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Examination of the relationship among financial soundness indicators of Private Life Insurance Companies

Dr. Jayant D. Chandrapal

Development Officer, LIC of India - Ahmedabad (India)

1. Introduction

Entry of private life insurance companies (PLIC) in the Indian life insurance sector posed intense competition and brought a transition. Das et al observed that the recent change in the insurance industry; however, appear to have increased the financial vulnerability of this sector, as well as the potential of insurance failures to have systematic implications. Further they have 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) (Das et al, 2003).

This transition 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. In this transitional phase the stability, soundness and resilience of the sector gained a considerable attention because the assumption of these implies the safer insurance sector. There is a stiff competition from LIC of India (LIC) to PLIC. In absence of financial stability or soundness no organization can sustain its position therefore there is great relevance in gauging the soundness of the PLIC.

Mwangi and Murigu pointed out that the financial performance is a measure of an organization's earnings, profits, appreciations in value as evidenced by the rise in the entity's share price. These measures can be classified as profit performance measures and investment performance measures (Mirie Mwangi and Jane Wanjugu Murigu, 2015).

This study is intended to explore the link among the financial soundness indicators of PLIC and attempt was made to identify and measure determinants of Profitability, Management Efficiency and Asset Quality. Kaya Observed one of the reasons for that can be found in the fact that insurers' profitability has direct implications on policyholders, shareholders, potential investors, employees, and other interested parties. A more important reason is to study the contribution of the insurance industry to economic growth and national wealth (Emine Öner Kaya, 2015).

It is obvious that the stiff competition from LIC leads PLIC to take some risky initiatives to acquire market share and improve profitability. This backdrop raises a question; whether the financial stability of the PLIC deteriorate due to competition? In the present study, an attempt was made to answer the above questions along with examining the relationship among financial soundness indicators in respect of PLIC.

2. Literature Review

Known and Wolfrom indicated that the common set of tools used in many countries (fifteen) is early-warning indicators, often including some of the indicators and ratios (Wolfrom). C Devinta, M Dachyar, and R Nurcahyo indicated that the constantly changing market and uncertainty in economic conditions cause insurance companies to consistently develop new strategies to compete in the current market. The growing competition in the insurance industry causes insurance companies are required to optimize their performance (Devinta et al -, 2017). Lace and Sundukova stated that the gaining of financial soundness (or stability; authors use these words as synonyms) is of great significance for the development of any company. In the course of operating, investing and financing activities continuous process of structure of assets and sources of financing, availability and requirement of financial resources are changing, leading to changes in the financial situation of a company. The financial situation may be classified as stable, unstable and critical (Natalja Lace and Zoja Sundukova, 2010). Smajla argued that by doing their core business, insurance companies are exposed to different types of risk, 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).

Trivedi identified the risks under risk profile of insurance companies; the following risks would be covered: (1) Insurance Risk (2) Investments Risk (3) Credit Risk (4) Asset- Liability Management Risk (5) Liquidity risk (6) Operational Risk and (7) Environmental Risk (Sonal Trivedi, 2016). Ansari and Fola's Statistical test based on CARAMEL model results reveal that; there was a significance difference between capital adequacy, asset quality, management efficiency, earnings & profitability and liquidity positions in private and public life insurance companies (Prof. Valeed A. Ansari & Mr. 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 are not satisfactory (Dr. Artta Bandhu Jena, 2014). Statistical results of the study carried away by Dar and Bhat reveal that there is statistically 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 is 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, the study 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). The study evaluated Bava and Chattha indicates that public sector player LIC has sound liquidity position among all life insurers. As 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 insurer is showing stability in its solvency position in five years. Return on asset measure of Bajaj Allianz and ICICI prudential sounds good. The ratio is stable and presents a healthy picture of public insurer. As far as leverage analysis is concerned the performance of LIC is far better than that of PLIC (Dr. Sumninder Kaur Bawa & Samiya Chattha, 2013). Mool Chand observed that after liberalization the private companies have been making waves. They have been penetrating their business more and more form year to year and has been increasing their market share and presence (Dr Mool Chand, 2014).

3. Purpose of the Study

To examining the relationship among financial soundness indicators of PLIC to explore the link among the financial soundness indicators of PLIC by the identification and measuring determinants of Profitability, Management Efficiency and Asset Quality.

4. Research Methodology

Multiple regression analysis was conducted to explore relationship among financial soundness indicators in respect of PLIC. To identify and measure determinants of Profitability, Management Efficiency and Asset Quality; the collinear relationship between outcomes variables and predictors was examined by the regression model. Capital Adequacy_1_2, Solvency Margin, Reinsurance and Actuarial Issues, Liquidity etc. were included as explanatory variables in the model.

