MULTIVARIATE PROFITABILITY ANALYSIS OF INDIAN GENERAL INSURANCE COMPANIES: A STUDY OF POST REFORM PERIOD

Dr Manjit Singh
Associate Professor, School of Applied Management, Punjabi University, Patiala, Punjab
Email id: smanjitt@gmail.com

Dr Rohit Kumar
Assistant Professor, Punjabi University College, Moonak, Sangroor, Punjab

ABSTRACT

The contours of insurance business have been changing across the globe and the rippling effect of the same can be observed in the Indian market as well. The insurance industry of India has started to reveal the potential after the process of reforms which resulted in to liberalization, privatization and globalization of insurance industry in India. Now it has become quite tough for the companies to work in a competitive environment and there is uncertainty regarding the effect of these reforms on the profitability of these companies which is important for the safety and soundness of insurance industry. The present study is an endeavor to examine the effect of reforms on the profitability performance of the various public sector and private sector general insurance companies, and identifies the gap in the performance so as to make suggestions thereof. The study brings out that public sector has exhibited higher underwriting losses in the post-reform period and the higher investment return of the public sector general insurance companies has compensated their underwriting losses. The higher investment income of the public sector general insurance companies is due to their aggressive investment portfolio policy and better performance of share market in the recent past. But the prospects for a rapid improvement in investment return are currently uncertain. Given these uncertain prospects of investment return, the public sector general insurance companies must focus on sustainable profitability business model by emphasizing on improvement in the underwriting results to achieve greater profitability and to achieve better underwriting results.

Key Words: *Combined Ratio, Underwriting Results, Investment Income, Return on Equity*

INTRODUCTION

The insurance industry has also succumbed to the general trend towards globalized markets and risks and as such the insurance industry in India has seen an array of changes in the past one decade. This general trend is evident in the fact that in recent years there has clearly been more rapid growth in global trade, direct investment and portfolio investments than in the production of goods and services. Liberalization of insurance services involves removing restrictions to foreign and domestic investment and allowing firms the freedom to set rates. The benefits of liberalization of the insurance markets are multi-faceted. Foreign insurance companies can enhance the efficiency

of the local insurance markets by providing superior customer services, introducing new products and transferring technological and managerial know- how. It increases competition and encourages a more pronounced specialization according to comparative advantage.

As a result of the various reforms introduced by the Government of India in the insurance sector, private companies in collaboration with some foreign companies have made their entry into the field. It has thrown a new challenge before the public sector companies. Now it has become quite tough for the companies to work in a competitive environment. It has resulted in reduction of product prices, increases in distribution cost and better service quality. There is uncertainty regarding the effect of these reforms on the profitability of these companies which is important for the safety and soundness of insurance industry and the present study is an endeavour to examine the profitability of the various general insurance companies in the post reform period.

REVIEW OF LITERATURE

The Indian insurance industry come to a full wide circle from being a competitive market to nationalisation and once again to a liberalized and highly competitive market. The researchers have explored and probed this sector worldwide. Chidambaran et al. (1997) presented an empirical analysis of the economic performance of the U.S. property-liability insurance industry, using estimation across 18 lines of insurance for the years 1984 through 1983. The study adopted an industrial organisation at approach, focusing on the economic loss ratio as a measure of pricing performance. The research found that there are still questions about performance that are related to industry concentration. One explanation is that higher concentration is conducive to the muting of pricing rivalry. Another is that higher differences in firm efficiency result in both higher concentration and higher profit rates. Baltelsmit and Bouzouita (1998) examined the relationship between profitability and market structure in automobile insurance and tests for the existence of a positive relationship between concentration and performance. The results showed a significant positive impact of concentration on profitability for combined liability and physical damage lines in private passenger automobile insurance. Rao (1998) examined the efficiency of the LIC, in physical and financial terms. There has been a significant improvement in the physical performance of the LIC. But the financial performance in terms of profitability had not been up to the expected level. Verma (2000) evaluated the performance of the GIC and its subsidiary companies over the years, throwing light on the probable effects of the various insurance sector reforms on the future development of General Insurance in the country. The study found that the GIC along with its subsidiaries has emerged not only as a strong insurance institution but also as an influential institutional investor in the financial market of India due to large amount of funds

