Chapter IV

Evaluation of Financial Soundness

4.1 Introduction

The primary objective of financial management is to plan, procure and utilize the funds, and to control the financial position of the company. There are many factors that influence an insurance company's overall financial position. Insurance companies have to analyse and control these factors in order to instil financial soundness. To attain an acceptable degree of reliability, a financial soundness analysis took into account all important quantitative factors connected to the company's financial position. The financial soundness is the outcome of prudent financial management. Hence, the present chapter has analysed financial soundness and evaluated factors contributing to financial soundness.

4.2 Financial Soundness

Globally, insurance sector has achieved significant growth rate. As result of which, regulators and supervisors have developed various models to evaluate and control business activities to achieve financial soundness. In many jurisdictions, regulators evaluate financial soundness by using financial statements. Based on literature review (IMF, 2003); (IMF, 2004); (International Monetory Fund, 2006), it has been found that some of the indicators have been developed by World Bank and International Monetary Fund to evaluate financial health & soundness of the insurers which are known as financial soundness indicators. These financial soundness indicators are based on data retrieved from balance sheet and income statement which evaluate company’s financial position using selected sets of ratios under financial soundness indicators (FSIs) of the CARAMELS. Generally, banking sector widely uses CAMELS framework, which connotes C- Capital Adequacy, A- Assets quality, M- Management Soundness, E- Earnings and profitability, L- Liquidity and S- sensitivity to market risk. In insurance business, the role of actuaries and reinsurers is very crucial. Therefore, apart from these indicators, the insurance company add one more indicator i.e., Actuarial and Reinsurance issue in CAMELS. Accordingly, CARAMELS evolved as Capital adequacy, Asset quality, Reinsurance & Actuarial issues, Management soundness, Earnings and profitability, Liquidity and Sensitivity to market risks. A background paper on financial soundness indicators has been originally prepared by the staff of the Monetary and Financial Systems and Statistics Departments (IMF) which was approved by Carol S. Carson and Stefan Ingves in May 14, 2003 (IMF, 2003). Afterwards Udaibir S. Das, Nigel Davies, and Richard

Podpiera (Das, Nigel Davies, & Podpiera, 2003) has prepared a working paper on Insurance and Issues in Financial Soundness. The IMF issued guidance on the concepts and definitions of financial soundness indicators in the year 2004. (Compilation Guide on Financial Soundness Indicators, IMF 2004). Furthermore, overall analytical framework for assessing financial system stability and developmental needs, broad guidance on approaches, methodologies, and techniques of assessing financial systems has been provided in Financial Sector Assessment: A Handbook (2005). IMF Executive Board amended Compilation Guide which represented a milestone in establishing a standard reference on the concepts and definitions, data sources, and techniques with respect to the compilation and dissemination of financial soundness indicators (International Monetory Fund, 2006).

Few books, articles, reports are available and limited research has been conducted and published on financial soundness indicators specifically using CARAMEL Model in the insurance sector (Cumminsa, Rubio-Misasb, & Vencappaca, 2016), (Darzi, 2012) (Jena, 2014), (Varvadiya , 2014). Some of the literature, including from India and outside is presented below.

Table 4.1 Summary of literature related to the financial soundness of insurance sector

Sr. No.	Author (s)	Year of publication	Period of study	Area of work	Country
1	Mr. Sanjaykumar. R. Shinde	2011	2000-01 to 2009-10	Life Insurance	India
2	Rabindra Ghimire	2013	2006-11	Non-Life Insurance	Nepal
3	Nikolina Smajla	2014	2011	Life & Non-Life Insurance	Croatia (Europe)
4	Mr. Ketan H. Popat	2014	2005-06 to 2011-12	Non-Life Insurance	India
5	Prof. Valeed A. Ansari & Mr. Wubshet Fola	2014	2008-09 to 2012-13	Life Insurance	India
6	Showket Ahmad Dar, Javaid Ahmad Bhat	2015	2005-16 to 2012-13	Life Insurance	India
7	Showket Ahmad Dar, Ishfaq Ahmad Thaku	2015	2003-04 to 2012-13	Non-Life Insurance	India
8	Mr. Ketan H. Popat	2015	2005-06 to 2011-12	Non-Life Insurance	India
9	Joy Chakraborty	2016	2008-09 to 2014-15	Non-Life Insurance	India
10	Jayant D. Chandrapal	2017	2005-2015	Life Insurance	India

