CHAPTER I

INTRODUCTION

1.1 INTRODUCTION

Economy is the root cause for the modern civilization. In a country’s economy savings plays a pivotal role because the public money should not be in idle form, it should be invested in the assets and the investment might be secured one that give the maximum return. This is what all investors expecting for their hard earned money. When they expect huge return there must be risk lying there. If they don’t want to take risk they simply put their money in the bank deposits, government bonds etc., but the question here is whether they get reasonable return or not. The word reasonable implies that the return must be above the inflation rate of the particular country, if not, the value of the investment could have been swallowed by the time. Stock market investment is one such investment that gives maximum return than other investment avenues. Investment is an important means for channelizing the idle savings into the growth of the economy. “The material wealth of a society is determined ultimately by the productive capacity of its economy – the goods and services that can be provided to its members. Investment raises the level of aggregate demand which in turn increases the level of income and employment in the economy” (M. Yogesh, 2008). Table 1.1 shows the various investment avenues with risk, return, liquidity and convenience. From this table it is observed that the stock market is the one such active investment avenue. The economically fast growing country like India might have the stock market with high growth potential. Though it might have risk on the investment, it is also the better place of investing the money that yields high return with good capital appreciation more than the inflation rate in the country.
Table 1.1
Evaluation of Various Investment Avenues

<table>
<thead>
<tr>
<th>Investment Avenues</th>
<th>Return</th>
<th>Marketability/Liquidity</th>
<th>Risk</th>
<th>Tax Shelter</th>
<th>Convenience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current yield</td>
<td>Capital Appreciation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity Shares</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Very high</td>
<td>High</td>
</tr>
<tr>
<td>Non-convertible Debentures</td>
<td>High</td>
<td>Negligible</td>
<td>Low</td>
<td>Average</td>
<td>Nil</td>
</tr>
<tr>
<td>Equity Schemes</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Very High</td>
</tr>
<tr>
<td>Debt Schemes</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>No tax on dividends</td>
</tr>
<tr>
<td>Bank Deposits</td>
<td>Moderate</td>
<td>Nil</td>
<td>Negligible</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Public Provident fund</td>
<td>Nil</td>
<td>Moderate</td>
<td>Nil</td>
<td>Average</td>
<td>Section 80c benefit</td>
</tr>
<tr>
<td>Life Insurance Policies</td>
<td>Nil</td>
<td>Moderate</td>
<td>Nil</td>
<td>Average</td>
<td>Section 80c benefit</td>
</tr>
<tr>
<td>Residential House</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Negligible</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Gold and Silver</td>
<td>Nil</td>
<td>Moderate</td>
<td>Average</td>
<td>High</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Source: Prasanna Chandra(2008), Investment Analysis and Portfolio Management, Tata Mcgraw Hill publications

Indian Securities Market

Securities market is the market for equity, debt, and derivatives. The Indian securities market consists of very active Equity, Debt and Derivative segments. The two broad components of equity market are primary market and secondary market. The
market where new securities are issued is called the primary market and the market where outstanding securities are traded is called the secondary market or otherwise stock market. This study is concerning about the stock market in which the stocks of PSUs are traded. There are 23 stock exchanges in India, among these Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) are the most active stock exchanges. Bombay stock exchange is a old stock exchange in Asia. Sensex, the index of the Bombay Stock Exchange, has a wide spread popularity all over the world. The NSE was started in 1992, by some big financial institutions in India. This stock exchange emerged as a technology oriented stock exchange and it incorporates all the technological developments.

**Investment**

Investment is the service of funds with the aim of getting return on it. Investment means the use of money with the hope of making more money. In finance, investment means the purchase of a financial product or other item of value with an expectation of favorable future returns. Investment of hard earned money is a crucial activity of every human being. Investment is the commitment of funds which have been saved from current consumption with the hope that some benefits will be received in future. Thus, it is a reward for waiting in terms of money. Savings are invested in assets by the people depending on their risk involvement and return of requirement. There are two ways of classifying the investment, namely, Economic Investment and Financial Investment

**Economic Investment**

According to economics, investment is the utilization of resources in order to increase income or production output in the future. An amount deposited into a bank or any financial activity with the aim of earning income in the long run leads to economic investments.
Financial Investment

This refers the allocation of monetary resources to assets that are expected to yield some gain or return over a given period of time. It means an exchange of financial claims such as shares and bonds, real estate, etc. Common stock is the first security of a company to be issued and the last to be retired (Francis, J. Clark, 1986). It represents the share in the ownership of a firm. It has the last claims on earnings and assets of all other securities issued. But it also has an unlimited potential for dividend payment through increasing earnings and for capital appreciation through raising prices.

