Financial Soundness in Indian Life Insurance: A Comparison Between Two Leading Private Players

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ABSTRACT

The author has made a study on the life insurance sector in India. The main purpose of this analytical study was to understand the level of soundness of the life insurers - Bajaj Allianz Life Insurance and ICICI Prudential Life Insurance - chosen as the sample for the purpose of the present research. The methodology applied is the CARAMELS framework developed by the International Monetary Fund to understand financial strengths and weaknesses of different sectors like banking, insurance etc. In fact, the CARAMELS model acts as a framework which considers different parameters for determining the soundness of organizations spread across different industries. The study on ICICI Prudential Life Insurance and Bajaj Allianz Life Insurance gave mixed results. Several areas have been identified which require a lot of improvement. This study is one of the unique studies on the financial soundness aspect in the insurance sector.

Keywords: CARAMELS, Financial Soundness, Life Insurance, Private Players

JEL Classification: C67, D57, G22

INTRODUCTION

❖ **Financial Soundness Indicators: The Background Story :** The IMF analyzed the scenarios in different economies of the world and also looked into the increasing vulnerabilities of the service industries like insurance, banking etc. On this basis, a model was developed in June 2001, which is popularly known as the CARAMELS framework. It prescribes some indicators, which analyze the different aspects of the insurance industry. Thus, it is clear that the framework is in the form of recommendations of some indicators to build a strong, robust and stable financial system primarily in the banking and insurance sectors. The main aims of the prescribed model are to support macroprudential analysis and determine the health and soundness of the financial institutions in a country.

❖ **Structure of Indicators :** The proposed FSIs developed by the IMF focus on different areas like Capital Adequacy, Asset Quality, Reinsurance Issues, Actuarial Issues, Management Soundness, Earnings and Profitability, Liquidity and Sensitivity to Market Risk.

LITERATURE REVIEW

The review of literature, both international and national, shows that no data-based study taken up before has analyzed the insurance sector (or insurance players) using the CARAMELS framework. Majority of the literature on the performance analysis of insurance players have used the Data Envelopment Approach (DEA) to determine efficiency. Some of the literatures covered by the author are as follows:

(a) International Studies

Carson and Ingves (2000): In their article comprising of seven sections, the researchers discussed in detail about the developments taking place across the globe through the initiatives of the IMF, the World Bank and other national and international bodies. They emphasized the need for macroprudential surveillance and identification of macroprudential indicators. The authors also pointed out the importance of both micro and macroprudential indicators for better financial sector surveillance. For better guidance in policy-making, they presented a summary of macroprudential indicators, which had been bifurcated into aggregated microprudential indicators and macro-economic indicators. They also studied in detail, the studies already conducted on the macroeconomic variables and aggregated microprudential indicators. In the later part of their research paper, they highlighted certain issues relating to the information on the basis of which macroprudential surveillance is carried out, which included accuracy, timeliness and comparability of macroprudential indicators across countries.

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Das, Davies and Podpiera (2003): The authors in the first two chapters of the book mentioned about the basics of financial sector assessment and the aspect of macroprudential surveillance. In the second chapter, specifically, they defined the indicators of financial structure, aspects relating to system wise indicators, indicators of the key attributes of the sector and measures of outreach of financial services. The relevant part for the present study relates to financial soundness indicators that are defined for the insurance sector, particularly for the life insurance sector, which had been categorized in terms of core and encouraged ones. The chapter also discussed about the FSIs relating to banking, securities market, etc.

Eckles and Saardchom (2007): The researchers analyzed the technical and scale efficiency results in the Thai Non-Life insurance industry. The analysis of data for the period from 1997 to 2003 showed that technical efficiency ranged from 0.691 to 0.791. A noticeable point was that those insurers who attained a score of one were not necessarily the largest firms in the industry. With regard to the returns to scale, they pointed out that 41.7% of the firms operated under CRS, 25.1% under DRS, and the remaining under IRS.

Frimpong (2010): The author investigated the relative efficiency of the Ghanaian Banks in 2007 by applying the input-oriented model. The sample used for the study included three state-owned sector banks, eight private domestic banks and eleven foreign banks. Hence, the efficiency analysis was done on a total of 22 banks. The researcher calculated the technical efficiency score for the industry which showed that only 18% of the insurers attained a score of one with the overall average being 74%. In the later part of the study, the relationship between technical efficiency scores and profitability (denoted by return on equity) was studied by plotting the ROE against the efficiency scores on a two-dimensional space.