Source: Computed from different studies

Measurement of Financial Soundness:

The present study applied ratio-based CARAMELS model as proposed by IMF, wherein 'S' interpreted as Sensitivity towards Market Risk. However, due to the lack of disclosure practices in selected life insurance companies, CARAMEL framework is used. The ratios used in this framework are divided in two parts i.e., 'Core Set' and 'Encouraged Set'. These are additional ratios to measure financial soundness. Summary of selected ratios describing financial soundness indicators (FSIs) are presented in table 4.2. There are 11 ratios that have been used for the six different indicators.

Table 4.2. CARAMEL Framework: Financial Soundness Indicators

Component	Core Set	Encouraged Set
Capital Adequacy (C)	Capital to Total Assets	Solvency Ratio
	Capital to Technical Reserves	
Assets Quality (A)	Equities/Total Assets	
Reinsurance and Actuarial Issues (RA)s	Risk Retention Ratio (Net Premium to Gross Premium)	
	Net Technical Reserves/Average of Net Premium Received in last three years	
Management Soundness (M)	First Year Premium/ Gross Premiums	Operating Expenses/Gross Premium
Earnings & Profitability (E)	ROE (Net Income/ Equity)	Net Profits to Assets (ROA)
Liquidity (L)	Current Assets to Current Liabilities	

Source: Compiled from IMF Working Paper on 'Insurance and Issues in Financial Soundness, WP/03/138 (2003)

4.2.1 Capital Adequacy (C)

The requirement of sufficient capital is known as capital adequacy. The companies or financial institutions must hold certain capital as required by financial regulator. Banking companies are required to maintain minimum 8% of capital to risk weighted assets. However, there is no internationally accepted threshold for capital adequacy in insurance sector. As per IRDA regulations insurance companies are required to register with minimum capital of 100 crores and have to maintained solvency margin of 150%. There is no provision for adequate capital. According to existing IRDA requirements, insurance companies must calculate needed solvency capital using a simple factor-based technique stated as a percentage of reserves and sum at risk.

Adequate Capital leads to increased risk bearing capacity of the company. In the life insurance, insurer can absorb losses arising from claims by adequate capital. It is considered as a buffer to protect insurer and stimulate the financial soundness of the companies (Bardhan, Dey, & Adhikari, 2015). Generally small companies transfer majority of risk to reinsurer because of inadequate capital and limited reserves over a period.

Nowadays, Capital requirement for the insurance industry is being revised with risk-bases approach in many countries worldwide. As the Indian insurance market is different from the developed markets. It is not appropriate to replicate risk-based solvency model of any developed country in India. Though, few companies have begun to use Risk Based Capital approach as an internal requirement by their joint venture partners or an initiative of their own to align with the global practices (Parekh, 2009).

The present study uses capital adequacy as a key financial soundness indicator adopting three different ratios such as capital to total assets ratio, capital to reserve ratio & solvency ratio which are calculated & presented in table 4.3 to 4.5 below.

Table 4.3: Capital to Total Assets Ratio (in %)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	13.60	24.29	12.05	15.76	16.37	10.06	8.88	30.02
2008-09	15.74	26.37	13.06	13.06	18.64	7.13	6.89	31.74
2009-10	9.45	18.21	7.94	8.10	13.53	4.50	3.66	18.29
2010-11	7.83	14.23	6.83	6.45	11.43	4.12	5.73	15.05
2011-12	6.57	12.73	6.89	6.37	10.93	4.59	9.03	16.06
2012-13	5.34	10.37	6.53	7.38	10.20	5.18	12.64	17.57
2013-14	4.33	8.64	6.22	8.64	8.43	5.67	14.95	18.27
2014-15	3.85	6.54	5.32	8.37	7.00	5.59	15.47	18.58
2015-16	4.27	5.62	5.19	9.11	6.88	5.86	17.20	9.52
2016-17	4.21	5.61	5.26	8.77	6.10	5.60	17.16	8.63
Average	**7.52**	**13.26**	**7.53**	**9.20**	**10.95**	**5.83**	**11.16**	**18.37**
***CV**	**55.94**	**56.81**	**37.12**	**32.26**	**38.27**	**29.35**	**44.43**	**40.77**

