INVESTMENT PATTERN OF PRIVATE INSURANCE SECTOR IN INDIA SINCE 2000

ABSTRACT

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ABSTRACT

The activities of insurance companies encompass underwriting insurance policies and investing the accumulated funds. Investment management seems to be a compelling need for both life and non-life insurers. Insurers collect premiums from individuals when selling contracts and invest the proceeds in varied instruments such as government securities, debenture, money market securities, equities, mutual funds and others with a view to meet the contractual obligations incurred in the future. Therefore, the main challenge for insurance companies is not only developing and promoting insurance products, but also the efficient allocation of internal and accumulated funds. The return on investment of insurance funds influences the premium rates and bonuses of insurance business and eventually, the buying behavior of customers. Thus, the rate of return offered by insurance companies has a direct bearing on the growth rate of insurance industry and its competitive position. A number of questions are raised about investment pattern of insurance companies i.e., how insurance companies are investing, where they are investing, how safe policyholder’s funds are, and what is the role of regulations in nurturing the investment of insurance companies. Therefore, this is not logical to leave investment decision on market forces and prudence of insurers. Allocation of funds for investment by insurance companies is regulated in most of countries.

At present, investment pattern of insurance companies in India are subjected to comprehensive regulations. Insurance Act, 1938 formally regulates the investment pattern of insurance companies where insurance companies have to comply with the section 27, 27A and 27B. In 1994, Malhotra committee recommended certain amendment to Life Insurance Corporation of India Act 1956, General Insurance Business Nationalization Act 1972 and Insurance Act 1938. On the briefing of Malhotra committee, The Insurance Regulatory and Development Authority of India (IRDAI) established on 19 April 2000, brings forth Investment regulation for insurance companies on 14 August 2000. Since then, IRDAI amended investment regulations several times in 31st May 2001, 2nd April 2002, 5th Jan 2004 and 8th Feb 2013. Recently, Insurance Regulatory and Development Authority of India (Investment) (Fifth Amendment)
Regulation, 2013 has come into force which made several amendments over the previous regulation.

IRDAI has prescribed quantitative limits on investment pattern of insurance companies. According to Insurance Regulatory and Development Authority of India (Investment) (Fifth Amendment) Regulation, 2013, the quantitative limits of:

Life Fund: A minimum of 25% is to be invested in central government securities. A minimum of 50% is to be invested in central government, state government securities or other approved securities. Approved investments subject to exposure / prudential norms cannot exceed 50%; and other investments subject to exposure / prudential norms cannot exceed 15%. Housing and infrastructure requires a minimum of 15% investment.

Pension and Annuity Plans: A minimum of 20% is to be invested in central government securities. A minimum of 40% is to be invested in central government securities, state government securities or other approved securities. Approved investments subject to exposure / prudential norms have a cap of 60%.

Unit Linked Insurance Plans (ULIPs): At least 75% should go to approved investments which tend to be liquid stocks with a strong dividend payment record, and not more than 25% to other investments.

General Insurance: A minimum of 20% is to be invested in central government securities. A minimum of 30% is to be invested in central government, state government securities or other approved securities. Approved investments cannot exceed 70%; and other investment cannot exceed 25%. Housing and loans to state governments for housing and fire-fighting equipment require a minimum of 5% investment and infrastructure requires a minimum of 10% investment.

Apart from these quantitative limits, investments of insurance companies are subjected to various exposure and prudential norms where there is limit for investments in investee company, entire group of investee company, and industry sector to which investee company belongs. There are also regulations which prescribe formation of investment committee, investment policy, operational control & risk management review.
Regulations are also regulating investment in mutual funds, derivatives, venture capital, private equity and list of approved and unapproved investment.

**Statement of the Problem**

The insurance industry is one of the fastest growing sectors in India. The insurance industry has registered significant growth during the last decade and emerged as an important financial intermediary. The penetration and density of the industry have also shown remarkable growth over the period of time. The growing importance of the industry may be observed in term of growing asset under management. The premium paid by policyholders form the main source of funds for the insurance companies. The asset under management of Indian insurance industry increased from Rs. 253769.2 crore in 2001-02 to Rs. 2408236 crore in 2014-15. Private insurance companies provide wide variety of options to the policyholders since there are wide-ranging insurance scheme with investment component offered by them. There is a scant of research in India regarding the investment pattern of private insurance sector. There is a need to conduct research to know investment pattern of private insurance companies especially by analyzing investment pattern in terms of investments in government securities, housing & infrastructure investments and approved & other investments. There is also a need of research which provides an empirical analysis related to investment efficiency of insurance companies. It will help policyholders, regulators, insurance investment managers and other participants in taking better decisions. The study will also offer suggestions to improve the investment pattern of insurance companies. Hence, the present study attempts to analyze the investment pattern of private insurance companies.

**Research Gap**

Review of literature shed light on various gaps in previous researches carried out in this field. The researcher is intended to put an honest effort to provide contribution in this regard. Although investment income constitutes a large share of insurers’ income and investment activities of insurance firms have important macroeconomic consequences for the allocation of investment funds between different sectors of the economy, relatively few studies have been conducted to investigate the investing activities of insurance companies in India. Majority of studies were based on theoretical
aspect of investment pattern, investment regulation and financial performance of insurance companies. Investment pattern is not given due importance or adequately explored. The present study differs from the earlier studies on the following aspects:

- This study has made an effort to address gaps in the literature by conducting a complete and comprehensive study on investment pattern of private insurance companies which has been rarely examined in any developing country.

- Although there are many studies in the literature on the investment performance of insurance and other financial institutions in other countries, few studies on the Indian insurance industry have been found. In particular, we have not found any quantitative studies on the investment efficiency or investment performance of the insurance sector in India. This is in part due to the lack of data before or difficulty in defining an appropriate model for such a relatively immature industry.

- The present study covers a detailed theoretical and analytical research for the recent period of thirteen years ranging from 2002-03 to 2014-15 regarding investment pattern and investment efficiency of insurance companies.