5. Examining relationship among financial soundness indicators of PLIC

Three models were developed to identify & measure determinants of financial soundness of PLIC. Asset Quality, Capital Adequacy and Management Efficiency were used as financial soundness outcomes. The description of outcome and predictors was revealed in Table - 1.0.

Table - 1.0 Description of Outcome Variable and Predictors – FSI* - PLIC

Model	Outcome Variable	Description	Predictor Variable	Description
1	V124 Asset Quality	Equity Divide by Total Assets	V121 Capital Adequacy_1	Capital/Total Assets
			V125 Reinsurance Issues	Net Premiums/Total Premiums
2	V121 Capital Adequacy_1	Capital Divide by Total Assets	V124 Asset Quality	Equity/Total Assets
			V125 Reinsurance Issues	Net Premiums/Total Premiums
3	V127 Mgt Efficiency_2	First Year Premium Divide by Gross Premiums	V123 Cap Adequacy_3**	ASM#/ RSM##
			V128 - Profitability - ROE	Net Income/Equity

*FSI = Financial Soundness Indicators ** Solvency Margin # Available Solvency Margin ## Required Solvency Margin

6. Data Analysis

Multiple regression analysis was conducted to explore relationship among financial soundness indicators in respect of PLIC. All the requested variables entered with forced entry method; the analysis of data reveals results of regression model as shown below.

6.1 Asset Quality Indicator Model – PLIC

Magnitude of inter correlation between the outcome variable (DV) [PLIC_Asset Quality (V124)] and Predictors (IV) [PLIC_Capital Adequcy_1 (V121) and PLIC_ Risk Retention Ratio (V125)] was checked before conducting the multiple regression analysis.

Table - 2.0 Regression Model results of Coefficients – PLIC_Asset Quality (V124)

Correlations				Model Parameters						
	V124	V121	V125	B	Std. Error	Beta	t	sig	Tolerance	VIF
V124	1	.962	-.785	.462	.088		5.24	.001		
		.000	.002							
V121	.962	1	-.613	1.036	.069	.770	14.98	.000	.624	1.602
	.000		.022							
V125	-.785	-.613	1	-.508	.083	-.313	-6.10	.000	.383	1.602
	.002	.022								
R	.993[a]			F	299.411		Standard Error$_{reg}$		.0101733601	

R^2	.987	sig	.000	Mean $Square_{reg}$	0.030988
Adjusted R^2	.984	d*	1.57	Mean $Square_{res}$	0.000103
a. Predictors: (Constant), PLIC-Capital Adequacy_1 (V121) , PLIC_Risk Retention Ratio (V125) *. d = Durbin Watson N = 11					

Table - 2 offers information on significant positive/negative inter correlation between outcome variable (V124) and Predictors (V121 and V125) .

It reveals that significant *p* values ($p < .05$) of the t test of each predictor indicate that V121 and V125 contribute to the model. Beta reveals relative importance of each Predictor in standardized term.

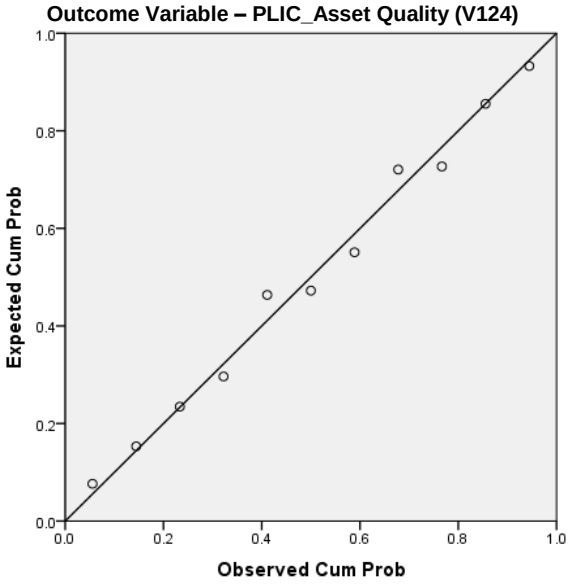

Figure – 1.0 Normal PP Plot of Regression Standardized Residual – (V124_V121-V125)

Homoscedasticity and normality of residuals were checked with Q-Q-Plot of Z*pred and Z*resid. Figure-1.0 shows the points close to a diagonal line. It indicates very little deviation of the expected values from the observed values. The plot reveals that there was no tendency in the error terms.

