Impact of Post-Liberalisation on Profitability of Public Sector General Insurance Companies in India: A Study of Pre-Liberal and Post-Liberal Periods

Anirban Sarkar[♦]

Abstract

In year 2000, the insurance sector in India was opened for the private companies with a maximum of 26% of foreign holding. The entry of large number of private companies in the general insurance sector threw new challenges before the existing four public sector companies. This study brings out that post-liberalization has adversely affected the underwriting results of all the public sector general insurance companies, which is mainly due to their increase in expense ratio and claim ratio. However, the higher investment returns of the public sector general insurance companies in the post-liberal period have compensated their underwriting losses. Therefore, no significant difference is found in the return on equity of the public insurers during the pre-liberal & post-liberal periods.

Key words: General Insurance, Non-Life, Public Sector, Profitability, Return on Equity, Net Premium, Net Retention, Underwriting Profit/Loss, Operating Profit/Loss.

Introduction

The Government of India nationalized the General Insurance Business under the General insurance Business Nationalization Act, 1972 to ensure orderly and healthy growth of the business. The then existing 107 companies including branches of foreign companies operating in India were brought under the aegis of General Insurance Corporation (GIC) of India. The GIC was thus entrusted with the responsibility of superintending, controlling, and ensuring smooth and healthy conduct of the general insurance business in India along with its four subsidiaries in all the zones in India, namely: National Insurance Co. Ltd. (Kolkata), United India Insurance Co. Ltd. (Chennai), New India Assurance Co. Ltd. (Mumbai) and Oriental Insurance Co. Ltd. (New

♦ Research Scholar, Dept. of Commerce with Farm Management, Vidyasagar University, Midnapore, West Bengal, India, PIN– 721 102

Delhi). They commenced general insurance business with effect from 1st January, 1973. Private entry in the insurance market was restricted till 2000. During 1973-2000, these public companies had tendency to focus their efforts on maintaining a strong status and market position within their local region rather than competing with one another. They rendered outstanding service by providing insurance cover for small and medium enterprise located in small towns and major panchayats and initiated a number of schemes to extend cover to households, small shop keepers and occupational groups involved in hazardous professions.

The following table shows the trend in gross direct premium of the public sector companies during the last few years of the pre-liberal period:

Table I
Gross Direct Premium of Public Sector General Insurance Companies in Pre-liberal Period

(Rs. in crore)

Year/Player	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00
National	860.1	957.4 (11.31)	1207.3 (26.10)	1456.5 (20.64)	1636.5 (12.35)	1853.5 (13.26)	2042.1 (10.17)
New India	1616.6	1777 (9.92)	2131.9 (19.97)	2433.6 (14.15)	2688.5 (10.47)	3017.6 (12.24)	3306.5 (9.57)
Oriental	1006.4	1098.1 (9.11)	1325.6 (20.71)	1524.2 (14.98)	1709.5 (12.15)	1969.9 (15.23)	2166.5 (9.98)
United India	1151.8	1319.2 (14.53)	1554.8 (17.85)	1798.3 (15.66)	1962.7 (9.14)	2260.8 (15.18)	2390.5 (5.73)
Total	4634.9	5151.7 (11.15)	6219.6 (20.73)	7212.6 (15.96)	7997.2 (10.87)	9101.8 (13.81)	9905.6 (8.83)

Source : Annual Reports of Public Sector General Insurance Companies from 1993-94 to 1999-00. Figure in parentheses show growth rate in Gross Direct Premium.

There is an upward trend in gross direct premium income of the public sector general insurance companies in pre-liberalization period. New India Assurance emerged as the largest public sector general insurance company during all the years of pre-liberal period followed by United India Insurance, Oriental Insurance and National Insurance.

It was felt in 1990s that the momentum generated through the reforms process in other sectors of the economy cannot be sustained by state controlled insurance industry and that general insurance penetration and enlargement of the market can be accomplished only when a large number of companies compete with each other. There was a growing recognition that the consumer did not benefit in the absence of competition in terms of wider choice and competitive pricing. There was a wide gap in terms of market potential and its exploitation by the nationalized four public sector insurer.

Following the recommendations of the Malhotra Committee (1994), in December 7, 1999, the government passed the IRDA Act to abolish its own monopoly in the insurance business Insurance Regulatory & Development Authority (IRDA) which was incorporated as a statutory body in April 2000, opened up the insurance market in August 2000 with the invitation of application for registrations of private companies allowing collaboration with foreign companies to enter in to the market with a maximum 26% stake. In December, 2000, the four subsidiaries (National, United, New India & Oriental) of GIC were restructured as independent companies and at the same time GIC was instructed to stop writing direct business and was converted into a national re-insurer.

Post-Liberal Period: Year 2000 Onwards

Competition was reintroduced with entry of large number of private companies into the field. It has thrown a new challenge before the public sector companies. Many large and well established world class private companies have entered into the general insurance sector in collaboration with suitable domestic partner to grab new opportunities. Such as, IFFCO Tokio, TATA AIG, Bajaj Allianz, ICICI Lombard, Reliance General etc. Now it has become quite tough to work in a competitive environment for the public companies who were habituated in receiving assistance from the government and did not concentrate to improve their levels of efficiency in the pre-liberal period. The benefits of post-liberalization can be seen with increase in volumes of premium of both the public and private sector, market penetration, insurance density; and innovation in all areas, like underwriting, product pricing, marketing, policyholder servicing etc.

Table II
Gross Direct Premium of General Insurance Companies during the Post-liberal Period

(Rs. in crores)

Year/ Player	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**
National	2227.7 (9.09)	2439.4 (9.50)	2869.9 (17.65)	3399.9 (18.47)	3810.7 (12.08)	3536.3 (-7.20)	3827.1 (8.22)	4022.0 (5.09)	4279.9 (6.41)	4625.1 (8.07)
New India	3493.1 (5.64)	4198.1 (20.18)	4812.7 (14.64)	4921.5 (2.26)	5103.2 (3.69)	5675.4 (11.21)	5936.8 (4.60)	6152.0 (3.62)	5508.8 (-10.5)	6042.5 (9.69)
Oriental	2247.1 (3.72)	2498.6 (11.19)	2868.2 (14.79)	2899.7 (1.10)	3090.5 (6.58)	3609.8 (16.80)	4020.9 (11.39)	3900.2 (-3.00)	3964.2 (1.64)	4736.7 (19.49)
United India	2524.0 (5.58)	2781.5 (10.20)	2969.6 (6.76)	3063.5 (3.16)	2944.5 (-3.88)	3154.8 (7.14)	3498.8 (10.90)	3739.6 (6.88)	4277.8 (14.39)	5239.1 (22.47)
Total Public Sector	10491.9 (5.92)	11917.6 (13.59)	13520.4 (13.45)	14284.7 (5.65)	14948.8 (4.65)	15976.4 (6.87)	17283.5 (8.18)	17813.8 (3.07)	18030.7 (1.22)	20643.4 (14.49)

Source: Annual Report of IRDA from 2000-01 to 2009-10.
Figures in Parenthesis show growth in gross direct premium in percentage.