- In previous studies, overall investment data have been taken to conduct research. Such overall figure may not provide meaningful inferences and the results cannot be generalized. To overcome this limitation, the present study based on 12 private life insurance companies and 8 private non-life insurance companies operating during entire study period.

- Earlier studies did not compare investment pattern across private insurance companies and did not provide insight in term of which insurance companies are more efficient than others.

**Scope of the Study**

In the contemporary world, insurance investment pattern have become popular due to globalization, liberalization, technological development and intensely competitive environment. The world economy is facing serious difficulties in terms of failure of major financial institutions and future growth prospects have become very uncertain exposing major economies to deep recession. In the midst of all the darkness and disorder of world economy, India’s insurance sector has been amongst the few to maintain
resilience. But in India there is a need of growing balance sheet, faster credit expansion, increasing profitability and productivity similar to the insurance companies of developed countries. This study emphasizes the investment pattern as the key enabler for rapid growth of Indian insurance sector. The study of investment pattern of private insurance sector in India since 2000 would cover a span of nearly one decade (2003-2015). This span of period would be more than sufficient to find out the trends in investment pattern of insurance companies vis-a-vis investment efficiency particularly in Indian insurance sector. Keeping this in mind the present study endeavors to assess investment pattern of private insurance sector in India in terms of investments in government securities, housing & infrastructure investments and approved & other investments. Investment efficiency of private insurance sector is assessed on Constant Return to Scale (CRS), Variable Return to Scale (VRS) and scale efficiency measure on the basis of input (Total investment) and outputs (Investment income to policyholders and Investment income to shareholders).

**Objectives of the Study**

Based on the existing research gap, the goal of study is take the investment pattern debate up to a higher level of quality. Consequently, the intention of this study is to achieve the following objectives:

**General Objectives:**

1. To study the growth and prospects of insurance sector in post privatization period.
2. To study the nature, composition and issues relating to the investment pattern of insurance companies.

**Specific Objectives:**

1. To examine the investment pattern of selected private life insurance companies of India.
2. To examine the investment pattern of selected private non-life insurance companies of India.
3. To trace out the investment pattern of private life insurance sector during pre and post insurance investment regulation.
4. To trace out the investment pattern of private non-life insurance sector during pre and post insurance investment regulation.
5. To analyze the investment efficiency of selected private life insurance companies of India.
6. To analyze the investment efficiency of selected private non-life insurance companies of India.

**Hypotheses of the Study**

The hypotheses have been developed on the basis of theories and prior empirical evidences. In the present study following hypotheses are selected for the empirical analysis. Rejection or acceptance of hypotheses is based on significance of results.

**H₀₁**: There is no significant difference in investment pattern across private life insurance companies.

H₀₁.1: There is no significant difference in government securities investments across private life insurance companies.
H₀₁.2: There is no significant difference in housing & infrastructure investments across private life insurance companies.
H₀₁.3: There is no significant difference in approved & other investments across private life insurance companies.

**H₀₂**: There is no significant difference in investment pattern across private non-life insurance companies.

H₀₂.1: There is no significant difference in government securities investments across private non-life insurance companies.
H₀₂.2: There is no significant difference in housing & infrastructure investments across private non-life insurance companies.
H₀₂.3: There is no significant difference in approved & other investments across private non-life insurance companies.
H₀3: There is no significant difference in investment pattern of private life insurance sector in pre and post insurance investment regulation.

H₀3.1: There is no significant difference in government securities investments of private life insurance sector in pre and post insurance investment regulation.

H₀3.2: There is no significant difference in housing & infrastructure investments of private life insurance sector in pre and post insurance investment regulation.

H₀3.3: There is no significant difference in approved & other investments of private life insurance sector in pre and post insurance investment regulation.

H₀4: There is no significant difference in investment pattern of private non-life insurance sector in pre and post insurance investment regulation.

H₀4.1: There is no significant difference in government securities investments of private non-life insurance sector in pre and post insurance investment regulation.

H₀4.2: There is no significant difference in housing & infrastructure investments of private non-life insurance sector in pre and post insurance investment regulation.

H₀4.3: There is no significant difference in approved & other investments of private non-life insurance sector in pre and post insurance investment regulation.

H₀5: Private life insurance companies are not investment efficient.

H₀5.1: Private life insurance companies are not investment efficient on constant return to scale.

H₀5.2: Private life insurance companies are not investment efficient on variable return to scale.

H₀5.3: Private life insurance companies are not investment efficient on scale efficiency measure.

H₀6: Private non-life insurance companies are not investment efficient.

H₀6.1: Private non-life insurance companies are not investment efficient on constant return to scale.
H06.2: Private non-life insurance companies are not investment efficient on variable return to scale.

H06.3: Private non-life insurance companies are not investment efficient on scale efficiency measure.

**Research Methodology**

Research methodology is an important part of research that describes the entire methodological process of the study. Under this part, sample scheme, data sources, sampling techniques, statistical tools & techniques, and variables and proxies measures are described in view of testing formulated hypotheses. The present study makes an empirical investigation of investment pattern of private insurance sector during post privatization. Therefore, this section of the chapter outlines entire research plan, which is as follows:

**Sample Scheme**

The empirical result of the study is primarily based on financial data of insurance companies. As on 31\textsuperscript{st} March 2015, there were 23 private life insurance companies, 1 public life insurance company, 22 private non life insurance companies (including five standalone health insurance companies – Star Health & Allied Insurance Co., Apollo Munich Health Insurance Co., Max Bupa Health Insurance Co., Religare Health Insurance Co., and Cigna TTK Health Insurance Co.) 6 public non-life insurance companies (including specialised insurance companies - Export Credit Guarantee Corporation of India Limited and Agriculture Insurance Company of India Limited) and one reinsurance company. Out of these companies, 12 private life insurance companies and 8 private non-life insurance companies are selected.

