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EVALUATION OF FINANCIAL SOUNDNESS INDICATORS OF INDIAN LIFE INSURANCE INDUSTRY: LIC OF INDIA Vs. PRIVATE LIFE INSURANCE COMPANIES

DR. JAYANT D. CHANDRAPAL
DEVELOPMENT OFFICER
LIC OF INDIA
AHMEDABAD

ABSTRACT

In the liberalized competitive landscape life insurers are exposed to the risk; this risk was classified in to the three categories namely (1) Technical Risk (2) Investment (Asset) Risk and Other Risk, these risks are considered to be a potential failure of financial system in the insurance sector. Therefore, financial stability is bearing a great concern in respect of financial soundness. Present study aims at the measuring financial soundness of the Indian life insurers (LIC of India and Private Life Insurance Companies (PLIC)) with the help of ratio analysis based on the CARAMEL framework. Financial Soundness indicators indicate the magnificent growth of the Indian life insurance industry. Since LIC of India was found sounder than the PLIC in respect of CARAMEL framework; however, there was a slower growth and some of the indicators such as Management Efficiency_1 shows decreasing trend in respect of financial soundness of LIC of India, on the other side PLIC have improved their position in area of cost effectiveness. It was also observed that PLIC shows improvement and increasing trend in the key areas of financial soundness such as Asset Quality and Cap_Ad_3 (Solvency Margin). This scenario alarms the future challenges to LIC of India and quote for the stiff competition from the PLIC in the coming days.

KEYWORDS

lic of india, insurance companies, financial ratios, financial soundness indicators.

JFL CLASSIFICATION

G22, G32.

1. INTRODUCTION

Insurance is a one of the strong pillars of the country's economy; it is a very useful tool to mobilize domestic saving on the large scale and it works as a lubricant that comprehends a smooth and efficient functioning of the financial activities. It generates huge long term capital that facilitates the financial stability in the national economy in turn it positively influences economic growth. Therefore, the robustness of the insurance sector is a mandatory for the economic growth and development. Robustness of the insurance sector can be termed as a financial soundness of the insurers that ensures the financial stability. There is a substantial amount of debate regarding strong macroeconomic fundamentals and financial stability nexus. Some of them have argued that the strong macroeconomic fundamental does always not guarantee a financial stability in the economy. Therefore, it was argued in the study of Rana Hasan that even if macroeconomic fundamentals show no vulnerability, it is still important to monitor financial soundness (Rana Hasan, 2015). Thus, Evaluating Financial Soundness of insurers by assessing their strength and weaknesses based on the financial performance of the insurers become inevitable.

Asian currency and financial crises in the year 1997, particularly in south East Asian countries and Korea laid a foundation for the Financial Stability Assessment Programme (FSAP) that was resulted in the development of Macro Prudential Indicators (MPI); later in the September 1999 MPIs were termed as FSIs (Financial Soundness Indicators). Six criterions consist of 39 indicators were introduced in consultation with the expert group of the World Bank. In the year 2006, the International Monetary Fund (IMF) defined the FSIs to examine health and stability of financial systems in the compilation guide that provides a conceptual framework, concept and definition. However, the global financial and economic crisis in the year 2008 paved a way for the amendments in the criterion and the CAMELS [(C)apital adequacy; (A)ssets Quality; (M)anagement Capability; (E)arnings; (L)iquidity (also called asset liability management; (S)ensitivity (sensitivity to market risk, especially interest rate risk)]. Framework was introduced in the year 2009.

In the liberalized competitive landscape life insurers are exposed to the risk; Das et al classified this risk in to the three categories namely (1) Technical Risk (2) Investment (Asset) Risk and Other Risk, these risks are considered to be a potential source of failure of financial system in the insurance sector. Therefore, precisely the measuring financial soundness of insurance sector the CARAMEL framework [(C)apital adequacy; (A)ssets Quality; (R)isk Insurance and (A)ctuarial issues (M)anagement Efficiency; (E)arning and Profitability; (L)iquidity] was revealed in the working paper presented by Das et al (Das et al, 2003); this framework was an extension of the CAMELS model. Present study aims at the measuring financial soundness of Indian life insurers with the help of ratio analysis based on the CARAMEL framework.

2. LITERATURE REVIEW

Rana Hasan pointed out that since the outbreaks of the Asian financial crisis in the late 1990s and the global financial turmoil in 2008, assessing the strengths and weaknesses of a financial sector based on a set of financial indicators has increasingly become important (Rana Hasan, 2015). Stephen enumerated the number of risks that an insurance company faces such as Underwriting Risk, Product Design and Pricing Risk, Actuarial Risk, Operational Risk, Management Risk, Liquidity Risk, Insolvency Risk, Reinsurance Risk, Regulatory Risk, Interest Rate Risk, Foreign Exchange Risk and Credit Risk in conducting its business. It was also stated that many insurance supervisors use a CARAMELS framework to assist their off-site analysts and on-site examiners in assessing and evaluating the risks run by insurance companies (Stephen Rossiter, 2016). Moorhouse provided some background to the IMF's FSI programme that explains how it links in with other international surveillance work and provides some detail about the data requested. (Andrew Moorhouse, 2004). Das et al observed recent changes in the Indian insurance industry due to the Liberalization, Privatization and Globalization (LPG) in the name of economic reforms. They argued that impact of liberalization cannot be measured without reviewing the role of insurers in the economy and the threat they face; it leads to understand the implications in respect of financial soundness and stability of insurance sector. Das et al observed one of the recent changes in the insurance sector in form of the increased financial vulnerability as a potential source of failure of financial system. Further they have observed the systematic implications and presented selected financial soundness indicators (FSI) within the frame work of CARAMELS (**C**apital Adequacy, **A**sset Quality, **R**einsurance and **A**ctuarial issues, **M**anagement Soundness, **E**arnings and Profitability, and **S**ensitivity to Market Risk). They argued that recent life insurance failures occurred after financial deregulation, economic expansion and a large price fluctuation. Financial deregulation caused insurance companies to employ more bank type products to compete with other financial institutions. The Economic expansion led insurers to invest in risky assets such as real assets and junk bonds. The resulting maturity mismatch between assets and liabilities and illiquidity of assets made insurers vulnerable to economic shocks including large price fluctuations. In addition, cross-share holdings between banks and insurance companies and close business relationship between the two industries increased the risk of contagion (Das et al, 2003). Smajla argued that the insurance companies are exposed to different types of risk by doing their core business, starting from underwriting risks that are accepted from insurers, through investment risks to the non-technical risks such as management risk, business risk and legal risk. The main task of evaluating financial soundness of insurance sector is therefore to explore risks to which insurers are exposed and to find a way to manage them (Nikolina Smajla, 2014). Armida and Andreas viewed FSIs as aggregate measures of the current financial health and soundness of the financial institutions in a country and of their corporate and household counterparties. Further The FSI project grew out of the need for better data and tools to monitor financial risks and vulnerabilities of national financial systems (Armida San Jose and Andreas Georgiou, 2015). Natalja and Zoja pointed