Table II shows that there has been an increasing trend in volume of business in terms of Gross Direct Premium of the public sector general insurers during the post-liberal period.

Even after the opening up of the insurance sector, the general insurance business was predominantly governed by the tariffs prescribed by Tariff Advisory Committee (TAC). Detariffication has been the most awaited reform in the general insurance industry ever since the Malhotra Committee recommended gradual removal of tariffs in the non-life insurance sector. Considering prevalence of such tariffs against the principles of competition, there was a constant demand from insurers and other industry experts to abolish the tariffs. In a competitive market, the products need to be priced equitably based on their individual risk experience which was not practiced due to tariff restrictions. Removal of tariffs is a natural way for any market to develop and grow, diversify and innovate. Thus, the Authority has accordingly considered moving to a tariff free regime in a phased manner. The de-tariffing exercise has two phases. The first phase started on January 1, 2007 when the IRDA allowed companies to charge their own premium for all classes of business barring Motor Third Party Liability Insurance for commercial vehicles in view of its large volume. The second phase which started from January 1, 2009 provided the General Insurance Companies more freedom to design their own products.

Objective of the Study

Specifically, the objective of the study is to make a comparative analysis of profitability of the public sector general insurance companies in both the pre-liberal and the post-liberal periods and also identifying the factors affecting profitability.

Hypothesis of the Study

To achieve the specific objective of this study, the main hypotheses formulated are:

H_0 - The profitability of the public sector general insurance companies is significantly higher during the post-liberal period than the pre-liberal period.

H1- The profitability of the public sector general insurance companies is not significantly higher during the post-liberal period than the pre-liberal period.

Research Methodology

Keeping in view the objective and hypotheses formulated for this study the methodology/techniques which will be used for collection and analysis of data in this study are as follows:

A) ***Collection of data:***

The data used in this study has been collected from secondary sources i.e. the published annual reports of the public insurance companies and from the publications including annual reports of the Insurance Regulatory & Development Authority (IRDA) during 2000-2010. To assess the effect of market post-liberalization on the profitability of the public sector general insurance companies, a comparison has been made of all the four public sector general insurance companies during the pre-liberal and post-liberal period. The pre-liberal period consists of the years 1993-94 to 1999-00, and the post-liberal period 2000-01 to 2009-10.

B) ***Analysis of data:***

For analyzing data, the technique of ratio analysis, simple mathematical tools like percentages, averages, median, standard deviation etc. and statistical techniques like Karl Pearson's correlation analysis, multivariate regression analysis has been used. The 't' test has been applied at appropriate places. The IBM SPSS Version 19 statistical software has been used for the purpose of data analysis. The hypotheses regarding profitability have been tested by the application of Wilcoxon-Mann-Whitney test. To asses the profitability performance of the general insurance companies, the following ratios (expressed in percentage form) has been analyzed:

1. Expense Ratio (commission & expenses of management to net written premium).
2. Claim Ratio (Net incurred claims to net written premium).
3. Underwriting Results Ratio (Underwriting profit/loss to net written premium).
4. Investment Income Ratio (Investment income to net written premium).
5. Net Retention Ratio (Net written premium to gross direct premium).
6. Operating Ratio (Net Profit before tax to net written premium).
7. Net Earning Ratio (Net Profit after tax to net written premium).
8. Return on Equity Ratio (Net Profit after tax to net worth).

Concept of Profitability and Its Drivers

Profit can be defined as the difference between total earnings from all earning assets and total expenditure on managing entire asset-liabilities portfolio. The term 'profitability' is a relative measure of profit earning capacity of an entity generally measured with the help of ratios. Profitability depicts the relationship of the absolute amount of profit with various other factors. Profitability is the most important and reliable indicator of the ability of an insurance company to raise its income level.

To analyze the drivers of profitability in respect of an insurer, it is useful to decompose Return on Equity (ROE) into its main components. Profits are determined first by underwriting performance i.e. the core business of an insurer which is influenced 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 pre-tax profit margin is the sum of the underwriting result and the investment result. An insurer's ROE is determined by profit 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).

Analysis and Findings of the Study

1. Ratio Analysis

(a) Expense Ratio

Expenses of a general insurance company largely comprises of commission expense and expenses of management. Commission expense is derived after considering commission payable and receivable on reinsurance business accepted or ceded respectively. Expenses of Management are generally operating expenses which include employees' remuneration and benefits, office and administrative expenses, etc. Expense ratio is calculated as a percentage of net premium, which reflects the percentage of revenue which is being utilized on account of commission and management expenses. This ratio is a pointer of the cost effectiveness and productivity. A higher ratio reflects financial instability of the business as a decrease in revenue may result in losses, whereas lower ratio is an indicator of better operational performance. It becomes important to examine, how far the public sector general insurance companies have been in a position to reduce their operating cost during the post-liberal period.

Table III presents the comparative expense ratio of the four public sector general insurance companies during the pre-liberal and post-liberal period. The study shows that during the pre-liberal period, the average expense ratio of National, New India, Oriental and United India was 27.17 %, 22.84 %, 26.07 % and 23.03 % respectively. Similarly, during the post-liberal period, the average expense ratio of National, New India, Oriental and United India was 32.66 %, 34.58 %, 34.20 % and 35.53 % respectively. The results indicate that the expense ratio of all the public insurers have increased during the post-liberal period as compared to the pre-liberal period. However, the increase in expense is not the same for all the four public insurers.

Table III

Expense Ratio of Public Sector General Insurance Companies during Pre-liberal and Post-liberal Periods

(Percentage)

Pre-liberal period							
Year	**National**	**New**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
1993-94	23.36	20.45	21.33	18.18	20.83	20.89	2.14
1994-95	25.62	18.70	22.19	18.69	21.30	20.44	3.31
1995-96	27.61	22.15	32.95	25.65	27.09	26.63	4.51
1996-97	31.10	29.31	27.12	25.91	28.36	28.21	2.30
1997-98	24.56	22.52	24.07	24.91	24.02	24.31	1.05
1998-99	28.75	22.42	24.58	23.36	24.78	23.97	2.79
1999-00	29.23	24.34	30.28	24.54	27.10	26.88	3.09
Mean	27.17	22.84	26.07	23.03	24.78		
Median	27.61	22.42	24.58	24.54			
S.D.	2.77	3.3	4.27	3.25			
Post-liberal Period							
Year	**National**	**New**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
2000-01	27.21	28.07	26.53	24.75	26.64	26.87	1.41
2001-02	30.59	27.95	32.22	31.56	30.58	31.08	1.88
2002-03	30.39	30.83	33.70	28.82	30.94	30.61	2.04
2003-04	32.08	43.05	41.70	38.77	38.9	40.24	4.89
2004-05	33.11	39.70	37.25	41.92	38.00	38.48	3.77
2005-06	38.13	38.76	38.16	46.75	40.45	38.46	4.21
2006-07	32.20	32.48	29.65	38.04	33.09	32.34	3.54
2007-08	34.55	30.08	33.17	36.42	33.56	33.86	2.67
2008-09	31.87	36.65	34.48	35.06	34.52	34.77	1.99
2009-10	36.46	38.27	35.13	33.17	35.76	35.80	2.15
Mean	32.66	34.58	34.20	35.53	34.24		
Median	32.14	34.57	34.09	35.74			
S.D.	3.13	5.36	4.31	6.39			

Source: IRDA Annual Reports from 2000-01 to 2009-10, Handbook on Indian Insurance Statistics 2007-08, Annual reports of National, New India, Oriental & United India from 1993-94 to 1999-00.