Source: Computed from IRDA Handbook of different years

The table 4.3 above depicts Capital to Total Assets Ratio, in which capital comprises of share capital, reserve surplus & adjustment of fair value change account, whereas total assets include short term & long-term investment of shareholders as well as policyholders, assets held to cover linked liabilities, loans & advances, fixed assets, and net current assets (after deducting current liabilities).

Capital to total assets ratio indicates percentage of share capital in the total assets. Most of the companies have increased their capital in the initial 3 years i.e., from

2007-08 to 2009-10. During the period 2007-08 to 2009-10, the companies have concentrated more on sale of ULIP products which required more capital. Accordingly, parent companies infused capital during this period.

However, due to stringent guidelines on ULIP plans introduced by IRDA in the year 2010, the companies diverted their focus to traditional plans rather than ULIP plans. Subsequently, the companies maintained the same level of capital but managed to increase their asset base.

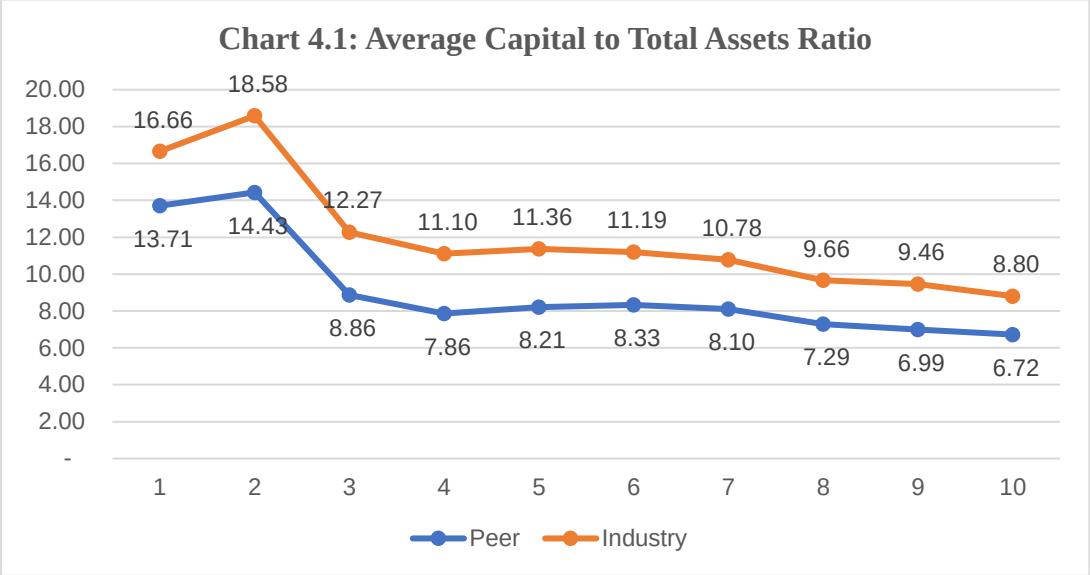
As regards to average capital to total assets ratio, SBI witnessed the lowest 5.83% ratio during the study period. By contrast, Reliance has highest 18.37% ratio during the study period. HDFC and ICICI have reported about 7.50% average capital to total assets ratio under the period consideration. Kotak has reported 9.20% average capital to total assets ratio with low variance.

On the other hand, Bajaj and Birla have reported about 11% and Max has reported 13.26% average capital to total assets ratio during the study period. Although, looking at the table in more detail, Max and Birla have significantly decreased their average capital to total assets ratio in the last four years of the study.