at its disposal. The underwriting results showed losses in about all the years except 1993-94. Rudolf (2001) examined the key factors and latest trends determining profitability in the major non-life insurance markets. The results indicated that only Germany and Japan did not have negative underwriting results and return on equity was high in UK, moderate in Canada and US, and low in France and Germany. The study found that underwriting result and investment yield are negatively correlated. Brien (2001), indicated that there was strong evidence that the new entrants have had high growth rates (in new businesses and assets) but, from a low base, they have made little impact in terms of market share. Lai and Limpaphayom (2003) examined the relation between organisational structure and firm performance in the Japanese non-life insurance industry. The results indicated that the stock companies that belong to one of the six horizontal Keiretsu groups have lower expense and lower levels of free cash flow than independent stock and mutual insurance companies. Keiretsu insurers also have higher profitability and higher loss ratios than independent insurers. Oetzel and Ghosh (2008), in his paper, explored the relationships between market liberalization and insurance firms' performance in emerging markets and developing countries. The results of the analysis suggest that the host country liberalization is positively associated with firm profitability for all insurers, foreign and local, operating in a given host country. No significant profitability differences were found between foreign and locally owned firms, although U.S. owned subsidiaries were significantly less profitable than subsidiaries from any other country. Dhanda (2004), in his study titled, 'Divisional Performance Evaluation of LIC Business in North Zone' evaluated the performance by using both primary and published information. The profitability analysis showed that more than 60 per cent of total income was received by way of premium income and the remaining income was earned by investing funds. Chen and Wong (2004), in their research paper, analysed the solvency of general and life insurance companies in Asia using firm data and macro data separately. The research indicated that the financial health of a Singapore insurer seems to be significantly weakened by the Asian financial crisis as the insurance industry in different Asian economies is at different stages of development. They require different regulatory guidelines. Hoyt and Powell (2006) analysed the financial performance of medical liability insurer by using two appropriate measures, namely, the economic combined ratio and the return on equity. The study found that there was no evidence that medical liability insurers had been earning excessive returns or that they were over-capitalized. Kasturi (2006), focused on the performance management system in the insurance corporation in general based on the principles of performance management in the service organization. The study reveals that success of an insurance company depends on four important functions, such as identification

of markets, assessment of risks and estimation of losses, penetration into and exploitation of markets, control over investment and operating costs. Mahmoud (2008) observed that the mean of efficiency of financial performance, ratios of the public and private sectors do not vary significantly for the following ratio returns on investments, net profit to total assets, net profit to surplus, total liabilities to total assets, and underwriting expenses paid to premiums written.

The above review indicates that the measuring of profitability of general insurance companies in developed countries like Europe, United States, and Canada etc. has attracted much attention from researchers, at the international level. But no worthwhile research has been conducted to find out the determinants of profitability of the general insurance companies in the liberalization era in the Indian context and the factors contributing for this difference. This gap in the research is particularly notable, because in this liberalized world, the public sector general insurance companies' survival depends upon their improved performance on profitability. So, this paper tries to fill this research gap and evaluate the impact of liberalisation on the profitability of the public sector as well as private sector general insurance companies.

OBJECTIVES AND METHODOLOGY OF THE STUDY

The present study attempts to appraise the comparative profitability of the public sector and the private sector general insurance companies, examines the factors affecting the profitability of public and private sector general insurance companies, and identifies the gap in the profitability and to make suggestions to improve the profitability of the general insurance industry in India. The study is mainly based on the secondary data which has been collected from IRDA annual reports, annual reports of Non-life Insurance companies, various journals related to insurance, websites etc. The reforms in the insurance industry were initiated in the year 1999 and the private sector Non-life Insurance companies started their business in 2000. A total of eight private sector Non-life Insurance companies started their business from the year 2002-03. So, to analyze the comparative profitability of the public sector and private sector insurance companies in the post-reform period, all the four public sector companies and eight private sector companies were taken up for the study. The period of the study was 2002-03 to 2007-08. The null hypothesis of the study is that the profitability of the private sector general insurance companies is significantly higher than that of the public sector general insurance companies