Wilcoxon-Mann-Whitney test (*U*-test)

Ratio	Value of '*U*' statistic		Significance
	U_{PL}*	U_L*	
Expense Ratio	67	03	Means of pre-liberal and post-liberal periods are significantly different

*At 10% level of significance, Z value for 90% of the area (acceptance region) under the normal curve is 3.28. So, upper limit and lower limit of '***U***' are 51.81 and 18.19 respectively where n_{pl}=7 & n_l=10, U_{PL} & U_L are 'U' values considering pre-liberal and post-liberal period respectively.

The highest average increase of expense ratio during the post-liberal period as compared to the pre-liberal period of United India was 12.50% followed by New India (11.74%), Oriental (8.13 %) and National (5.49 %). During the pre-liberal period, National Insurance Company registered the highest average expense ratio, whereas during the post-liberal period, it registered the lowest average expense ratio.

Overall, the average expense ratios of all the public insurers during the pre-liberal and post-liberal period were 24.78% and 34.24% respectively which shows an increase of 9.46% during the post-liberal period. During the post-liberal period, the public insurers collectively registered the highest average expense ratio in the year 2005-06 (40.45 %) which is much higher than the highest value in the pre-liberal period i.e. 28.36 % in 1996-97. The results of Wilcoxon-Mann-Whitney test also depict a significant increase in average expense ratio during the post-liberal period over the pre-liberal period as the '***U***' values are beyond the upper & lower limits. The increase in expense ratio is probably due to higher spending of the public insurers on advertisements, commission and other expenses to cope up with the rapidly expanding competitive insurance market.

(b) Claim Ratio

Claim ratio is expressed as a percentage of total net incurred claims to net premium underwritten. A lower claim ratio signifies the efficiency of the risk underwriting team and also a better claims management mechanism. **Table IV** explains the comparative claim ratio of the four public sector general insurance companies during the pre-liberal and the post-liberal periods. The average claim ratio of all the public insurers during the pre-liberal period was 78.76 % which increased to 85.26 % during the post-liberal period.

The average claim ratio was highest, i.e., 90.00 % in the year 1994-95 which belongs to the pre-liberal period whereas in the post-liberal period year 2001-02 registered the highest claim ratio i.e. 91.50 % followed by 90.87 % in 2005-06. Among the public insurers, in the pre-liberal period, United India's average claim ratio was the highest, i.e., 82.56% followed by Oriental, National and New India with the respective percentages of 82.20%, 76.19% and 74.08% which exhibits that during the pre-liberal period United India registered the highest claim ratio, whereas New India recorded the lowest claim ratio. During the post-liberal period, National showed the highest claim ratio of 86.90% followed by United India (86.46%), Oriental (86.06%), and New India (81.61%). The Wilcoxon-Mann-Whitney test also indicates that claim ratio of the public insurers is significantly higher during the post-liberal period than the pre-liberal period. Individually, during the pre-liberal period, National Insurance registered both the highest claim ratio of 91.58 % in 1994-95 and lowest claim ratio of 63.56 % in 1995-96 whereas in the post-liberal period also it registered the highest individual claim ratio of 105.49 % in 2005-06. On the contrary, United India registered the lowest claim ratio of 71.65 % in the year 2008-09 which belongs to the post-liberal period.

Table IV

Claim Ratio of Public Sector General Insurance Companies during the Pre-liberal and Post-liberal Periods

(Percentage)

Pre-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Media**	**S.D.**
1993-94	66.70	69.43	71.59	73.90	70.40	70.51	3.07
1994-95	91.58	89.61	88.83	89.98	90.00	89.80	1.16
1995-96	63.56	69.87	82.96	83.99	75.09	76.42	10.02
1996-97	73.92	69.90	83.56	82.42	77.45	78.17	6.62
1997-98	78.42	71.43	80.26	82.29	78.10	79.34	4.72
1998-99	78.51	71.41	86.61	78.15	78.67	78.33	6.22
1999-00	80.68	76.94	81.63	87.22	81.62	81.16	4.25
Mean	76.19	74.08	82.20	82.56	78.76		
Median	78.42	71.41	82.96	82.42			
S.D.	9.33	7.31	5.52	5.38			
Post-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Media**	**S.D.**
2000-01	81.00	85.34	87.06	94.30	86.93	86.20	5.54
2001-02	95.14	83.28	100.52	87.06	91.50	91.10	7.79
2002-03	76.01	82.46	77.23	91.06	81.69	79.85	6.84
2003-04	84.10	74.65	78.09	85.63	80.62	81.10	5.14
2004-05	79.92	74.58	86.04	91.99	83.13	82.98	7.54
2005-06	105.49	83.64	82.57	91.77	90.87	87.71	10.58
2006-07	83.85	76.68	81.91	84.68	81.78	82.88	3.59
2007-08	89.05	85.01	90.40	87.00	87.87	88.03	2.36
2008-09	92.88	84.94	94.50	71.65	85.99	88.91	10.43
2009-10	81.59	85.50	82.28	79.45	82.21	81.94	2.51
Mean	86.90	81.61	86.06	86.46	85.26		
Median	83.98	83.46	84.31	87.03			
S.D.	8.83	4.49	7.34	6.79			

Source: IRDA Annual Reports from 2000-01 to 2009-10, Handbook on Indian Insurance Statistics 2007-08,
Annual reports of National, New India, Oriental & United India from 1993-94 to 1999-00.

Wilcoxon-Mann-Whitney test (*U*-test)

Ratio	Value of '*U*' statistic		Significance
	U_{PL}*	U_L*	
Claim Ratio	61	09	Means of pre-liberal and post-liberal periods are significantly different
*At 10% level of significance, Z value for 90% of the area (acceptance region) under the normal curve is 3.28. So, upper limit and lower limit of '*U*' are 51.81 and 18.19 respectively where n_{pl}=7 & n_l=10. U_{PL} & U_L are 'U' values considering pre-liberal and post-liberal period respectively.			