Lee and Kim (2008): The authors pointed towards the changes encompassing the Korean life insurance industry in terms of the changing market structure, distribution channels and increasing amount of competition. They tried to measure, analyze and decompose the relative efficiency of the Korean life insurers. The data covered twenty-two registered insurers covering data for the year 2006 only. They employed the DEA (both BCC and CCR) approach, Slack-based measure and the Super-efficiency models to analyze the data. They applied the input-oriented model on the DEA-SOLVER software to arrive at their results, which showed the average BCC, CCR and SBM efficiency scores to be 0.988, 0.961 and 0.892 respectively, thereby pointing towards a high efficiency level. The reason behind such a high average score was that of the total insurers, 81%, 54% and 54% were found to be perfectly efficient under BCC, CCR and SBM approach respectively. In terms of returns to scale, the number of companies under increasing, decreasing and constant returns to scale were three, seven and twelve respectively. A further in-depth analysis of the results of efficiency showed that the twelve efficient insurers were both technically and scale efficient. In the DEA results, since there were many companies having the score of 1, for ranking of the DMUs, the super-efficiency model had been applied for further refinement. The average super-efficiency scores under BCC, CCR and SBM were found to be 1.269, 1.103 and 0.966 respectively.

Saad and Idris (2011): Their paper made a comparative analysis of efficiency of life insurance companies of Malaysia and Brunei. The authors used DEA to identify the contribution of technical and efficiency change to the productivity growth by applying the Malmquist Index for the period from 2002-05. The data set consisted of eleven companies - nine from Malaysia and two from Brunei. This study utilized two-input and two-output cases. The two inputs were Commission and Management, whereas the outputs were Premium and Net Investment Income. The results of efficiency were arrived at by using both variables - Returns to scale (VRS) and Constant returns to scale (CRS) assumptions. There were only three insurers who got a score of 1 in both the cases. In terms of the industry average, it is seen that efficiency performance of the life insurance industry was relatively higher based on VRS than CRS. If we look at the trend in movement of the efficiency average, it is seen that it was not the same under CRS and VRS. In the first case, there was an increase from 2000 to 2002, and then a decline during the period from 2003-04, but then the trend reversed. On the other hand, in the case of VRS, there was no definite trend between 2000 to 2003, but then it showed an increase. The results showed that the total factor productivity is due to both efficiency and technical changes, where scale efficiency and not pure efficiency plays a dominant role. Furthermore, all the firms experienced both technical progress and regress. For the entire period of the study, there was an improvement in relative efficiency throughout these years with a slight deterioration during the period from 2002-2003 at -12.3 percent.

Saeidy and Kazemipour (2011): The researchers investigated the relative efficiency scores of public and private life insurers of Iran by studying data for the period from 1383 to 1387. A non-parametric method like the input-oriented DEA with VRS technology was applied. Moreover, they studied whether there was any significant difference in the

efficiency score of the public and private sector. The analysis of the input and output variables showed that the performance of the public sector companies was significantly much better than that of their private counterparts.
Sundarajan et al. (2002): The authors made an in - depth study on financial soundness indicators and mentioned the need to have flexibility in indicators that will be considered for macro analysis of a country's sector. Their work not only pointed to the areas where significant progress had been made, but at the same time, the study also included scope for further research. It had been clearly shown that the macro-prudential indicators play a vital role, not only in the analysis at the macro-level, but also at the firm level.
Tone and Sahoo (2005): The authors applied DEA to analyze the cost efficiency and returns to scale of Life Insurance Corporation (LIC) by using time series data. The data set covered a period of 19 years from 1982-83 to 2000-2001. The results showed that there existed heterogeneity in the cost efficiency over the period of study. There was a decreasing performance after 1994-95, mainly due to the allocative inefficiency arising from the modernization measures undertaken by LIC. However, the authors reported that it was encouraging to see that there was a significant increase in efficiency in 2000-01.