out that Comparing actual and sufficient value of analyzed indicators of financial soundness, it is possible to approve, that both excess, and decrease of actual values against sufficient value has certain negative consequences. Thus, the growth of financial stability at the expense of the growth of owner equity should not take place uncontrolled because due to the growth of the share of owner equity its profitability may decrease, i.e., profit per unit of owner equity decreases. Further they stated that concerning liquidity two situations are possible: 1) actual values do not reach a sufficient value then the enterprises should pay attention on ability to cover short-term liabilities; 2) actual values considerably exceed a sufficient value, it testifies to inefficient use of means, freezing means in in-ventures or granting a loan to buyers. In this case use of term "sufficient" is correct. Therefore For the analysis of dynamics of financial stability the ratio of actual level of financial coefficient to sufficient should be calculated (Natalja Lace and Zoja Sundukova, 2010). Joo observed the analysis of solvency margins highlights the upper hand of public insurers over the private insurers that reflect a comparatively good financial strength for public insurers. However it was argued that the use of financial ratios and multiple regressions to see the impact of increasing financial performance on insurers' solvency does not support the fact that there is negative impact on the non-life segments of the insurance industry (Bashir Ahmad Joo, 2013). Ansari and Fola's Statistical test based on CARAMEL model indicate that; there was a significance difference between capital adequacy, asset quality, management efficiency, earnings & profitability and liquidity positions in private and public life insurance (Valeed Ansari and Wubshet Fola, 2014). Jena observed LIC's liquid ratio too high and LIC has invested more out of its internal equities than the external equities; on other side ICICI prudential, SBI, Birla Sun life and HDFC Standard life insurance Company's current ratio of various years were not satis-factory (Artta Bandhu Jena, 2014). Statistical results of the study carried away by Dar and Bhat reveal that there was a significant difference between capital adequacy, earnings and profitability and liquidity position in selected public and private life insurers. The overall results reveal that the capital adequacy level of selected private life insurers was far better than the mean capital adequacy level of public life insurer. However, in terms of earnings and profitability, the public life insurers have outperformed the private life insurers during the period under review. Further, it was also concluded that compared to private life insurers, public life insurers possess higher degree of liquidity during the period under review (Showket Ahmad Dar and Javaid Ahmad Bhat, 2015). Bava and Chattha indicate that public sector player LIC has sound liquidity position among all life insurers. So far as PLIC are concerned Companies like Future Generali, IDBI, Sahara, Shri Ram and SBI life have sound liquidity position. In case of solvency position, life insurers like Aviva, Bajaj Allianz, IDBI, Max Life, Sahara and SBI life insurance have higher solvency ratio as compared to others. Public life insurers were showing stability in its solvency position in five years. Measures of return on asset of Bajaj Allianz and ICICI prudential were sound good. The ratio was stable and presents a healthy picture of public insurer. So far as leverage analysis is concerned the performance of LIC was far better than that of private players (Sumninder Kaur Bawa & Samiya Chattha, 2013). It was concluded in the Dey et al's regression analysis that there was significant positive relationship of underwriting risk and size with financial performance (ROE) of life insurance companies in India under the study. It was also found that there was a significant negative relationship between volume of capital and leverage with ROE. Finally insignificant positive relationship of tangibility and liquidity with ROE was revealed (Dey et al, 2015). Wani and Dar concluded that capital management risk, solvency risk, liquidity risk and size of company were most important determinants of financial performance of life insurance companies in India. These microeconomic variables have a profound impact on the financial performance of life insurance companies in India. On the other hand, underwriting risk was found to have statistically insignificant relationship with financial performance of life insurance companies (Wani and Dar, 2015).

3. CARAMEL FRAMEWORK

It is utmost essential to evaluate financial position and performance of Indian life insurers to study the Impact of liberalization on Indian life insurance industry. Das et al (Das et al, 2003) suggested two set of insurance Financial Soundness Indicators (FSI); Core set and Encouraged Set.

TABLE 1.0: INSURANCE FINANCIAL SOUNDNESS INDICATORS: CARAMEL FRAMEWORK

Category	Financial Soundness Indicators	
	Core Set	**Encouraged Set**
Capital adequacy	Capital/Total Assets Capital/Technical Reserves	Solvency Ratio
Asset Quality	Equities/Total Assets	
Reinsurance and Actuarial Issues	Net Premium/Gross Premium	
Management Soundness	First Year Premiums/ Gross Premium	Operating Expenses/ Gross Premiums
Earnings and profitability	Return on equity (ROE) = Net Income to Equity	Return on Asset (ROA) = Net Income to Total Asset
Liquidity	Current Asset to Current Liability	

Source: Udaibir R Das, Nigel Davies and Richard Podpiera (2003): Insurance and Issues in Financial Soundness, IMF Working Paper No. 3/138, Compiled From p. 28 and p. 37

This study reveals analysis based on the CARAMEL framework suggested by Das et al. Various results has been found as follows.

4. RESEARCH METHODOLOGY

4.1 PURPOSE OF THE STUDY

In the liberalized competitive landscape life insurers are exposed to the risks which are considered to be a potential source of failure of financial system in the insurance sector. Therefore, financial vulnerability is bearing a great concern in respect of financial soundness. Present study aims at the measuring financial soundness of the Indian life insurers (LIC of India (LIC) and Private Life Insurance Companies (PLIC)) with the help of ratio analysis based on the CARAMEL frame-work.