(c) Underwriting Results Ratio

Underwriting results indicate the performance of an insurance company from core insurance business. To ascertain the underwriting performance, first net underwritten premium is adjusted with the increase/decrease in unexpired risk reserve to arrive at net premium (earned). Thereafter, underwriting profit/loss of a general insurer is ascertained after deducting the commission expenses, claims incurred and management expenses from net premium (earned). The underwriting results ratio is calculated by dividing underwriting results by net underwritten premium.

The underwriting results of the four public sector general insurance companies for the pre-liberal and post-liberal periods are presented in **Table V**. This table highlights underwriting losses in all the years of the pre-liberal and post-liberal period except in the year 1993-94 when the four public sector insurers earned an average underwriting profit of 1.79%. The average underwriting loss of the four public insurers during the pre-liberal and post-liberal period is 9.08 % and 23.34 % respectively which reveals that there were more underwriting losses in the post-liberal period than the pre-liberal period. During the pre-liberal period under study, Oriental suffered the maximum underwriting loss in 1995-96 (26.55 %) whereas in 2005-06, National suffered the maximum loss of 40.64 % among all the four public sector companies in the post-liberal period. A glance at the year-wise underwriting losses during the pre-liberal period provides that the year 1994-95 showed the highest average underwriting loss of 15.30% followed by 12.84% in the year 1995-96. However, during the post-liberal period, the year 2005-06 registered the highest average underwriting loss of 33.65% followed by 2008-09 with a loss of 26.75%.

The Wilcoxon-Mann-Whitney test also signifies the increase in underwriting losses during the post-liberal period. The main reason of higher underwriting losses of the four public insurers during the post-liberal period is mainly due to their higher expenses of management and incurred claims. The public insurers are gradually realizing the need of experienced underwriting agents rather than mere selling agents. A 360 degree view of the risk is to be considered before insuring any risk otherwise it may lead to huge claims which adversely affect the underwriting results of the public insurers. Public sector general insurance companies must reduce their staff strength specifically their own in-house sales agents and use better sophisticated technology to reduce their expense of management.

Table V
Underwriting Results Ratio of Public Sector General Insurance Companies during the Pre-liberal and Post-liberal Periods
(Percentage)

Pre-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
1993-94	0.71	3.08	1.59	1.80	01.79	1.70	0.98
1994-95	-20.14	-13.31	-15.91	-11.84	-15.30	-14.61	3.64
1995-96	-3.53	-1.70	-26.55	-19.57	-12.84	-11.55	12.17
1996-97	-11.94	-4.37	-14.79	-12.90	-11.00	-12.42	4.58
1997-98	-7.35	2.94	-9.12	-12.29	-6.45	-8.24	6.59
1998-99	-14.52	0.60	-18.07	-7.92	-9.98	-11.22	8.21
1999-00	-14.36	-7.18	-1.83	-15.78	-9.79	-10.77	6.50
Mean	-10.16	-2.85	-12.10	-11.21	-9.08		
Median	-11.94	-1.70	-14.79	-12.29			
S.D.	7.18	5.95	9.73	6.77			
Post-liberal Period							
Year	**National**	**New**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
2000-01	-13.74	-16.97	-16.00	-22.35	-17.27	-16.49	3.65
2001-02	-25.51	-18.05	-32.62	-22.15	-24.58	-23.83	6.17
2002-03	-14.14	-13.82	-13.21	-19.08	-15.06	-13.98	2.71
2003-04	-21.00	-18.96	-22.77	-25.09	-21.96	-21.89	2.61
2004-05	-18.96	-17.57	-27.56	-34.37	-24.62	-23.26	7.86
2005-06	-40.64	-27.50	-26.52	-39.94	-33.65	-33.72	7.68
2006-07	-19.13	-13.72	-18.12	-28.90	-19.97	-18.63	6.4
2007-08	-28.92	-17.18	-23.65	-29.62	-24.84	-26.29	5.76
2008-09	-31.09	-26.15	-34.18	-15.58	-26.75	-28.62	8.15
2009-10	-22.12	-28.64	-26.79	-21.03	-24.65	-24.46	3.65
Mean	-23.53	-19.86	-24.14	-25.81	-23.34		
Median	-21.56	-17.81	-25.09	-23.72			
S.D.	8.27	5.52	6.84	7.42			

Source: IRDA Annual Reports from 2000-01 to 2009-10, Handbook on Indian Insurance Statistics 2007-08,
Annual Reports of National, New India, Oriental & United India from 1993-94 to 1999-00.

Wilcoxon-Mann-Whitney test (*U*-test)

Ratio	**Value of '*U*' statistic**		**Significance**
	U_{PL}*	U_L*	
Underwriting Results Ratio	01	69	Means of pre-liberal and post-liberal periods are significantly different

*At 10% level of significance, Z value for 90% of the area (acceptance region) under the normal curve is 3.28. So, upper limit and lower limit of '***U***' are 51.81 and 18.19 respectively where n_{pl}=7 & n_l=10. U_{PL} & U_L are 'U' values considering pre-liberal and post-liberal period respectively.

(d) Investment Income Ratio

Income from investments creates a significant impact on profitability of an insurance company. Insurers collect huge amount of money as premium and invest it efficiently to maximize its return. The investment income ratio is determined by investment income to net written premium. This ratio indicates the effectiveness and efficiency of investment decisions.

Table VI
Investment Income Ratio of Public Sector General Insurance Companies during the Pre-liberal and the Post-liberal Periods

(Percentage)

Pre-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
1993-94	19.83	23.86	19.89	20.69	21.07	20.29	1.90
1994-95	22.00	25.66	21.72	22.63	23.00	22.32	1.81
1995-96	21.39	26.78	22.69	24.86	23.93	23.78	2.38
1996-97	21.67	25.26	25.23	26.29	24.61	25.25	2.02
1997-98	22.54	29.51	25.26	26.00	25.83	25.63	2.87
1998-99	21.63	26.95	23.97	25.75	24.58	24.86	2.31
1999-00	21.33	27.68	22.52	25.35	24.22	23.94	2.86
Mean	21.48	26.53	23.04	24.51	23.89		
Median	21.63	26.78	22.69	25.35			
S.D.	0.84	1.82	1.94	2.08			
Post-liberal Period							
Year	**National**	**New**	**Oriental**	**United**	**Mean**	**Media**	**S.D.**
2000-01	22.35	29.79	22.94	25.77	25.21	24.36	3.4
2001-02	24.26	28.00	24.06	30.53	26.71	26.13	3.12
2002-03	22.80	25.05	25.38	32.07	26.33	25.22	4.00
2003-04	26.42	34.85	46.39	43.95	37.90	39.40	9.12
2004-05	24.19	38.32	48.79	49.26	40.14	43.56	11.77
2005-06	37.64	47.96	44.69	62.92	48.30	46.33	10.65
2006-07	36.94	47.46	40.29	51.96	44.16	43.88	6.80
2007-08	37.04	47.74	39.71	54.75	44.81	43.73	8.04
2008-09	28.45	30.49	30.78	30.98	30.18	30.64	1.17
2009-10	33.90	35.66	29.51	40.30	34.84	34.78	4.46
Mean	29.4	36.53	35.25	42.25	35.86		
Median	27.44	35.26	35.25	42.13			
S.D.	6.32	10.19	9.83	12.35			

Source: IRDA Annual Reports from 2000-01 to 2009-10, Handbook on Indian Insurance Statistics 2007-08,
Annual Reports of National, New India, Oriental & United India from 1993-94 to 1999-00.