(b) Indian Studies

Bawa and Ruchita (2011): The authors examined the technical efficiency of general insurers engaged in the health insurance business in India by applying DEA. The paper studied the data from 2002-03 to 2009-10 of ten general insurers including four public sector insurers. The results had been presented company wise, year wise, sector wise and all insurers considered together. The points covered in the results pointed towards technical efficiency, pure technical efficiency, scale efficiency and returns to scale. Some of the key results are as follows: Firstly, as per the study, New India Assurance Company Limited and National Insurance Company Limited were the two fully efficient insurance companies. During the later one/two years, however, they showed an efficiency level of less than 1 in every year. Secondly, the researchers found that in almost all the years, they found at least one or even two public sector players who lay on the efficient frontier. However, in the later years of the study period, not even one player of the public sector showed perfect efficiency, which may be attributed to decreasing returns to scale because of the entry of private players. In the third part of the analysis, the results showed that the mean technical efficiency of the private players was on the rise (from 0.062 in 2002-03 to 0.776 in 2009-10) in contrast to the falling trend observed in the case of the public sector players (from 0.878 in 2002-03 to 0.661 in 2009-10). This downfall was due to the falling pure technical efficiency (PTE) and scale efficiency (SE). For the private sector and the public sector, the mean of PTE fell from 0.942 and 1.00 in 2002-03 to 0.893 and 0.978 in 2009-10 respectively. On the other hand, for the private sector, the SE increased from 0.064 (in 2002-03) to 0.858 (in 2009-10), whereas for the public sector, there was a fall from 0.878 (in 2002-03) to 0.675 (in 2009-10). In the last part of the analysis, it was seen that the overall mean technical efficiency of all insurers increased from 0.389 in 2002-03 to 0.730 in 2009-10. Further analysis showed that for the private sector, the improvement space came down, showing that it was moving closer to the efficient frontier in contrast to the decreasing returns to scale observed for the public sector.
Kulkarni and Sagar (2011): The authors focused on the position of LIC in terms of its market share. Moreover, they discussed the marketing strategies being adopted by the public giant to improve its competitive strength and dominance in the market. The authors pointed out the market share of the individual players as at the end of 2008-09; LIC had a share of 70.92 percent, whereas the private insures taken together had a share of 29.08 percent dominated by ICICI Prudential Life, Bajaj Allianz Life and SBI Life Insurance. Moreover, they provided supportive data to show the rapid rate of growth of the private sector. They mentioned that there was a 800 percent increase in the premium volume in the industry in 2008-09, with respect to 1999-2000. In the later part of their article, they elaborated the strategies adopted by LIC to fight the increasing competition which included innovative product development, launch of health insurance-related products, widening the distribution network, inclusion of micro-insurance agents for the micro-insurance business, bancassurance and opening up of foreign branches.
Sinha and Chatterjee (2007): The authors in the initial part of the paper highlighted the growth of the Indian insurance industry. In the later part of the study, they analyzed the cost efficiencies of the life insurers which included LIC and the private players. The analysis of the data for the period from 2002-03 to 2006-07 suggests an inconsistency in the trend of cost efficiency. In the initial four years, there was an upward trend, after which the trend reversed.

Hence, the researcher found that there are only theoretical discussions on the CARAMELS framework without any empirical study using the model. Similarly, there are a number of academic materials on efficiency analysis using

DEA. Hence, the contribution of the present paper is to practically apply the model on the insurance industry with reference to India.

OBJECTIVE AND METHODOLOGY

❖ **Objective of the study :** The objective is to understand the comparative position in terms of financial soundness of the top two private sector life insurance players in India - ICICI Prudential Life Insurance and Bajaj Allianz Life Insurance.

❖ **Sample Selection :** Purposive sampling was the method adopted for selection of the two insurers in the sample. On the basis of the analysis of the market share among the private life insurance companies for the years 2004-05 to 2009-10, the researcher considered the top two players on the basis of their average ranking during the years considered as the time period for the study. The top two ranks during the period of the study were held by ICICI Prudential Life Insurance and Bajaj Allianz Life insurance. Since the study was carried out in the middle of 2011, the last annual report of 2010-11 was not considered since it was not available at that point of time.

❖ **Methodology :** The CARAMELS framework was used for the study of the insurance sector (which is analogous to the CAMELS framework applied for the banking sector). According to the framework, several aspects are considered, which in totality determine the financial soundness of an organization. Data had been collected from IRDA Annual Reports for the years 2004-05 to 2009-10.

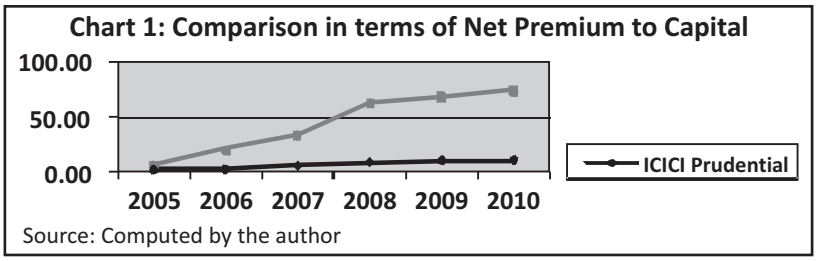
ANALYSIS AND FINDINGS

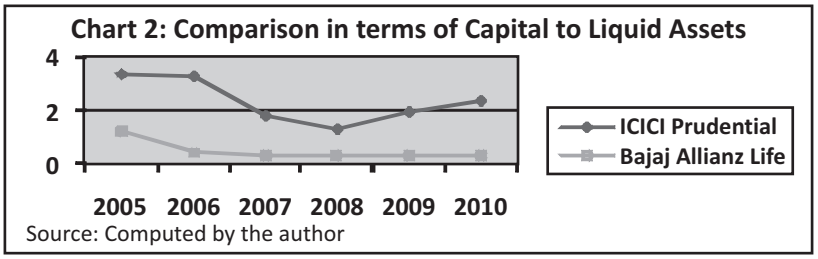
The above mentioned model was applied to determine the financial soundness of the said organizations. A one-to-one analysis of the ratios has been done in order to analyze the status of these two leading life insurers.

