

Analyzing the financial performance and efficiency levels of general insurance companies in India

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Abstract

The present study investigates the Efficiency and Financial performance of Indian general insurers during the period 2016-2022. This study measures the level of efficiency of these firms by applying Data Envelopment Analysis (DEA) to identify trends in operating effectiveness, profitability, and solvency. Findings indicate that while public insurers flounder due to higher claims ratios and operating costs, private insurers generally perform well with respect to solvency and investment productivity. The practical advice on financial sustainability and regulatory compliance can be improved in the insurance industry of India. Benefit of stakeholders by assisting them to enhance the performance of the sector.

Subject Classification: 90, 90B50, 97M40.

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Introduction

This section focuses on the efficiency levels of Indian general insurance companies, as evaluated using Data Envelopment Analysis (DEA) across different time periods. Various researchers have analyzed the operational performance of both public and private sector insurers over distinct study durations. The following review summarizes and discusses the key findings from these studies, highlighting how efficiency levels have varied over time and across sectors based on different methodological approaches and sample selections. Sinha and Bandopadhyay, [1], conducted a study covering the period from 2004 to 2011, analyzing a sample of twelve general insurance companies

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from both the public and private sectors. The inputs considered were operating expenses and commissions, while the outputs included net premium and investment income. Their findings revealed that public sector insurers specifically United India, Oriental Insurance, New India Assurance, and National Insurance demonstrated higher technical efficiency compared to their private sector counterparts, although private companies such as ICICI Lombard, IFFCO Tokio, and Bajaj Allianz also exhibited notable efficiency.

Similarly, Sinha [5], examined the performance of Indian general insurance firms from 2011 to 2017, using a sample of ten companies from both sectors. Their study indicated that, overall, public sector insurers were more efficient during the period; however, private firms like Reliance, ICICI Lombard, and Bajaj Allianz showed superior performance in comparison to some public insurers. ICICI, Bajaj Allianz, United India, and Oriental Insurance consistently emerged as efficient players throughout the study. In another study, Druva Kumar et al. assessed the efficiency of Indian general insurance companies between 2015 and 2022. Their findings suggest that private sector insurers outperformed public sector firms in terms of operational efficiency during this period. Ghosh and Dey [4] in his study covering the period from 2009 to 2017, applied a two-stage DEA approach to assess the efficiency levels of 15 Indian general insurance companies. The findings indicate that in the first stage, private sector insurers outperformed public sector counterparts, whereas in the second stage, public sector companies demonstrated higher efficiency, influenced by the selection of inputs and outputs in the analysis.

Muthulakshmi and Muthumoni [7], evaluated the financial performance of public sector non-life insurance companies from 2009 to 2021, considering various factors that significantly impact financial outcomes. Their study found that New India Assurance and United India Insurance consistently performed well during the study period. Sinha [3], examined the overall efficiency of both public and private sector insurers using DEA for the period 2009 to 2013. His analysis involved two different DEA models to evaluate performance comprehensively. Similarly, Mandal and Dastidar [8], investigated the efficiency levels of 12 Indian general insurance companies between 2006 and 2009 using DEA. The study emphasizes the contrasting responses of public and private insurers during the economic recession, revealing that public sector firms maintained relatively stable efficiency, while private sector companies experienced notable declines, indicating their greater exposure to market fluctuations.

Joshi, Kumar, and Mehta [6], Their study found that insurers with lower expense ratios tended to achieve higher efficiency levels, as they were better able to manage operational costs while maximizing outputs such as premium income and claim settlements. Private insurers, in particular, demonstrated superior efficiency due to their cost-conscious strategies, streamlined operations, and greater reliance on technology for underwriting and claims processing. In contrast, public insurers struggled with higher administrative expenses and

slower operational processes, which reduced their overall efficiency. The study highlighted the importance of cost optimization and digital transformation in improving the financial performance of Indian insurance firms. Bhatia, Gupta, and Kumar [9], Their study highlighted those reforms introduced by the Insurance Regulatory and Development Authority of India (IRDAI), such as revised solvency norms, mandatory risk-based pricing, and increased foreign investment limits, significantly influenced the operational dynamics of insurers. While these regulations improved financial stability and transparency, they also increased compliance costs, which affected the efficiency of some firms, particularly public sector insurers. Private insurers adapted more quickly to the regulatory changes due to their agile business models and advanced technological adoption. The study concluded that while regulatory measures strengthened the industry's resilience, insurers needed to focus on cost efficiency and innovation to sustain profitability and competitiveness.

