

CHAPTER-3

RESEARCH METHODOLOGY

3.1. INTRODUCTION

Research methodology is a crucial component of any academic study, providing the systematic plan and structure that guide the entire research process. It outlines the procedures, techniques, and tools used to collect, analyse, and interpret data in a manner that ensures accuracy, validity, and reliability. For a study to be credible and scientifically grounded, the methodology must be clearly defined and appropriately aligned with the research objectives.

This chapter presents the research methodology adopted for the study titled, *"Comparative Financial Analysis of Public Non-Life Insurance Companies & Selected Private Non-Life Insurance Companies with Reference to the CARMEL Model."* The primary aim of this research is to evaluate and compare the financial soundness and performance of selected non-life insurers in India using the CARMEL framework, which incorporates essential financial indicators such as capital adequacy, asset quality, management efficiency, earnings quality, and liquidity.

The methodology chapter elaborates on various aspects, including the research design, the population and sample of the study, data sources, time frame, tools of analysis, and hypothesis formulation. The study is primarily analytical in nature and is based on secondary data collected from published financial reports and regulatory documents. The selected time frame of ten years (2013–14 to 2022–23) provides a comprehensive period for examining long-term financial trends and performance variations.

By employing appropriate statistical tools and ratio analysis, the study attempts to highlight significant differences between public and private sector non-life insurance companies. The methodology also ensures that the research process remains objective, consistent, and free from personal bias. In doing so, it lays a strong foundation for achieving the research objectives and deriving meaningful insights that can contribute to financial decision-making, policy formulation, and further academic exploration within the insurance sector.

3.2. RESEARCH PROBLEMS

In recent decades, the Indian insurance sector has undergone significant transformation, particularly after the liberalization of the industry and the entry of private players. The non-life insurance segment, which covers general insurance services like health, motor,

fire, and marine, plays a vital role in risk mitigation and economic stability. Both public and private sector companies operate within this space, regulated by the Insurance Regulatory and Development Authority of India (IRDAI). While public insurers have a legacy presence and extensive reach, private insurers have brought technological advancements, customer-centric innovations, and competitive pricing strategies.

Despite this evolution, there remains a pressing need to assess and compare the financial performance and stability of public and private non-life insurance companies. Financial soundness is essential not only for an insurer's sustainability but also for the protection of policyholders' interests and for maintaining public trust in the insurance ecosystem. However, many previous studies have tended to focus on isolated aspects such as profitability or solvency alone, lacking a holistic evaluation framework.

This research identifies a critical gap in the literature: the absence of an integrated financial performance evaluation model that encompasses multiple dimensions of an insurer's financial health. The CARMEL model—which stands for Capital Adequacy, Asset Quality, Reinsurance and Actuarial Issues, Management Efficiency, Earnings Quality, and Liquidity—offers a comprehensive tool for such an analysis. While this model has been applied in banking and finance sectors, its application in non-life insurance, especially in the Indian context, is limited.

Furthermore, public and private insurers operate under different business models, management styles, customer bases, and operational challenges. As a result, their financial performances may vary significantly. Understanding these differences is essential for regulators, policymakers, investors, and company executives. However, there is a lack of empirical studies that systematically compare these two groups using uniform metrics over a substantial time period.

Another challenge lies in data availability and reliability. Although insurers are required to disclose financial information, inconsistencies in reporting standards, varying levels of transparency, and limited access to actuarial data make comprehensive comparisons difficult. This study seeks to overcome such issues by relying on authentic secondary

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sources such as IRDAI publications, audited financial statements, and company reports, covering a ten-year span from 2013–14 to 2022–23.

In light of these concerns, the research problem may be stated as: “How do public and selected private non-life insurance companies in India compare in terms of financial performance and soundness, when evaluated under the parameters of the CARMEL model over a decade-long period?”

By addressing this question, the study aims to contribute meaningful insights into the financial dynamics of the insurance industry and offer a reliable evaluation model for future academic and policy-based research. The findings may help stakeholders make informed decisions and ensure long-term financial sustainability of the non-life insurance sector in India.

3.3. REVIEW OF LITERATURE

Some studies conducted in context with the financial analysis of Life insurance Corporations and General Insurance Companies in India have been studied separately in the Review of Literature chapter.

3.4. RESEARCH GAP

The Indian non-life insurance sector has witnessed substantial growth and structural transformation since the liberalization of the industry. With the entry of private players, the market has become more competitive, dynamic, and customer focused. Public sector insurers, with their vast experience and nationwide presence, continue to dominate in terms of outreach and social insurance penetration. On the other hand, private insurers have leveraged innovation, digital infrastructure, and marketing strategies to expand rapidly. While numerous studies have explored the financial performance of non-life insurers, most of them are either company-specific or focus on limited financial indicators such as profitability or solvency.

