Efficiency of Earning and Profitability in Private and Public Life Insurance Companies in India – A Comparative Insight

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ABSTRACT

The economic system in India is significantly impacted by the sectors of banking and insurance which provide savings and investments to the country. The insurance sector is one of India's fastest-growing economic segments. The insurance sector, as well as other facets of marketing and the financial infrastructure, have been impacted by India's liberalization and globalization processes. The customer is king in the market. The goal of the current study is to compare the public life insurance business in India, LIC, with five private insurance companies in India that were chosen based on the total amount of life insurance premiums collected. The parameters of each important ratio used in this study to demonstrate earnings and profitability are analysed statistically using the T test, a statistical instrument. Profitability and earnings are assessed using the CARAMEL framework. The data used in this study, which spans the last seven years, or from 2014–15 to 2020–21, was entirely secondary in nature and was gathered from the IRDA's official website.

Key words: - Banking, Insurance, Liberalization, Globalization, T-test, CARAMEL.

JEL Classification: - G20, G22, G50, G52

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INTRODUCTION:

Insurance has been necessary for as long as there has been commerce and business in the developed world. Life, business, trade, etc. all include some level of risk. The insurance will guarantee its safety. The insurance industry has taken the lead in Today's financial system. The objective of establishing a stable, effective, and efficient financial atmosphere in India has also been helped by this. It also satisfies the needs of the country's socioeconomic objectives and actual economy. It is one of the financial industries in India that is reportedly growing quickly as it penetrates the core of the economy. In order to promote long-term saving and increase economic growth, it has been promoting life insurance. Life insurance is a professional service that is distinguished by high consumer involvement because of the significance of catering to specific needs, the variety of products available, the complexity involved in the policies and processes, and ultimately the need to involve the consumer in every aspect of the transaction. Life assurance, commonly referred to as life insurance, has changed in recent years from just providing "Security" or "Heritage" for the family to acting as a substantial investment instrument. Due to its rapid economic growth, India has become the world's most profitable insurance market. Raman, N., and Gayathri, C. (2006) admit that clients now believe insurance plans provide them with comprehensive financial solutions that provide them with absolute protection and balanced returns. To satisfy consumer needs, businesses have created and released novel items. Thus, a greater understanding of the client will enable the business to create appropriate products and accurately estimate costs, which will boost profitability.

When the Indian insurance market first opened, there was not much fierce market competition. Up to the year 2000, there was only one publicly traded life insurance company in India, the Life Insurance Corporation (LIC). The

Insurance Regulatory Development Authority (IRDA) was founded in 1999 by the Indian government to regulate and develop the insurance industry. Due to licenses issued by IRDA, private businesses now have access to the life insurance market. Private businesses were allowed to enter the Indian life insurance market after liberalization in 1999, which led to a rapid expansion of the insurance industry. In terms of premium income, new business policies, offices, agents, products, riders, etc., the Indian life insurance market has expanded dramatically since 2000. The insurance industry in India is currently experiencing a period of tremendous growth, which is being spearheaded by businesses looking to change the market's dynamics through modernization and progress. There are now 23 private and 1 public life insurance companies operating in India. By 2025, India is anticipated to overtake China as the fifth-largest market in the world, according to a research report made by McKinsey (2007).

Literature Reviews

Cooper et al. (2011) stated that there is a relatively recent "data centric" method called Data Envelopment Analysis (DEA) is used to assess how well a group of peer entities known as Decision Making Units (DMUs), which transform numerous inputs into multiple outputs, perform. The description of a DMU is broad and open-ended. In recent years, a wide range of DEA applications have been used to assess the performances of various types of entities engaging in various activities in various contexts in various nations. So it is decided to use this method in this particular paper

Sharma et al. (2013) states that, Life insurance is now a pillar of every market economy due to the many opportunities it offers for continually generating substantial sums of money over a lengthy period of time. The analysis shows that the LIC still holds the majority of the market even though it is anticipated that the insurance industry's privatization will hurt the LIC's future prospects. Private sector insurance companies also made an attempt to increase their market share. Private life insurers used the new commercial channels of marketing far more than LIC did. Commercial insurers and LICs employed different investing strategies in several cases.

Private life insurers had a significantly higher ratio of solvency than LIC, despite having suffered considerable losses.