1.2 PUBLIC SECTOR COMPANIES IN INDIA

Public Sector – Definition

The sole purpose of creating public sector is to deliver goods and services by and for the government in the interest of the people of the country. According to Harjit (2008) “An enterprise where there is no private ownership, where its functions are not merely confined to the maximization of profits or the promotion of the private interest of the enterprise, but are governed by the public or social interest, and where the management is responsible to the government either directly as in a department undertaking or indirectly as in government companies and corporations.”

There has been a tremendous growth of public sector undertaking companies (PSUs) in India. The four decades prior to 1991 witnessed a substantial growth and expansion of the public sector. They were viewed as a mechanism for structural transformation of the economy and for growth with equity and social justice. They were created as private initiative and not forthcoming in vital sectors of the economy. Eventually the perception that public sector should acquire the commanding heights of the economy led to government involvement in diverse areas of economic activity. Therefore the government has set up PSU to serve the broad macro-economic objectives of higher economic growth, self-sufficiency in production of goods and services, long term equilibrium in balance of payments and low as well as stable prices. While there were only five PSUs with a total investment of Rs. 29.00 crore at the time of the First
Five Year Plan, there were as many 260 PSUs (excluding 7 Insurance Companies) with a total investment of Rs. 7, 29,228 crore as on 31st March, 2012. A large number of PSUs have been set up as Greenfield projects consequent to the initiatives taken during the five year plans. PSUs such as National Textile Corporation, Coal India Limited (and its subsidiaries) have, however, been taken over from the private sector as a consequence of nationalization. On the other hand industrial companies such as Indian Petrochemicals Corporation Limited., Modern Food Industries Limited., Hindustan Zinc Limited., Bharat Aluminum Company and Maruti Udyog Limited, which were PSUs earlier, ceased to be PSUs after their privatization. Along with other public sector organisations such as State Bank of India in the banking sector, Life Insurance Corporation in the insurance sector and Indian Railways in transportation, PSUs are the leading companies of India with significant market-shares in the sectors such as petroleum, (e.g. ONGC, GAIL and Indian Oil Corporation); mining (e.g. Coal India Limited. and NMDC); power generation (e.g. NTPC and NHPC); power transmission (e.g. Power Grid Corporation of India Limited.); nuclear energy (e.g. Nuclear Power Corporation of India Limited.); heavy engineering (e.g. BHEL); aviation industry (e.g. Hindustan Aeronautics Limited. and Air India Limited.); storage and public distribution system (e.g. Food Corporation of India Limited., and Central Warehousing Corporation); shipping and trading (e.g. Shipping Corporation of India Limited, and State Trading Corporation of India Limited.) and telecommunication (e.g. BSNL and MTNL). During economic liberalization, sectors that were preserved exclusively for the PSUs were opened to the private sector. The PSUs, therefore, are faced with competition from both domestic private sector companies (some of which have grown very fast) and the large multi-national corporations (MNCs). (www.divest.nic.in).

1.3 IMPACT OF PSUs ON INDIAN ECONOMY

The PSUs play a critical role in Indian Economy. They influence the growth in the economy and are affected by the overall growth in the economy. As against the nominal GDP growth of 15% in 2011-12, the gross value addition by the PSUs grew by 4.24% during this year. The turnover of petroleum (Refinery &Marketing), Coal,
Fertilizers, Electricity (Generation and Transmission), Heavy Engineering, and Contract & Construction, showed a significant increase during the year. Significant gains in terms of net profits were made by PSUs in the Coal, Crude Oil, and Transportation equipment, Power Generation, Contract & Construction and Consultancy Services. The net losses, however, increased for PSUs operating in telecommunication and transportation services.