The purposive sampling technique has been adopted in the study while taking scope and limitation of the study into due consideration. The study imposes certain specific restrictions in the sample selection and only those firms qualify for sampling which fulfils the following criteria:

1. Companies must exist on 31\textsuperscript{st} March 2015.
2. Companies should have been incorporated in or before the financial year 2002-03.
3. Companies should have maintained its identity and reported its audited financial statements without any gaps for financial years from 2002-03 to 2014-15.

After fulfilling the above mention criteria, twelve private life insurance companies and eight private non-life insurance companies are selected. The selected sample firms are true representative of the population. Twelve private life insurance companies represent 88.75 per cent of private life insurance market and eight private non-life insurance companies cover 77.82 per cent of private non-life insurance market.

Data Sources

The study is exclusively based on secondary sources of data. The financial data of companies related to investment and other variables have been extracted from IRDAI annual reports. The additional financial information has been collected from the various published annual reports and financial statements of sample companies that have been extracted from the respective website of sample companies. Furthermore, research reports of various contributors on the subject, articles in various journals, magazines, newspapers and other published literature on subject matter have been screened to gather required information for the study. Finally collected raw data has been converted into ratios and classified according to the requirement of the study.

Statistical Methods

In order to analyze data collected, Analysis of Variance (ANOVA), post hoc test, paired sample t test, and Data Envelopment Analysis (DEA) have been applied. One-way ANOVA is used to evaluate mean difference in investment pattern of selected private life insurance companies. One-way ANOVA is also used to analyze mean difference in investment pattern of selected private non-life insurance companies. Post hoc test is used to spell out which specific groups of insurance companies are significantly different from each other. Paired sample t test is used to analyze investment pattern of private life and non-life insurance sector during pre and post insurance investment regulation. To calculate investment efficiency of selected private life and non-life insurance companies, the technique of DEA is used. Finally SPSS (Statistical Package for the Social Sciences) version 19 is used to generate results of paired sample t test and one-way ANOVA.
DEAP (Data Envelopment Analysis Computer Program) version 2.1 software is used to generate results of DEA.

One-Way Analysis of Variance

To evaluate mean difference in investment pattern of selected private life insurance companies, the study employed one-way ANOVA. One-way ANOVA is also used to analyse mean difference in investment pattern of selected private non-life insurance companies. The one-way ANOVA is simply a series of independent sample t-test conducted for an independent variable that has three or more classifications. Specifically, it tests the null hypothesis

\[ H_0: \mu_1 = \mu_2 = \mu_3 = \ldots = \mu_k \]

against the alternative hypothesis

\[ H_1: \text{At least two population means are not equal.} \]

An F ratio is calculated as:

\[ F = \frac{MS_B}{MS_W} \]

\[ MS_B = \frac{SS_B}{df_b} \]

\[ MS_W = \frac{SS_W}{df_w} \]

Where

df is degree of freedom

Post Hoc Tests

The one-way ANOVA is an omnibus test statistic and cannot spell out which specific groups were significantly different from each other. To figure out which specific groups differed from one another, the study utilized Tukey’s Honestly Significant Difference post hoc tests.

The formula to compute a Tukey’s HSD test follows:

Tukey’s HSD test \[ HSD = q_{\alpha, C, N-C} \sqrt{MSE/n} \]

Where:
Paired Sample t Test

This test has applied by the researcher to analyze whether there is any significant difference in investment pattern of private life insurance sector in pre and post insurance investment regulation. This test has also applied by the researcher to analyze whether there is any significant difference in investment pattern of private non-life insurance sector in pre and post insurance investment regulation. Paired sample t test is a statistical test which is applied to find out whether there is a significant difference between the average values of the same measurement conducted under two different settings.

The null hypothesis (H₀) is that there is no significant difference between the two population means which denotes as:

\[ H₀: \mu_A - \mu_B = 0 \text{ or } H₀: \mu_A = \mu_B \]

Alternate hypothesis H₁ is that there is significant difference between two population means which denotes as

\[ H₁: \mu_A - \mu_B \neq 0 \text{ or } H₁: \mu_A \neq \mu_B \]

Formula for the paired sample t test:

\[ t_{\text{obtained}} = \frac{\overline{D} - \mu_D}{s_D} = \frac{\overline{D} - \mu_D}{s_D \sqrt{\frac{n}{n-1}}} \]

Under the null hypothesis, \( \mu_D = 0 \), so our formula becomes

\[ t_{\text{obtained}} = \frac{\overline{D}}{s_D} = \frac{\overline{D}}{s_D \sqrt{\frac{n}{n-1}}} \]

where

degree of freedom = \( n - 1 \)

\( \overline{D} = \frac{\sum D_i}{n} \) is the mean
\[ SD^2 = \frac{\sum (d_i - \bar{D})^2}{n-1} \] is the variance and the positive square root \(|SD|\) is the standard deviation of the differences \(D_i\) (i = 1, 2, ...., n).

**Data Envelopment Analysis**

The researcher has applied DEA models to analyze investment efficiency of 12 private life insurance companies and 8 private non life insurance companies for the financial years 2002-03 to 2014-15. The Indian insurance industry is still in its nascent stage, so it makes sense to use Charnes, Cooper and Rhodes (CCR) model and Banker, Charnes and Cooper (BCC) model to calculate technical efficiency, pure technical efficiency and scale efficiency. Output orientation (the Linear Programming is oriented to maximum possible increase in outputs) is opted for the investment model, since the investment managers want to maximize the investment gains.