There exists a significant gap in the literature when it comes to a comprehensive and comparative financial analysis of public and private sector non-life insurance companies using a multidimensional evaluation framework. Earlier research has relied

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on conventional ratio analysis without integrating diverse components that affect financial health and sustainability. The CARMEL model—which includes Capital Adequacy, Asset Quality, Reinsurance and Actuarial Issues, Management Efficiency, Earnings Quality, and Liquidity—provides a more holistic tool for evaluating financial soundness, yet its application in the Indian non-life insurance sector remains limited. Furthermore, studies that do apply financial models often focus on a short time frame, failing to capture long-term trends or structural changes in the industry. There is also a lack of comparative analysis between public and private players under uniform criteria over an extended period. Additionally, the sectoral impact of regulatory developments, competitive pressure, and market volatility on financial metrics is insufficiently addressed in existing research.

This study aims to bridge these gaps by conducting a comparative financial performance evaluation of selected public and private non-life insurers in India over a ten-year period (2013–14 to 2022–23), using the CARMEL framework. It seeks to offer a balanced, in-depth understanding of financial stability, efficiency, and sustainability across different ownership structures, contributing to both academic discourse and practical policy formulation.

3.5. RESEARCH TITLE

The present study focuses on financial evaluation of Indian general insurance companies. So, the title of the study is “**COMPARATIVE FINANCIAL ANALYSIS OF PUBLIC NON-LIFE INSURANCE COMPANIES AND SELECTED PRIVATE NON-LIFE INSURANCE COMPANIES WITH REFERENCE TO CARMEL MODEL**”

3.6. RESEARCH SCOPE

Insurance industry generally encounters risk of underwriting, investment, management, business and legal risk. This industry must overcome the risk of solvency and liquidity. Financial analysis and interpretation of the Insurance industry is difficult due to liabilities of claims and unexpected risk of future and reserve for that need to be maintained.

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There are different techniques and models developed to study the financial strength of insurance companies. Some of the models are Risk based capital, Financial Strength Rating, CARMEL model. CARMEL model was suggested by the IMF for financial evaluation of insurance companies.

In India, the Insurance sector is in its growth phase as India is a developing country, and the population is now aware about their safety and security especially after the corona pandemic. Insurance sector has a lot more to achieve in India, so this study will be helpful for users and investors.

3.7. RESEARCH DESIGN

A research design serves as the foundational framework that directs the entire research process in a structured, systematic, and logical manner. It defines the methodology for data collection, analysis, and interpretation, ensuring that the research objectives are met effectively and that hypotheses are addressed accurately. A robust research design enhances the reliability, validity, and objectivity of the study by minimizing potential biases and methodological errors.

The present study adopts a descriptive and analytical research design, which is well-suited for examining and comparing the financial performance of selected non-life insurance companies. The descriptive component facilitates the presentation of financial facts, trends, and performance status, while the analytical part focuses on in-depth evaluation using financial tools such as the CARMEL model. The study is entirely based on secondary data, sourced from credible platforms such as annual reports of insurers, IRDAI publications, and official websites.

• **POPULATION OF RESEARCH**

In India there are a total 32 insurers who are providing non-life insurance services.

- General Insurance 23 (public and Private)
- Standalone health 7 (providing only health insurance)
- Specialized 2(1 agriculture insurance and 1 export credit)

- **RESEARCH SAMPLE**

For better and exact results of study and analysis standalone health and specialized insurance companies have not taken in sample.

Out of a total 23 general companies, researcher has selected 8 companies for the study of which 4 will be public sector companies. From the remaining 19 private non-life insurance companies in India, researcher has selected 4 non-life insurance companies based on their market share in premium earned during year 2021.

Selected 08 Sample Non-Life Insurance Companies for Research are as follows :

PUBLIC SECTOR	PRIVATE SECTOR
<ul style="list-style-type: none">• The New India Assurance Co. Ltd.• The Oriental Insurance Co. Ltd.• National Insurance Co. Ltd.• United India Insurance Co. Ltd.	<ul style="list-style-type: none">• Bajaj Allianz General Insurance Co. Ltd.• TATA AIG General Insurance Co. Ltd.• IFFCO-TOKIO General Insurance Co. Ltd.• ICICI Lombard General Insurance Co. Ltd.

By selecting a representative sample based on company type and market strength, this research design facilitates a meaningful comparative analysis of financial performance under the CARMEL model. It provides a logical, coherent structure to evaluate differences and similarities in capital adequacy, asset quality, management efficiency, and other performance indicators between public and private sector non-life insurance companies in India.

3.8. RESERARCH OBJECTIVES

- To review the historical development and evolution of the insurance industry in India.
- To evaluate the overall financial strength and performance of non-life insurance companies operating in India.
- To interpret the CARMEL model and its application to the insurance industry.
- An assessment of the Asset Quality of Specific Indian non-life insurance companies included in the study.

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- An assessment of the Reinsurance and Actuarial issues of Specific Indian non-life insurance companies included in the study.
- An assessment of the Management efficiency of Specific Indian non-life insurance companies included in the study.
- An assessment of the Earnings and profitability of Specific Indian non-life insurance companies included in the study.
- An assessment of the financial soundness and Liquidity of Specific Indian non-life insurance companies included in the study.