**Highlights of the PSUs performance on Indian Economy**

- **Total paid up capital in 260 PSUs** as on 31.3.2012 stood at Rs.1,63,863 crores compared to Rs.1,57,438 crore as on 31.3. 2011 (248 PSUs), showing a growth of 4.08%.
- **Total investment (equity plus long term loans)** in all PSUs stood at Rs.7, 29,228 crores as on 31.3.2012 compared to Rs. 6, 03,975crore as on 31.3.2011, recording a growth of 20.74%.
- **Capital Employed (Paid up capital plus reserve & surplus and long term loans)** in all PSUs stood at Rs.13,43,176 crore as on 31.3.2012 compared to Rs.11, 64,178crore as on 31.3.2011 showing a growth of 15.38%.
- **Total turnover/gross revenue from operation** of all PSUs during 2011-12 stood at Rs.18, 41,927 crore compared to Rs.14, 98,018 crore in the previous year showing an increase of 22.96%.
- **Total income** of all PSUs during 2011-12 stood at Rs.18, 24,627croe compared to Rs.14, 70,569crore in 2010-11, showing an increase of 24.08%.
- **Profit** of profit making PSUs stood at Rs.1, 25,115 crore during 2011-12 compared to Rs.1, 13,944 crore in 2010-11, showing a growth of 9.80%.
- **Loss** of loss incurring PSUs stood at Rs.27, 602 crore in 2011-12 compared to Rs.21, 817 crore in 2010-11, showing an increase in loss by 26.52%.
- **Overall net profit** of all 225 PSUs during 2011-12 stood at Rs.97, 513croe compared to Rs.92, 128 crore during 2010-11, showing an increase of 5.84%.
- **Reserves & Surplus** of all PSUs went up from Rs.5, 60,203crore in 2010-11 to Rs.6, 13,949 crores in 2011-12, showing an increase by 9.59%.
Net worth of all PSUs went up from Rs.7, 17,641 crore in 2010-11 to Rs.7, 77,812 crore in 2011-12 registering a growth of 8.38%.

Contribution of PSUs to Central Exchequer by way of excise duty, customs duty, corporate tax, interest on Central Government loans, dividend and other duties and taxes increased from Rs.1,56,751 crore in 2010-11 to Rs.1,60,801 crore in 2011-12, showing an increase of 2.58%.

PSUs employed 13.98 lakh people (excluding contractual & casual labours) in 2011-12 compared to 14.40 lakh in 2010-11, showing a reduction in employees by 2.91%.

Salary and wages went up in all PSUs from Rs.98, 402 crore in 2010-11 to Rs.1, 05,407 crore in 2011-12, showing a growth of 7.12%.

Source: (public enterprise survey 2011-12)

1.4 ROLE OF PSUs IN INDIAN STOCK MARKET

There are thousands of companies listed in Indian stock exchanges which belong to all the sectors of the economy. Many studies have been conducted to analyze the returns of various companies stocks in the past two decades. This study focuses on the central PSUs which is owned by Government of India. The research on PSU is limited but the performances of these companies are as good as private companies. From the investment point of view the institutional investors (FII, Mutual Funds, Private investment organizations, AMC, HNI, etc.) and retail investors are very much interested for the investment in investing the PSU companies. All PSU companies accounted 25.43 % of total market capitalization of all companies listed in BSE as on 31 December 2012 (www.divest.nic.in/). Thus the PSU companies constitute nearly one fourth of the total market capitalization of BSE. Retail investor participation in the PSUs on the whole are higher than the other private sector companies. The listed stocks of PSUs in Indian Stock market along with industry and other information are showed in Appendix 1. In BSE scrip code is allotted to the each security. The scrip code is a security identification code allotted to all the securities listed in BSE.
Listed stocks of PSUs in BSE

There are totally 260 central public sector enterprises (PSUs), in the country according to the survey of Department of Disinvestment in the year 2011-12. This study used the name PSUs for Public Sector Enterprises as more apprehensive in the investment world, Gupta (2012). Listing in the stock exchange is the status symbol of any corporate company. Public can take part in the ownership of PSUs by the way of listing in the stock exchange.