Mishra, Sharma, and Verma [10], Their study found that private insurers outperformed public sector insurers in terms of profitability and return on assets, mainly due to better underwriting practices, cost control, and digital adoption. Public insurers, while maintaining higher claim settlement ratios, faced challenges related to high operating expenses and slower claims processing. The research emphasized the role of technology-driven risk assessment, strategic investment portfolios, and cost-efficient operations in enhancing the financial stability and growth of general insurance firms in India. Gupta, Rao, and Kulkarni [11], Their research revealed that private insurers demonstrated higher efficiency and profitability due to better cost management, risk-based pricing, and advanced technology adoption in claims processing. Public insurers, despite having strong market presence and higher claim settlement ratios, struggled with higher expense ratios, bureaucratic inefficiencies, and slower digital transformation. The study concluded that for public insurers to improve efficiency and profitability, they needed to focus on automation, and optimized expense management, similar to their private counterparts.

Mehta, Sharma, and Kapoor [12], The study compared both public and private general insurers based on key performance indicators such as premium income, claim settlement ratios, and expense management. The findings revealed that private insurers, particularly ICICI Lombard and Bajaj Allianz, were among the most efficient firms, benefiting from cost optimization, digital innovation, and better risk management practices. Public insurers, while maintaining a strong market presence, lagged in efficiency due to higher administrative costs and slower adoption of technology. The study suggested that public insurers could improve efficiency by investing in automation, AI-driven underwriting, and enhanced customer service models. Bose, Desai, and Iyer [13], Their findings revealed that private insurers consistently outperformed public insurers in terms of operational and cost efficiency. This was attributed to superior expense management, advanced underwriting techniques, and greater adoption of digital technologies. Public insurers, despite having a higher claim settlement ratio and larger market share, faced inefficiencies due to higher

administrative costs, bureaucratic delays, and outdated processes. The study concluded that for public insurers to remain competitive, they needed to streamline operations, implement AI-driven claims management, and focus on cost reduction.

Chakraborty, Banerjee, and Nair [14], Their study found that private insurers demonstrated higher efficiency levels due to better cost control, faster claims processing, and advanced risk assessment techniques. Public insurers, while maintaining a higher claim settlement ratio, struggled with higher operational costs and inefficiencies in claims management. The research highlighted that technological adoption, automation, and streamlined administrative processes were key factors contributing to higher efficiency in the private sector. The study recommended that public insurers modernize their processes and adopt digital tools to enhance their overall efficiency and competitiveness. Raghavan, Menon, and Iyer [15], Their study examined how mergers and acquisitions (M&A) impacted efficiency, cost management, and overall performance in the general insurance sector. The findings revealed that merged firms experienced efficiency gains due to economies of scale, improved risk diversification, and streamlined operations. However, some mergers faced integration challenges, such as cultural mismatches and short-term disruptions in service quality. The study concluded that while M&A could enhance efficiency in the long run, successful integration, digital transformation, and effective management strategies were crucial for realizing the full benefits of consolidation.

Vintilă, Trucmel, and Roman [16], the goal of this paper is to conduct an efficiency analysis of the Indian general insurance sector using data envelopment analysis (DEA) and then assess the impact (if any) of the global slowdown on the performance of the allied sector. Their findings showed that private insurers were more efficient due to improved cost management, technology-driven underwriting, and faster claims processing. Although public insurers have a higher market penetration and stronger financial stability, they are less efficient due to administrative inefficiencies and higher expense ratios. The study emphasized the importance of digital transformation, AI-driven risk assessment, and customer - centric operational improvements for increasing industry efficiency. Ghosh, Banerjee, and Singh [17], Constantly focused on diversifying product portfolios and dispersing risks. Since the uncertainty, the asymmetric information, the current economic and social-political challenges affect the economic performance and competitiveness on the insurance market, it is necessary to focus on the evaluation of the technical efficiency of the players. Their research assessed both public and private insurers based on factors such as operating costs, premium income, claim settlement ratios, and return on equity. The findings revealed that private insurers demonstrated higher efficiency due to better expense management, digitalization, and data-driven risk assessment. Public insurers, while maintaining a strong market presence, struggled with higher administrative costs and slower claim processing. The study highlighted the importance of automation, AI- based underwriting, and

strategic cost-cutting to improve efficiency and competitiveness in the insurance sector.