6.2 Management Efficiency Indicator Model – FYP to Gross Premium – PLIC. Players

Magnitude of inter correlation between the outcome variable (DV) [PLIC_Management Efficiency_2 (V127)] and Predictors (IV) [PLIC_Capital Adequacy_3 (Solvency Margin) (V123), PLIC_ROE (V128)] were checked before conducting the multiple regression analysis.

Table – 3.0 Regression Model results of Coefficients – PLIC_Mgt Efficiency_2 (V127)

Correlations				Model Parameters						
	V127	V123	V128	B	Std. Error	Beta	t	sig	Tolerance	VIF
V127	1	-.813	-.863	.679	.062		10.91	.000		
		.001	.000							
V123	-.813	1	.596	-.061	.020	-.463	-3.08	.015	.645	1.551
	.001		.026							
V128	-.863	.596	1	-.365	.093	-.588	-3.91	.004	.645	1.551
	.000	.026								
R	.940[a]		F	30.353		Standard $Error_{reg}$		0.054886		
R^2	.884		Sig	.000		Mean $Square_{reg}$		0.091437		
Adjusted R^2	.854		d*	1.282		Mean $Square_{res}$		0.003012		
a. Predictors: (Constant), PLIC_Capital Adequacy_3 (V123), PLIC_Return on Equity (V128) *. d = Durbin Watson N = 11										

Table - 3.0 reveals information on the significant positive/Negative inter correlation between outcome variable (V127) and Predictors (V123 and V128).

Table – 3.0 offers information on the significant *p* values of the t test of each predictor that V123 and V128

contributes to the model. Beta reveals relative importance of each Predictor in standardized term.

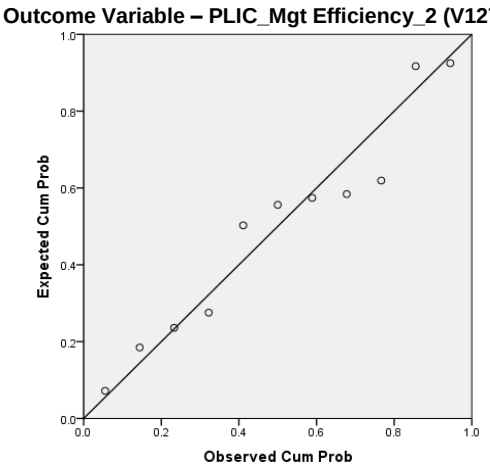

Figure – 2.0 Normal PP Plot of Regression Standardized Residual – (V127_V123-V128)

Homoscedasticity and normality of residuals were checked with Q-Q-Plot of Z*pred (The standardized predicted values of the DV based on the Model on the x axis) and Z*resid (The Standardized residuals or errors on the y axis). Figure-5.5 shows the points close to a diagonal line. It indicates very little deviation of the expected values from the observed values. The plot reveals that there was no tendency in the error terms.

6.3 Capital Adequacy_1 Indicator Model: – Capital to Total Assets – PLIC. Players

Magnitude of inter correlation between the Outcome Variable (DV) [PLIC_Capital Adequacy_1 (V121)] and Predictors (IV) [PLIC_Asset Quality (V124) and PLIC_Risk Retention Ratio (V125)] were checked before conducting the multiple regression analysis.

Table – 4.0 Regression Model results of Coefficients – PLIC_Capital Adequacy_1 (V121)

Correlations				Model Parameters						
	V121	V124	V125	B	Std. Error	Beta	t	sig	Tolerance	VIF
V121	1	.962	-.613	-.401	.105		-3.829	.005		
		.000	.022							
V124	.962	1	-.785	.932	.062	1.25	14.984	.000	.383	2.61
	.000		.002							
V125	-.613	-.785	1	.448	.101	.372	4.443	.002	..383	2.61
	.022	.002								

R	.989[a]	F	182.268	Standard Error$_{reg}$	0.009650
R^2	.979	sig	.000	Mean Square$_{reg}$	0.016975
Adjusted R^2	.973	d*	1.541	Mean Square$_{res}$	0.000093

a. Predictors: (Constant), PLIC_Asset Quality (V124), PLIC_Risk Retention Ratio (V125) *. d = Durbin Watson N = 11

Table – 4.0 reveals information on the significant positive/Negative inter correlation between outcome variable (V121) and Predictors (V124 and V125).

Table – 4.0 offers information on the significant p values ($p < .05$) of the t test of each predictor indicate that V124 and V125 contributes to the model; Beta reveals relative importance of each Predictor in standardized term.