**Model for Analysis of Investment Efficiency**

The study utilized both BCC and CCR envelopment surfaces to examine scale efficiency issues as given in equation 1 and equation 2. The mathematical solution to implement the conceptual model is given in equation 1 and equation 2. Assume there are data on K inputs and M outputs on each of N firms or decision making units. For the i-th decision making unit these are represented by vectors of \(x_i\) and \(y_i\) respectively. The K*N input matrix, X, and the M*N output matrix, Y, represent data of all N decision making units. \(\lambda\) is a vector of constant.
Equation 1 represents output oriented CCR DEA model and Equation 2 represents output oriented BCC DEA model.

\[
\begin{align*}
\text{Max}_{\Phi, \lambda} & \Phi, \\
\lambda Y & \geq \Phi y_i \quad \text{(equation 1)} \\
\lambda X & \leq x_i \\
\lambda & \geq 0
\end{align*}
\]

Performing a DEA analysis requires the solution of \( N \) linear programming problems of the above form, one for each decision making unit. In the study, there are data on twelve life insurance companies for 13 years; hence there are twelve linear programming problems for CCR DEA to be solved in a particular year. While eight non-life insurance companies are taken into consideration for 13 years, hence there are eight linear programming problems for CCR DEA to be solved in a particular year. The CRS linear programming can be easily modified to account for VRS by adding the convexity constraint: \( N^1 \lambda = 1 \) to equation 1 to provide:

\[
\begin{align*}
\text{Max}_{\Phi, \lambda} & \Phi, \\
\lambda Y & \geq \Phi y_i \quad \text{(equation 2)} \\
\lambda X & \leq x_i \\
N^1 \lambda & = 1 \\
\lambda & \geq 0
\end{align*}
\]

\( N^1 \) is \( N^*1 \) vector of ones. The approach forms a convex hull of intersecting plans which envelope the data point more tightly than CRS hull and thus provide technical efficiency score which is greater than or equal to those obtained using the CRS model.

Note that the linear programming problem given in equation 2 must be solved \( N \) times, once for each decision making unit in the sample for a particular year. In the study, there are data on twelve life insurance companies for 13 years; hence there are twelve linear programming problems for VRS DEA to be solved in a particular year. While eight non-life insurance companies are taken into consideration for 13 years, hence there are eight linear programming problems for VRS DEA to be solved in a particular year.
Furthermore, it is important to point out that peer count of a firm represents the extent of its robustness compared with other efficient firms. The higher number of peer count of a firm represents that it is more robust than other efficient firms. Specifically, a firm with higher peer count is probably efficient one with respect to large number of factors and likely to be a good example of a “global leader”.

**Variables and Proxies Measures**

The selection of variables and their measurements are primarily based on the prior theoretical and empirical findings and the availability of data.

Government securities investments, housing & infrastructure investments, and approved & other investments are taken to analyze investment pattern of insurance companies.

To analyze investment efficiency total investment is taken as input and investment income to shareholders & investment income to policyholders are taken as output variables.

**Proxy Measures for Variables of Investment Pattern**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Proxy measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government securities investments</td>
<td>Central government securities, state government securities or other approved Securities investments/ Total investment</td>
</tr>
<tr>
<td>Housing &amp; infrastructure investments</td>
<td>Housing &amp; infrastructure investments/ Total investment</td>
</tr>
<tr>
<td>Approved &amp; other investments</td>
<td>Approved &amp; other investments/ Total investment</td>
</tr>
</tbody>
</table>
Proxy Measures for Input Output Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Proxy measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input variable</td>
<td>Total investment</td>
</tr>
<tr>
<td>Output variables</td>
<td>Investment income to shareholders</td>
</tr>
<tr>
<td></td>
<td>Investment income to policyholders</td>
</tr>
</tbody>
</table>

Structure of the Research

In order to achieve objectives of the present study, the entire work has been broadly divided into following six chapters.

The present chapter “Introduction and Research Design of the Study” provides introductory background on investment pattern of insurance sector and explains the importance of study on the subject matter. The chapter defines the statement of problem, research gap, research objectives, hypotheses, and explain the scope, expected contribution and limitations of the study. It also deals with entire methodological process of the study. Under this part, sample scheme, data sources, sampling techniques, statistical tools & techniques, and variables and proxies measures are also discussed.

Chapter II “Review of Literature” is devoted to review the existing theoretical and empirical literature on present status, challenges and future prospect of insurance industry, investment pattern of insurance companies, investment regulation of insurance companies and investment performance of insurance companies.

Chapter III “Privatization of Insurance Sector in India” deals with the concept of privatization, rationale of privatization both positive and negative, shortcoming of privatization, privatization in India, economic and financial sector reform and privatization of Indian insurance sector in detail which covers formation of the committee for reform in the insurance sector, establishment of IRDAI, entrance of private companies and growth and development of Indian insurance sector during post privatization.

Chapter IV “Investment Pattern of Insurance Sector in India” provides concept of investment in insurance companies, the approach of investment, principles of insurance
investment and determinants of investment pattern of insurance sector in detail. This chapter also presents growth and trends of investment of insurance sector.

Chapter V “Investment Pattern of Private Insurance Sector in India since 2000: Analysis and Interpretation” analyses the investment pattern of private insurance companies and evaluates investment pattern of private insurance sector pre and post insurance investment regulation. Furthermore, the study analyses investment efficiency of private insurance companies. The finding of this chapter provides better understanding of investment pattern of private insurance companies.

Chapter VI “Findings, Conclusion and Suggestions” concludes the research finding and offers suggestions. Finally it provides direction for future research on the subject matters.

Findings of the Study

The findings are based on in depth investigation of the research problem and analysis of the data. The major findings of research are:

Findings Related to Investment Pattern of Private Insurance Companies

This section deals with findings related to investment pattern of private insurance companies. Under this section, findings related to hypothesis 1 and hypothesis 2 are presented. In India, investment pattern of insurance companies is broadly divided into three categories. These are government securities investments; housing & infrastructure investments; and approved & other investments.

Private Life Insurance Companies

- Investments in government securities by private life insurance companies have declined during the study period. From the one-way ANOVA statistic a significant difference is found in government securities investments of selected private life insurance companies of India during 2003-15. From the Tukey’s HSD post hoc analysis, it is found that seven mean comparisons are statistically significantly different which are AVIVA Life and Max Life (0.038), Birla Life and Max Life (0.000), Birla Life and MET Life (0.026), Birla Life and SBI LIFE
(0.013), Birla Life and TATA Life (0.000), ICICI Life and MAX Life (0.002) and finally between ICICI Life and TATA Life (0.005).