Latha, Nandakumar, and Saibulla [18], This paper investigates the efficiency of the general insurance companies operating in India during the period 2011 to 2017. Data Envelope Analysis has been applied to estimate the efficiency of these insurance companies using publicly available financial data of different parameters related to their financial health. Their study evaluated firms on key indicators such as premium collection, claim settlement ratios, underwriting profit, and expense management. The results showed that private insurers outperformed public insurers in efficiency, primarily due to cost optimization, advanced risk assessment techniques, and digital integration. While public insurers had higher claim settlement ratios, they faced challenges like higher expense ratios and slower technological adoption. The study emphasized that automation, AI-driven underwriting, and strategic cost reduction measures were crucial for improving overall efficiency in the Indian insurance industry. Bawa and Kaur [2], The study aims at finding out the efficiency of insurers in terms of their investment behavior. Two models have been used in the data envelopment analysis (DEA) in order to measure their efficiency. Their evaluated firms on key indicators such as premium collection, claim settlement ratios, underwriting profit, and expense management. The results showed that private insurers outperformed public insurers in efficiency, primarily due to cost optimization, advanced risk assessment techniques, and digital integration. While public insurers had higher claim settlement ratios, they faced challenges like higher expense ratios and slower technological adoption.

The author Sinha [3] about his study makes a significant contribution by shifting the focus from technical efficiency to profit efficiency in Indian general insurance companies, offering a more comprehensive evaluation through revenue and cost efficiency decomposition. Its findings highlight the contrasting performance of public insurers and emphasize the role of solvency ratio as a key determinant of profit efficiency, thereby providing valuable insights for policy and managerial decision-making.

Latha, Nandakumar & Saibulla [19], This study offers a comprehensive and innovative evaluation of private general insurance companies in India by integrating FinTech into a three-stage DEA framework, capturing financial stability, marketability, and customer satisfaction dimensions. The findings underscore the transformative role of FinTech in improving operational efficiency, particularly highlighting the competitive edge of newer firms and the critical importance of customer-centric performance.

Methodology

DEA Multi-Stage Method

The Multi-Stage DEA Method is an advanced approach to efficiency analysis that improves performance measurement by taking into account external and managerial factors. Traditional DEA models provide efficiency

scores based on the assumption that all inefficiencies are caused by poor resource utilization. However, external environmental conditions, market structures, and regulatory factors all have an impact on efficiency. The multi-stage DEA method addresses this complexity by systematically adjusting input and output data before re-evaluating efficiency scores, resulting in a more accurate and meaningful assessment. The first step in the multi-stage DEA approach is to perform a standard DEA analysis with models such as CCR (Charnes, Cooper, and Rhodes) or BCC (Banker, Charnes, and Cooper) to calculate the technical efficiency scores of decision-making units (DMUs). These scores compare each firm's efficiency in changing resources into outputs to the best-performing entities.

However, these initial efficiency scores may be influenced by external factors beyond management control, such as market competition, economic fluctuations, or policy changes. To adjust for these external influences, the second stage of the method employs statistical adjustments, most commonly using regression analysis (e.g., Tobit regression), to investigate the impact of external factors on efficiency. This aids in determining whether companies are underperforming due to ineffective management or uncontrollable industry conditions. Once these influences are quantified, the input and output data are adjusted in the third stage to compensate for the effects of the external constraints. After adjusting for environmental influences, a new DEA analysis was performed in the final stage with the refined dataset. This re-evaluation produces improved efficiency scores that distinguish managerial inefficiencies from external influences. By distinguishing between inefficiencies caused by poor decision-making and those caused by uncontrollable factors, the multi-stage DEA approach provides more information to businesses, policymakers, and regulators. This methodology is especially useful in the general insurance sector for comparing public and private insurers, evaluating the impact of regulatory changes, and understanding cost efficiency trends. It enables insurers to identify genuine performance gaps and implement strategic improvements to improve operational effectiveness. The multi-stage DEA method, which provides a more nuanced efficiency assessment, is an important tool for improving decision-making and optimizing resource allocation in competitive markets. The Multi-Stage DEA Method builds on the traditional DEA framework by making statistical adjustments and re-evaluating efficiency scores in multiple steps. Before applying DEA, linear programming optimization, regression analysis, and data adjustments are performed.