Wilcoxon-Mann-Whitney test (*U*-test)

Ratio	Value of '*U*' statistic		Significance
	U_{PL}*	U_L*	
Investment Income Ratio	69	01	Means of pre-liberal and post-liberal periods are significantly different

*At 10% level of significance, Z value for 90% of the area (acceptance region) under the normal curve is 3.28. So, upper limit and lower limit of '*U*' are 51.81 and 18.19 respectively where n_{pl}=7 & n_l=10. U_{PL} & U_L are 'U' values considering pre-liberal and post-liberal period respectively.

Table VI exhibits the results of investment income to net written premium ratio of the four public insurers for both the pre-liberal and post-liberal periods. The results indicate that during the pre-liberal period, New India showed the highest average investment income ratio of 26.53 % followed by United India (24.51%), Oriental (23.04%) and National (21.48%). During the post-liberal period, United India exhibited the highest average investment income ratio of 42.25% followed by New India 36.53%, Oriental 35.25% and National 29.40%. The average investment income ratios of the four public insurers during the pre-liberal and post-liberal period are 23.89 % and 35.86 % respectively which shows that investment income ratio increased during the post-liberal period than the pre-liberal period. The result of Wilcoxon-Mann-Whitney test also supports this observation. The less fluctuation in standard deviation results also reveals that investment income ratio was much more consistent in the pre-liberal period than the post-liberal period.

(e) Net Retention Ratio

Net retention ratio signifies an insurer's ability to bear risk. It is expressed as a percentage of business retained (net of reinsurance ceded) in relation to gross direct premium. As per the latest IRDA guidelines issued in April 2007, every insurer has to compulsorily cede a minimum of 15% (earlier it was 20%) of their business to the national re-insurer, i.e. GIC. In general, the companies having a stronger capital base and huge amount of reserve & surpluses are able to retain more of their portfolios, whereas the companies, with relatively lower capitalization (and hence lower capacity to retain risks) have resorted to higher utilization of reinsurance.

Table VII explains the net retention ratio of the four public sector general insurance companies under study for the pre-liberal and post-liberal periods. The average net retention ratios of the public insurers during the pre-liberal and post-liberal period are 75.17% and 75.88% respectively which indicates a marginal increase of 0.71% during the post-liberal period.

Year-wise study shows that during the pre-liberal period, year 1993-94 exhibited the highest net retention ratio of 76.83% followed by 1995-96 with 76.78%, while during the post-liberal period, the year 2009-10 exhibited the highest average net retention ratio of 82.94% followed by 2008-09 with 82.91%. The Wilcoxon-Mann-Whitney test also indicates that there is no significant gap between the net retention ratio of the public insurers during the pre-liberal and post-liberal period.

Table VII

Net Retention Ratio of Public Sector General Insurance Companies during the Pre-liberal and Post-liberal Periods

(Percentage)

Pre-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
1993-94	83.90	74.11	73.78	75.53	76.83	74.82	4.77
1994-95	80.31	75.04	74.85	71.02	75.31	74.95	3.82
1995-96	82.39	75.83	76.13	72.78	76.78	75.98	4.03
1996-97	79.72	74.25	73.31	70.67	74.49	73.78	3.80
1997-98	77.19	72.34	72.29	71.47	73.32	72.32	2.61
1998-99	79.09	72.47	72.28	71.46	73.83	72.38	3.54
1999-00	79.07	74.93	75.33	73.33	75.67	75.13	2.43
Mean	80.24	74.14	74.00	72.32	75.17		
Median	79.72	74.25	73.78	71.47			
S.D.	2.25	1.31	1.50	1.70			
Post-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
2000-01	81.00	76.48	76.78	74.66	77.23	76.63	2.68
2001-02	74.33	73.09	72.78	73.52	73.43	73.31	0.67
2002-03	74.25	73.06	66.21	70.46	71.00	71.76	3.56
2003-04	73.78	73.86	70.11	70.23	72.00	72.01	2.11
2004-05	74.32	76.33	71.77	73.79	74.05	74.06	1.87
2005-06	75.87	76.52	69.27	70.55	73.05	73.21	3.68
2006-07	74.61	80.04	71.62	72.30	74.64	73.46	3.82
2007-08	79.26	79.88	73.81	77.03	77.50	78.15	2.74
2008-09	85.05	85.20	79.33	82.06	82.91	83.56	2.79
2009-10	85.61	84.55	81.62	79.98	82.94	83.09	2.60
Mean	77.81	77.9	73.33	74.46	75.88		
Median	75.24	76.5	72.28	73.66			
S.D.	4.63	4.41	4.71	4.08			

Source: IRDA Annual Reports from 2000-01 to 2009-10, Handbook on Indian Insurance Statistics 2007-08,
Annual Reports of National, New India, Oriental & United India from 1993-94 to 1999-00.

Wilcoxon-Mann-Whitney test (*U*-test)

Ratio	**Value of '*U*' statistic**		**Significance**
	U_{PL}*	U_L*	
Net Retention Ratio	34	36	Means of pre-liberal and post-liberal periods are significantly identical

*At 10% level of significance, Z value for 90% of the area (acceptance region) under the normal curve is 3.28. So, upper limit and lower limit of '***U***' are 51.81 and 18.19 respectively where n_{pl}=7 & n_l=10. U_{PL} **&** U_L are 'U' values considering pre-liberal and post-liberal period respectively.

(f) Net Earning Ratio

The Net Earning Ratio has been calculated by dividing net profit after tax to net premium underwritten. This ratio is an acceptable measure of profitability of the insurance business. This ratio discloses the net result of the underwriting and investment activities.