4.2 THE OMNIBUS NULL HYPOTHESIS

Examining the Financial Soundness Indicators based on the CARAMEL framework that might not differentiate between LIC and PLIC and assumes that the mean of two paired samples of FSI (LIC and PLIC) are equal ($\mu d = 0$)

4.3 RESEARCH DESIGN

The research design for this study is a descriptive in nature, followed a ratio analysis based on the CARAMEL Framework suggested by the International Monitory Fund.

Secondary data i.e. year wise financial performance statistics of the LIC and PLIC from the year 2005 to 2015 obtained, compiled and tabulated from the respective year's IRDA annual reports;

Paired Samples t test was conducted to test null hypothesis that assumes that the mean of two paired samples are equal

5. DATA ANALYSIS

A paired-samples t-test was conducted to compare financial soundness of the Indian life insurers**.** Table – 2 reveals pair wise results of FSIs in two conditions LIC and PLIC.

TABLE 2: PAIRED SAMPLES TEST STATISTICS FOR FSI (CARAMEL) IN LIC AND PLIC

	Paired Samples Statistics (N = 11)			Paired Sample Test (df# 10)				
		Mean	SD*	Mean	SD	SE**	t	Sig.
Pair - 1	CapAd-1_LIC	0.0004	.00005	-0.152	0.059	0.018	-8.531	0.000
	CapAd-1_PLIC	0.1518	0.0589					
Pair - 2	CapAd-2_LIC	1.1054	0.1164	-5.106	6.208	1.872	-2.788	0.021
	CapAd-2_PLIC	6.2109	6.1565					
Pair-3	CapAd-3_LIC	1.4918	0.0958	-1.609	0.506	0.153	-10.55	0.000
	CapAd-3_PLIC	3.1009	0.5745					
Pair - 4	AQ_LIC	.00003	.00003	-0.123	0.079	0.024	-5.156	0.000
	AQ_PLIC	0.1233	0.0793					
Pair -5	RR_LIC	0.9995	0.0002	0.023	0.049	0.015	1.558	0.150
	RR_PLIC	0.9765	0.0489					
Pair -6	ME-1_LIC	0.0724	0.0131	0.142	0.048	0.014	-9.839	0.000
	ME-1_PLIC	0.2140	0.0391					
Pair -7	ME-2_LIC	0.3738	0.0487	-0.144	0.167	0.051	-2.851	0.017
	ME-2_PLIC	0.5177	0.1439					
Pair -8	ROE_LIC	97.207	82.07	97.25	82.27	24.81	3.920	0.003
	ROE_PLIC	-0.0429	0.231					
Pair -9	ROA_LIC	0.0011	0.0002	0.017	0.030	0.009	1.872	0.091
	ROA_PLIC	-0.0157	0.0295					
Pair -10	LiQ_LIC	3.3585	2.086	2.499	1.993	0.601	4.158	0.002
	LiQ_PLIC	0.8596	0.1445					

*SD = Standard Deviation **SE = Standard Error of Mean #df = Degree of Freedom

The results indicate that there was a statistically significant difference between LIC and PLIC conditions of FSI in respect of all the pairs except pair – 5 and pair - 9.

6. RESULTS AND DISCUSSION

6.1 Capital Adequacy Ratio (Pair -1, 2 & 3)

It was revealed in the CARAMEL framework that there are three measures of capital adequacy as an indicator of financial soundness; CapAd-1 (Capital to Total Assets), CapAd-2 (Capital to Reserves) and CapAd-3 (Solvency margin).

6.1.1 Pair – 1: CapAd - 1 (Capital to Total Assets)

Capital adequacy is considered as the key indicator of an insurer's financial soundness; prudential standards recognize the importance of adequate capitalization with solvency as key focus area of insurance supervision (Das et al, 2003).

CapAd-1 was calculated and tabulated as shown in Table – A1 (Annexure – 1) that reveals year wise position of capital adequacy of LIC and PLIC;

Table – 2 reveal scores of a paired-samples t-test for the comparison of CapAd-1 as financial soundness indicator of the Indian life insurers in LIC and PLIC

There was significant difference in the scores for PLIC (M=.15181, SD=.0589) and LIC (M=.00035, SD=.00005) conditions; t (11) = -8.531, p = 0.000.

Negative score of *t* statistic suggests that the LIC had exhibited lower mean than the PLIC that indicates efficient use and investment of capital to create greater asset base. Therefore, it was concluded that LIC achieved best results in terms of CapAd-1 ratio than the PLIC. Data reveals that LIC shows steady growth in the total asset base; however, PLIC have enrolled significant growth in their total asset base.

6.1.2 Pair – 2: CapAd - 2 (Capital to Reserves)

Another way to measure capital adequacy is to calculate a ratio of capital to total asset and a ratio of capital to technical reserves.

Year wise CapAd-2 was calculated and tabulated as shown in Table – A2 (Annexure – 1) that reveals year wise position of Capital to Reserves of LIC and PLIC;

Table – 2 reveals scores of a paired-samples *t* - test for the comparison of CapAd-2 in LIC and PLIC.

There was a significant difference in the scores for PLIC (M=6.2109, SD=6.1565) and LIC (M=1.1054, SD=.11644) conditions; *t* (10) = -2.788, *p* = 0.021.

Negative score of *t* statistic suggests that the LIC had exhibited lower mean than the PLIC indicates that the LIC was better in holding comparatively higher reserves than PLIC. Therefore, it was concluded that LIC achieved best results in terms of CapAd-2 ratio than the PLIC; however, the trends shows a significant improvement in CapAd-2 ratio in respect of PLIC.

6.1.3 Pair – 3: CapAd-3 (Solvency Margin)

The solvency margin is the size of capital of insurance companies to meet potential financial obligations. IRDA has made it mandatory for the insurance companies to maintain minimum solvency margin in ratio of 1.5 (not less than).

Table – A3 (Annexure – 1) that reveals year wise position of solvency margin of LIC and PLIC;

Table – 2 reveal scores of a paired-samples *t* - test for the comparison of CapAd-3 (Solvency Margin) in LIC and PLIC.

There was a significant difference in the scores for PLIC (M=3.101, SD=.575) and LIC (M=1.492, SD=.096) conditions; *t* (10) = -10.545, *p* = 0.000.

Negative score of *t* statistic suggests that the LIC had exhibited lower mean than the PLIC indicates that the PLIC was better in holding comparatively higher solvency margin than LIC. LIC has maintained solvency ratio near by the statutory requirement prescribed by IRDA; Peer average i.e. PLIC enrolled a steady growth and strong position in maintaining solvency ratio.