3.9. RESEARCH HYPOTHESIS

1. Null Hypothesis (H₀):

There is no significant difference in capital adequacy among the selected public and private non-life insurance firms in India.

Alternative Hypothesis (H₁):

There is significant difference in capital adequacy among the selected public and private non-life insurance firms in India.

2. Null Hypothesis (H₀):

There is no significant difference in Asset Quality among the selected public and private non-life insurance firms in India.

Alternative Hypothesis (H₁):

There is significant difference in Asset Quality among the selected public and private non-life insurance firms in India.

3. Null Hypothesis (H₀):

There is no significant difference in risk protection among the selected public and private non-life insurance firms in India.

Alternative Hypothesis (H₁):

There is significant difference in risk protection among the selected public and private non-life insurance firms in India.

4. Null Hypothesis (H₀):

There is no significant difference in management efficiency among the selected public and private non-life insurance firms in India.

Alternative Hypothesis (H₁):

There is significant difference in management efficiency among the selected public and private non-life insurance firms in India.

5. Null Hypothesis (H₀):

There is no significant difference in claim ratio among the selected public and private non-life insurance firms in India.

Alternative Hypothesis (H₁):

There is significant difference in claim ratio among the selected public and private non-life insurance firms in India.

6. Null Hypothesis (H₀):

There is no significant difference in operating ratio among the selected public and private non-life insurance firms in India.

Alternative Hypothesis (H₁):

There is significant difference in operating ratio among the selected public and private non-life insurance firms in India.

3.10. ANALYTICAL FRAMEWORK

The analytical framework provides the foundation for evaluating the financial performance and soundness of selected non-life insurance companies. It defines the tools, techniques, and parameters used to process, analyze, and interpret the collected data systematically. In this study, the framework incorporates both accounting tools and statistical methods to ensure a comprehensive, objective, and data-driven evaluation.

ACCOUNTING TOOLS – RATIO ANALYSIS

Ratio analysis is one of the most widely used accounting tools in financial performance evaluation. It allows the researcher to measure various aspects of an organization's operations and financial health through a series of quantitative indicators. In the context

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of this study, key financial ratios are applied under the CARMEL model, which includes:

- **Capital Adequacy Ratios**
- **Asset Quality Ratios**
- **Reinsurance and Actuarial Ratios**
- **Management Efficiency Ratios**
- **Earnings and Profitability Ratios**
- **Liquidity Ratios**

These ratios provide meaningful insights into how efficiently insurance companies are managing capital, underwriting risk, maintaining solvency, and generating profits. The analysis also helps identify trends, strengths, and areas of concern over the ten-year study period.

GRAPHICAL PRESENTATION

In addition to numerical analysis, graphical representation has been used to illustrate the trends and comparisons more clearly. Charts and graphs, such as bar diagrams and line graphs, are used to depict the variation in financial ratios over time and across companies. These visuals enhance the interpretability of complex data, highlight disparities, and provide an intuitive understanding of key findings.

STATISTICAL TOOLS – ANOVA TEST

To complement ratio analysis and validate findings, the study employs Analysis of Variance (ANOVA) as a statistical tool. ANOVA is used to determine whether there are statistically significant differences in the financial performance indicators of public and private sector non-life insurance companies. By comparing the mean values of different financial ratios across multiple companies and time periods, ANOVA helps test the null hypothesis that no significant difference exists between the two groups.

The combination of ratio analysis and ANOVA enhances the robustness of the study. While ratio analysis provides detailed financial insights, ANOVA adds a layer of statistical validation, helping to support or reject assumptions made during the evaluation. Together, these tools form an integrated analytical framework, ensuring the reliability, objectivity, and academic rigor of the research.

3.11. UNCOVERED ASPECTS IN THE STUDY

- The study is based solely on secondary data, which may have inconsistencies or limited transparency.
- Only eight non-life insurance companies were selected, which may not represent the entire industry.
- Standalone health and specialized insurers were excluded due to differences in business models.
- External factors such as regulatory changes, economic disruptions, or market conditions were not considered in depth.
- Limited availability of uniform data for certain ratios across all companies constrained some areas of analysis.
- The findings are time-bound and may not reflect future performance trends or policy impacts.

3.12. BLUEPRINT OF THE CHAPTERS

- **Chapter-1 : The Insurance Industry : A Strategic Overview**
Strategic overview and history of insurance in India, defining risk and major insurance types, establishing context.
- **Chapter-2 : Literature Review**
Literature review—mapping both international and Indian research, identifying conceptual gaps and setting the theoretical base.
- **Chapter-3 : Research Methodology**
Research methodology—sample, data collection, hypothesis formulation, analytical tools.
- **Chapter-4 : Statistical Data Analysis**
Statistical data analysis and findings—detailed ratio analysis, ANOVA outputs, interpretation.
- **Chapter-5 : Conclusion, Findings & Suggestions**
Comprehensive discussion, actionable recommendations, conclusions, and suggested avenues for future research.