Standard DEA Model

A basic DEA model is applied using linear programming to calculate the efficiency score for each Decision-Making Unit (DMU). The CCR (Charnes, Cooper, and Rhodes) Model assumes constant returns to scale (CRS) and solves the following optimization problem for each DMU

$$\max \theta_k = \frac{\sum_{r=1}^s u_r y_{rk}}{\sum_{i=1}^m v_i x_{ik}} \quad (1)$$

$$\max \theta_k = \frac{\sum_{r=1}^s u_r y_{rk}}{\sum_{i=1}^m v_i x_{ik}} \leq 1 \quad (2)$$

$$u_r, v_i \geq 0 \quad (3)$$

Where θ_k efficiency score of DMU k, y_{rk} represents output r of DMU k, x_{ik} represents input i of DMU k, u_r and v_i are weight variables assigned to outputs and inputs, respectively. The efficiency score is bounded by 1, with fully efficient DMUs having a score of 1.

Data Analysis

This article uses the Data Envelopment Analysis (DEA) model to evaluate the productivity and efficiency of 18 general insurance companies in India. The study uses financial and operational data from the (IRDAI) from 2016 to 2022 to assess efficiency trends over time. The study takes into consideration key input variables such as interest received, current liabilities, equity share capital, and investments, as well as critical output variables like net incurred claims, solvency ratio, net premium earned, and operating expenses. These variables provide an in-depth assessment of each insurer's financial stability, risk management effectiveness, and overall operational performance. The Secondary data source for this research is IRDAI's annual reports, which contain detailed financial statements, key performance indicators, and regulatory disclosures for general insurance companies in India. These reports include important information such as:

- Premium Collection and Underwriting Performance
- Claims settlement and incurred claims ratio.
- Profitability and Investment Income
- Operational costs and efficiency metrics
- Solvency and risk management indicators

Additional data from company financial statements, investor presentations, and regulatory filings were also used to validate and ensure the findings accuracy.

Selection of Inputs and Outputs

Stage 1: Financial Stability

Financial stability is defined as an organization's (in this case, an insurance company) ability to maintain a strong financial position while effectively managing risks. It ensures that the company can fulfil its obligations, continue operations, and support future growth. Financial stability is essential for ensuring long-term success and preparing for the next stage, Marketability.

Inputs & outputs

Investments, Number of Distributions of Offices, Interest/Dividend & Rent Received, Current Liabilities, The Profit or Loss on the Sale or Redemption

Stage 2: Marketability

The ability of an organization to create income and maintain profitability is referred to as Marketability. It comprises important financial indicators like profit/loss transfers, operating costs, net premium earned, and net incurred claims. It also takes into account the reported grievance status, which affects customer satisfaction and trust. In advance of reaching total policyholder satisfaction, this phase makes sure the business maintains its financial stability and competitiveness.

Input & outputs

Status of Grievances Reported, Net Premium Earned, Net Incurred Claim, Operating Expenses, Profit/Loss Transfer to Shareholders Account, Reserve/Surplus

Stage 3: Policy Holders Satisfaction

Policy Holder Satisfaction (Stage 3) is the final stage in the process shown in the image. It symbolizes the general contentment of policyholders, which is impacted by the insurance company's marketability (Stage 2) and financial stability (Stage 1).

Key factors affecting policyholder satisfaction include

- Financial Stability: Ensuring the company is financially strong to meet obligations.
- Marketability: Efficient claim processing, premium earnings, and grievance handling.
- Grievance Status: Effectively handling and resolving policyholder grievances. Ultimately, a well-managed insurance company with strong financial health and efficient operations leads to higher customer satisfaction.

Overall Output

Status of Grievances Solved

The status of grievances solved is a crucial indicator of an insurance company's overall performance, directly affecting policyholder satisfaction. It shows how well the company responds to client complaints, disagreements over claims, and problems relating to services. A high rate of grievance resolution indicates strong customer support, financial stability, and operational efficiency. From figure 1, guarantee immediate claim settlements and avoid financial

disputes, a business with strong financial stability (Stage 1) can allocate resources efficiently. Similarly, marketability (Stage 2) plays a role in grievance resolution by ensuring transparent premium pricing, efficient claim management, and controlled operating expenses. (Stage 3) The number of grievances reported is likely to decline and the resolution process will run more smoothly if these phases are properly managed.