6.2 Pair – 4: Asset Quality

Types of asset quality of investment portfolio determine the level of business risk of insurance companies. Equities to total asset indicate a quality of assets and it is a very important measure in credit rating and financial strength rating of insurance companies. Das et al indicated that equities to total assets ratio reveals the degree of insurer's exposure to stock market risk and fluctuations of the economy (Das et al, 2003).

Table – A4 (Annexure – 1) reveals year wise position of Asset Quality LIC and PLIC.

Table – 2 reveal scores of a paired-samples *t* - test for the comparison of Asset Quality in LIC and PLIC.

The results indicate that there was a significant difference in the scores for PLIC (M=.00003, SD=.00003) and LIC (M=.123, SD=.079) conditions; *t* (10) = -5.156, *p* = 0.000.

Negative score of *t* statistic suggests that the LIC had exhibited lower mean than the PLIC. Lower mean indicates better asset quality; just like as CapAd-1 it reveals that the proportionately less amount invested in the more risky (Equity) or less liquid (Real Estate) assets to find better match between the yield on assets and the long tail liabilities. Therefore, it was concluded that there was a best result achieved by LIC by lower ratios than the PLIC. It indicates proportionately larger amount is invested in the total asset than the equity; however, there was a continuous decrease in the asset quality ratio of PLIC. It indicates significant improvement in the asset quality of PLIC during the study period.

6.3 Pair – 5: Reinsurance and Actuarial Issues

Risk Retention Ratio as a measure of financial soundness of life insurance companies; it reveals the risk bearing capacity of the insurance companies. Risk Retention Ratio is purely a reinsurance and actuarial issue in which underwriting strategy of insurers can be viewed that how much degree of risk they retain and how much degree of risk they pass on to the reinsurers. Risk Retention Ratio is a ratio of net premium to gross premium.

Table - A5 (Annexure – 1) shows year wise Risk Retention position that uncovers a trend of risk bearing capacity of LIC and PLIC.

Table - 2 reveals scores of a paired-samples *t* - test for the comparison of Risk Retention Ratio in LIC and PLIC.

The results indicate the test scores for LIC (M=.9765, SD=.0489) and PLIC (M=.9995, SD=.0003) conditions; *t* (10) = 1.558, *p* =.150 indicates that There was no statistically significant difference between LIC and PLIC; Therefore, it was concluded that the differences between condition Means are likely due to chance and not likely due to the independent variable manipulation.

However, the positive score of *t* statistic suggests that the LIC had exhibited higher mean than the PLIC. The result indicates that the risk passed on to the reinsurers is very negligible in respect of Indian life insurers; however private insurers have shown better results achieved as compare to LIC; Data reveals decreasing trend of ratios that indicates better use of reinsurance services by PLIC.

6.4 Management Efficiency (Pair – 6 & 7)

Financial strength of the insurer can also be viewed in respect of practice of sound management system where efficiency of operations results in to a better performance. Das et al prescribed ratio of Operating Expenses to Gross Premiums as a core set of indicator and ratio of First year premium to Gross premium as encouraged set of indicator in respect of management efficiency. They are positively correlated with the sound management system.

6.4.1 Pair – 6: Management Efficiency_1 (Operating Expenses to Gross Premiums)

Table - A6 (Annexure - 1) reveals year wise operational efficiency and new business procurement capacity of LIC and PLIC and depicts a trend of management efficiency in LIC and PLIC.

Table – 2 reveal scores of a paired-samples *t* - test for the comparison of Management Efficiency_1 in LIC and PLIC conditions.

The results indicate that there was a significant difference in the scores for PLIC (M=.2140, SD=.0391) and LIC (M=.0724, SD=.0131) conditions; *t* (10) = -9.839, *p* =.000.

Negative score of *t* statistic suggests that the LIC had exhibited lower mean than the PLIC. There were the best results for LIC in terms of management efficiency_1 that yields larger size of gross premiums at the cost of lower proportion of the operating expenses as compare to PLIC. However, the PLIC recorded improvement by exhibiting fluctuated and decreasing trend in the ratio of management efficiency_1. During the study period LIC witnessed a fluctuating trend in the ratio; however, the increasing trend was observed during the year 2013 to 2015 in respect of LIC. In contrast to LIC; PLIC exhibit decreasing trend during the year 2013 to 2015.

6.4.2 Pair – 7: Management Efficiency_2 (First Year's Premium to Total Premium)

Table - A7 (Annexure - 1) reveals Year wise operational efficiency and new business procurement capacity of LIC and PLIC that depicts a trend of management efficiency in LIC and PLIC.

Table – 2 reveal scores of a paired-samples *t* - test for the comparison of Management Efficiency_2 in LIC and PLIC conditions.

The results indicate that there was a significant difference in the scores for PLIC (M=.518, SD=.144) and LIC (M=.374, SD=.049) conditions; *t* (10) = -2.851, *p* =.017

Negative score of *t* statistic suggests that the LIC had exhibited lower mean than the PLIC. There were the best results for LIC in terms of management efficiency_1; Table - A7 Exhibit that LIC witnessed fluctuating but increasing trend in the ratio analysis during the study period. It indicates a positive growth of new business. PLIC witnessed fluctuating but decreasing trend in the ratio analysis during the study period. It indicates a negative growth of new business.

6.5 Earning and Profitability (Pair – 8 & 9)

As noted by readyratio.com **Profitability ratios** measure a company's ability to generate earnings relative to sales, assets and equity. These ratios assess the ability of a company to generate earnings, profits and cash flows relative to some metric, often the amount of money invested. They highlight how effectively the profitability of a company is being managed (readyratios.com, 2012). There are variety of ratios but as prescribed by Das et al through CARAMEL framework; Return on Equity (ROE) as a core set indicator whereas Return on Asset (ROA) prescribed as an encouraged set indicator of earning and profitability.

6.5.1 Pair – 8: Return on Equity (Net Income (Profit after Tax) to Equity)

Return on equity (ROE) is the amount of net income returned as a percentage of shareholder's equity. It reveals how much profit a company earned in comparison to the total amount of shareholder equity found on the balance sheet. ROE is calculated by dividing Net Income by Equity. It shows the company's ability to generate profits before leverage, rather than by using leverage (readyratios.com, 2012).