Generally, capital is employed for creation of assets. A higher ratio shows a company's strong reliance on capital and inefficient use of capital to produce assets, whereas a lower ratio indicates a company's larger asset base with less capital. From the analysis it has been found that assets base of most of the selected companies has been increasing over the period of time and capital levels are relatively smaller. It shows effective utilisation of capital employed to create assets base. In other words, compared to initial years the assets base of the company has been financed by other liabilities. However, industry does not have scientific capital adequacy determination norms.

The chart 4.1 depicts comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with regard to average capital to total assets ratio. The figures have been derived by dividing average capital to average total assets for each year of the study period. It can be observed that average capital to total asset ratio has attained the growth during the initial period and then after a gradual decline on aggregate basis for all selected companies. Similar trend has been observed for industry. The ratio in the peer companies have decreased from 13.71% to 6.72% during the period of the study. Industry has also reflected decreasing trend from 16.66% to 8.80% during the period of the study. The above

chart clearly indicates that peer companies have managed to enhance their assets base by maintaining the lower capital base.



Source: Computed

Table 4.4: Capital to Reserve Ratio (in %)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	2,399	14,026	159	1,023	-	21,285	114	413
2008-09	3,334	-	143	1,081	1,666	-	114	173
2009-10	3,693	1,533	143	1,081	510	496	114	164
2010-11	1,004	1,525	143	1,081	510	262	107	161
2011-12	1,004	1,210	141	597	510	193	104	154
2012-13	1,003	1,168	144	275	510	161	103	154
2013-14	1,027	1,178	148	196	809	145	103	155
2014-15	433	2,158	153	167	809	136	102	157
2015-16	262	2,122	146	150	809	128	102	498
2016-17	212	428	136	139	809	124	102	507
Average	**1,437**	**2,535**	**146**	**579**	**694**	**2,293**	**107**	**254**
CV	**87.50**	**161.44**	**4.50**	**75.93**	**61.01**	**291.06**	**5.13**	**60.39**

Source: Computed from IRDA Handbook of different years

The table 4.4 above depicts capital to reserve ratio, in which the term capital comprises of share capital, reserve surplus & adjustment of fair value change account, whereas total assets include short term & long-term investment of shareholders as well as policyholders, assets held to cover linked liabilities, loans & advances, fixed assets, and net current assets (after deducting current liabilities). Although, reserve includes capital reserve, capital redemption reserve, adjusted share premium, revaluation reserve, adjusted general reserve, catastrophe reserve, other reserve and balance of profit in profit & loss account. Most of the life insurance companies have

included only adjusted share premium, revaluation reserve, and balance of profit if any in profit & loss account.

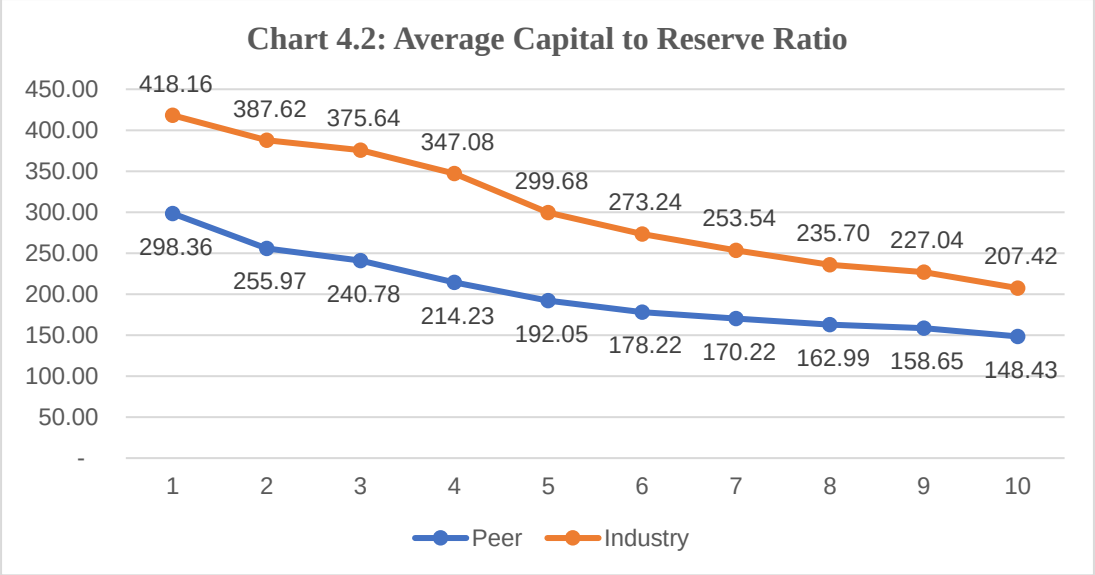
Overall, all selected companies have observed downward trend in capital to general reserve ratio. During the first three years of the study period, Companies have observed less general reserve as compared to capital. In particular, Birla has posted no general reserve in the year 2007-08, likewise Max and SBI have posted no general reserve in the year 2008-09.