- It is found that private life insurance companies’ investments in housing & infrastructure have shrunk during the study period. The one-way ANOVA statistic shows that there is a statistically significant difference in housing & infrastructure investments across selected private life insurance companies. Examination of the Tukey’s HSD post hoc analysis finds that statistically significant difference exist between six mean comparisons which are Birla Life and Exide Life (0.004), Birla Life and MAX Life (0.000), Birla Life and MET Life (0.001), ICICI Life and Exide Life (0.005), ICICI Life and MAX Life (0.000) and finally between ICICI Life and MET Life (0.001).

- Approved & other investments have shown a substantial increase from 2002-03 to 2014-15. The result of one-way ANOVA shows that there is a statistically significant difference in approved & other investments across private life insurance companies. Examination of the Tukey’s HSD post hoc analysis reveals that there is statistically significant difference between AVIVA life and Max Life (0.042), Birla Life and Exide Life (0.030), Birla Life and MAX Life (0.000), Birla Life and MET Life (0.010), Birla Life and SBI LIFE (0.025), Birla Life and TATA Life (0.001), ICICI Life and MAX Life (0.001) and finally between ICICI Life and TATA Life (0.005).

**Private Non-Life Insurance Companies**

- It is found that government securities investments by private non-life insurance companies have shown a decline from 2002-03 to 2014-15. Based on the result of one-way ANOVA, it is found that there is a statistically significant difference in government securities investment across private non-life insurance companies. Examination of the Tukey’s HSD post hoc analysis reveals that three mean comparisons are significantly different which are Bajaj General and TATA General (0.036), IFFCO General and TATA General (0.031), and finally Royal General and TATA General (0.014).
Housing & infrastructure investments by private non-life insurance companies have shown upward movement from 2002-03 to 2014-15. The result of one-way ANOVA shows that there is a statistically significant difference in housing & infrastructure investments across private non-life insurance companies. The result of Tukey’s HSD post hoc analysis finds that twelve mean comparisons are significantly different. These are between Bajaj General and Royal General (0.000), Chola MS General and Royal General (0.000), HDFC General and Royal General (0.000), ICICI General and Royal General (0.000), IFFCO General and Royal General (0.000) and Reliance and Royal (0.000), Bajaj General and TATA general (0.049), Chola MS General and TATA General (0.000), HDFC General and TATA General (0.007), ICICI General and TATA General (0.005), IFFCO General and TATA General (0.002) and finally Reliance General and TATA General (0.002).

Approved & other investments by private non-life insurance companies have shown substantial fluctuation during 2002-03 to 2014-15. These investments show negative movement for Bajaj General, ICICI General, IFFCO General, Royal General, and finally TATA General. Chola MS General, HDFC General and Reliance General have shown positive movement. The result of one-way ANOVA indicates that there is a statistically significant difference in approved & other investments across private non-life insurance companies. Examination of the Tukey’s HSD post hoc analysis reveals that statistically significant difference exist between nine mean comparisons which are Bajaj General and TATA General (0.000), Chola MS General and TATA General (0.000), HDFC General and TATA General (0.000), ICICI General and TATA General (0.000), IFFCO General and TATA General (0.000), Reliance General and TATA General (0.000), ICICI General and Royal General (0.036), IFFCO General and Royal General (0.006), and finally Reliance General and Royal General (0.026).
Findings Related to Insurance Investment Regulation and Investment Pattern of Private Insurance Sector

In this section findings related to comparison of government securities investments; housing & infrastructure investments; and approved & other investments of private life insurance sector in pre and post insurance investment (amendment) regulation 2008 are presented. This section also covered findings related to comparison of government securities investments; housing & infrastructure investments; and approved & other investments of private non-life sector in pre and post insurance investment (amendment) regulation 2008. Data pertaining to private life and non-life insurance sector consists of all companies operating in India during 2001-02 to 2014-15.

Life Insurance Companies

- It is found that private life sector has invested more in government securities in pre regulatory framework than post regulatory framework. Mean government securities investments of private life insurance sector is 33.942 per cent in pre regulatory framework and 15.633 per cent in post regulatory framework. However, the result of paired sample t test shows that there is no significant difference in government securities investments of private life insurance sector during pre and post regulatory framework.

- Private life sector investments in housing & infrastructure are little bit more in pre regulatory framework as compared to post regulatory framework. Its mean investment in housing & infrastructure is 9.289 per cent in pre regulatory framework and 4.388 per cent in post regulatory framework. The paired sample statistic shows that there is no significant difference in housing & infrastructure investments of private life insurance sector during pre and post regulatory framework.

- Mean investment of private life insurance sector in approved & other investments is 57.010 per cent in pre regulatory framework and 79.976 in post regulatory framework which indicates that they have invested less in this category of investment in pre regulatory framework than post regulatory framework. However, according to the result of the paired sample t-test analysis, no
significant difference exist in approved & other investments of private life insurance sector during pre and post regulatory framework.

**Non-Life Insurance Companies**

- Private non-life sector investments in government securities are higher in pre regulatory framework as compared to post regulatory framework. Its mean investment in these securities is 43.348 per cent in pre regulatory framework and 34.679 per cent in post regulatory framework. The result of the paired sample t-test analysis reveals that there is significant difference in government securities investments of private non-life insurance sector during pre and post regulatory framework.

- It is found that private non-life sector has invested less in housing & infrastructure in pre regulatory framework than post regulatory framework. Mean investment of private non-life insurance sector in housing & infrastructure is 23.730 per cent in pre regulatory framework and 30.466 per cent in post regulatory framework. The result of the paired sample t-test analysis reveals that there is significant difference in housing & infrastructure investments of private non-life insurance sector during pre and post regulatory framework.