Table – A8 (Annexure – 1) shows Year Wise Return on Equity that indicates a trend of earning and profitability of LIC and PLIC.

Table – 2 reveals scores of a paired-samples *t* - test for the comparison of ROE in LIC and PLIC conditions.

The results indicate that there was a significant difference in the scores for LIC (M=97.21, SD=82.07) and PLIC (M=-.043, SD=.231) conditions; *t* (10) = 3.920, *p* =.003.

Positive score of *t* statistic suggests that the LIC had exhibited higher mean than the PLIC. There were the best results for LIC in terms of ROE. Table – A8 Exhibit continuous increasing trend of Return on Equity in respect of LIC. PLIC have recorded negative ROE during the study period 2005 to 2010, fluctuating but increasing trend was observed during the study period 2005 to 2013, PLIC exhibit decreasing trend during the year 2014 and 2015. Increasing trend in ROE depicts a growth of earning and profitability.

6.5.2 Pair – 9: Return on Asset (Net Income (Profit after Tax) to Total Assets)

Return on assets is a key profitability ratio which measures the amount of profit made by a company in relation to its overall resources (total assets). ROA measurements include all of a company's assets – including those which arise from liabilities to creditors as well as those which arise from contributions by investors. So, ROA gives an idea as to how efficiently management use company's assets to generate profit (readyratios.com, 2012). ROA is calculated by dividing Net Income by Total Assets.

Table – A9 (Annexure – 1) shows year wise Return on Asset that depicts a trend of earning and profitability of LIC and PLIC.

Table – 2 reveal scores of a paired-samples *t* - test for the comparison of ROA in LIC and PLIC conditions.

The results uncover the scores for LIC (M=.0011, SD=.0002) and PLIC (M=-.-.0157, SD=.0295) conditions; *t* (10) = 1.872, *p* =.091; indicates that there was no statistically significant difference between LIC and PLIC; Therefore, it was concluded that the differences between two condition Means are likely due to chance and not likely due to the independent variable manipulation.

Positive score of *t* statistic suggests that the LIC had exhibited higher mean than the PLIC. However, Table – A9 reveals ratio of Return on Assets; it exhibits satisfactory performance of LIC as well as Pvt. Players. LIC witnessed marginally decreasing trend whereas PLIC witnessed continuous increasing trend during the study period 2005 to 2013 thereafter there was a decrease in ROA.

6.6 Pair – 10: Liquidity Analysis

Liquidity ratios are the measure of liquidity position of business entity. There are number of ratios such as Current Ratio, Working Capital Ratio, Acid Test Ratio, Quick Ratio.....so on. Das et al prescribed current ratio as a core set indicator of financial soundness to measure liquidity position. As described by readyratio.com the current ratio indicates a company's ability to meet short-term debt obligations. The current ratio measures whether or not a firm has enough resources to pay its debts over the next 12 months. The current ratio can also give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. The current ratio is calculated by dividing current assets by current liabilities. The higher the ratio, the more liquid the company is. Commonly acceptable current ratio is 2; it's a comfortable financial position for most enterprises (readyratios.com, 2012).

Table – A10 (Annexure – 1) shows year wise trend of liquidity position to measures an ability of LIC and PLIC to meet immediate financial obligations and short term commitments.

Table – 2 uncovers the scores of a paired-samples *t* - test for the comparison ROA in LIC and PLIC conditions.

The results reveal that there was a significant difference in the scores for LIC (M=3.386, SD=2.086) and PLIC (M=.860, SD=.145) conditions; *t* (10) = 4.158, *p* =.002.

Positive score of *t* statistic suggests that the LIC had exhibited higher mean than the PLIC. There were the best results for LIC in terms of Liquidity. Table – A10 shows year wise liquidity position of LIC and PLIC. Rule of thumb in respect of current ratio is 1:1. The analysis indicates that LIC recorded increasing trend with strong liquidity position as compare to PLIC. PLIC recorded poor liquidity position with decreasing trend during the study period year 2005 to 2012 and it was remained below 1:1.

7. CONCLUSION

Evaluation of financial performance of Indian life insurance sector by CARAMEL Parameters depicts a story of growth and development of Indian life insurance sector in post liberalization landscape. The results of analytical ratios and empirical examination by paired samples *t* test were revealed that LIC has achieved better results than the PLIC; the financial soundness indicators such as capital adequacy, asset quality, management efficiency, profitability and liquidity position shows that LIC was found more financially sound than the PLIC. It was concluded that

- LIC uses and invests capital efficiently to create greater asset base that leads to steady growth in the total asset base. (Capital Adequacy_1).
- LIC kept relatively higher reserve that indicates LIC's ability to meet long tail liabilities such as future claims (Capital Adequacy_2).
- LIC Found better match between the yield on asset and long tail liabilities that reveals LIC's strength to efficiently manage market risk and fluctuations of the economy (Asset Quality)
- LIC achieved Cost effectiveness in respect of operating expenses that results into a better performance (Management Efficiency_1)
- LIC yielded positive new business growth (Management Efficiency_2)
- LIC yielded better Return on Equity (Profitability) and it shows LIC's ability to generate profits before leverage, rather than by using leverage
- LIC achieved strong Liquidity Position and it indicates LIC's ability to meet short-term debt obligations.

However, the analysis suggests that there was improvement in the financial soundness of the PLIC; it enumerates some of the potentials for the PLIC in the Indian Life Insurance Industry.

- PLIC were found better in solvency margin;
- PLIC have recorded satisfactory improvement in area of Capital Adequacy and Asset Quality;
- PLIC exposed to overall unsatisfactory performance in area of new business growth & cost effectiveness (Management Efficiency_1), Return on Equity (Profitability) and liquidity position.

LIC recorded improvement in Return on Assets; but in last three years of the study period its cost effectiveness in respect of operating expenses affected adversely; therefore, LIC recorded unsatisfactory performance in the area of Management Efficiency_1. On the other hand, PLIC have improved their position in area of cost effectiveness.

Financial Soundness indicators indicate the magnificent growth of the Indian life insurance industry. Since LIC was found sounder than the PLIC; however, there was a slower growth and some of the indicators shows decreasing trend in respect of financial soundness of LIC. On the other side PLIC shows improvement and increasing trend in the key areas of financial soundness. This scenario alarms the future challenges to LIC and indicates the stiff competition from the PLIC in the coming days.