During the period of the study significant decline in the given ratio has been observed in all selected companies. Between the year 2007-08 to 2016-17, decline in HDFC is from 2,399% to 212%, Max is from 14,026% to 428%, Kotak is from 1,023% to 139%, Birla is from 1666% to 809%, and SBI is from 21,285% to 124%. ICICI and Bajaj have observed marginally decline in the given ratio from 159% to 136% and 114% to 102% respectively. Higher the ratio indicates less reserve and lesser the ratio indicates high reserve.

As regards average capital to reserve ratio, all selected companies have witnessed higher average ratio. However, their higher CV indicates large fluctuations in their ratio during the year. Gradually all selected companies have increased their reserve during the period of the study. Year on year increase in reserve & surplus indicates fairly improving position of life insurance companies.

The chart 4.2 depicts a comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with regard to average capital to reserve ratio. The figures have been derived by dividing average capital to average reserve for each year of the study period. Looking at the chart, downward trend has been observed in peer companies as well as industry.

The ratio in the peer companies have decreased from 298.36% to 148.43% during the period of the study. Industry has also reflected decreasing trend from 418.16% to 207.42% during the period of the study. The above chart clearly indicates that peer companies have managed to enhance their reserves and surplus base by maintaining the lower capital base.



Source: Computed

Table 4.5: Solvency Ratio **(in %)**

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	238.00	225.00	174.00	241.00	429.00	330.00	234.00	165.00
2008-09	258.00	304.00	231.00	269.00	244.00	292.00	262.00	250.00
2009-10	180.00	322.00	290.00	279.00	211.00	217.00	268.00	186.00
2010-11	172.00	365.00	327.00	267.00	289.00	204.00	366.00	166.00
2011-12	188.00	534.00	371.30	306.00	299.00	534.00	515.00	353.00
2012-13	217.00	521.00	395.70	521.00	267.00	215.00	634.00	429.00
2013-14	194.00	485.00	372.30	302.00	186.00	228.00	734.00	442.00
2014-15	196.00	425.00	336.90	313.00	205.00	216.00	761.00	355.00
2015-16	198.00	343.00	320.00	311.00	211.00	212.00	793.00	304.00
2016-17	192.00	309.00	281.00	300.00	200.00	204.00	582.00	272.00
Average	**203.30**	**383.30**	**309.92**	**310.90**	**254.10**	**265.20**	**514.90**	**292.20**
CV	**13.15**	**26.99**	**22.06**	**24.90**	**28.68**	**38.97**	**42.48**	**35.07**

Source: Computed from IRDA Handbook of different years

As per IRDA (Assets, Liabilities, and Solvency Margin of Insurers) Regulations, 2000 The ratio of Available Solvency Margin to Required Solvency Margin is referred to as the Solvency Ratio. The excess of the defined value of assets over the value of life insurance liabilities and other obligations of policyholders' and shareholders' funds is known as available solvency margin. Required solvency margin has been calculated based on mathematical reserve & sum at risk and assets of policy holders fund by actuaries as per the statement given in IRDA (Actuarial Report and Abstract) Regulations, 2000. As per section 64VA of insurance act 1938 & IRDA (Assets, Liabilities, and Solvency Margin of Insurers) Regulations, 2000 life insurers require to maintain a minimum solvency ratio 150%. Solvency margin means excess of the value of assets over the amount of policyholder’s liability. Generally, solvency

margin is calculated as net assets to net premium written. Different countries use different methodology to calculate the same.