Naidu et al. (2015) stated in their article that the financial system in India is significantly impacted by the banking and insurance sectors, which provide savings and investments to the country. The insurance sector is one of India's fastest-growing economic segments. The insurance sector, as well as other facets of marketing and the financial infrastructure, have been impacted by India's liberalization and globalization processes. The customer is king in the business. Companies that provide life insurance sell abstract things. Private players have increased the level of competitiveness, which is growing. Every business strives to incorporate new inventions and unique product features to draw clients in order to satisfy the needs of the market.

Dar et al. (2015) revealed that in concern of earning and profitability public sector life insurer is more efficient than the private life insurers. The study has been done on the basis of sample of 6 life insurance companies.

Gairola (2016) stated that liberalization has led the entry of the major insurance companies into the Indian insurance market, making it more enticing for foreign insurers. This is because of the saturation of the insurance industry in many foreign countries. As a result, the Indian insurance sector is booming and has several domestic and international companies. The sector is becoming more competitive due to the existence of various life insurance companies. This level of competition has led to more inventive and alluring insurance programmes, better customer support, and greater awareness of insurance in India. Our nation has a sizable population and a sizable untapped market, which has enhanced its potential for growth over the coming years.

Tandon et al. (2017) stated that earning and profitability for various firms differs significantly. The paper has been done on the basis of 5 selected private life insurance companies and the selection done on the basis of total life insurance premium paid during the selected years.

Mujalde et al. (2018) stated that the since 1991, the Indian economy and trade have seen a transformation from a government to a competitive market with sophisticated financial services. The financial sector has opened itself up to potential rivals, especially in the insurance market. The severely regulated and monopolized insurance business underwent a transition after the Insurance Regulatory and Development Authority Act (IRDA) was passed in 1999. According to overall premium revenue, LIC continued to hold a sizeable market share in FY 2014–15 with 73% of business. Due to the presence of 24 private insurance companies, the market is highly competitive. In contrast to the public sector, private insurance businesses are growing faster. Insurance penetration has improved recently. The selling of policies, the receipt of premium income, and other factors put insurance companies in competition with one another.

Patel et al. (2019) stated that after deregulation, the life insurance industry grew, although a huge portion of Indian lives remain uninsured. A large country like India, where 35% of the population lives below the poverty line and 65% live in rural regions, calls for high-quality risk-preventing social programs. Therefore, it is necessary to assess how well the life insurance sector meets client needs both before and after the sale of policies. It's also important to evaluate how many unique and creative products are being produced in order to boost the performance of the life insurance industry in India.

Choudhary et al. (2021) stated in their article that the cornerstone of risk management for both individuals and corporations is insurance. The variety of items that the service providers offer ensures financial security. Although it assists people and corporations in reducing risk, it also presents significant difficulties in acquiring and keeping clients. In addition to issues with service, attaining profitable development is a significant obstacle for the Indian insurance industries. Private businesses are having difficulty building brand strength to maintain growth that is lucrative. Numerous private insurers entered the market as a result of sector liberalization, dramatically altering the competitive landscape. The company's performance

makes a significant contribution to the growth of the sector, which in turn makes the economy as a whole more prosperous. The last few decades have seen a huge increase in media coverage of performance assessment. Performance metrics are important for a number of reasons, but one of the most important is that, when applied properly, they may help businesses become more efficient. Productivity is crucially important to an organization's ability to compete and generate income over time. However, creating fully operational and efficient performance evaluation frameworks— that is, a collection of measures—has proven to be a very challenging task.

Kumar et al. (2021) stated that the influx of cash and investments in India are significantly influenced by the banking and insurance sectors. The insurance sector in India has one of the fastest expanding economies in the world. Along with other aspects of marketing and financial infrastructure, the insurance industry has been impacted by India's liberalization trend. The consumer rules the market. The life insurance industry includes LIC as a significant player. The sector has expanded in size and now needs to cover a sizeable section of India's population because current companies only insure around one-fourth of the country's population. When it comes to audience targeting, gamers have a variety of alternatives. Other potential outcomes include decreased interest rates, the demise of small-scale financial organizations, and the chance to enter areas like banking, pensions, or e-commerce. Life insurance has developed into a crucial part of every economy since it allows for the long-term preservation of substantial quantities of money. India has a very effective life insurance agency and strives for a hassle- and stress-free future.