Listing of stocks in Stock Exchanges

Listing means admission of securities to dealings on a recognized stock exchange. The securities may be of any public limited company, central or state government, quasi governmental and other financial institutions/corporations, municipalities, etc. The main objectives of listing are:

- To provide liquidity to securities
- To mobilize savings for economic development
- To protect interest of investors by ensuring full disclosures

The Government has to grant approval for listing of securities of companies in accordance with the provisions of the Securities Contracts (Regulation) Act, 1956, Securities Contracts (Regulation) Rules, 1957, Companies Act, 1956, Guidelines issued by SEBI and Rules, Bye-laws and Regulations of BSE. BSE has set various guidelines and forms that need to be adhered to and submitted by the companies. These guidelines will help companies to expedite the fulfillment of the various formalities and disclosure requirements that are required at various stages of

- Public Issues
- Initial Public Offering
- Further Public Offering
- Preferential Issues
- Indian Depository Receipts
- Amalgamation
Qualified Institutions Placements.

A company intended to be listed in BSE has to comply with the listing requirements prescribed by it. The requirements of listing details are obtainable from the SEBI official website (www.sebi.gov.in).

This study involves the follow on public offer (FPO) of shares of PSUs for analysis. The explanation about the FPO is as given below.

**FPO – Meaning**

Follow on Public Offer is a process by which a company, already listed in a stock exchange, issues new shares to the investors or the shareholders, usually the promoters. A particular company uses FPO after it has gone through the process of an IPO (Initial Public Offer) and decides to make more of its shares available to the public or to raise capital to expand or pay off debt.

The PSUs have adopted FPO for diversifying government stakes and they make it available more shares to the public. The proceeds of the FPO of PSUs are used by the government to bridge the fiscal deficit in the last decade.

**BSE PSU Index**

The index comprises all the listed PSU stocks in BSE. This index gives a picture about the PSU stock returns in performance analysis. Six kinds of returns have been computed for the index and it is used for the analysis.

**Computation PSU Index**

The methodology adopted for computing PSU index is as follows.

The index value is obtained by using the following formula:

\[
\text{Present Value} = \frac{\text{Full market capitalization of index constituents}}{\text{Base Market capitalization}} \times \text{Base Index Value}
\]
<table>
<thead>
<tr>
<th><strong>Base Year</strong></th>
<th>February 01, 1999</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Index Value</strong></td>
<td>1000</td>
</tr>
<tr>
<td><strong>Date of Launch</strong></td>
<td>June 04, 2001</td>
</tr>
<tr>
<td><strong>Method of calculation</strong></td>
<td>Full market</td>
</tr>
<tr>
<td><strong>Number of scrips</strong></td>
<td>All PSU stocks in S&amp;P BSE-500 index</td>
</tr>
<tr>
<td><strong>Index calculation frequency</strong></td>
<td>Real Time</td>
</tr>
</tbody>
</table>

Source: www.bseindia.com

**1.5 MOTIVATION OF THE STUDY**

The literature survey shows that there are numerous research conducted on equity market in the world wide as well as in Indian context. Lot of investors often confused by the deviation in this research findings. Most of these studies giving thrust only to identify the prominent factors, which determine the stock returns in India during a particular period. But the ability of those factors in predicting the stock return are not tested and they failed to give concrete solutions to the problems persisting in the investment decision on the stocks in securities market. This study is focused on the public sector stocks of interest for investment decisions. There is a prominent role played by the PSUs in Indian stock market. Because of its bigger percentage stocks hold by government, the retail investors feels safety for their investment. In the literature we have found that there is no exclusive study of public sector companies in this context. This study might fill the gap and the findings of the analysis might be helpful to the investors from the investment point of view and eventually to enrich the knowledge of the government in decision making.