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ANNEXURE

ANNEXURE – 1: YEAR WISE FINANCIAL PERFORMANCE STATISTICS OF THE LIC OF INDIA AND PLIC

TABLE A1: CAPITAL ADEQUACY_1 INDICATOR – CAPITAL TO TOTAL ASSETS (AMOUNT IN '000)

Year Ended	LIC of India			PLIC			Industry Total		
	Capital	Total Asset	**Ratio**	Capital	Total Asset	**Ratio**	Capital	Total Asset	**Ratio**
2005	1371889	4169103587	**0.000329**	36701733	136530134	**0.268818**	38073622	4305633721	**0.008843**
2006	1769985	5313903529	**0.000333**	64408268	289104230	**0.222786**	66178253	5603007759	**0.011811**
2007	2928099	6259569888	**0.000468**	96972897	530485105	**0.182800**	99900996	6790054993	**0.014713**
2008	3078461	7769049378	**0.000396**	172280358	1012086946	**0.170223**	175358819	8781136324	**0.019970**
2009	3360791	8412728692	**0.000399**	250585859	1348050569	**0.185888**	253946650	9760779261	**0.026017**
2010	3658732	11174161779	**0.000327**	293829588	2394407754	**0.122715**	297488320	13568569533	**0.021925**
2011	4037360	12821285784	**0.000315**	335303828	3015683197	**0.111187**	339341188	15836968981	**0.021427**
2012	5305679	13801166227	**0.000384**	376436342	3313653515	**0.113602**	381742021	17114819742	**0.022305**
2013	5154706	15230711834	**0.000338**	385639401	3593370159	**0.107320**	390794107	18824081993	**0.020760**
2014	5385953	17244575591	**0.000312**	431048881	3998143731	**0.107812**	436434834	21242719322	**0.020545**
2015	5625442	19920785179	**0.000282**	364223972	4745236175	**0.076756**	369849414	246660,21,354	**0.014994**

Source: Data pertaining to Capital and Total Assets compiled from **Public Disclosures in Life Insurers' website and IRDA Annual Reports**

TABLE A2: CAPITAL ADEQUACY_2 INDICATORS – CAPITAL TO RESERVES (Amount in '000)

Year Ended	LIC of India			PLIC			Industry Total		
	Capital	Reserve	**Ratio**	Capital	Reserve	**Ratio**	Capital	Reserve	**Ratio**
2005	1371889	13,21,889	**1.037825**	36701733	17,65,928	**20.783256**	38073622	30,87,817	**12.330272**
2006	1769985	17,19,985	**1.029070**	64408268	41,60,343	**15.481480**	66178253	58,80,328	**11.254177**
2007	2928099	28,78,099	**1.017373**	96972897	138,78,430	**6.987310**	99900996	167,56,529	**5.961915**
2008	3078461	30,28,461	**1.016510**	172280358	413,97,806	**4.161582**	175358819	444,26,267	**3.947188**
2009	3360791	33,10,791	**1.015102**	250585859	646,46,883	**3.876225**	253946650	679,57,674	**3.736836**
2010	3658732	36,08,732	**1.013855**	293829588	782,21,476	**3.756380**	297488320	818,30,208	**3.635434**
2011	4037360	39,50,598	**1.021962**	335303828	969,55,453	**3.458329**	339341188	1009,06,051	**3.362942**
2012	5305679	42,72,260	**1.241890**	376436342	1256,12,531	**2.996806**	381742021	1298,84,791	**2.939082**
2013	5154706	40,75,719	**1.264735**	385639401	1699,19,685	**2.269539**	390794107	1739,95,404	**2.246002**
2014	5385953	43,00,037	**1.252536**	431048881	1968,19,685	**2.190070**	436434834	2011,19,722	**2.170025**
2015	5625442	45,07,114	**1.248125**	364223972	1968,28,959	**2.358515**	369849414	2013,36,073	**2.333657**

Source: Data pertaining to Capital and Reserve compiled from **Public Disclosures in Life Insurers' website and IRDA Annual Reports**

TABLE A3: CAPITAL ADEQUACY_3 INDICATORS – SOLVENCY RATIO

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
LIC	1.30	1.50	1.52	1.54	1.54	1.54	1.54	1.54	1.54	1.55
Private	2.31	2.57	2.68	3.04	2.99	3.43	3.87	3.55	3.65	3.71
Industry	1.81	2.04	2.10	2.29	2.27	2.49	2.71	2.55	2.60	2.63

Source: Data pertaining to Solvency compiled from **Public Disclosures (Form No. L - 32) in Life Insurers' website and IRDA Annual Reports**

TABLE A4: ASSET QUALITY INDICATORS - EQUITY TO TOTAL ASSET (Amount in '000)

Year Ended	LIC of India			PLIC			Industry Total		
	Equity	Total Asset	**Ratio**	Equity	Total Asset	**Ratio**	Equity	Total Asset	**Ratio**
2005	50000	4169103587	**0.000012**	434,54,100	136530134	**0.3183**	435,04,100	4305633721	**0.0101**
2006	50000	5313903529	**0.000012**	588,57,200	289104230	**0.2036**	589,07,200	5603007759	**0.0105**
2007	50000	6259569888	**0.000008**	811,85,200	530485105	**0.1530**	812,35,200	6790054993	**0.0120**
2008	50000	7769049378	**0.000006**	1238,95,400	1012086946	**0.1224**	1239,45,400	8781136324	**0.0141**
2009	50000	8412728692	**0.000006**	1824,91,800	1348050569	**0.1354**	1825,41,800	9760779261	**0.0187**
2010	50000	11174161779	**0.000004**	2038,24,300	2394407754	**0.0851**	2038,74,300	13568569533	**0.0150**
2011	1000000	12821285784	**0.00008**	2365,70,135	3015683197	**0.0784**	2375,70,135	15836968981	**0.0150**
2012	1000000	13801166227	**0.00007**	2483,13,735	3313653515	**0.0749**	2493,13,735	17114819742	**0.0146**
2013	1000000	15230711834	**0.00007**	2340,74,046	3593370159	**0.0651**	2350,74,046	18824081993	**0.0125**
2014	1000000	17244575591	**0.00006**	2583,81,773	3998143731	**0.0646**	2593,81,773	21242719322	**0.0122**
2015	1000000	19920785179	**0.00005**	2613,95,574	4745236175	**0.0551**	2623,95,574	246660,21,354	**0.0106**