DIMENSIONS COVERED

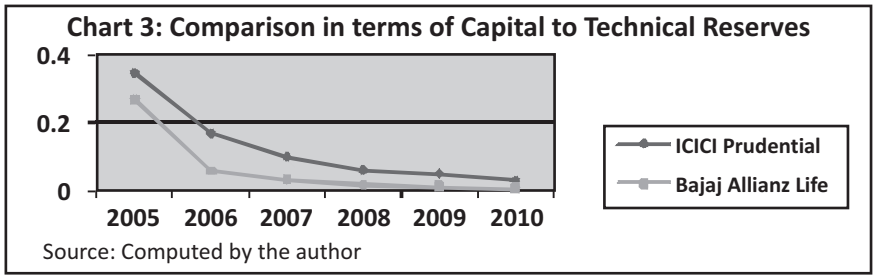
(1) Capital Adequacy: Capital adequacy can be viewed as the key indicator of an insurer's financial soundness. For life insurers, the researcher has included three indicators - Net Premium/Capital, Capital/Liquid Assets and Capital/Technical Reserves. The ratios indicate the capacity of the sector to absorb losses relative to risk exposures; exposure measured by asset size, reserves, and regulatory capital or risk models.

(a) Net Premium / Capital : The Chart 1 depicts that there was an increasing trend in the Net Premium to Capital ratio of both the companies. It is also seen that Bajaj Allianz Life Insurance generated much more premium as compared to ICICI Prudential in terms of capital invested. On the basis of data of 2004-05 to 2009-2010, the Net Premium to



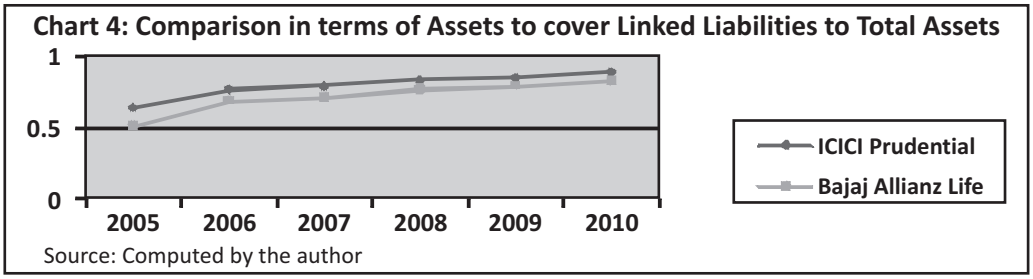


Capital ratio of ICICI Prudential Life Insurance increased from 2.55 to 11.54, whereas that of Bajaj Allianz Life Insurance increased from 6.66 to 75.58.



(b) Capital/Liquid Assets : From the Chart 2, it can be seen that during 2004-05 to 2006-07, there was a decreasing trend in the Capital to Liquid Asset ratio of both the companies. During 2007-08, the Capital to Liquid Asset ratio of ICICI Prudential decreased further to 1.31, but finally, it increased to 2.37 by 2009-2010. On the other hand, the Capital to Liquid Asset ratio of Bajaj Allianz Life Insurance became stagnant during 2007-08 to 2009-2010.

(c) Capital / Technical Reserves : From the Chart 3, we can observe a decreasing trend in the Capital to Technical Reserve ratio of both the companies. Technical reserve includes insurance reserves and provision for linked liabilities. Hence, there was a need to increase the capital base as the provision for linked liabilities was substantial and the ratio showed a continuous decrease.