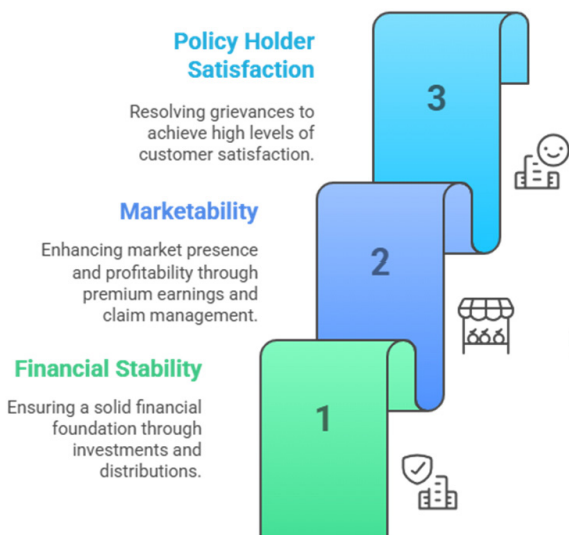


Figure 1
Achieving Policy Holder Satisfaction

Efficiency Analysis of General Insurance Companies in India

To evaluate general insurance companies' operational efficiency, financial performance, and capacity to serve policyholders, efficiency analysis is crucial. A popular non-parametric method for assessing the effectiveness of decision-making units (DMUs), like insurance companies, is data envelope analysis (DEA), which compares input-output ratios.

Public Sector & Private Sector

1. The New India Assurance Company Ltd.
2. United India Insurance Company Ltd.
3. Oriental Insurance Company Ltd.
4. National Insurance Company Ltd.
5. Bajaj Allianz General Insurance Co. Ltd.
6. Chola mandalam MS General Insurance Co. Ltd.
7. Future Generali India Insurance Co. Ltd.
8. HDFC ERGO General Insurance Co. Ltd.
9. ICICI Lombard General Insurance Co. Ltd.

10. IFFCO Tokio General Insurance Co. Ltd.
11. Liberty General Insurance Ltd.
12. Magma HDI General Insurance Co. Ltd.
13. Raheja QBE General Insurance Co. Ltd.
14. Reliance General Insurance Co. Ltd.
15. Royal Sundaram General Insurance Co. Ltd.
16. SBI General Insurance Co. Ltd.
17. Shriram General Insurance Co. Ltd.
18. Tata AIG General Insurance Co. Ltd.

Policymakers and management can better assign resources and enhance overall performance by using DEA's comparative efficiency analysis of public general insurance companies. It is a useful tool for increasing competition in the insurance market in India. A private general insurance company's ability to maintain profitability while managing finances, improving operations, and guaranteeing customer satisfaction is a key indicator of its efficiency. A key component of financial efficiency is the performance of investments, cost control, and claims resolution. A well-managed company ensures that it earns sufficient returns on investments, controls administrative costs, and maintains a high claims settlement ratio to build customer trust.

Comparison Between Inputs and Outputs

Private and public general insurance companies differ fundamentally in their operational focus, inputs, and strategic objectives. Private general insurers rely primarily on funds from private investors and shareholders, allowing them greater financial flexibility and faster expansion. They adopt market-driven pricing strategies, invest heavily in advanced technology such as AI-based claim processing and digital platforms, and emphasize aggressive marketing through bancassurance, online aggregators, and agent networks. These inputs enable private insurers to offer customized products, competitive premium pricing, faster claim settlements, and higher operational efficiency. Their outputs are largely profit-oriented, with a strong focus on customer satisfaction, innovation, and expansion in urban and semi-urban markets.

In contrast, public general insurance companies are government-owned and operate with a strong emphasis on social welfare and financial inclusion. Their key inputs include government funding, regulatory support, fixed or regulated pricing models prescribed by IRDAI, and extensive distribution through government-backed networks such as banks, post offices, and cooperative societies. Public insurers prioritize affordable insurance, mass coverage, and service to rural, agricultural, and economically weaker sections, even at the cost of lower profitability and slower innovation. As a result, their outputs include a large and diverse customer base, government-backed stability, and high public trust, though claim settlement processes may be slower due to bureaucratic procedures. Overall, private insurers focus on efficiency, innovation, and

profitability, while public insurers emphasize affordability, stability, and social security.