Source: Data pertaining to Equity and Total Assets compiled from **Public Disclosures (Form No. L – 3A BS) in respective Life Insurers' website and IRDA Annual Reports**

TABLE A5: RISK RETENTION INDICATORS – NP* TO TP (Amount in Crore)**

Year Ended	LIC of India			PLIC			Industry Total		
	NP	TP	**Ratio**	NP	TP	**Ratio**	NP	TP	**Ratio**
2005	75,122.07	75,127.29	**0.9999**	6,412.56	7727.51	**0.8298**	81,534.63	82,854.80	**0.9841**
2006	90,759.20	90,792.22	**0.9996**	14,977.81	15083.54	**0.9930**	1,05,737.01	1,05,875.76	**0.9987**
2007	1,27,782.26	1,27,822.84	**0.9997**	28,039.42	28242.48	**0.9928**	1,55,821.68	1,56,065.32	**0.9984**
2008	1,49,705.59	1,49,789.99	**0.9994**	51,315.14	51561.42	**0.9952**	2,01,020.73	2,01,351.41	**0.9984**
2009	1,57,186.55	1,57,288.04	**0.9994**	64,069.89	64497.43	**0.9934**	2,21,256.44	2,21,785.47	**0.9976**
2010	1,85,985.91	1,86,077.31	**0.9995**	78,962.78	79373.06	**0.9948**	2,64,948.70	2,65,450.37	**0.9981**
2011	2,03,358.05	2,03,473.40	**0.9994**	87,634.26	88165.24	**0.9940**	2,90,992.30	2,91,638.64	**0.9978**
2012	2,02,802.90	2,02,889.28	**0.9996**	83,501.33	84182.83	**0.9919**	2,86,304.23	2,87,072.11	**0.9973**
2013	2,08,589.72	2,08,803.58	**0.9990**	77,576.81	78398.81	**0.9895**	2,86,166.53	2,87,202.49	**0.9964**
2014	2,36,798.07	2,36,942.30	**0.9994**	76,391.70	77340.9	**0.9877**	3,13,189.77	3,14,283.20	**0.9965**
2015	2,39,482.77	2,39,667.65	**0.9992**	85,643.42	87494.69	**0.9788**	3,25,126.19	3,27,162.34	**0.9938**
* NP = Net Premium (Total Premium - Reinsurance ceded + Reinsurance accepted)								**TP = Total Premium	

Source: Data pertaining to NP and TP compiled from **Public Disclosures (Form No. L-1-A-RA and Form No. L-4) in respective Life Insurers' website and IRDA Annual Reports**

TABLE A6: MANAGEMENT EFFICIENCY_1 INDICATOR - OPEX* TO TP (Amount in Crore)**

Year Ended	LIC of India			PLIC			Industry Total		
	OPEX	TP	Ratio	OPEX	TP	Ratio	OPEX	TP	Ratio
2005	5987.18	75,127.29	0.0797	2228.42	7727.51	0.2884	8215.6	82,854.80	0.0992
2006	6041.56	90,792.22	0.0665	3569.48	15083.54	0.2366	9611.04	1,05,875.76	0.0908
2007	7085.84	1,27,822.84	0.0554	6500.00	28242.48	0.2302	13585.84	1,56,065.32	0.0871
2008	8309.32	1,49,789.99	0.0555	11997.43	51561.42	0.2327	20306.75	2,01,351.41	0.1009
2009	9064.29	1,57,288.04	0.0576	16767.62	64497.43	0.2600	25831.91	2,21,785.47	0.1165
2010	12245.82	1,86,077.31	0.0658	16671.82	79373.06	0.2100	28917.64	2,65,450.37	0.1089
2011	16980.28	2,03,473.40	0.0835	15962.01	88165.24	0.1810	32942.29	2,91,638.64	0.1130
2012	14914.4	2,02,889.28	0.0735	14760.79	84182.83	0.1753	29675.19	2,87,072.11	0.1034
2013	16707.66	2,08,803.58	0.0800	14853.66	78398.81	0.1895	31561.32	2,87,202.49	0.1099
2014	20277.88	2,36,942.30	0.0856	14467.29	77340.9	0.1871	34745.17	3,14,283.20	0.1106
2015	22392.7	2,39,667.65	0.0934	14246.86	87494.69	0.1628	36639.56	3,27,162.34	0.1120
* OPEX = Operating Expenses related to Insurance Business **TP = Total Premium									

Source: Data pertaining to OPEX and TP compiled from **Public Disclosures (Form No. L-1-A-RA and Form No. L-4) in respective Life Insurers' websites and IRDA Annual Reports**

TABLE A7: MANAGEMENT EFFICIENCY_2 INDICATORS - FYP* TO TP (Amount in Crore)**

Year Ended	LIC of India			PLIC			Industry Total		
	FYP	TP	Ratio	FYP	TP	Ratio	FYP	TP	Ratio
2005	20653.06	75,127.29	**0.2749**	10269.67	7727.51	**0.7201**	26217.64	82,854.80	**0.3164**
2006	28515.87	90,792.22	**0.3141**	5564.57	15083.54	**0.6809**	38785.54	1,05,875.76	**0.3663**
2007	56223.56	1,27,822.84	**0.4399**	19425.65	28242.48	**0.6878**	75649.21	1,56,065.32	**0.4847**
2008	59996.57	1,49,789.99	**0.4005**	33715.95	51561.42	**0.6539**	93712.52	2,01,351.41	**0.4654**
2009	53179.08	1,57,288.04	**0.3381**	34152.00	64497.43	**0.5295**	87331.08	2,21,785.47	**0.3938**
2010	71521.90	1,86,077.31	**0.3844**	38372.12	79373.06	**0.4834**	109894.02	2,65,450.37	**0.4140**
2011	87012.35	2,03,473.40	**0.4276**	39368.65	88165.24	**0.4465**	126381.00	2,91,638.64	**0.4333**
2012	81862.25	2,02,889.28	**0.4035**	32079.92	84182.83	**0.3811**	113942.17	2,87,072.11	**0.3969**
2013	76611.50	2,08,803.58	**0.3669**	30749.58	78398.81	**0.3922**	107361.08	2,87,202.49	**0.3738**
2014	90808.79	2,36,942.30	**0.3833**	29503.87	77340.9	**0.3815**	120319.66	3,14,283.20	**0.3828**
2015	90644.57	2,39,667.65	**0.3782**	29511.99	87494.69	**0.3373**	120156.56	3,27,162.34	**0.3673**
* FYP = First Year's Premiums ** Total Premiums									