During the last decade there has been a remarkable development in the Indian capital market which was showed by enormous in breath and volume terms. Moreover lot
of public sector undertaking companies has come to the capital market during this period. In the mean time huge number of trading and Demat accounts were opened. The increasing participation of retail investors in the capital market leads the authorities to safeguard the interest and investment of the retail investors to certain extent. Eventually this study highlights the investment decision that might be made on knowing the financial position and basic value of the companies of their own interest. This study helps to those investors who want to invest in the public sector companies by testing the ability of factors causing the fluctuations of returns of companies. In Indian market a number of huge profitable companies belong to public sector undertakings. Companies such ONGC, BHEL, SAIL, BPCL, IOC, NTPC etc, are constituents of India’s major stock indices namely SENSEX and NIFTY. Consequently the contribution of the PSUs towards the price movements of Indian stock market is high. The assessment of financial health of the public sector firms so as to trace out the prominent factors for the success of profitable stocks lead to investment decisions.

1.6 OBJECTIVES OF THE STUDY

- To study the degree of persistency in the stock returns of PSUs through Fractal Analysis based on the computation of Hurst Exponent (P1)
- To analyze the impact of select macroeconomic factors on the performance of stock returns of PSUs in India (H₀₁)
- To find the impact of successive disinvestment of PSUs on the performance of stocks. (H₀₂)
- To evaluate the forecasting performance of stock returns of PSUs using neural network analysis and ARIMA models. (P2)
Proposition I

For attaining the first objective the persistent behaviour in the six kinds of stock returns (one day, one week, one month, three months, six months and one year return) of all listed PSUs in BSE is analyzed in the third chapter. To know the degree of persistency the Hurst exponent is used. The statistics behind the Hurst exponent is explained in the second chapter. For computation and analysis the study used Gretl (Gnu Regression Econometrics Time series Library), an open source software, which is freely available in the internet. The details about this software and other open source software which are used in this study are explained in the second chapter.

Proposition II

To accomplishing the fourth objective the stock returns of PSUs is analyzed using multilayer perceptron (MLP) neural network (NN) model. The researcher attempts to explain the prediction accuracy in the various kinds of stock returns of PSUs. To work out MLP NN, WEKA (Waikato Environment for Knowledge Analysis) software is used. This is open source software developed by University of Waikato, Switzerland. The detail about the software is explained in the second chapter.

Hypotheses of the Study

To achieve the second and third objective the following hypotheses have been formulated:

Hypothesis\textsubscript{01}

The macroeconomic factors of the country do not significantly impact the stock returns of PSUs in India.

Hypothesis\textsubscript{02}

The disinvestments of listed PSU stocks do not significantly impact the stock returns of PSUs in India.
1.7 CHAPTER SCHEME OF THE STUDY

Chapter I  Introduction

- The first chapter begins with the concept of investment and genesis of financial and economic investment. It presents an overview of the role of PSUs in Indian economy and Indian capital market. It also includes the motivation and objectives of the study. Further it outlines the hypotheses used in this study.

Chapter II  Review of Literature and Research Design

- The second chapter presents a bird’s view of earlier studies in the field of investment in stock market. It explains the data utilized in the study, tools used for the analysis and open source software employed in the analysis.

Chapter III  Fractal Analysis on Stock Returns of Public Sector Companies

- The third chapter consists of the fractal analysis on the stock returns of PSUs and estimates the Hurst exponent for all different types of returns. It further elaborates the interpretation of observed Hurst values in the study.

Chapter IV  Role of Macroeconomic Factors on the Performance Stock Returns of PSUs.

- The fourth chapter finds the impact of macroeconomic factors on the stock returns of PSUs. It includes the econometric analysis such as unit root test, vector auto regression, etc. The study assumes stock returns of PSUs as dependent variable and all other variables as independent variables.

Chapter V  Impact of Disinvestment on the Stock Returns of PSUs

- The fifth chapter discusses the impact of disinvestment announcement on the existing listed stocks during the study period. This chapter makes the inferences which are helpful to the investors making investment decision on the stocks of PSUs.
Chapter VI Neural Network analysis on the Stock Returns of PSUs

- The *sixth chapter* explains the MLP neural network analysis on six different kinds of stock returns of PSUs. It presents the justifications on the predictions of stock returns by WEKA software.

Chapter VII Summary of Findings, Suggestions and Conclusion

- The *seventh chapter* gives the overall findings, suggestions and summary of conclusions of this study.