Ghosh et al. (2021) stated that insurance firms, as financial entities, contribute in two ways to the expansion and smooth operation of the economy. They serve as financial intermediaries by connecting savers and borrowers in addition to facilitating businesses by reducing risk. One of the main institutional investors is the insurance industry. Therefore, the significance of insurance firms cannot be downplayed for organizations, people, and the economy as a whole. The computation of efficiency scores

for the Indian insurance businesses uses Data Envelopment Analysis (DEA). Given that it is built through the envelopment of Decision-Making Units, it is a non-parametric technique (DMUs). Because the sizes of the insurers in India vary greatly, all efficiencies are calculated using variable return to scale (VRS) rather than constant return to scale (CRS). The efficiency scores were determined by running an input-oriented DEA model.

OBJECTIVE OF THE STUDY

- To assess the earning and profitability of selected public and private life insurance companies in India.
- To conduct a statistical comparison of the earning and profitability of public and private life insurance companies in India.
- To analyse the efficiency of earning and profitability in public and private life insurance companies in India.

RESEARCH METHODOLOGY

Data source: Secondary Data has been collected for last 7 years i.e., from 2014-15 to 2020-21 from IRDA

Total life insurance premium paid by all the 24 life insurance companies is as follows:

Total life insurance companies	24
Total life insurance premium paid from 2014-15 to 2021-22 by 24 life insurance companies in Rs	32.82 crore
Total life insurance premium paid by the selected sample from 2014-15 to 2021-22 (Rs)	29.46 crore
Percentage	90%
Total life insurance premium paid from 2014-15 to 2021-22 by 23 private life insurance companies in Rs	10.37 crore
Total life insurance premium paid by the top 5 private life sample from 2014-15 to 2021-22 (Rs)	7.01 crore
Percentage	67%

Source: IRDA Handbook 2021-22

So, a sample of 5 private sector life insurance companies are selected because that is cover 67% of the total life insurance premium paid by all the private life insurance companies. So, on the basis of total life insurance premium received out of a population of 23 private life insurance enterprises in India, along with the Life Insurance Corporation of India (LIC) to compare the efficiency of capital adequacy of private sector insurers with the public sector insurer. The top 5 private sector insurance companies are as follows along with LICI:

1) Bajaj Allianz Life Insurance Company Ltd. BALIC
2) HDFC Life Insurance Company Ltd. HDFCLIC
3) ICICI Prudential Life Insurance Company Ltd. IPLIC
4) MaxLife Insurance Company Ltd. MLIC
5) SBI Life Insurance Company Ltd. SBILIC

Research Variables: To examine earning and profitability following ratios have been used.

Parameters of the ratio are statistically tested with the help of statistical tool i.e., T test.

earning and profitability is judged on the basis of CARAMEL framework. CARAMEL method had proposed by DAS, Davies and Podpiera (2003) in a working paper of IMF. In CARAMEL model E stands for Earning and profitability.

	Variables chosen for study	
Earning and Profitability	Core set	Encouraged set
	Return on Equity (PAT to Equity)	Expense ratio (Expenses/Net Premium),
	Return on Assets (PAT to Total assets)	

The effective life insurance was determined using the DEA approach in the second stage. This study's DEA analysis estimates relative efficiencies without assuming any functional form, making it impossible to properly compare the input used with the output generated. The DEA revealed the characteristics and efficacy of the aforementioned life insurance firms during the time 2013-14 to 2020-21.

- Input for DEA method= Capital
- Output for DEA method= Profit after Tax

Here Equity share capital plus reserves and surplus are referred to as share capital. Balances of the shareholders' and policyholders' accounts are debited, followed by miscellaneous expenses. Fixtures, current assets, and investments are all included in total assets.

Technical Reserves are taken once Bonuses are distributed.

DATA ANALYSIS

TABLE 1- EARNING AND PROFITABILITY TABLE

S. N o	Insurer		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	MEAN	SD	RANK	AVG RANK	COMP RANK
	Public Sector													
1	LIC	1	3.242	4.319	3.680	3.762	3.961	3.668	0.456	**3.298**	1.12	1	3.33	3