- Mean investment of private non-life insurance sector in approved & other investments is 32.904 per cent in pre regulatory framework and 34.852 per cent in post regulatory framework which indicates that private non-life sector has invested less in this category of investment in pre regulatory framework than post regulatory framework. However, the result of the paired sample t-test analysis shows that there is no significant difference in approved & other investments of private non-life insurance sector during pre and post regulatory framework.

**Findings Related to Investment Efficiency of Private Insurance Companies**

The investment efficiency evaluation of the sample private life and non-life insurance companies has been carried out with the help of DEA. In this section findings related to the investment efficiency evaluation of the sample private life and non-life insurance companies are presented.
Life Insurance Companies

- In case of CRS, investment efficiency of private life insurance industry has shown an increasing trend from 2002-03 to 2014-15. Average efficiency score was as high as 0.864 in 2014-15 and in 2002-03 it was as low as 0.473. Aviva Life scored highest rank in OTE with mean efficiency score estimated to be 0.879 and HDFC Life scored lowest rank in OTE with mean efficiency stood at 0.575. It can be observed from the table 6.31 that five private life insurers show efficiency score in between 0.75 to 1; and seven private life insurers report efficiency score in between 0.50 to 0.75 on CRS. Hence, five (41.66%) private life insurers are found to be investment efficient out of twelve private life insurers.

- In case of VRS, average efficiency score has increased from 0.836 in 2002-03 to 0.938 in 2014-15 which shows an upward trend in investment efficiency of private life insurers. Aviva Life scored highest rank as mean efficiency stood at 0.980 and Birla Life scored lowest rank as mean efficiency stood at 0.721. It is found that ten private life insurers show efficiency score in between 0.75 to 1 and rest are placed under 0.50 to 0.75. Therefore, ten (83.33%) private life insurers are investment efficient out of twelve private life insurers.

- Average scale efficiency score has increased from 0.566 in 2002-03 to 0.923 in 2014-15 which reflects an improvement in investment efficiency of private life insurers. Met Life scored highest rank in scale efficiency as average efficiency score stood at 0.928 while ICICI Life scored lowest rank as average efficiency score is estimated to be 0.705. In case of scale efficiency, it is found that eleven private life insurers fall under 0.75 to 1. It is important to note that eleven (91.66%) private life insurers are investment efficient out of twelve private life insurers.

- During all years under study, most of private life companies have marked decreasing return to scale except in the year 2010-11 when no private insurer depicted decreasing return to scale. Decreasing return to scale reveals that increase in output has been less than proportionate increase in input. However it is important to note that in year 2010, 2011 and 2014, good number of insurers
depicted increasing return to scale which reveals increase in output has been more than proportionate increase in input.

**Non-Life Insurance Companies**

- Average overall technical efficiency score has increased from 0.185 in 2002-03 to 0.828 in 2014-15 which exhibits an increasing trend in investment efficiency of private non-life insurance companies. Reliance General got highest mean efficiency stood at 0.907 and HDFC General scored lowest mean efficiency stood at 0.758. It is found that all non-life insurers show investment efficiency score in between 0.75 to 1. Therefore, all private non-life insurers are efficient.

- In case of VRS, investment efficiency of private non-life insurance industry has shown an increasing trend from 2002-03 to 2014-15. Average efficiency score was as high as 0.974 in 2014-15 and in 2002-03 it was as low as 0.704. ICICI General scored highest mean efficiency stood at 0.982 and Royal General got lowest mean efficiency stood at 0.878. Furthermore, it is found that all non-life insurers show investment efficiency score in between 0.75 to 1 and all private non-life insurers are efficient.

- Average scale efficiency score was 0.228 in 2002-03 and 0.930 in 2014-15 which exhibits an improvement in investment efficiency of private non-life insurance companies. Reliance General got highest mean scale efficiency score stood at 0.962 and lowest mean efficiency score stood at 0.796 reported by HDFC General. It is found that all non-life insurers show investment efficiency score in between 0.75 to 1 and all private non-life insurers are efficient.

- During all the years under study, maximum insurers have marked increasing return to scale except in the year 2002-03 when no private insurer depicted increasing return to scale. However insurers also revealed decreasing return to scale except 2005-06 and 2007-08.
<table>
<thead>
<tr>
<th>S. No.</th>
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<tr>
<td>1</td>
<td>H₀₁: There is no significant difference in investment pattern across private life insurance companies.</td>
<td>One way ANOVA</td>
<td>P value (.000) &lt; 0.05 (Significant)</td>
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<td>H₀₁.1: There is no significant difference in government securities investments across private life insurance companies.</td>
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<td>H₀₁.2: There is no significant difference in housing &amp; infrastructure investments across private life insurance companies.</td>
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<td>H₀₁.3: There is no significant difference in approved &amp; other investments across private life insurance companies.</td>
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<td>H₀₂: There is no significant difference in investment pattern across private non life insurance companies.</td>
<td>One way ANOVA</td>
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<td>H₀₂.1: There is no significant difference in government securities investments across private non life insurance companies.</td>
<td>One way ANOVA</td>
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<td><strong>H₀₄.₁:</strong> There is no significant difference in government securities investments of private non-life insurance sector in pre and post insurance investment regulation.</td>
<td>P value (.028) &lt; 0.05 (Significant)</td>
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<td><strong>H₀₄.₂:</strong> There is no significant difference in housing &amp; infrastructure investments of private non-life insurance sector</td>
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<td>H₀</td>
<td>Private life insurance companies are not investment efficient.</td>
<td>Data Envelopment Analysis</td>
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<td><strong>5</strong></td>
<td><strong>H₀5.1</strong>: Private life insurance companies are not investment efficient on constant return to scale.</td>
<td>5 (41.66%) private life insurers are efficient out of 12 private life insurers.</td>
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<td><strong>H₀5.2</strong>: Private life insurance companies are not investment efficient on variable return to scale.</td>
<td>Ten (83.33%) private life insurers are efficient out of 12 private life insurers.</td>
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<td></td>
<td><strong>H₀5.3</strong>: Private life insurance companies are not investment efficient on scale efficiency measure.</td>
<td>11 (91.66%) private life insurers are efficient out of 12 private life insurers.</td>
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<td></td>
<td><strong>H₀6</strong>: Private life insurance companies are not investment efficient.</td>
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<td><strong>6</strong></td>
<td><strong>H₀6.1</strong>: Private non-life insurance companies are not investment efficient on constant return to scale.</td>
<td>All private non-life insurers are efficient out of 8 private non-life insurers.</td>
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<td><strong>H₀6.2</strong>: Private non-life insurance companies are not investment efficient on variable return to scale.</td>
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<tr>
<td>H₀6.3: Private non-life insurance companies are not investment efficient on scale efficiency measure.</td>
<td>All private non-life insurers are efficient out of 8 private non-life insurers.</td>
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*Source: Developed on the basis of the results of the test undertaken*
Suggestions