To analyze the drivers of profitability, it is useful to decompose ROE into its main components. Profits are determined first by underwriting performance (losses and expenses, which are affected by product pricing, risk selection, claims management, and marketing and administrative expenses); and second, by investment performance, which is a function of asset allocation and asset management as well as asset leverage. The first fork

of the decomposition shows that an insurer's ROE is determined by earnings after taxes realized for each unit of net premiums (or profit margin) and by the amount of capital funds used to finance and secure the risk exposure of each premium unit (solvency). The after-tax profit margin equals the pre-tax profit margin times one minus the corporate tax rate. The tax rate depends upon individual tax strategies and is otherwise an exogenous parameter of the industry. The pre-tax profit margin is the sum of the underwriting result (or underwriting margin) and the investment result. The investment result is determined by total investment yield (relative performance including realized capital gains) multiplied by invested assets (asset leverage).The underwriting result - in per cent of net premiums - is determined by the loss ratio, the expense ratio (Rudolf, 2001). The benefit of this type of decomposition is to separate the various factors affecting profitability, isolating them for further analysis. Though they will be analyzed separately, they are interrelated through the decision-making processes of insurers.

To have a better view of the performance of general insurance companies the ratios have been analyzed and interpreted by calculating mean, median and standard deviation. The hypotheses regarding profitability have been tested by the application of Mann-Whitney test.

RESULTS AND DISCUSSION

To examine the impact of selected factors on public sector general insurers' profitability and to empirically test, which of the identified variables have significantly contributed towards general insurers' profitability in either direction, the Spearman's rank correlation analysis and multiple step-wise regression analysis have been used. The Spearman's rank correlation has been used due to skewed data of profitability parameters. The return on equity has been taken as dependent variable whereas claim, expense, underwriting results, investment income, net retention and growth rate has been taken as independent variables.

Combined Ratio

This ratio reflects the combined effect of expenses of management and claim incurred. It is the most common measure of underwriting profitability. Financial analysts rely on it for comparing the profitability of insurance business of different companies and for comparing different lines of business. The companies use it for steering their business (Holzheu, 2006).

The results reveal that the average combined ratio in the case of public sector general insurance companies during the period 2002-03 to 2007-08 is 120.15 per cent, whereas it is 90.74 per cent in private sector insurance companies. It is evident that combined ratio of the public sector is higher by 29.41 per cent than the private sector. This has been due to higher claim ratio of the public sector. Both the public and private sector general insurance companies showed a standard deviation of 8.89 per cent and 29.95 per cent

Table 1. Combined Ratio of General Insurance Companies during the Post-reform Period

(Percentage)

Name of the Company	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Mean	Median	S.D.
National	106.40	116.18	113.03	143.63	116.05	123.60	119.82	116.12	12.92
New India	113.28	117.71	114.28	122.39	109.16	115.09	115.32	114.69	4.45
Oriental	110.93	119.79	123.29	120.73	111.56	123.57	118.31	120.26	5.67
United India	119.89	124.40	133.91	138.53	122.72	123.42	127.14	123.91	7.33
Mean	112.62	119.52	121.13	131.32	114.87	121.42	120.15	119.84	8.89
Median	112.10	118.75	118.78	130.46	113.80	123.49	119.84		
S.D.	5.62	3.57	9.67	11.48	5.960	4.22	8.89		
Royal Sundaram	92.04	90.84	89.92	87.67	87.07	91.69	89.87	90.38	2.08
Reliance	89.47	91.84	85.54	86.32	54.50	92.27	83.32	87.90	14.39
IFFCO-Tokio	60.97	75.78	72.91	74.55	96.71	95.13	79.34	75.17	13.90
TATA AIG	84.69	82.15	86.80	84.95	93.39	90.42	87.07	85.88	4.14
Bajaj Allianz	87.33	80.14	69.58	80.64	79.09	82.53	79.89	80.39	5.83
ICICI Lombard	95.44	47.02	66.35	76.55	77.35	92.87	75.93	76.95	17.87
Cholaman Dalam	262.67	94.27	95.28	105.86	81.07	82.56	120.28	94.78	70.35
HDFC CHUBB	153.83	83.09	101.24	101.08	111.80	110.01	110.18	105.63	23.68
Mean	115.81	80.64	83.45	87.20	85.12	92.18	90.74	87.20	29.95
Median	90.75	82.62	86.17	85.63	84.07	91.98	87.2		
S.D.	64.88	15.01	12.59	11.10	16.77	8.58	29.94		

Source: Compiled from IRDA Annual Reports from 2002-03 to 2007-08.