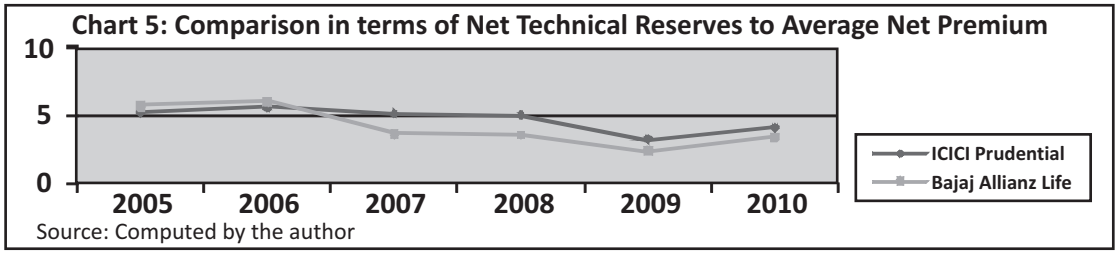


(2) Asset Quality: On the asset side of the balance sheet, the researcher explored the structure of assets and focused on the ability to meet liabilities.

(a) Assets Held To Cover Linked Liabilities/ Total Assets : A look at Chart 4 shows that the ratio showed the position in terms of its readiness to meet its liabilities. The sign was positive for both the insurers. However, recent data shows that Bajaj Allianz has improved its position recently. But , the overall the position of ICICI Prudential was better.

❖ **Non Performing Loans / Total Gross Loans :** According to the IRDA annual report, the Non- Performing Loan to Total Gross Loans of both the companies during these years was zero. Hence, the graph could not be plotted. But it was a very positive sign for both the insurers that this ratio was zero.

(3) Reinsurance and Actuarial Issues: It reflects the overall underwriting strategy of the insurer. Also, it reflects the



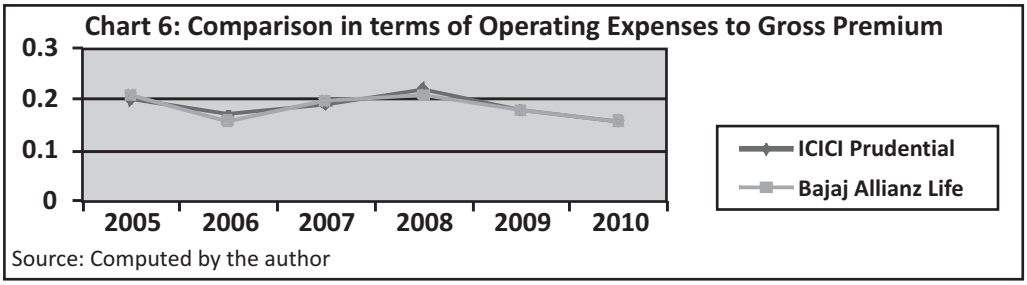
correctness of pricing of the products in comparison to the risk the product covers. It is an indicator of adequacy of technical reserves. It can be measured from the following ratio:

Net Technical Reserve/ Average of Net Premium received in the last 3 years

Net Technical Reserves consist of insurance reserves and provision for linked liabilities. As per the Chart 5, both the insurers showed a declining trend till 2009, after which they showed an upward turn. However, the graph line clearly shows that ICICI Prudential was better in terms of this capital adequacy ratio. Hence, underwriting had to be improved so that the Net Technical Reserves and the ratio showed an overall increase.

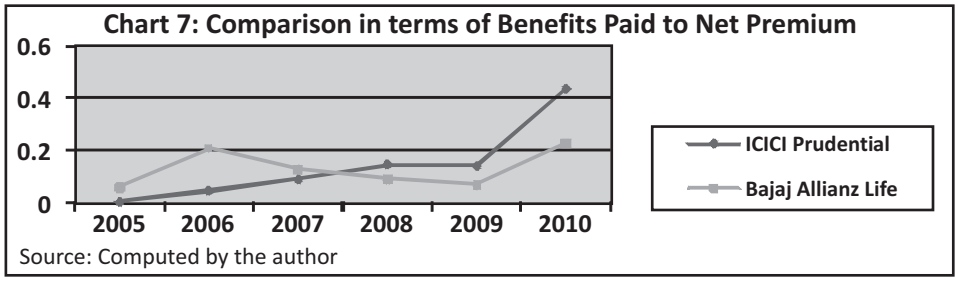
(4) Management Soundness: It can be measured from the following ratio:

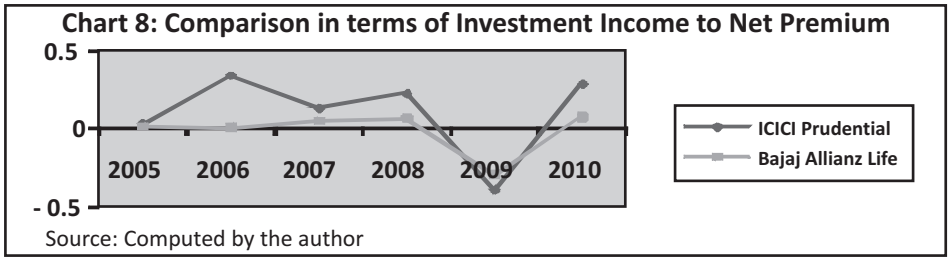
(a) Operating Expense /Gross Premium : Operating Expense to Gross Premium being the expense ratio, the decreasing trend of this ratio has a positive impact on a company's management soundness. As depicted by Chart 6, both the companies were almost on the same trend line, indicating almost equal management soundness. It is to be noted that both the companies had to improve their management soundness from 2004-05 to 2009-10. It shows a very good trend.