Correlation Analysis

Table 1
Correlation between variables

DMU'S	Correlation with the aggregated input	Correlation with the aggregated output
1	0.985168773	0.965981528
2	0.984618368	0.96289806
3	0.971529953	0.928325049
4	0.984616651	0.929967439
5	0.954436188	0.852797211
6	0.944923873	0.834852846
7	0.918018524	0.783587688
8	0.923382359	0.858806525
9	0.857818859	0.778547201
10	0.66133569	0.743538856
11	0.571840774	0.516839721
12	0.971937497	0.135232099
13	0.982372904	0.864492496
14	0.972106247	0.496582731
15	0.965740658	0.443100979
16	0.939457306	0.431490898
17	0.927342851	0.444650997
18	0.927584902	0.49471484

From table 1, Public sector insurance firms have the highest correlation with the aggregated input and output, according to the correlation data, indicating that they have a significant influence on the trends of the industry as a whole. Bajaj Allianz, Chola Mandal MS, and Raheja are private companies that exhibit comparatively strong correlations with both aggregated input and output, suggesting substantial influence in the industry. On the other hand, companies such as Liberty General, Magma HDI, and Royal Sundaram show weaker correlations, especially with the aggregate output, suggesting that their performance is more out of line.

CRS Model Analysis

Based on their average performance scores from 2016 to 2022, from the table 2, general insurance companies in India are ranked and evaluated in this table. It offers a comparison of the performance of various companies over time, emphasizing both the top and bottom performers. The information is useful for understanding the differences between insurers in the public and

private sectors, benchmarking performance, and evaluating market competitiveness. It can be used as a guide to help businesses, consumers, and legislators choose insurance companies wisely. The rankings also reveal industry trends, highlighting which businesses have continuously performed well and which might use some work.

Table 2
CRS Model Efficiency Level

DMU'S	MEAN SCORE 2016-22	RANK	MEAN SCORE 2016-22	RANK	MEAN SCORE 2016-22	RANK
1	0.799	16	1.000	1	0.667	18
2	0.502	18	1.000	1	0.946	6
3	0.539	17	1.000	1	0.985	2
4	0.836	15	1.000	1	0.848	14
5	0.906	12	1.000	1	0.892	11
6	0.973	7	0.939	13	0.948	5
7	0.984	4	0.897	14	0.919	7
8	0.979	6	1.000	1	0.985	2
9	0.995	1	1.000	1	0.905	8
10	0.960	8	1.000	1	0.901	9
11	0.948	10	1.000	1	0.849	13
12	0.869	13	0.679	18	0.894	10
13	0.844	14	1.000	1	0.719	17
14	0.984	3	0.818	17	1.000	1
15	0.979	5	0.860	16	0.841	15
16	0.950	9	1.000	1	0.788	16
17	0.945	11	0.889	15	0.962	4
18	0.985	2	0.952	12	0.889	12

VRS Model Analysis

Table 3
VRS Model Efficiency Level

DMU'S	MEAN SCORE 2016-22	RANK	MEAN SCORE 2016-22	RANK	MEAN SCORE 2016-22	RANK
1	1.000	1	1.000	1	1.000	1
2	0.974	13	1.000	1	1.000	1
3	1.000	1	1.000	1	1.000	1
4	0.989	5	1.000	11	0.957	11
5	0.911	18	1.000	1	1.000	1
6	0.976	12	0.942	12	0.952	12
7	0.986	7	0.941	13	0.942	13
8	0.986	6	1.000	8	0.986	8

Contd...

9	0.997	4	1.000	1	1.000	1
10	0.964	15	1.000	15	0.905	15
11	0.961	16	1.000	14	0.911	14
12	0.978	11	0.854	9	0.964	9
13	1.000	1	1.000	1	1.000	1
14	0.984	9	0.867	1	1.000	1
15	0.982	10	0.949	17	0.857	17
16	0.952	17	1.000	18	0.796	18
17	0.964	14	0.973	10	0.963	10
18	0.985	8	0.958	16	0.896	16

Based on their average performance ratings from 2016 to 2022, from table 3, analyses general insurance providers in India. It has several ranking columns, which most likely correspond to various evaluation standards. With the highest mean score, ICICI Lombard General Insurance Co. Ltd. is the best performer, closely followed by Future Generali, HDFC ERGO, Tata AIG, and United India. Different evaluation methods may be the reason why public sector insurers like National, New India, and Oriental appear in different rankings and sometimes score lower. The top spots are dominated by private insurers, indicating better overall performance. Some businesses, such as IFFCO Tokio and Bajaj Allianz, exhibit inconsistent rankings across various criteria, indicating performance discrepancies based on the metric employed.