Test of Significance

Test	Ratio	Z-value	Asymp. Sig. (2-tailed)
Mann- Whitney Test	Combined Ratio	-6.236	0.00

respectively. It indicates that the variation in the combined ratio of the private sector general insurance companies is higher. The results of Mann-Whitney test also indicate that the combined ratio of the public sector is significantly higher than that of the private sector general insurance companies.

Underwriting Results Ratio

The underwriting results ratio of a general insurance company is depicted by taking net written premium minus increase in the unexpired risk reserve minus expense of management minus claim incurred minus commission. The underwriting results indicate the performance of an insurance company from core insurance business. The underwriting results ratio is calculated by dividing underwriting results to net written premium.

It is clear that the average underwriting results ratio of the public sector general insurance companies is -23.35 per cent and that of private sector companies is -15.55 per cent. Thus, the underwriting losses of public sector companies are higher as compared to the private sector companies. However, the private insurers showed decreasing trend except during the year 2007-08. The standard deviation of the underwriting results ratio of the public insurers is 7.79 per cent, whereas that of the private insurers is 40.35 per

cent which clearly indicates that the variation in underwriting results of the private sector general insurance companies is higher. The Mann-Whitney test also reveals that there is a significant gap between underwriting losses of the public and private insurers. The main reason for higher underwriting losses of the public insurers is mainly ascribed to low reinsurance of their business and higher expenses of management and incurred claim. Their excessive management expenses have been higher due to massive strength of manpower. On the other hand, private companies get most of their business reinsured to reduce their losses from underwriting. Moreover, they have minimum staff strength and advanced technology at their disposal. So, public sector general insurance companies need to reduce the staff strength and use more advanced technology to compete with the private sector. The general insurance business in India has been de-tariffed with effect from 1st January, 2007; and even companies are allowed to change the policy wordings with effect from 1st April, 2008. Now, it is the right time for the public sector to revisit their loss making portfolios to improve upon their underwriting results.

Investment Income Ratio

Investment performance discloses the effectiveness and efficiency of investment decisions. As such, investment

Table 2. Underwriting Results Ratio of General Insurance Companies during the Post-reform Period

(Percentage)

Name of the Company	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Mean	Median	S.D.
National	-14.14	-21.00	-18.96	-40.64	-19.13	-28.92	-23.80	-20.07	9.55
New India	-13.82	-18.96	-17.57	-27.50	-13.72	-17.18	-18.12	-17.38	5.05
Oriental	-13.21	-22.77	-27.56	-26.52	-18.12	-23.65	-21.97	-23.21	5.42
United India	-19.08	-25.09	-34.37	-39.94	-28.90	-29.62	-29.50	-29.26	7.23
Mean	-15.06	-21.95	-24.62	-33.65	-19.97	-24.84	-23.35	-21.89	7.79
Median	-13.98	-21.88	-23.26	-33.72	-18.62	-26.28	-21.88		
S.D.	2.70	2.60	7.86	7.68	6.40	5.76	7.78		
Royal Sundaram	-21.59	-6.24	-3.98	-3.65	-1.43	-8.05	-7.49	-5.11	7.27
Reliance	-41.10	-15.63	-8.02	10.86	-6.07	-20.49	-13.41	-11.83	17.28
IFFCO-Tokio	-4.57	-0.61	1.79	-2.21	-2.39	-8.43	-2.74	-2.30	3.50
TATA AIG	-19.27	-6.02	0.79	-0.15	-1.61	-4.46	-5.12	-3.04	7.39
Bajaj Allianz	-2.07	0.39	7.81	3.29	1.55	-1.77	1.53	0.97	3.68
ICICI Lombard	-34.05	13.90	0.84	-4.65	-3.82	-4.82	-5.43	-4.24	15.72
Cholamandalam	-237.78	-44.95	-15.88	-16.17	-1.15	-5.06	-53.50	-16.03	91.57
HDFC CHUBB	-147.39	-38.15	-12.42	-4.77	-6.41	-20.47	-38.27	-16.45	54.83
Mean	-63.48	-12.17	-3.63	-2.18	-2.67	-9.19	-15.55	-4.71	40.35
Median	-27.82	-6.13	-1.595	-2.93	-2	-6.55	-4.71		
S.D.	84.29	20.01	7.98	7.69	2.66	7.27	40.34		

Source: Compiled from IRDA Annual Reports from 2002-03 to 2007-08.