(5) Earnings and Profitability: Earnings are the key and arguably, the only long-term source of capital. Profitability is considered a leading indicator for solvency problems. Therefore, considerable attention was given to this area.

(a) Benefits Paid / Net Premium : As depicted in the Chart 7, initially, both the companies started with an increasing trend of Benefits Paid to Net Premium Ratio. During 2005-06 to 2008-09, the earnings of Bajaj Allianz Life Insurance increased, but the same reduced after 2008-09. On the other hand, the Benefits Paid to Net Premium Ratio of ICICI Prudential maintained an upward trend. Since, Benefits Paid are considered as an output in the insurance industry, the increasing trend was a good sign.

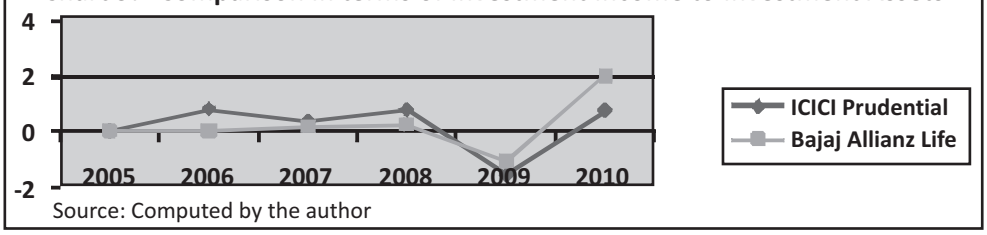




(b) Investment Income / Net Premium : This ratio being an income ratio, the increasing trend of this ratio had a positive impact on the company's earnings. Investment income includes income from investment of both shareholders' account and policy holders' account. As shown by the Chart 8, both the companies started at the same point. The increasing trend of ICICI Prudential shows an increasing investment income in terms of Net Premium, but it was fluctuating. During 2008-09, the investment income fell drastically, leading to a steep decline in the ratio, which fell to a value of -0.399. The reason could be the adverse situation in the equity markets worldwide since end of 2008. The investment income of Bajaj Allianz Life Insurance improved in the beginning, but it also fell to -0.3 during the year 2008-09. However, overall, ICICI Prudential showed a better performance as compared to Bajaj Allianz Life Insurance. When the markets were stabilizing, this ratio showed a significant increase, which was a positive sign for both the companies.

(c) Investment Income / Investment Assets (Total) : The Chart 9 indicates the scope of investment income to offset losses from the insurance business. During the time period from 2004-05 to 2007-08, ICICI Prudential was performing better than Bajaj Allianz Life Insurance and the income level of both the companies was positive. In the year 2008-09, the income level of both the companies became negative due to the same reason as cited above. However, in 2009-10, both the companies managed to increase their income from investments, thereby, raising the Investment Income to Investment Asset Ratio to a positive level, which was a good sign.

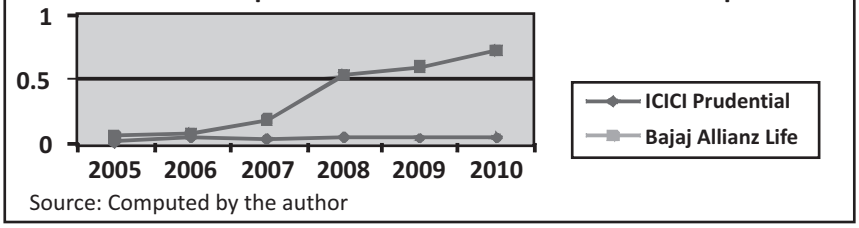
Chart 9: Comparison in terms of Investment Income to Investment Assets



Source: Computed by the author

(d) Return / Share Capital : This ratio indicates the scope for earnings to offset losses relative to capital or assets. Return includes income from investment of shareholders account. According to the Chart 10, the performance of Bajaj Allianz Life Insurance was much better as compared to that of ICICI Prudential. This ratio improved substantially for Bajaj Allianz Life Insurance - from 0.07 in 2005-06, it went on to attain a value of 0.72 in 2009-2010. ICICI Prudential, on the other hand, was not able to increase its Return to Capital ratio.