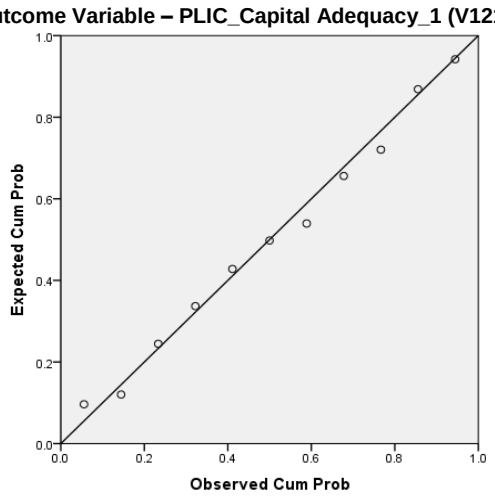

Figure – 3.0 Normal PP Plot of Regression Standardized Residual - (V121_V124-V125)

Homoscedasticity and normality of residuals were checked with Q-Q-Plot of Z*pred and Z*resid. Figure-3.0 shows the points close to a diagonal line. It indicates very little deviation of the expected values from the observed values. The plot reveals that there was no tendency in the error terms.

7. Discussion of the Results

Results of multiple regression analysis shows the significant results and reveals summary of multiple regression model for PLIC_Asset Quality (V124), LIC_Management Efficiency_2 (V127) and PLIC_Capital Adequacy_1 .

7.1 Multiple Regression analysis for Model: PLIC_Asset Quality (V124)

Table-2.0 reveals summary of multiple regression model PLIC_Asset Quality (V124) indicate overall model fit and improve ability to predict outcome variable PLIC_Asset Quality

- **R = .99** indicate strong multiple correlation coefficient between PLIC_Asset Quality and all the two predictors.
- **R^2 = .987** indicates the measure of 99 percent variability in the PLIC_Asset Quality was accounted for by all the two predictors.

Table – 2.0 indicates that

- The coefficient for V121 (LIC_Capital Adequacy_1) was 1.036; therefore every unit increase in the V121; while the other predictors remain constant it was expected to **increase 1.036 unit in outcome variable** V128 (PLIC_Asset Quality).
- The coefficient for V125 (PLIC_Risk Retention Ratio) was - .508; therefore every unit increase in the V125; while the other predictors remain constant it was expected to **decrease .508 unit in outcome variable** V124 (PLIC_Asset Quality).
- The standardized coefficient or **beta for V121 = .770**; which was the largest absolute value therefore it has a great impact on the V124 (PLIC_Asset Quality) whereas **beta for V125 = -.313**; which was the smallest absolute value therefore it has a small impact on the V124 (PLIC_Asset Quality).
- Based on the b values revealed by the output; the **Equation for Current Model**:

  $PLIC\_Asset\ Quality_i = b_0^{*\ Constant} + b_1^{*\ PLIC\_\ Capital\ Adequacy\_1} + b_2^{*\ PLIC\_\ Risk\ Retention\ Ratio}$

  $PLIC\_Asset\ Quality_i = .462 + 1.036 + (-.508)$

6.8.5 Multiple Regression analysis for Model: PLIC_Management Efficiency_2 (V127)

Table – 3.0 reveals summary of multiple regression model PLIC_Management Efficiency_2 (V127) indicates overall model fit and improve ability to predict outcome variable PLIC_Management Efficiency_2

- **R = .94** indicate strong multiple correlation coefficient between PLIC_ Management Efficiency_2 and all the two predictors.
- **R^2 = .884** indicates the measure of 88 percent variability in the PLIC_ Management Efficiency_2 was accounted for by all the two predictors.

Table – 3.0 indicates that

- The coefficient for V123 (LIC_Capital Adequacy_3 – Solvency Margin) was - .061; therefore every unit increase in the V123; while the other predictors remain constant it was expected to **decrease .061 unit in outcome variable** V127 (PLIC_ Management Efficiency_2).
- The coefficient for V128 (PLIC_ROE) was - .365; therefore every unit increase in the V128; while the other predictors remain constant it was expected to **increase .365 unit in outcome variable** V127 (PLIC_ Management Efficiency_2).
- The standardized coefficient or **beta for V123 = -.463**; which was the moderate absolute value therefore it has a moderate impact on the V127 (PLIC_ Mgt Eff_2) whereas **beta for V128 = -.588**; which was the moderate absolute value therefore it has a moderate impact on the V127 (PLIC_ Management Efficiency_2).
- Based on the b values revealed by the output; the **Equation for Current Model**:

  $PLIC\_Mgt\ Efficiency\_2_i = b_0^{*\ Constant} + b_1^{*\ PLIC\_\ Capital\ Adequacy\_3} + b_2^{*\ PLIC\_\ ROE}$

PLIC_Management Efficiency_2$_i$ = .679 + (- .061) + (- .365)

At the α = 0.05 level of significance there exists enough evidence to conclude that the slope of the V123 and V128 was not zero and hence the V123 and V128 was useful with each other as a predictor of outcome variable PLIC_Management Efficiency_2 (V127) for indicating financial soundness of PLIC.