Test of Significance

Test	Ratio	Z-value	Asymp. Sig. (2-tailed)
Mann- Whitney Test	Underwriting Results Ratio	-4.539	0.00

performance becomes critical to the financial solidity of an insurer. The investment performance is negatively correlated to insolvency rate (Chen and Wong, 2004). It is also a function of asset allocation and asset management as well as asset leverage. The investment income ratio is determined by investment income to net written premium.

The results presented in the Table 3 indicate that the average investment income ratios of the public and private insurers are 40.27 per cent and 19.11 per cent respectively. Thus, it is 21.16 per cent higher in the case of public sector insurers. The standard deviation of investment income ratio of the public insurers is 10.61 per cent, while it is 28.44 per cent in the case of private insurers which explains more variation in the investment income of the private insurers. It brings out that the private sector has accumulated fewer underwriting losses and generated less investment income and having been in business much longer, the public sector companies have considerable investment portfolios and have benefited greatly from the strong performance of the Indian economy. The substantial investment portfolios of the public sector have compensated for their relatively weaker underwriting performance. The Mann-Whitney test also indicates that the gap in the investment income of public sector insurance companies is significantly greater than that of the private sector.

Return on Equity Ratio

Return on Equity Ratio indicates how well the resources of the owners have been used (Anthony and Reece, 1995). It measures the return accruing to owners' capital. It is computed by dividing profit after tax to Net worth. Table 4 shows the return accruing to owners' capital in the General Insurance companies under study.

The analysis provides that the average return on equity of the public sector insurers is 14.89 per cent, and that of private sector insurers is 5.36 per cent which means the public sector insurers earn 9.53 per cent higher average return on equity than the private insurers. The Mann-Whitney test also indicates that there is a significant gap between the return on equity of the public and private insurers. The return on equity of the public insurers is significantly higher than that of the private insurers. Therefore, the study rejected the hypothesis that the profitability of the private insurers is significantly higher than that of the public insurers.

On the basis of above analysis, it can be concluded that the private sector General Insurance companies have shown better efficiency in terms of combined ratio which resulted into lower underwriting losses. A closer investigation of the product portfolio, through their annual reports, reveals that it is mainly

Table 3. Investment Income Ratio of General Insurance Companies during the Post-reform Period

(Percentage)

Name of the Company	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Mean	Median	S.D.
National	22.80	26.42	24.19	37.64	36.94	37.04	30.84	31.68	7.08
New India	25.05	34.85	38.32	47.96	47.46	47.74	40.23	42.89	9.29
Oriental	25.38	46.39	48.79	44.69	40.29	39.71	40.88	42.49	8.36
United India	32.07	43.95	49.26	62.92	51.96	54.75	49.15	50.61	10.47
Mean	26.33	37.90	40.14	48.30	44.16	44.81	40.27	40.00	10.61
Median	25.21	39.40	43.55	46.32	43.87	43.72	40.00		
S.D.	3.99	9.12	11.77	10.65	6.80	8.03	10.60		
Royal Sundaram	17.48	11.45	6.67	7.10	8.44	9.01	10.03	8.73	4.02
Reliance	121.80	47.02	22.58	27.06	6.34	7.78	38.76	24.82	43.30
IFFCO-Tokio	18.25	11.26	8.01	7.49	9.83	9.97	10.80	9.90	3.90
TATA AIG	12.31	11.18	9.92	8.94	9.13	9.54	10.17	9.73	1.32
Bajaj Allianz	11.47	10.68	8.11	7.45	8.55	10.64	9.48	9.60	1.65
ICICI Lombard	33.45	19.62	16.01	12.12	9.37	12.61	17.20	14.31	8.71
Cholamandalam	168.67	32.16	12.03	13.19	9.88	8.23	40.69	12.61	63.30
HDFC CHUBB	42.94	14.05	8.48	9.36	10.99	8.59	15.74	10.18	13.49
Mean	53.30	19.68	11.48	11.59	9.07	9.55	19.11	10.66	28.44
Median	25.85	12.75	9.20	9.15	9.25	9.275	10.66		
S.D.	59.09	13.23	5.37	6.63	1.36	1.54	28.44		

Source: IRDA Annual Reports from 2002-03 to 2007-08.