Table VIII highlights the net earning ratio of all the four public sector insurers under study during the pre-liberal and post-liberal period. During the pre-liberal period, New India recorded the highest average net earning ratio of 14.83% followed by United India, National, and Oriental companies with the respective ratios of 9.23%, 8.18% and 5.78%. However, during the post-liberal period, United registered the highest average net earning ratio of 13.98% followed by New India, Oriental, and National with the ratios of 13.34%, 5.13% and 3.20% respectively. During the pre-liberal period, Oriental Insurance Co. exhibited the lowest average net earning ratio, whereas during the post-liberal period, National Insurance Co. exhibited the lowest average net earning ratio. The average net earning ratio of all these four insurers during the pre-liberal period was 9.50%, whereas it was 8.91% during the post-liberal period. Hence, the decrease was quite marginal during the post-liberal period. A year-wise analysis of average net earning ratio provides that there had been an upward trend (from 5.62 % to 14.73 %) during the years 1994-95 to 1997-98, but during the year 1999-00 the ratio reached at the level of 6.97%. During the post-liberal period, the average net earning ratio of the four public insurers was the highest in the year 2006-07 followed by the year 2007-08. The standard deviation indicates that consistency in net earning was higher during the post-liberal period than the preliberal period. The Wilcoxon-Mann-Whitney test also indicates that there is insignificant gap between the net earning ratio of the public sector insurers during the pre-liberal and post-liberal period.

Individually, New India registered the maximum net earning ratio in both the pre-liberal and post-liberal period (24.21% in 1997-98 and 30.72% in 2006-07 respectively) while the Oriental Insurance Co. registered the lowest net earning ratio in both the study period (-04.56 % in 1995-96 and -12.96 % in 2001-02 respectively).

Table VIII

Net Earning Ratio of Public Sector General Insurance Companies during the Pre-liberal and Post-liberal Periods

(Percentage)

Pre-liberal Period							
Year	**National**	**New India**	**Oriental**	**United India**	**Mean**	**Median**	**S.D.**
1993-94	12.67	16.15	13.16	13.62	13.90	13.39	1.55
1994-95	1.80	8.87	3.74	8.06	5.62	5.90	3.40
1995-96	12.62	14.93	-4.56	4.14	6.78	8.38	8.87
1996-97	7.06	10.89	8.18	9.35	8.87	8.77	1.64

1997-98	11.68	24.21	12.45	10.59	14.73	12.07	6.36
1998-99	5.45	17.15	4.06	11.89	9.64	8.67	6.06
1999-00	5.98	11.60	3.38	6.94	6.97	6.46	3.43
Mean	8.18	14.83	5.78	9.23	9.50		
Median	7.06	14.93	4.06	9.35			
S.D.	4.21	5.11	6.12	3.18			
Post-liberal Period							
Year	**National**	**New India**	**Oriental**	**United India**	**Mean**	**Median**	**S.D.**
2000-01	5.69	8.37	4.30	-0.12	4.56	5.00	3.55
2001-02	-4.99	4.59	-12.96	7.50	-1.47	-0.20	9.34
2002-03	6.33	7.28	3.34	8.17	6.28	6.81	2.10
2003-04	2.84	16.24	15.56	17.68	13.08	15.90	6.88
2004-05	4.63	10.33	14.90	14.16	11.01	12.25	4.70
2005-06	-3.96	16.50	11.35	19.10	10.75	13.93	10.32
2006-07	14.75	30.72	17.27	20.91	20.91	19.09	7.01
2007-08	5.13	28.51	0.32	21.93	13.97	13.53	13.41
2008-09	-4.08	4.08	-1.63	13.56	2.98	1.23	7.84
2009-10	5.65	6.74	-1.12	16.89	7.04	6.20	7.43
Mean	3.2	13.34	5.13	13.98	8.91		
Median	4.88	9.35	3.82	15.53			
S.D.	6.08	9.59	9.60	6.95			

Source: IRDA Annual Reports from 2000-01 to 2009-10, Handbook on Indian Insurance Statistics 2007-08,
Annual Reports of National, New India, Oriental & United India from 1993-94 to 1999-00.

Wilcoxon-Mann-Whitney test (*U*-test)

Ratio	Value of '*U*' statistic		Significance
	U_{PL}*	U_L*	
Net Earning Ratio	32	38	Means of pre-liberal and post-liberal periods are significantly identical
*At 10% level of significance, Z value for 90% of the area (acceptance region) under the normal curve is 3.28. So, upper limit and lower limit of '*U*' are 51.81 and 18.19 respectively where n_{pl}=7 & n_l=10. U_{PL} & U_L are 'U' values considering pre-liberal and post-liberal period respectively.			

(g) Operating Ratio

Table IX highlights the operating ratio (i.e. profit before tax to net premium underwritten) of the four public sector general insurance companies under study during the pre-liberal and post-liberal period. The average operating ratio of all the four public sector insurers during the pre-liberal period was 13.54%, whereas it was 11.05% during the post-liberal period. It indicates that the ratio is lower by 2.49 % during the post-liberal period. This ratio depicts similar trend with Net Earning ratio. Year-wise analysis provides that during the pre-liberal period, the public insurers showed the highest average operating ratio of 22.70 % in the year 1993-94. The average operating ratio showed an upward trend during the period 1994-95 to 1997-98 when it rose from 7.70% to 18.81%.

Table IX

Operating Ratio of Public Sector General Insurance Companies during the Pre-liberal and Post-liberal Periods

(Percentage)

Pre-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
1993-94	20.03	26.91	21.36	22.49	22.70	21.93	2.98
1994-95	2.18	12.62	5.32	10.70	7.70	8.01	4.81
1995-96	16.56	24.44	-4.17	4.84	10.42	10.70	12.63
1996-97	8.84	20.23	9.93	13.10	13.02	11.52	5.13
1997-98	14.71	31.91	14.86	13.75	18.81	14.79	8.75
1998-99	5.69	25.82	4.71	16.18	13.10	10.94	9.94
1999-00	6.22	17.57	3.73	8.58	9.02	7.40	6.03
Mean	10.61	22.79	7.96	12.81	13.54		
Median	8.84	24.44	5.32	13.10			
S.D.	6.57	6.45	8.30	5.66			
Post-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
2000-01	6.15	10.81	4.32	0.43	5.43	5.24	4.31
2001-02	-5.18	6.75	-12.93	7.66	-0.93	0.79	9.91
2002-03	6.54	8.90	9.23	10.24	8.73	9.07	1.57
2003-04	2.91	17.82	22.35	18.29	15.34	18.06	8.53
2004-05	4.99	20.48	21.27	14.65	15.35	17.57	7.51
2005-06	-2.22	19.70	13.37	20.34	12.8	16.54	10.49
2006-07	15.96	33.96	21.86	20.57	23.09	21.22	7.68

2007-08	5.40	30.96	15.37	22.85	18.65	19.11	10.89
2008-09	-3.65	5.40	-2.73	14.33	3.34	1.34	8.38
2009-10	6.75	5.99	2.23	19.64	8.65	6.37	7.59
Mean	3.77	16.08	9.43	14.90	11.05		
Median	5.20	14.32	11.3	16.47			
S.D.	6.21	10.32	11.73	7.01			

Source: IRDA Annual Reports from 2000-01 to 2009-10, Handbook on Indian Insurance Statistics 2007-08 Annual Reports of National, New India, Oriental & United India

Wilcoxon-Mann-Whitney test (*U*-test)

Ratio	Value of '*U*' statistic		Significance
	U_{PL}*	U_L*	
Operating Ratio	27	43	Means of pre-liberal and post-liberal periods are significantly identical
*At 10% level of significance, Z value for 90% of the area (acceptance region) under the normal curve is 3.28. So, upper limit and lower limit of '***U***' are 51.81 and 18.19 respectively where n_{pl}=7 & n_l=10. U_{PL} & U_L are 'U' values considering pre-liberal and post-liberal period respectively.			