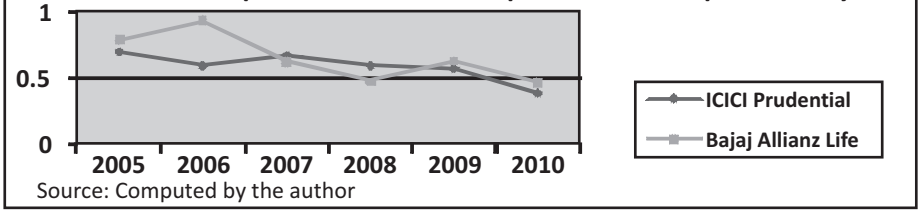
Chart 10: Comparison in terms of Return on Share Capital



Source: Computed by the author

(6) Liquidity: Liquidity identifies the ability to meet the liabilities in time. It can be measured from the following ratios:

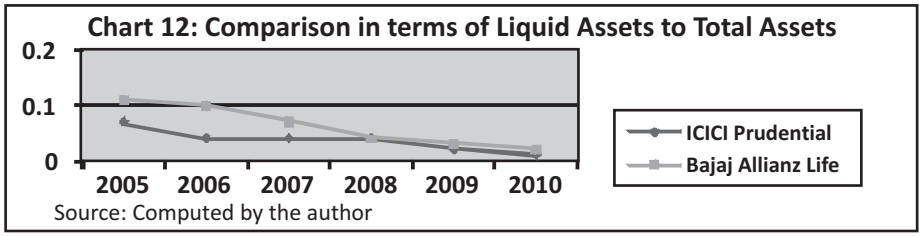
Chart 11: Comparison in terms of Liquid Assets to Liquid Liability



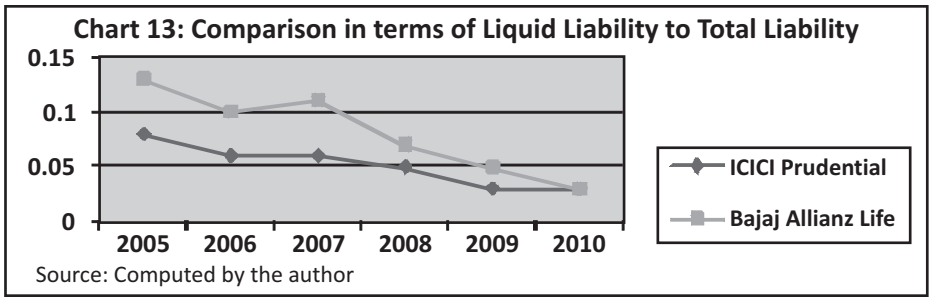
Source: Computed by the author

(a) Liquid Assets / Current Liability : This ratio identifies the liquidity position of the company. As Chart 11 shows, the liquidity ratio of Bajaj Allianz Life showed a greater fluctuation than the liquidity ratio of ICICI Prudential. But, overall, the trend was negative as the liquidity ratio declined during the study period.

(b) Liquid Assets / Total Assets : The Chart 12 shows the liquidity position of both the companies in terms of Liquid Asset to Total Assets Ratio. Unfortunately, both the insurers show a downward trend. However, Bajaj Allianz had been maintaining a better liquidity position as compared to ICICI Prudential. Hence, both the companies needed to improve their liquidity position.



(c) Liquid Liability/ Total Liability : The Chart 13 shows the liquidity position of both the companies in terms of Liquid Liability to Total Liability ratio, which followed a downward trend. ICICI Prudential Life maintained a better position as compared to Bajaj Allianz Life Insurance. It can be observed that this ratio was in line with the Liquid Assets to Total Assets ratio, thereby showing a clear match between the movement of liquid assets and liquid liabilities. Hence, in this regard, both the companies were following a good asset-liability matching strategy.



CONCLUSION AND RECOMMENDATIONS

On the basis of the above analysis, it is clear that all is not well for the life insurers, in the present case, the two insurers on which the study has been made. There are several areas which need focus and attention, thereby calling for improvement strategies.

1) Bajaj Allianz and ICICI Prudential Life Insurance should try to infuse capital so that they are able to increase the capital adequacy.

2) Both the insurers should keep an eye on the Operating Expenses to Net Premium ratio as it is showed a fluctuating tendency and was at a high percentage. Both the companies were approaching a break-even point, hence this ratio was crucial.

3) It was found that during the period of economic slowdown, the investment income reduced drastically. Thus, it is suggested that both the insurers should take a look at their portfolio so that they can play safe and do not get hit in their earnings during such global or domestic events.