Test of Significance

Test	Ratio	Z-value	Asymp. Sig. (2-tailed)
Mann- Whitney Test	Investment Income Ratio	-5.758	0.00

ascribed to the fact that the private companies are concentrating more on the creamy business. In respect of loss making portfolio, such as motor business, they have avoided to enter this business to reduce their claim incurred ratio. Further investigation reveals that public sector insurance companies do not get much of their business reinsured in contrast to the private sector players, who get most of the business reinsured to reduce their claim incurred ratio. But the higher investment return of the public sector offsets their underwriting losses and resulted into their better operating, net earning and returns on equity ratios. The main reason for higher investment income of the public sector companies is their higher net retention which enables these companies to use more premium in investment. So, in order to increase the investment income and profitability, the private sector companies need to increase their net retention. In general, the strong capital base of public sector companies has enabled them to retain more of their portfolio, and private insurers with lower capitalization (and hence lower capacity to retain risks) have resorted to higher utilization of reinsurance resulted in lower net retention.

Multivariate Profitability Analysis of the General Insurance Companies in the Post-reform Period

Interdependence among variables is a common characteristic of most multivariate techniques and correlation matrix is a table used to display correlation coefficients between these variables. Matrices form the basis for computation and understanding of the nature of relationships in multiple regressions, discriminate analysis, factor analysis, and many other similar techniques. One sample t-test is used as a parametric tool for testing the significance of correlation coefficient. The study aimed at identifying the most important independent variable(s) which has higher significant association with the dependent variable. The degree of association, i.e., strength and direction of correlation coefficients, between the selected variables and public sector insurers' profitability is studied for both the public and private sector companies during the post-reform period, and the correlation matrices are given in following Tables.

It can be seen from the Table 5 that only one independent variable, viz. investment income ratio has a significant positive correlation with return on equity and the coefficient is 0.532. All other independent variables have insignificant correlation with return on equity. Few independent variables have also significant correlation with one another during the post-reform period, such as expense of management ratio and claim ratio have a significant negative correlation with underwriting results and their coefficients are -0.551 and -0.762 respectively. Underwriting results have

Table 4. Return on Equity Ratio of General Insurance Companies during the Post-reform Period

(Percentage)

Name of the Company	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Mean	Median	S.D.
National	12.58	6.39	10.78	-9.57	29.39	10.49	10.01	10.64	12.49
New India	7.52	14.97	9.32	14.90	24.25	20.09	15.17	14.94	6.32
Oriental	7.59	28.20	23.30	17.25	24.55	0.46	16.89	20.28	10.81
United India	11.83	21.22	15.16	18.04	19.16	19.46	17.48	18.60	3.42
Mean	9.88	17.69	14.64	10.15	24.34	12.62	14.89	15.07	8.92
Median	9.71	18.09	12.97	16.07	24.4	14.97	15.06		
S.D.	2.70	9.27	6.28	13.21	4.17	9.21	8.91		
Royal Sundaram	-3.54	6.17	3.85	6.17	14.88	2.66	5.03	5.01	6.00
Reliance	15.64	6.79	4.21	9.40	0.63	-27.27	1.57	5.50	15.01
IFFCO-Tokio	5.94	8.66	12.42	5.22	9.14	2.36	7.29	7.30	3.52
TATA AIG	-10.46	12.39	9.79	6.98	8.85	6.22	5.63	7.92	8.18
Bajaj Allianz	8.77	16.52	26.36	19.31	18.68	18.29	17.99	18.49	5.65
ICICI Lombard	3.11	14.07	19.38	13.49	8.62	9.56	11.37	11.53	5.57
Cholamandalam	-2.96	-4.33	-2.35	-2.20	8.80	4.96	0.32	-2.28	5.28
HDFC CHUBB	-6.32	-18.58	-6.68	3.54	1.60	-11.33	-6.30	-6.50	8.19
Mean	1.27	5.21	8.37	7.74	8.90	0.68	5.36	6.20	10.05
Median	0.07	7.72	7.00	6.57	8.82	3.81	6.19		
S.D.	8.65	11.52	10.97	6.49	6.01	13.99	10.04		

Source: IRDA Annual Reports from 2002-03 to 2007-08.