After this period, it showed a downward trend and reached at 9.02% in the year 1999-00. During the post-liberal period, the average operating ratio was the highest, i.e., 23.09% in the year 2006-07. It showed an upward trend during the period 2001-02 to 2004-05, when it rose from -0.93% to 15.35%. The Mann-Whitney test indicates that there is no significant gap between the operating ratio of the public insurers during the pre-liberal and post-liberal period.

(h) Return On Equity

Return on Equity is the most popular measure of profitability of a business concern irrespective of its nature of business. It measures the return available for accruing to owners' capital. It is calculated by dividing net profit after tax to Net Worth.

Table X reveals the data showing the comparative return on equity ratio of the four public sector general insurance companies for the period under study. During the pre-liberal period, New India recorded the highest average return on equity, i.e., 15.96% followed by United India, National and Oriental companies with the respective ratios of 15.30%, 13.66% and 9.55%. Further, the return on equity of all the public insurers during the pre-liberal period is positive except Oriental company where it is -09.29% during the year 1995-96. During the post-liberal period, United India exhibited the highest average return on equity of 14.67%. It was followed by New India, Oriental, and National with the respective returns of 11.13%, 6.94% and 6.40%. The average return on equity of all the four public insurers during the pre-liberal period is 13.62%, whereas it is 9.79% during the post-liberal period showing a decline of 3.83% in the average return on equity during the post-liberal period. A year-wise analysis of the pre-liberal period discloses that the public insurers showed the highest average return on equity of 20.55% during the year 1993-94. From 1994-95 to 1997-98 there was an upward trend in the average returns on equity when it increased from 8.03% to 20.14%. However, after this period it showed a downward trend and reached to 9.27% during the year 1999-00. During the post-liberal period, the public insurers showed the highest average return on equity of 24.34% in the year 2006-07 followed by 17.70 % in the year 2003-04.

Table X

Return on Equity of Public Sector General Insurance Companies during the Pre-liberal and Post-liberal Periods

(Percentage)

Pre-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
1993-94	20.44	20.48	18.93	22.37	20.55	20.46	1.41
1994-95	2.96	10.94	5.69	12.53	8.03	8.32	4.47
1995-96	21.63	18.33	-9.29	7.37	9.51	12.85	13.94
1996-97	12.70	13.09	16.50	17.24	14.88	14.80	2.32
1997-98	18.75	23.97	21.24	17.92	20.47	20.00	2.73
1998-99	9.23	14.86	7.33	19.02	12.61	12.05	5.34
1999-00	9.91	10.05	6.48	10.65	9.27	9.98	1.89
Mean	13.66	15.96	9.55	15.30	13.62		
Median	12.70	14.86	7.33	17.24			
S.D.	6.89	5.16	10.47	5.27			
Post-liberal Period							
Year	**National**	**New India**	**Oriental**	**United**	**Mean**	**Median**	**S.D.**
2000-01	9.73	7.29	8.00	-0.19	6.21	7.65	4.39
2001-02	-9.38	4.42	-35.04	11.77	-7.06	-2.48	20.61
2002-03	12.58	7.52	7.59	11.83	9.88	9.71	2.70
2003-04	6.39	14.97	28.20	21.22	17.70	18.1	9.27
2004-05	10.78	9.32	23.30	15.16	14.64	12.97	6.28
2005-06	-9.57	14.90	17.25	18.04	10.16	16.08	13.22
2006-07	29.39	24.25	24.55	19.16	24.34	24.40	4.18
2007-08	10.49	20.09	0.46	19.46	12.63	14.98	9.22
2008-09	-10.59	3.06	-2.67	13.17	0.74	0.20	10.00
2009-10	14.21	5.45	-2.29	17.05	8.61	9.83	8.78
Mean	6.40	11.13	6.94	14.67	9.79		
Median	10.11	8.42	7.80	16.11			
S.D.	12.77	7.11	18.62	6.17			

Source: IRDA Annual Reports from 2000-01 to 2009-10, Handbook on Indian Insurance Statistics 2007-08, Annual Reports of National, New India, Oriental & United India from 1993-94 to 1999-00.

Wilcoxon-Mann-Whitney test (*U*-test)

Ratio	Value of '*U*' statistic		Significance
	U_{PL}*	U_L*	
Return On Equity	27	43	Means of pre-liberal and post-liberal periods are significantly identical
*At 10% level of significance, Z value for 90% of the area (acceptance region) under the normal curve is 3.28. So, upper limit and lower limit of '*U*' are 51.81 and 18.19 respectively where n_{pl}=7 & n_l=10. U_{PL} **&** U_L are 'U' values considering pre-liberal and post-liberal period respectively.			

The public insurers also showed a negative average return on equity of -7.06% in the year 2001-02. The standard deviation results reveal that variations in the return on equity of the public insurers are more during the post-liberal period than the pre-liberal period. The Wilcoxon-Mann-Whitney test implies that there is no significant difference between the return on equity of the public insurers during the pre-liberal and post-liberal period.

2. Karl Pearson's Correlation Analysis

Correlation analysis helps to measure the magnitude and direction of the relationship between two or more variables. 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. t-test has been used as a parametric tool for testing the significance of correlation coefficient. The study aimed at identifying the most important variable or variables which have higher significant association with the dependent variable.

In **Table XI & Table XII**, the degree of association, i.e., strength and direction of correlation coefficients, between the selected variables and public general insurers' profitability is studied for both the pre-liberal and post-liberal periods and is presented in the form of correlation matrices.

Table XI

Pearson's Correlation Matrix of Public Sector General Insurance Companies during the Pre-liberal Period (1994-2000)

	Return on_Equity	Expense	Claim	Underwriting Results	Investment Income	Net Retention
Return On Equity	1					
Expense	-.305	1				
Claim	-.653	-.114	1			
Underwriting Results	.836*	-.416	-.739	1		
Investment Income	-.056	.610	.221	-.449	1	
Net Retention	-.238	-.132	-.292	.185	-.772*	1

*. Correlation is significant at the 0.05 level (2-tailed).