Suggestions for Insurance Companies

It is generally perceived that insurance companies’ investment portfolio is determined by the regulations and they do not have enough space to perform their investment functions. However, the study finds that investment pattern of private insurance companies differs. This shows that insurance companies have their own investment style & philosophy and they have imperative role to play in their asset management. Investment efficiency of private insurance companies has been improved over the years. This can be seen in the findings relating to investment efficiency of insurance companies on constant return to scale, variable return to scale and scale efficiency measures. The study offers some suggestions for insurance companies, these are:

- Insurance companies should have a pool of investment managers and trustees with a deep reservoir of skill sets. Insurance companies should not be overlook regulatory constraints and investment managers have to naturally do a ‘tight ropewalk’ and still end up successful. With product proliferation and increased competition in the investment market, it is not easy for insurance companies to compete without continuous improvement in skill of asset allocation, portfolio design and investment research. Investment managers should put their acumen to ensure that investments should be made in a profitable manner. Insurance companies should painstakingly select persons to the investment committee and assess board-led governance processes. Capacity building needs to take place across the board to enable fund managers, compliance officers, and risk administrators to enhance their skills and deliver improved returns to investors. Besides, a successful investment portfolio entails high degree of involvement and use of the actuarial science. Thankfully, the actuarial resources in India are progressively seeing a gigantic development over the last couple of decades. Actuarial skills would go far in handling the complexities related to insurance investments.
• Investment performance is a critical success factor since it affects the whole performance of business management. Insurers must sustain their relative efficiency because declining profit could cause serious business failure. Investment performance extends the ability of an insurer to deliver higher rate of return to its policy owners and shareholders. Good investment performance can enhance its competitive position. Fortunately, investment efficiency of private life and private non-life insurance companies has been improved over the years. It is hence very important for the insurance firms to keep up their investment performance and try to improve it further.

• In spite of the fact that the primary objective of insurers is to fulfill their obligation, they cannot disregard the significance of maximizing returns without undermining the credit quality of the portfolio. Insurers could maximize their efficiency if proper investment strategies are adopted. Therefore, investment portfolio of insurance companies should be diligently built up. They should estimate the risks and future expected return of various asset classes in which they are going to invest. Good asset management could generate higher returns adding to the bottom line of the firm. It might likewise prompt the insurer to handle higher insurance exposure.

• There has to be a clearly defined policy for the insurer’s management and its board for reviewing the investment management process. It should cover periodically written portfolio reviews including a discussion of the investment portfolio’s results, its compliance to investment guidelines and its risk position.

• Insurance companies should rigorously design their risk management framework. They generally confront two major risks: underwriting risk and investment risk. Insurance companies have to diversify investments in order to minimize risk. More investment risk in their investment portfolio ordinarily brings about higher expected returns but it also tends to increase their asset-liability mismatch thereby imperilling future insurance benefits. Insurance companies should invest according to risk/return objectives reasonably suited to them. Insurance investment managers should invest only in those assets whose risk they can appropriately identify, measure, manage, monitor, control and report. They should
conduct extensive analysis into investment risk issues and design investment risk parameters. Insurance companies should do exhaustive work on risk-predictive and risk-mitigation models. They can partially curtail risk by investing in commodities, derivatives and inflation-indexed bonds.

- Proper reporting of diverse aspects of insurance business to the regulator is of vital significance especially in areas that are strictly mandated. There should be timely divulgence of the particulars by insurance companies to enable the regulator to analyze the composition of their investments. Disclosure of information would also empower policyholder and shareholders to deliberately make their decisions. The investment committees of the insurers should bear out that there is not the slightest chuck hole in the timely reporting of their investment activities.

- The nature of the funds’ flow in insurance business essentially creates demand for investment of such funds in highly profitable manner and claims those come up for payments must be regarded. On the other hand, the nature of the business implies that the availability of funds is not at the helm of insurers because it is subject to the payment of premiums by the policyholders regularly. As such, the asset liability management calls for exactitude because life and general insurance businesses are influenced by AM risks on a potentially bigger scale because of liquidity risk. Scrimpy liquid assets to meet cash flow requirements could cause forceful selling of securities which adversely impact the profitability. There is nothing termed as a perfect ALM. The mismatch is undoubtedly being there, but it’s the accountability of insurers to measure the risk and report the investment team of the probable risk or liabilities. The investment team should appropriately identify securities matching these potential liabilities. Insurers should ensure that adequate sum is put into liquid assets to meet any commitments.

**Suggestions for the Regulator**

In India, there are extensive regulations governing investment pattern of insurance companies. There are quantitative investment limit for investment in certain classes of securities. These restrictions seem to suppress insurance companies from realization of
their potential and adopting a more risky investment strategy. Also, exiguous supply of assets averts investment in those securities. The study finds that insurance companies’ investment in government securities has been come down which shows their inclination towards securities with attractive risk/return profile. The IRDAI investment regulations 2008 & 2013 include new classes of securities under ambit of insurance investment and there are some important guidelines on insurance business in general and ULIP business in particular. So, relaxed regulation could improve investment portfolio of insurance companies. Therefore, the following suggestions are made by the researcher for the regulator:

- There should be freedom for insurance companies to invest in broad range of securities i.e. additional equities, derivatives (including futures, options and credit default swaps), alternatives (private equities, venture funds and hedge funds), real estate and infrastructure projects. But insurance companies are unable to make investments in some highly profitable projects because they do not come under approved investments.