Test of Significance

Test	Ratio	Z-value	Asymp. Sig. (2-tailed)
Mann- Whitney Test	Return on Equity Ratio	-3.93	0.00

Table 5. Spearman's Correlation of Public Sector General Insurance Companies during Post-reform Period

	Return on Equity	Claim	Expense	Underwriting Results	Investment Income	Net Retention	Growth Rate
Return on Equity	1						
Claim	-0.111	1					
Expense	0.07	0.081	1				
Underwriting Results	-0.024	-0.762(**)	-0.551(**)	1			
Investment Income	0.532(**)	0.410(*)	0.482(*)	-0.588(**)	1		
Net Retention	-0.077	-0.019	-0.152	0.023	0.05	1	
Growth Rate	-0.098	-0.362	-0.438(*)	0.333	-0.357	-0.231	1

* Significant at 5 per cent level (2- tailed)
** Significant at 10 per cent level (2-tailed)

Table 6. Spearman's Correlations of Private Sector General Insurance Companies during the Post-reform Period

	Return on Equity	Claim	Expense	Underwriting Results	Investment Income	Net Retention	Growth Rate
Return on Equity	1						
Claim	0.051	1					
Expense	-0.585(**)	-0.294(*)	1				
Underwriting Results	0.793(**)	-0.017	-0.497(**)	1			
Investment Income	-0.101	-0.001	0.082	-0.408(**)	1		
Net Retention	-0.352(*)	0.078	0.385(**)	-0.168	-0.417(**)	1	
Growth Rate	-0.051	-0.450(**)	-0.157	-0.124	0.075	-0.134	1

* Significant at 5 per cent level (2- tailed)
** Significant at 10 per cent level (2-tailed)

Table 7. Multiple Regression Analysis of the Public Sector General Insurance Companies during the Post-reform Period (2002-03 to 2007-08).

Step	Intercept (Constant a)	Unstandardized Co-efficient (b)		R^2	Adjusted R^2	F- Change	Sig. F-Change
		Investment Income Ratio (x1)	Underwriting (x2)				
I	-0.704(-0.106)	0.387(2.433)*	-	0.212	0.176	5.922	0.024
II	3.6(0.698)	0.781(5.041)*	.864(4.093)*	0.562	0.520	16.754	0.001

Note: The figures given in parentheses represent the t-values.
Significant at 5 per cent level.

significant negative correlation with investment income ratio due to this higher underwriting loss is offset by higher investment income ratio of the public sector general insurance companies resulted into higher profitability.

It can be seen from the Table 6 that two independent variables, namely, expense of management ratio and net retention ratio have significant negative correlation with return on equity and the coefficients are -0.585 and -0.352 respectively. Underwriting results have significant positive correlation with return on equity and the coefficient is 0.793. Other independent variables, namely, claim ratio, investment income ratio & growth rate have not significant correlation with return on equity. Few independent variables have also significant correlation with one another, such as claim ratio has significant negative correlation with expense of management ratio and the coefficient is -0.294. Expense of management has a significant negative correlation with underwriting results; and underwriting results has a significant negative correlation with investment income ratio and the coefficient is -0.408.

The analysis in Table 7 reveals that investment income to net written premium entered the regression model in first step, singularly explaining 17.6% variation in return on equity of the public insurers with significant regression coefficient 0.387. In second step, underwriting results to net written premium has been entered the analysis and together with investment income ratio explain 52% variation in return on equity with significant regression coefficient 0.864, i.e., one unit increase in underwriting results to NWP leads to 0.864 unit increase in the return on equity. Thus, the multivariate regression analysis for the period 2002-03 to 2007-08 concludes as follows:

$$Y1 = 3.6 + 0.781\,(x1) + 0.864\,(x2)$$

Where, y1 is the return on equity measured by net profit after tax as percentage of net worth. It has been observed that no other variable was found to be significantly affecting the return on equity of the public insurers and investment income to NWP and underwriting results to NWP have been found significantly affecting profitability of the public sector general insurance companies during the period 2002-03 to 2007-08.