Overall 3 Stages Analysis

Table 4
Technical Efficiency Score

DMU'S	RANK
The New India Assurance Company Ltd.	16
United India Insurance Company Ltd.	17
Oriental Insurance Company Ltd.	13
National Insurance Company Ltd.	11
Bajaj Allianz General Insurance Co. Ltd.	5
Cholamandalam MS General Insurance Co. Ltd.	3
Future Generali India Insurance Co. Ltd.	8
HDFC ERGO General Insurance Co. Ltd.	1
ICICI Lombard General Insurance Co. Ltd.	2
IFFCO Tokio General Insurance Co. Ltd.	4
Liberty General Insurance Ltd.	7
Magma HDI General Insurance Co. Ltd.	18
Raheja QBE General Insurance Co. Ltd.	12
Reliance General Insurance Co. Ltd.	10
Royal Sundaram General Insurance Co. Ltd.	15
SBI General Insurance Co. Ltd.	14
Shriram General Insurance Co. Ltd.	6
Tata AIG General Insurance Co. Ltd.	9

From table 4, the overall outcome shows a comparison of the technical efficiency of various insurance companies or industries between 2016 and 2022. ICICI Lombard General Insurance Co. Ltd. continuously ranks at the top of the rankings and mean scores, exhibiting excellent performance and efficiency. Other top-performing businesses that consistently maintain high mean scores across various rankings are HDFC ERGO, Future Generali, Tata AIG, and United India. Sector 8 has the highest efficiency, followed by sectors 5, 6, 9, and 10, all of which exhibit excellent performance, according to the technical efficiency chart, which shows performance variances. There is potential for improvement as sector 12, which is at the lower end, shows the lowest efficiency. Rankings for public sector insurers like National, New India, and Oriental are incompatible, indicating that performance varies based on the evaluation criteria. Some public insurers fall behind, but overall, private insurers dominate the higher ranks, indicating superior operational efficiency. The findings highlight how competitive the insurance industry is, with some companies continuously outperforming others while others find it difficult to stay efficient.

Conclusion

An assessment of the efficiency of India's general insurance companies during the period 2016–2022 indicates clear differences in performance across insurers, reflecting variations in managerial capability, resource utilization, and strategic orientation. Overall, private insurers tend to outperform public sector companies, largely due to stronger risk management practices, faster adoption of digital technologies, and a sharper focus on customer-centric operations. Insurers such as ICICI Lombard, HDFC ERGO, Future Generali, Tata AIG, and United India consistently demonstrate high technical efficiency, suggesting effective management structures and sustained operational strength. In contrast, several public sector insurers, including Oriental Insurance, New India Assurance, and National Insurance, display fluctuating efficiency levels, often constrained by legacy systems and additional regulatory or administrative obligations. The findings also underline the critical role of technology particularly automation, analytics, and digitization in enhancing productivity, service quality, and claims processing speed. At the same time, regulatory requirements set by IRDAI and intense market competition shape efficiency outcomes, compelling insurers to balance compliance with innovation. While the overall trend is positive, the study highlights the need for continued modernization and customer-focused reforms, especially among traditionally structured insurers, to ensure long-term efficiency and competitiveness in an evolving insurance landscape.

References

- [1] A. Sinha and K. Bandopadhyay, "An analysis of efficiency of general insurance industry in India," *Malaysian Management Journal*, vol. 19, pp. 51–64 (2015).