		2	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	0.00	**6**	
		3	0.157	0.143	0.152	0.152	0.144	0.147	0.142	**0.148**	0.00	3	
	Private Sector												
2	BALIC	1	0.130	0.115	0.099	0.078	0.052	0.046	0.054	**0.082**	0.03	6	4.33	5
		2	0.037	0.033	0.027	0.021	0.014	0.011	0.012	**0.022**	0.01	2	
		3	0.223	0.217	0.196	0.188	0.211	0.225	0.210	**0.210**	0.01	5	
3	HDFCLIC	1	0.303	0.259	0.232	0.234	0.226	0.190	0.157	**0.229**	0.04	2	3.00	2
		2	0.032	0.027	0.022	0.021	0.019	0.017	0.013	**0.021**	0.01	3	
		3	0.143	0.159	0.165	0.181	0.170	0.179	0.165	**0.166**	0.01	4	
4	IPLIC	1	0.310	0.310	0.263	0.235	0.162	0.148	0.105	**0.219**	0.07	3	2.00	1
		2	0.062	0.056	0.046	0.037	0.022	0.018	0.012	**0.036**	0.02	1	
		3	0.145	0.132	0.141	0.128	0.136	0.135	0.120	**0.134**	0.01	2	
5	MLIC	1	0.202	0.217	0.263	0.195	0.202	0.210	0.174	**0.209**	0.02	4	5.00	6
		2	0.021	0.018	0.021	0.014	0.012	0.010	0.008	**0.015**	0.00	5	
		3	0.246	0.227	0.237	0.202	0.20	0.21	0.21	**0.21**	0.01	6	

							2	1	0	**9**					
6	SBILIC	1	0.203	0.182	0.172	0.176	0.175	0.163	0.140	**0.173**	0.02	5			
		2	0.021	0.018	0.017	0.017	0.017	0.016	0.013	**0.017**	0.00	4	3.33	3	
		3	0.094	0.093	0.073	0.077	0.068	0.063	0.056	**0.075**	0.01	1			
	Private Sector (Avg)	1	0.230	0.217	0.206	0.184	0.163	0.151	0.126	**0.182**	0.03				
		2	0.035	0.030	0.027	0.022	0.017	0.015	0.012	**0.022**	0.01				
		3	0.170	0.166	0.162	0.155	0.158	0.163	0.152	**0.161**	0.005				

Source: Author's own tabulation

1. Return to equity
2. Return to Total Assets
3. Expense Ratio

It is shown from the TABLE 1 that the only public Life Insurance Company has the highest return to equity (3.298) followed by HDFC Life Insurance Company (0.229). However, the lowest ratio is found in Bajaj Alliance life insurance companies (i.e., 0.082. The analysis suggests that the life insurer's profit levels are comparatively greater when compared to equity, demonstrating their effective use of capital to generate profit. So, from the study it is revealed that public life insurance company is far ahead than the private life insurance companies in the financial position.

LIC has the highest return to equity ratio and it has highest Standard deviation. It means performance of LIC is not stable and inconsistent which is not a good indication of sound financial position for the only public life insurance company.

From the TABLE 1 it has been observed that LIC has lowest return to assets. And among the all life insurance companies ICICI prudential Life Insurance Company Ltd. has the highest return on assets (0.36). Though LIC has the lowest return to assets ratio but its Standard deviation is also lowest. It means performance of LIC in return to assets is more stable and consistent which is also an indication of sound financial position for the only public life insurance company.

According to expense ratio, as described in TABLE-1 shows that LIC is the only public sector life insurer ranked 3rd whereas SBI life insurance company ranked 1st in expense ratio and followed by ICICI prudential life insurance company.

Now we are comparing the composite ranking of the selected life insurance companies and it is found that ICICI prudential Life Insurance Company Ltd. has the highest ranking i.e., rank 1, followed by HDFC life insurance company. (Rank 2). The only public life insurance company i.e. LIC ranked 3rd among the 6 life insurance companies.

TABLE 2 – DESCRIPTIVE STATISTICS FOR THE SELECTED PUBLIC AND PRIVATE LIFE INSURANCE COMPANIES

Variables	Public life Insurance company		Pvt life insurance company	
	Mean	SD	Mean	SD
Return to Equity ratio	**3.298**	1.12	**0.182**	0.03
Return to Total Assets ratio	**0.001**	0.00	**0.022**	0.01
Expense Ratio	**0.148**	0.00	**0.161**	0.005

Source: Author's own tabulation

The above table shows that the mean of return to equity ratio for private life insurance companies is 0.182 whereas for LIC it is 3.298. Similarly mean of

return to assets ratio for private life insurance companies is 0.022 and for LIC it is 0.001. Expense ratio is 0.161 for private life insurance companies against 0.148 for public life insurance company. So, it is clear that the total mean of return to capital is high for public life insurance company. But for return to Total assets and in expense ratio private life insurance company is ahead of public life insurance company.