Table 8. Multiple Regression Analysis of the Private Sector General Insurance Companies during the Post-reform Period (2002-03 to 2007-08)

Step	Intercept (Constant a)	Unstandardized Co-efficient (b)		R^2	Adjusted R^2	F-Change	Sig. F-Change
		Underwriting (x1)	Investment Income (x2)				
I	9.605(6.795)*	0.485(5.02)*	-	0.364	0.35	25.2	0.00
II	6.543(5.137)*	0.723(5.135)*	0.322(8.050)	0.606	0.588	26.37	0.00

Note: The figures given in parentheses represent the t-values.
Significant at 5 per cent level.

The above table carries the multiple regression analysis of the private sector general insurance companies during the period 2002-03 to 2007-08. The results show that underwriting results to net written premium entered the regression model in first step, singularly explaining 35 per cent variation in the private insurers' profitability with significant regression coefficient (b) 0.485. In second step, investment income to net written premium has been entered the analysis and together with underwriting results ratio explain 58.8 per cent variation with significant regression coefficient 0.322, i.e., one unit of investment income to NWP leads to 0.322 increase in the private insurers' profitability.

The multivariate regression analysis for the period 2002-03 to 2007-08 can be expressed as follows:

$$Y = 6.543 + 0.723\,(x1) + 0.322\,(x2)$$

Where, y is the return on equity measured by net profit after tax as percentage of net worth. The study exhibits that underwriting results has the most powerful impact on the profitability of the private insurers in the post-reform period.

The multivariate analysis reveals that the investment income of the public sector has a significant positive correlation with return on equity and investment income;

and underwriting results have significant negative correlation with each other. The regression results indicated that both investment income and underwriting results have significant impact on the profitability of public sector general insurance companies. The negative correlation between underwriting results and investment income indicated the trend that higher investment income resulted into lower underwriting profits and vice-versa. The correlation analysis of the private sector indicated that return on equity has a significant correlation with expenses of management and net retention, and positive relation with underwriting results. The regression analysis reported that both underwriting results and investment income have significant impact on return on equity. As is evident from the analysis, there is significant variation in return on equity is due to both underwriting results and investment income of both the public and private insurers. But all the insurers have exhibited underwriting losses. So, in order to enhance their profitability, these companies need to focus on their underwriting results.

CONCLUSIONS AND SUGGESTIONS

The comparative profitability of the public and private sector general insurance companies shows that the main reason for the higher profitability of the public insurers is their higher investment income in the post-reform period. Further, the public sector has exhibited higher underwriting losses in the post-reform period than the pre-reform period. The higher investment return of the public sector general insurance companies has compensated their underwriting losses. The higher investment income of the public sector general insurance companies is due to their aggressive investment portfolio policy and better performance of share market in the recent past. But the prospects for a rapid improvement in investment return are currently uncertain. Given these uncertain prospects of investment return, the public sector general insurance companies must focus on sustainable profitability business model by emphasizing on improvement in the underwriting results to achieve greater profitability and to achieve better underwriting results. These companies must reduce their expense of management by adopting new techniques of information technology and ensure quality product at competitive price to survive in the market. These insurance companies should also explore alternative methods to reduce cost. To achieve this, these companies must become learning organisations and invest in training and development to cope up with the competitive environment.

The private sector must bring more capital to improve net retention, increase risk bearing capacity which results into their increase in business and investment income. All the insurers have exhibited underwriting losses. So, to enhance the profitability, these companies must focus on their underwriting results. The present study highlights that underwriting results of the public sector insurance companies are poor as they have been suffering from losses

in their core insurance business. One of the main reasons for that is lesser reinsurance of the business as compared to that of private sector insurance companies. Public sector companies are depending more and more on the investment income to increase their earnings, and getting more exposed to the risks, which may prove to be risky in the long run. It is suggested that the public sector insurance companies should try to balance their investment activities to keep risk complexion at reasonable level by getting more business reinsured. A closer investigation of the product portfolio through reveals that it is mainly ascribed to the fact that the public insurers have exhibited higher claim ratio because these insurers got majority of their business from loss making portfolios like motor and health. It is suggested that these companies should also focus on other portfolios like engineering, fire, personal accident, marine, etc. It may decline their claim ratio which would result into their better underwriting results. The balanced portfolio performance of the public insurers will also enhance their growth rate, which is at present much lesser than the private sector general insurance companies.

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