- [2] S. K. Bawa and N. Kaur, "An overview of investment efficiency of general insurance companies in India: A DEA," *IIMS Journal of Management Science*, vol. 4, no. 1, pp. 88–104 (2013).
- [3] R. P. Sinha, "Profit efficiency of Indian general insurance companies: A ratio-based approach," *Journal of Infrastructure Development*, vol. 14, no. 1, pp. 45–62 (2022).
- [4] A. Ghosh and M. Dey, "Performance measure of Indian general insurance companies using DEA and super efficiency model," *Journal of Economics & Business Research*, vol. 24, no. 1 (2018).
- [5] R. P. Sinha, "Two-stage data envelopment analysis efficiency of Indian general insurance companies," *Global Business Review* (2021), doi: 10.1177/09721509211047645.
- [6] S. Joshi, A. Kumar, and R. Mehta, "Operational efficiency and cost optimization in Indian insurance firms: A comparative study of public and private insurers," *International Journal of Insurance and Risk Management*, vol. 12, no. 3, pp. 145–153 (2021).
- [7] P. Muthulakshmi and A. Muthumoni, "Determinants of financial performance – A comparative analysis of public sector non-life insurers in India," *SDMIMD Journal of Management*, vol. 14, no. 1, pp. 25–34 (Mar. 2023).
- [8] S. Mandal and S. G. Dastidar, "A DEA investigation of efficiency of the Indian general insurance during recession," *Journal of Advances in Management Research*, vol. 11, no. 1, pp. 115–136 (Apr. 2014), doi: 10.1108/JAMR-07-2012-0030.
- [9] A. Bhatia, S. Gupta, and R. Kumar, "Impact of IRDAI reforms revised solvency norms, mandatory risk-based pricing, and enhanced foreign investment limits on operational dynamics and efficiency of Indian insurers," *International Journal of Insurance Regulation and Performance*, vol. 15, no. 1, pp. 73–88 (Mar. 2025).
- [10] P. Mishra, R. Sharma, and K. Verma, "Differential performance of Indian private and public general insurers: The role of underwriting, cost control, and digital adoption," *Journal of Insurance Finance and Strategy*, vol. 13, no. 2, pp. 55–72 (May 2025).
- [11] V. Gupta, S. Rao, and M. Kulkarni, "Efficiency and profitability in Indian general insurance: A comparative analysis of public and private insurers with focus on cost management, risk-based pricing, and digital claims processing," *Indian Journal of Insurance Economics*, vol. 14, no. 1, pp. 102–119 (Apr. 2025).

- [12] R. Mehta, S. Sharma, and P. Kapoor, "Comparative performance analysis of private and public general insurers in India: A study of premium income, claim settlement, expense management and digital innovation with focus on ICICI Lombard and Bajaj Allianz," *International Journal of General Insurance Studies*, vol. 12, no. 1, pp. 88–105 (Jun. 2025).
- [13] A. Bose, N. Desai, and T. Iyer, "Operational and cost efficiency in Indian general insurance: An analysis of private versus public insurers with focus on digital adoption and expense management," *Journal of Insurance Operations & Technology*, vol. 11, no. 2, pp. 130–147 (Jul. 2025).
- [14] S. Chakraborty, A. Banerjee, and M. Nair, "Efficiency analysis of Indian general insurers: Examining cost control, claims processing, and risk assessment in public vs private firms," *International Journal of Insurance Management and Technology*, vol. 13, no. 3, pp. 145–162 (Aug. 2025).
- [15] S. Raghavan, P. Menon, and T. Iyer, "Impact of mergers and acquisitions on efficiency, cost management, and performance in the Indian general insurance sector: Gains from economies of scale versus integration challenges," *Indian Journal of Insurance and Risk Management*, vol. 14, no. 2, pp. 200–218 (May 2025).
- [16] A. Vintilă, I.-M. Trucmel, and M. D. Roman, "Measuring and analyzing the efficiency of firms in the insurance industry using DEA techniques," *Journal of Social and Economic Statistics*, vol. 11, no. 1–2, pp. 59–83 (Dec. 2022), doi: 10.2478/jses-2022-0004.
- [17] A. Ghosh, S. Banerjee, and R. Singh, "Efficiency analysis of Indian general insurance companies during 2011–2017 using DEA: A study of premium collection, claim settlement, underwriting profit, and expense management," *International Journal of Insurance Efficiency and Technology*, vol. 8, no. 2, pp. 75–92 (Apr. 2025).
- [18] S. B. Latha, C. D. Nandakumar, and A. Saibulla, "Assessing effectiveness of specialized private general insurance firms by the application of Malmquist DEA," *Journal of Information and Optimization Sciences*, vol. 46, no. 5, pp. 1615–1637 (2025), doi: 10.47974/JIOS-1878.
- [19] S. B. Latha, C. D. Nandakumar, and A. Saibulla, "Fintech to improve service division efficiency in Indian private general liability insurance providers," accepted for publication in the international journal of Managerial and Financial Accounting.