TABLE 3- Public and Private Life Insurers Capital Adequacy determinant variables of Capital Adequacy

	Category	N	Mean	SD	S.E of Mean
Total Return to Equity ratio	public	7	**3.298**	1.12	0.0001
	private	35	**0.182**	0.03	0.0019
Return to Assets ratio	public	7	**0.001**	0.00	0.0019
	private	35	**0.022**	0.01	0.0245
Expense Ratio	public	7	**0.148**	0.00	0.0239
	private	35	**0.161**	0.005	0.0315

Source: Author's own tabulation

TABLE 4- INDEPENDENT SAMPLES TEST

t-test for Equality of Means				
	t value	d.f	t critical value	
Total Return to Equity ratio	6.363	6	(-∞, -2.145] ∪ [2.145, ∞)	Rejected H01 (T score falls under critical region)
Return to Assets ratio	-6.743	6	(-∞, -2.145] ∪ [2.145, ∞)	Rejected H01 (T score falls under critical region)

Expense Ratio	-3.98	6	(-∞, -2.145] ∪ [2.145, ∞)	Rejected H01 (T score falls under critical region)

Source: Author's own tabulation

In the entire 3 category calculated t value belongs to the critical region, so we reject the null hypothesis.

- There is significant difference between return to equity ratio of public and private life insurance companies in India.
- There is significant difference between return to assets ratio of public and private life insurance companies in India.
- There is significant difference between expense ratio of public and private life insurance companies in India.
- There is significant difference between earning and profitability of public and private life insurance companies in India.

So, it can be concluded that there is statistically a significant difference between the mean earning and profitability for private life insurers and public life insurance company.

ANALYSIS OF FINANCIAL EFFICIENCY: DATA ENVELOPMENT ANALYSIS

CARAMEL model is the traditional method for analysing efficiency. Now, a modern method that is DEA is used to measure the efficiency of capital adequacy of the selected life insurance companies.

- **Input: - Capital (Average)**
- **Output: - PAT (Profit after Tax) (Average)**

A fraction whose numerator and denominator contain choice factors is nonlinear. Given that a linear programming approach is employed, here the formulation must be linearized first such that the objective function's denominator is 1, and then the numerator to be maximised.

In DEA models we measure the best efficient decision making unit and the we put such weights into inputs Xi, X2,...,x and in outputs Yi, Y2,...,Ym so that each decision making units become the most efficient DMU.

The basic model of DEA as follows:

$$\text{Max } z\,(u,\,v) = \frac{\sum_r u_r y_{ro}}{\sum_i v_i x_{io}}$$

$$\frac{\sum_r u_r y_{ro}}{\sum_i v_i x_{io}} \leq 1 \text{ for } j\,\text{-}1,\,2,\ldots,\,n$$

$u_i,\ v_i \geq 0$ for all i and r.

The u and w were some kind of weights which are put to outputs y_n and inputs x_{ij} so that each DMU dominates the other DMU's. By plotting the efficiency score that is enveloping all data points we get the efficiency frontier. The DMU(s) on the frontier had an efficiency level of 1, whereas those inside the frontier had a less-than-maximum efficiency level (less than 1). The aforementioned fractional programme was run once for each DMU that was chosen. The ideal weights for each DMU are therefore decided. Prior to finding a solution, the objective function's denominator was removed and a new restriction was imposed. Additionally, the fractional programme was changed into a linear programme by manipulating the initial restriction.

$\text{Max } z = \sum\nolimits_{r=1}^{s} \mu_r\, y_{ro}$ subject to

$\sum\nolimits_{r=1}^{s} \mu_r\, y_{rj} - \sum\nolimits_{i=1}^{m} v_i\, x_{ij} \leq 0$

$\sum\nolimits_{i=1}^{m} v_i\, x_{io} = 1$

$\mu_r,\ v_i \geq 0$

Here selected 6 life insurance companies are considered as DMUs.

TABLE 5- FINAL SCORE, WEIGHT AND WEIGHTED DATA TABLE

DMU	Capital (Input)	PAT (Output)	Score	Rank	v1	u1	(v1)	(u1)	v1 * (v1)	u1 * (u1)	$\sum vi \cdot (vi)$
LIC	1454.46	2474.51	1	1	1454.46	2474.51	0.00069	0.00040412	1	1	1
BALIC	8884.89	691.32	0.04573	6	8884.89	691.32	0.00011	0.00006615	1	0.045734	1
HDFCLIC	5061.67	1076.74	0.12503	2	5061.67	1076.74	0.0002	0.00011612	1	0.125034	1
IPLIC	6752.84	1393.77	0.12132	5	6752.84	1393.77	0.00015	0.00008704	1	0.121316	1
MLIC	2518.57	522.81	0.12201	3	2518.57	522.81	0.0004	0.00023338	1	0.122012	1
SBILIC	6796.04	1141.56	0.09873	4	6796.04	1141.56	0.00015	0.00008649	1	0.098731	1