6.8.6 Multiple Regression analysis for Model: PLIC_Capital Adequacy_1 (V121)

Table – 4.0 reveals summary of multiple regression model PLIC_Capital Adequacy_1 indicates overall model fit and improve ability to predict outcome variable PLIC_Capital Adequacy_1 (V121).

- **R = .989** indicate strong multiple correlation coefficient between PLIC_Capital Adequacy_1 and all the two predictors.
- **R^2 = .979** indicates the measure of 98 Percent variability in the PLIC_Capital Adequacy_1 was accounted for by all the two predictors.

Table – 4.0 indicates that

- The coefficient for V124 (PLIC_Asset Quality) was .932; therefore every unit increase in the V124; while the other predictors remain constant it was expected to **increase .932 unit in outcome variable** V121 (PLIC_Capital Adequacy_1).
- The coefficient for V125 (PLIC_Risk Retention Ratio) was .448; therefore every unit increase in the V125; while the other predictors remain constant it was expected to **decrease .448 unit in outcome variable** V121 (PLIC_CapAd_1).
- The standardized coefficient or **beta for V124 = 1.25**; which was the largest absolute value therefore it has a great impact on the V121 (PLIC_Capital Adequacy_1) whereas **beta for V125 = .372**; which was the smallest absolute value therefore it has a small impact on the V121 (PLIC_Capital Adequacy_1).
- Based on the b values revealed by the output; the **Equation for Current Model**:

  PLIC_Capital Adequacy_1$_i$ = b_0 * Constant + b_1 * PLIC_Asset Quality + b_2 *PLIC_Risk Retention Ratio

  PLIC_Capital Adequacy_1$_i$ = - .401 + .932 + .448

At the α = 0.05 level of significance there exists enough evidence to conclude that the slope of the V124 and V125 was not zero and hence the V124 and V125 was useful with each other as a predictor of PLIC_Cap Adequacy for indicating financial soundness of PLIC Players.

8. Conclusion

Evaluation of financial performance of PLIC by CARAMEL Parameters depicts a story of growth and development of PLIC in post liberalization landscape. The results of empirical examination and analytical ratios reveal that PLIC has performed better in area of asset quality, management efficiency, and capital adequacy. There was a significant as well strong relationship between the outcome variable and all the two predictors.

At the α = 0.05 level of significance in terms of PLIC_Asset Quality, PLIC_Management Efficiency_2 and PLIC_Capital Adequacy_1 model there exists enough evidence to conclude for indicating financial soundness of PLIC that

- The slope of the PLIC_Capital Adequcy (V121) and PLIC_Reinsurance Issues (V125) was not zero and hence the V121 and V125 was useful with each other as a predictor of PLIC_Asset Quality (V124).
- The slope of the Cap Adequacy_3 (V123) and Profitability - ROE (V128) was not zero and hence the V123 and V128 was useful with each other as a predictor of outcome variable PLIC_Management Efficiency_2 (V127).
- The slope of the PLIC_Asset Quality V124 and PLIC_Reinsurance Issues V125 was not zero and hence the V124 and V125 was useful with each other as a predictor of PLIC_Cap Adequacy_1 (V121) for indicating financial soundness of PLIC Players.

PLIC recorded satisfactory improvement in area of Capital Adequacy and Asset Quality; but results reveal unsatisfactory overall performance in area of new business growth and cost effectiveness (Management Efficiency_1), Return on Equity (Profitability) and liquidity position.

Furthermore, results reveal PLIC found better in

- Keeping higher Solvency Margin (Capital Adequacy_3).
- Using more reinsurance services; Passing risk on to the reinsurers (Reinsurance and Actuarial issues)
- Return on Assets (Profitability)

The financial performance of the PLIC endorses the growth and development of Indian life insurance industry. Slower growth of LIC of India and improvement of PLIC in key areas of financial soundness will pose the challenges in front of LIC of India.