4) Both the insurers should keep an eye on the liquidity position as in both cases, liquidity showed an overall declining trend.

LIMITATIONS OF THE STUDY

Though the researcher has made an effort to determine and compare the financial soundness of the two sample private insurers, due to insufficient data, all the ratios mentioned in the CARAMELS framework could not be computed. Moreover, the overall industry could not be studied.

SCOPE FOR FUTURE RESEARCH

On the basis of literature review, there is scope for improving the area of research. Future studies can focus on developing a model which can establish a relationship between the financial soundness score and efficiency scores. Another suggested area can be to find out the effect of the insurance sector reforms on different areas that have been considered important under the above-mentioned framework. A comparative study with LIC would be another interesting area of research.

REFERENCES

1) Bawa, S.K., and Ruchita (2011). "Efficiencies of Health Insurance Business in India: An Application of DEA." *American Journal of Social and Management Sciences, 2* (2), pp. 237-247.

2) Carson, C.S., and Ingves, S. (2000). *"Macroprudential Indicators of Financial System."* IMF Occasional Paper, No. 192, Washington DC, pp. 1-33.

3) Das, Davies et al. (2003). *"Insurance and Issues in Financial Soundness."* IMF Working Paper No. 03/138, July, pp. 1-5.

4) Eckles, D.L., and Saardchom, N. (2007). "Technical and Scale Efficiency in the Thai Non-Life Insurance Industry." *NIDA Business Journal, 3*, pp. 105-124.

5) Evans, Leone & et al. (2000). *"Macroprudential Indicators of Financial System Soundness."* IMF Occasional Paper 192, April, pp. 1-49, http://www.jvi.org/uploads/tx_abaeasydownloads/L-12%20-%20Evans-macroprudential-indicators-OP192.pdf accessed on April 10, 2012.

6) Frimpong, J.M. (2010). "Investigating Efficiency of Ghana Banks: A Non-Parametric Approach." *American Journal of Scientific Research, Issue 7*, pp. 64-76.

7) Kulkarni, S.J., and Sagar, P.N. (2011). "Recent Trends in Marketing Strategy of LIC of India." *Mahmul, 1* (1), pp. 20-25.

8) Lee, H., and Kim, K. (2008). "Decomposition and Super-efficiency in the Korean Life Insurance Industry employing DEA." *International Journal of Contents, 4* (3), pp. 1-8.

9) Podpiera. R. (2005). "Indicators of Financial Structure, Development, and Soundness", In *"Financial Sector Assessment: A Handbook."* World Bank and International Monetary Fund, Chapter 2, World Bank, Washington DC, USA, http://www.imf.org/external/pubs/ft/fsa/eng/pdf/ch02.pdf accessed on July 5, 2011.

10) "Review of Insurance Sector" (2003). Pakistan Financial Sector Assessment, State Bank of Pakistan, Chapter 5, pp. 95-109, www.sbp.org.pk/publications/FSA-2003/Chapter_5.pdf accessed on August 21, 2010.

11) Saad, N., and Idris, N.E.H. (2011). "Efficiency of Life Insurance Companies in Malaysia and Brunei: A Comparative Analysis." *International Journal of Humanities and Social Science, 1* (3), pp. 111-122.

12) Saeidy, P. and Kazemipour, S.A. (2011). "Compare the Performance of Private and Public Insurance Companies in using Data Envelopment Analysis." *World Applied Sciences Journal, 13* (5), pp. 988-992.

13) Sinha, R.P., and Chatterjee, B. (2007). *"Are Indian Life Insurance Companies Cost Efficient?"* pp. 1-10, http://www.igidr.ac.in/money/mfc-11/Sinha_Rampratap.pdf accessed on April 20, 2011.

14) Slack , G. (2003). *"Availability of Financial Soundness Indicators."* IMF Working Paper No. 03/58, pp. 1-62.

15) Sundararajan, Enoch & et al. (2002). *"Financial Soundness Indicators: Analytical Aspects and Country Practices."* IMF Occasional Paper No. 212, April 8, pp. 1-111.

16) Tone, K., and Sahoo, B.K. (2005). "Evaluating Cost Efficiency and Returns To Scale in the Life Insurance Corporation of India using Data Envelopmental Analysis." *Socio-Economic Planning Sciences, Issue 39*, pp. 261-285.

17) World Bank and International Monetary Fund (2005). *"Financial Sector Assessment: A Handbook."* published by World Bank, Washington DC, USA, http://books.google.co.in/books accessed on March 25, 2012.

18) www.irdaindia.org accessed during the period from June 01, 2011 to May 30, 2012.