Source: Data pertaining to FYP and TP compiled from **Public Disclosures (Form No. L-4) in respective Life Insurers' websites and IRDA Annual Reports**

TABLE A8: EARNING AND PROFITABILITY INDICATOR – ROE* (Amount in '000)

Year Ended	LIC of India			PLIC			Industry Total		
	PAT**	Equity	Ratio	PAT**	Equity	Ratio	PAT**	Equity	Ratio
2005	7083650	50000	**141.6730**	-8765890	434,54,100	**-0.2017**	-1682240	435,04,100	**-0.0387**
2006	6315801	50000	**126.3160**	-10833235	588,57,200	**-0.1841**	-4517434	589,07,200	**-0.0767**
2007	7736203	50000	**154.7241**	-19367887	811,85,200	**-0.2386**	-11631684	812,35,200	**-0.1432**
2008	8446259	50000	**168.9252**	-43177077	1238,95,400	**-0.3485**	-34730818	1239,45,400	**-0.2802**
2009	9573488	50000	**191.4698**	-58403500	1824,91,800	**-0.3200**	-48830012	1825,41,800	**-0.2675**
2010	10607168	50000	**212.1434**	-20495160	2038,24,300	**-0.1006**	-9887992	2038,74,300	**-0.0485**
2011	11718037	1000000	**11.7180**	14756679	2365,70,135	**0.0624**	26474716	2375,70,135	**0.1114**
2012	13133429	1000000	**13.1334**	46601968	2483,13,735	**0.1877**	59735397	2493,13,735	**0.2396**
2013	14375925	1000000	**14.3759**	55107927	2340,74,046	**0.2354**	69483852	2350,74,046	**0.2956**
2014	16566813	1000000	**16.5668**	59531413	2583,81,773	**0.2304**	76098226	2593,81,773	**0.2934**
2015	18237837	1000000	**18.2378**	536,48,337	2613,95,574	**0.2052**	71886174	2623,95,574	**0.2740**
*ROE = Return on Equity = Net Income to Equity **PAT = Profit After Tax (Net Income)									

Source: Data pertaining to Net Income and Equity compiled from **Public Disclosures (Form No. L-2-A-PL and L-3-A-BS) in respective Life Insurers' websites and IRDA Annual Reports**

TABLE A9: EARNING AND PROFITABILITY INDICATOR – ROA* (Amount in '000)

Year Ended	LIC of India			PLIC			Industry Total		
	PAT**	Total Assets	Ratio	PAT	Total Assets	Ratio	PAT	Total Assets	Ratio
2005	7083650	4169103587	**0.00170**	-8765890	136530134	**-0.0640**	-1682240	4305633721	**-0.00039**
2006	6315801	5313903529	**0.00119**	-10833235	289104230	**-0.0370**	-4517434	5603007759	**-0.00081**
2007	7736203	6259569888	**0.00124**	-19367887	530485105	**-0.0370**	-11631684	6790054993	**-0.00171**
2008	8446259	7769049378	**0.00109**	-43177077	1012086946	**-0.0430**	-34730818	8781136324	**-0.00396**
2009	9573488	8412728692	**0.00114**	-58403500	1348050569	**-0.0430**	-48830012	9760779261	**-0.00500**
2010	10607168	11174161779	**0.00095**	-20495160	2394407754	**-0.0090**	-9887992	13568569533	**-0.00073**
2011	11718037	12821285784	**0.00091**	14756679	3015683197	**0.0049**	26474716	15836968981	**0.00167**
2012	13133429	13801166227	**0.00095**	46601968	3313653515	**0.0141**	59735397	17114819742	**0.00349**
2013	14375925	15230711834	**0.00094**	55107927	3593370159	**0.0153**	69483852	18824081993	**0.00369**
2014	16566813	17244575591	**0.00096**	59531413	3998143731	**0.0149**	76098226	21242719322	**0.00358**
2015	18237837	19920785179	**0.00092**	536,48,337	4745236175	**0.0113**	71886174	246660,21,354	**0.00291**
*ROA = Return on Assets = Net Income (PAT) to Total Assets **PAT = Profit After Tax (Net Income)									

Source: Data pertaining to Net Income and Equity compiled from **Public Disclosures (Form No. L-2-A-PL and L-3-A-BS) in respective Life Insurers' websites and IRDA Annual Reports**

TABLE A10: LIQUIDITY INDICATOR – CA* TO CL (Amount in '000)**

Year Ended	LIC of India			PLIC			Industry Total		
	CA	CL	Ratio	CA	CL	Ratio	CA	CL	Ratio
2005	241986098	205299077	**1.179**	13271162	14876602	**0.892**	255257260	220175679	**1.159**
2006	310432807	213075592	**1.457**	21609492	25423324	**0.850**	332042299	238498916	**1.392**
2007	343157380	202667136	**1.693**	35869926	45997890	**0.780**	379027306	248665026	**1.524**
2008	427950277	220878503	**1.937**	59055942	75746034	**0.780**	487006219	296624537	**1.642**
2009	487146675	195902190	**2.487**	62628477	83983989	**0.746**	549775152	279886179	**1.964**
2010	494780941	219021982	**2.259**	67605206	106233144	**0.636**	562386147	325255126	**1.729**
2011	613449341	164777795	**3.723**	79423086	114062607	**0.696**	692872427	278840402	**2.485**
2012	992767535	321582984	**3.087**	122364124	124512987	**0.983**	1115131659	446095971	**2.500**
2013	1436201072	245150121	**5.858**	150936115	150489618	**1.003**	1587137187	395639739	**4.012**
2014	1582165388	221853969	**7.132**	164197968	160250943	**1.025**	1746363356	382104912	**4.570**
2015	1373826498	224047080	**6.132**	171944377	1613,83,144	**1.065**	1545770875	3854,30,224	**4.011**

*CA = Current Assets ** CL = Current Liabilities

Source: Data pertaining to Current Assets and Current Liabilities compiled from **Public Disclosures (Form No. L-3-A-BS) in respective Life Insurers' websites and IRDA Annual Reports**

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