industry and provides several new products like Mini Nifty, Long Dated
Options and Mutual Fund Service System. Responding to market needs, NSE has introduced services like DMA, FIX capabilities, co-location facility and mobile trading to cater to the evolving need of the market and various categories of market participants.

NSE has made its global presence felt with cross-listing arrangements, including license agreements covering benchmark indexes for U.S. and Indian equities with CME Group and has also signed a Memorandum of Understanding (MOU) with Singapore Exchange (SGX) to cooperate in the development of a market for India-linked products and services to be listed on SGX. The two exchanges also will look into a bilateral securities trading link to enable investors in one country to seamlessly trade on the other country’s exchange.

NSE is committed to operate a market ecosystem which is transparent and at the same time offers high levels of safety, integrity and corporate governance, providing ever growing trading & investment opportunities for investors.

1.4.11 About Indices

An Index is used to give information about the price movements of products in the financial, commodities or any other markets. Financial indexes are constructed to measure price movements of stocks, bonds, T-bills and other forms of investments. Stock market indexes are meant to capture the overall behaviour of equity markets. A stock market index is created by selecting a group of stocks that are representative of the whole market or a specified sector or segment of the market. An Index is calculated with reference to a base period and a base index value.

Stock market indexes are useful for a variety of reasons. Some of them are:

- They provide a historical comparison of returns on money invested in the stock market against other forms of investments such as gold or debt.
- They can be used as a standard against which to compare the performance of an equity fund.
In it is a lead indicator of the performance of the overall economy or a sector of the economy.

Stock indexes reflect highly up to date information.

Modern financial applications such as Index Funds, Index Futures, Index Options play an important role in financial investments and risk management.

1.4.12 About IISL

India Index Services & Products Limited (IISL), a subsidiary of NSE Strategic Investment Corporation Limited was setup in May 1998 to provide a variety of indices and index related services and products for the Indian capital markets.

IISL provides a broad range of services, products and professional index services. It maintains over 80 equity indices comprising broad-based benchmark indices, sectoral indices and customised indices. Many investment and risk management products based on IISL indices have been developed in the recent past, within India and abroad. These include index based derivatives traded on NSE, Singapore Exchange (SGX) and Chicago Mercantile Exchange (CME) and a number of index funds and exchange traded funds.

Objectives of IISL

IISL pools the index development efforts of NSE into a coordinated whole - India's first specialised company focused upon the index as a core product. IISL has the following objectives:

- To develop, construct and maintain indices on Indian equities that serve as useful market performance benchmarks and are the underlying indices for derivatives trading
- To provide data and information on the trading activity in the Indian stock markets
An Index is used to give information about the price movements of products in the financial, commodities or any other markets. Financial indexes are constructed to measure price movements of stocks, bonds, T-bills and other forms of investments. Stock market indexes are meant to capture the overall behavior of equity markets. A stock market index is created by selecting a group of stocks that are representative of the whole market or a specified sector or segment of the market. An Index is calculated with reference to a base period and a base index value.

Stock market indexes are useful for a variety of reasons. Some of them are:
• They provide a historical comparison of returns on money invested in the stock market against other forms of investments such as gold or debt.

• They can be used as a standard against which to compare the performance of an equity fund.

• It is a lead indicator of the performance of the overall economy or a sector of the economy

• Stock indexes reflect highly up to date information

• Modern financial applications such as Index Funds, Index Futures, Index Options play an important role in financial investments and risk management

1.4.14 Major Indices of NSE

Broad Market Indices

These indices are broad-market indices, consisting of the large, liquid stocks listed on the Exchange. They serve as a benchmark for measuring the performance of the stocks or portfolios such as mutual fund investments.

- CNX Nifty
- CNX Nifty Junior
- LIIX 15
- CNX 100
- CNX 200
- CNX 500
- CNX Midcap*
- Nifty Midcap 50
- CNX Smallcap Index
- CNX Midcap 200 **
- India Vix

* CNX Midcap - Introduced from July 18, 2005
** CNX Midcap 200 - Discontinued from July 18, 2005**

**Sectoral Indices**

These indices are framed as per sectors of the economy.

- CNX Auto Index
- CNX Bank Index
- CNX Energy Index
- CNX Finance Index
- CNX FMCG Index
- CNX IT Index
- CNX Media Index
- CNX Metal Index
- CNX Pharma Index
- CNX PSU Bank Index
- CNX Realty Index
- IISL CNX Industry Indices

**Thematic Indices**

- CNX Commodities Index
- CNX Consumption Index
- CPSE Index
- CNX Infrastructure Index
Strategy Indices

Strategic indices are designed on the basis of quantitative models / investment strategies to provide a single value for the aggregate performance of a number of companies.

- CNX 100 Equal Weight
- CNX Alpha Index
- CNX Defty
- CNX Dividend Opportunities Index
- CNX High Beta Index
- CNX Low Volatility Index
- CNX Nifty Dividend
- NV20 Index
- NI15 Index

Customised Indices

IISL undertakes development & maintenance of customised indices for clients as well as offers consultancy services for developing indices. Customised indices can be used for
tracking the performance of the client’s portfolio of stocks vis-à-vis objectively defined benchmarks, or for benchmarking NAV performance to customised indices.

The customised indices can be sub-sets of existing indices or a completely new index. Some of the indices that can be constructed include:

- Sector Indices
- Individual Business Group Indices
- Portfolios
- Industry Indices

**Services to Clients**

Reports and other Information will be provided as per clients requirements.

**Fixed Income Indices**

Fixed income index is used to measure performance of the bond market. The fixed income indices are useful tool for investors to measure and compare performance of bond portfolio. Fixed income indices also used for introduction of Exchange Traded Funds.

- GSEC10 NSE Index
- GSECBM NSE Index
1.5 REFERENCES

Books


Research papers


Web sites

http://www.nseindia.com/products/content/equities/indices/indices.htm
http://www.nseindia.com/products/content/equities/indices/broad_indices.htm
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http://www.nseindia.com/products/content/equities/indices/thematic_indices.htm
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http://www.moneycontrol.com/stocksmarketsindia/

**News Paper**

- The Times of India published from Mumbai
- The Economic Times published from Ahmedabad
- The Economic Times published from Mumbai
- Financial Express published from Mumbai
- Business Standard published from Delhi