It can be seen from **Table XI** that during the pre-liberal period underwriting results ratio had a significant positive correlation with the public sector general insurers' return on equity and the coefficient is 0.836. Net retention has a significant negative correlation with investment income (-0.772). Claims and Underwriting Results ratios depict a negative correlation (-0.739) but is not significantly correlated at 5% level.

Table XII
Pearson's Correlation Matrix of Public Sector General Insurance Companies during the Post-liberal Period (2000-2010)

	Return on_Equity	Expense	Claim	Underwriting Results	Investment Income	Net Retention
Return On Equity	1					
Expense	.370	1				
Claim	-.652*	-.138	1			
Underwriting Results	.191	-.693*	-.555	1		
Investment Income	.648*	.713*	.013	-.574	1	
Net Retention	-.270	-.091	.017	-.216	-.122	1

*. Correlation is significant at the 0.05 level (2-tailed).

From **Table XII**, it is evident that in the post-liberal period the public sector general insurance companies' return on equity is significantly correlated with claims and investment income ratio. Significant negative correlation coefficient of -0.652 lies in between return on equity and claim while the investment income and return on equity depicts a positive correlation of 0.648 which is statistically significant at 5% level. The expense ratio seems to be a significant determinant of the underwriting results in the post-liberal period showing a negative correlation of 0.693.

3. Multiple Correlations and Multiple Regression Analysis

In **Table XIII** & **Table XIV**, an attempt has been made to examine the combined impact of some selected factors on public sector general insurers' profitability in the pre-liberal and post-liberal period. Accordingly, multiple correlation and multiple regression techniques have been applied to study the joint influence of the selected ratios, namely Claim Ratio (CR), Expense Ratio (ER) & Investment Income Ratio (IR) on Return on Equity (ROE) and the regression coefficients have been tested with 't' test. For this purpose, CR, ER & IR have been considered as the independent variables and ROE has been used as the dependent variable. The regression model used in this analysis is $ROE = a + b_1 CR + b_2 ER + b_3 IR$ where a, b_1, b_2, b_3 are the parameters of the ROE line.

Table XIII
Multiple Correlations and Multiple Regression Analysis of Public Sector General Insurance Companies during the Pre-liberal Period (1994-2000)

Details	**a/b**	**Std. Error**	**t value**	**Significance**	
Constant (a)	56.849	26.875	2.115	0.125	R=0.880 R^2=0.774 Adj. R^2=0.549 Std. Error of R=3.51808
Claim Ratio (CR)	-0.757	0.257	-2.950	0.060	
Expense Ratio (ER)	-1.385	0.651	-2.128	0.123	
Investment Income Ratio (IR)	2.125	1.294	1.642	0.199	

Table XIII shows the results of the multivariate correlations and regression analysis of the public sector general insurance companies during the pre-liberal period (1994-2000). It depicts the strength of relationship between the dependent variable, Return on Equity (ROE) and the independent variables (CR, ER and IR) taken together and the impact of these independent variables on the profitability of the public sector general insurance companies during the pre-liberal period (1994-2000). The results provide the following regression equation: ROE = 56.849 – 0.757 CR – 1.385 ER + 2.125 IR. It is observed that when CR and ER increase by one unit; the ROE decreased by 0.757 unit and 1.38 units respectively. Again, an increase in one unit of IR favourably affects the Return on Equity by 2.125 units which is statistically significant at 5% level. The Multiple correlation coefficients between the dependent variable ROE and the independent variables CR, ER and IR taken together were 0.880. It indicates that the profitability was highly influenced by CR, ER and IR. It is also evident from the value of R^2 that 77.40 % of variation in ROE was accounted by the joint variation in CR, ER and IR.

Table XIV
Multiple Correlations and Multiple Regression Analysis of Public Sector General Insurance Companies during the Post-liberal Period (2000-2010)

Details	a/b	Std. Error	t value	Significance	
Constant (a)	138.725	23.422	5.923	0.001	R=0.965 R^2=0.931 Adj. R^2=0.897 Std. Error of R=2.80799
Claim Ratio (CR)	-1.588	0.242	-6.559	0.001	
Expense Ratio (ER)	-0.828	0.323	-2.564	0.043	
Investment Income Ratio (IR)	0.970	0.159	6.086	0.001	

Table XIV shows the results of the multivariate correlations and regression analysis of the public sector general insurance companies during the post-liberal period (2000-2010). It provides the following regression equation: ROE = 138.725 – 1.588 CR – 0.828 ER + 0.970 IR. It is observed that when CR and ER increase by one unit, the ROE decreased by 1.588 units and 0.828 unit respectively. However, when IR increases in one unit, the ROE is affected positively by 0.970 unit. The Multiple correlation coefficients between the dependent variable ROE and the independent variables CR, ER and IR taken together were 0.965. It indicates that the profitability was almost perfectly influenced by CR, ER and IR. It is also evident from the value of R^2 that 93.10 % of variation in ROE was accounted by the joint variation in CR, ER and IR.

It is evident from the multiple regression equations of pre-liberal and post-liberal periods that the ROE was highly influenced by the change in IR in the pre-liberal period than the post-liberal period (unstandardized co-efficient of IR was 2.125 and 0.970 in pre-liberal and post-liberal period respectively) while an unit change in CR effects the profitability much more notably in the post-liberal period (unstandardized co-efficient of CR was -0.757 and -1.588 in pre-liberal and post-liberal period respectively).

Conclusion

It is evident that the total volume of business of the public companies operating in the general insurance industry as a whole has recorded profound growth after liberalization, though the reforms have adversely affected the underwriting results of all of them owing to increase in expense ratio and claim ratio in the post-liberal period. The public companies have been compelled to increase spending on commission expenses, advertisements and information technology in the changed competitive environment. However, the higher return on investment of the public sector general insurance companies have 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. The study implies that there is no significant gap between the return on equity of the public insurers during the pre-liberal and post-liberal period. Therefore, the study rejects the null hypothesis that the profitability of the public sector insurers is significantly higher in the post-liberal period than the pre-liberal period, and accepts the alternative hypothesis.

References

- Annual Reports of IRDA from 2000-01, 2001-02, 2002-03, 2003-04,2004-05,2005-06, 2006-07, 2007-08, 2008-09.
- Annual Reports of National Insurance Company Limited from 1993-94, 1994-95, 1995-96, 1996-97, 1997-98, 1998-99, 1999-2000.
- Annual Reports of New India Assurance Company Limited 1993-94, 1994-95,1995-96, 1996-97, 1997-98, 1998-99, 1999-2000.
- Annual Reports of Oriental Insurance Company Limited from 1993-94, 1994-95, 1995-96, 1996-97, 1997-98, 1998-99, 1999-2000.
- Annual Reports of United India Insurance Company Limited from 1993-94,1994-95, 1995-96, 1996-97, 1997-98, 1998-99, and 1999-2000.
- Handbook on Indian Insurance Statistics 2007-08