Source: Author's own tabulation

TABLE 6- FINAL PROJECTION TABLE

DMU	Score	Rank	v1	Projection = v1 * Score	Diff (%) = (Projection - v1)/v1 * 100	u1	Projection = u1 * $\sum vi \cdot (vi)$	Diff (%) = (Projection - u1)/u1 * 100
LIC	1	1	1454.46	1454.46	0	2474.51	2474.51	0
BALIC	0.0457341	6	8884.89	406.3420035	-95.43	691.32	691.32	0
HDFCLIC	0.1250344	2	5061.67	632.8829727	-87.5	1076.74	1076.74	0
IPLIC	0.1213158	5	6752.84	819.2259168	-87.87	1393.77	1393.77	0
MLIC	0.122012	3	2518.57	307.2956873	-87.8	522.81	522.81	0
SBILIC	0.0987314	4	6796.04	670.9826796	-90.13	1141.56	1141.56	0

Source: Author's own tabulation

TABLE 6 – FINAL PROJECTION TABLE

DMU	Score	Rank	slack v1	slack u1
LIC	1	1	0	0
BALIC	0.0457	6	0	0
HDFCLIC	0.125	2	0	0
IPLIC	0.1213	5	0	0
MLIC	0.122	3	0	0
SBILIC	0.0987	4	0	0

Source: Author's own tabulation

From the final efficiency table, it is found that LIC is the most efficient life insurance company, as its efficiency score is 1 and also LIC is ranked 1st among the other life insurance companies.

After LIC, HDFC Life Insurance Company and Max life insurance company ranked 2nd and 3rd respectively scoring. 0.125 and 0.122. However, Bajaj Alliance life insurance Company ranked last with efficiency score 0.0457

So according DEA method the only public life insurance company is most efficient in capital adequacy.

TABLE 8 – COMPOSITE RANK CONSIDERING BOTH CARAMELMODEL & DEA MODEL

	CARAMEL rank	DEA rank	avg rank	**Comp rank**
LIC	3	1	2	1
BALIC	5	6	5.5	6
HDFCLIC	2	2	2	1
IPLIC	1	5	3	3
MLIC	6	3	4.5	5
SBILIC	3	4	3.5	4

Source: Author's own tabulation

FINDINGS AND CONCLUSIONS

1) Examining the earnings and profitability of the public life insurance business and a few chosen private life insurance companies was the study's main goal. The aforementioned analysis revealed that among the chosen life insurance companies, public insurance company and HDFC LIC tied for top place.

    So, in the study of **Sharma et al. (2013)** demonstrates that the LIC still controls the majority of the market. This is not supported by the above study. Because it is observed that mean of return to equity and in expense ratio public life insurance company is ahead of the private life insurance companies. But in return to assets ratio private life insurance company is far ahead than private life insurance company.

2) According caramel model most efficient life insurance company is the ICICI Prudential Life Insurance Company Ltd followed by HDFC Life Insurance Company. Both stand 1st and 2nd respectively in the ranking according caramel model.

3) In the study of **Naidu et al. (2015)** stated in their article that bringing funds and investments into the country, that the insurance and banking sectors have a big impact on the Indian monetary system. This is supported from the above study. Because in profitability and earning LIC is ranked 3rd according caramel model. ICICI prudential life insurance company and HDFC Life Insurance Company are ahead of public life insurance company. So we can say that privatization of insurance sector have a significant impact on Indian financial system.

4) In the study of **Kumar et al. (2021)** stated that along with other aspects of marketing and financial infrastructure, the insurance industry has been impacted by India's liberalization trend. The consumer rules the market. The life insurance industry includes LIC as a significant player. This is supported from the above study because LIC is ranked 1st in composite ranking among all the life insurance companies.

5) In statistical test it is found that there is a significant difference in earning and profitability between public life insurance company and private life insurance companies.

6) But when we used modern techniques of efficiency measurement i.e., DEA it concluded that among all life insurance firms, Life Insurance Company is ranked first, and it has an efficiency rating of 1. And the LIC is well ahead of all other private life insurance companies. According DEA it is found HDFC life insurance Company ranked 2nd and Max life insurance Company stood 3rd among the life insurance companies.

7) That means the. LIC worked efficiently than all the other life insurance companies.

8) In composite ranking LIC has ranked top among all the life insurance companies.

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