- Regulator should permit insurance companies to put a higher percentage of their investible funds in securities with credit rating below AAA. At present, regulatory guidelines mandated that at least 75% of debt instruments, excluding government and other approved securities, shall have an AAA or equivalent credit rating. Because of this condition, insurance sector exposure to infrastructure projects gets confined to only AAA paper, most of which are issued by public sector companies. Insurance sector has the ability to invest in long dated bonds, albeit they are below the desired credit rating. There are some projects which become unprofitable in initial stage but highly profitable in later stage like infrastructure projects, venture funds etc. But, they do not come under approved investment. The study suggests that ambit of approved investments should be enlarged.

- At present, insurance companies can’t invest more than 10% in any single company. The regulator should rethink the applicability of this condition in the current environment, especially when the current shallow market does not provide enough space for large investors to invest elsewhere profitably.
It is apparent that the era of directed investments is over and the time has come to hunt down new paradigms. Investment philosophy relating to the insurance business has to shift to the prudent person rule. Nevertheless, it must be kept in mind that such a big shift cannot happen without risks and due consideration has to be taken while proceeding to this new investment regime. The reason behind this measure is simple. The study after reviewing various literatures feels that the concern for preserving the investors’ capital should stay vital in any case but not at the cost of abrading their real returns. Indians parting their savings with insurance should get a positive real rate of return. Individuals save in their working years so that a fund is accessible to finance consumption during years spent in retirement. Getting a marginal addition to the original corpus is injustice to the investors.

Customers should have adequate, accurate and reliable information accessible in the public domain which they can use to compare and take a good decision before selecting any insurance fund. It is vital for the regulator to ensure adequate and timely disclosure of information.

As a precautionary measure, the regulator should set down rules and standards concerning fit and appropriate persons that can be designated to the investment committee and stipulate specified guidelines on the broad principles of the administration processes, including risk management and risk mitigation. This should take into account knowledge, expertise and experience of the person being appointed to the committee.

Existing regulations and guidelines restrict insurance companies from investing in equity and debentures of private limited companies. This rule might have had some rationale before but in the present scenario it looks illogical. Most infrastructure projects are managed by private limited companies. These firms are termed as Special Purpose Vehicles (SPVs) which is expected to lend funds for projects in the airports, roads and tourism sector. Consequently, these remain out of the investment realm of insurance companies. This rule, therefore, has to be scrapped or modified.
• There is a great need to develop corporate bonds market in India particularly long term debt market. Life insurance companies have huge amount of funds to be invested in long term due to long term nature of their policy liabilities. But there is a lack of long-term instrument in corporate bond market. The majority of corporate bond are presently available with maturity of 2-5 years while life insurance companies would like to invest for duration of 10 years or more. Therefore, insurance companies are not getting enough space available for investments in Indian bond market in the context of IRDAI’s current regulatory framework. Therefore, government should take initiatives to resolve the outstanding issue to develop corporate bond market. Lastly, issuers of corporate debt abstain from disclosing information unless requested with regard to borrowing program. Every company should publish a borrowing calendar in the same way the government reports its borrowing schedule. This would help companies to plan the cash flows. Also such disclosure will promote good corporate governance.

• In India, it is mandatory for insurance companies to have an in-house investment team. The major drawback of this is for smaller companies with smaller fund size which might not have expertise to the level that is really required. So it could have been easier to access outside fund managing expertise. Fund management is a very specialized job and needs experts to understand various facets of asset management. Increased competitive pressure, regulatory limits, accounting standards and new class of risks are generating tremendous pressure on fund managers. Therefore, outsourcing of investment functions can enable insurance companies to achieve considerable cost saving. Indian insurers need to think of improving fund management skills and efficiency by many fold or to resort the support of a third party asset management company. As a result, an outsourcing of investment function is more expedient alternative for many insurers. If external fund management arrangement is carefully selected, it will give smaller insurers sufficient investment proficiency and expertise at a reasonable cost.
Limitations of Research

1. First and foremost, only private life and non life insurance companies have been included in final sample. Yet public sector represents a large market share and contributes a lot to industry.

2. Indian insurance companies include 23 private life insurance companies and 17 private non life insurance companies (excluding standalone health insurance companies) out of which 12 from private life and 8 from private non life insurance company taken as sample.

3. The reference period has been taken from the post liberalization period that range from 2000-2015, but due to unavailability of data before 2002-03 the researcher has taken data from 2003 to 2015.

Direction for Future Research

The present study is an attempt to analyze investment pattern of private life and private non-life insurance companies in India. The study is also made an honest attempt to evaluate investment efficiency of private life and non-life insurance companies in India. Although, the present study has contributed significantly, it has simultaneously opened new frontiers for future research. There are various research issues which have not been addressed in this study and need further investigation. Some of the issues that have forward for future research are as follows:

- The study considers the classification of the investment pattern according to investment regulation (government securities, housing & infrastructure investment, and approved & other investment). However, research can also be conducted on different categorization such as security wise classification (equities, debentures, mutual funds etc.,), duration wise classification (long term investments and short term investments) and classification according to stakeholders (shareholders’ investments and policyholders’ investments).
- The area of research may also include the determinants of investment pattern which are not touched in this thesis such as impact of firm specific factors (firm
size, leverage, liquidity, profitability and reinsurance) and macro-economic factors (inflation, interest rate, capital market condition and tax policies).

- The study considers investment pattern, investment regulation and investment efficiency only in context of India. A cross country comparison of investment pattern, investment regulation and investment efficiency can also be carried out.