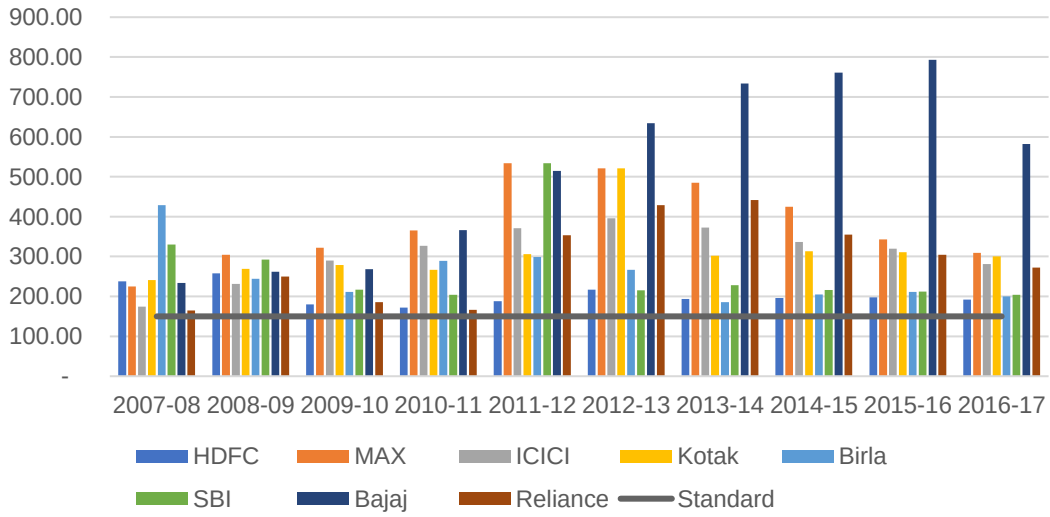
Overall, selected companies have maintained minimum solvency margin 150% successfully throughout the study period. It indicates the strong & stable financial health of the selected companies.

As regards average solvency margin, Bajaj has witnessed the highest 514.90% during the period of the study. However, HDFC has reported lowest 203.30% average solvency margin during the study period. Max has reported 383.30% average solvency margin under the period consideration.

Birla, SBI and Reliance have reported average solvency margin between 250% and 300% during the period of the study. On the other hand, ICICI and Kotak have reported average solvency margin about 310% during the study period.

The data above revealed that all selected companies have maintained healthy solvency margins with minimum variance.

Chart 4.3: Solvency Ratio



Source: Computed

The chart 4.3 above depicts level of solvency margin over and above its standard 150% during the period of the study. In comparison, Bajaj has achieved significantly higher solvency margin in the last five years of study period. Overall, with respect to standard solvency margin, all selected companies have maintained a solvency margin under economic stress over a period of time.

4.2.2 Assets Quality (A)

Assets quality is the most important criterion to determine the overall financial soundness of insurance companies. There are various ratios to calculate assets qualities such as (real estate + unquoted equities+ debtors) / total assets, debtors/ (gross premium + reinsurance recoveries), non-performing loans to total gross loans, equities/total assets (Das, Nigel Davies, & Podpiera, 2003). In the context of Indian insurance market, assets quality of insurers is controlled by the various regulations of IRDA. However, in India majority of the companies are non-listed and having smaller amount of direct investment in share market. In consideration of Indian scenario, percentage of equities to total assets has been considered as an appropriate measure to check the assets quality. It measures the degree of exposure to equity risk.

Table 4.6 Equities to Total Assets (in %)

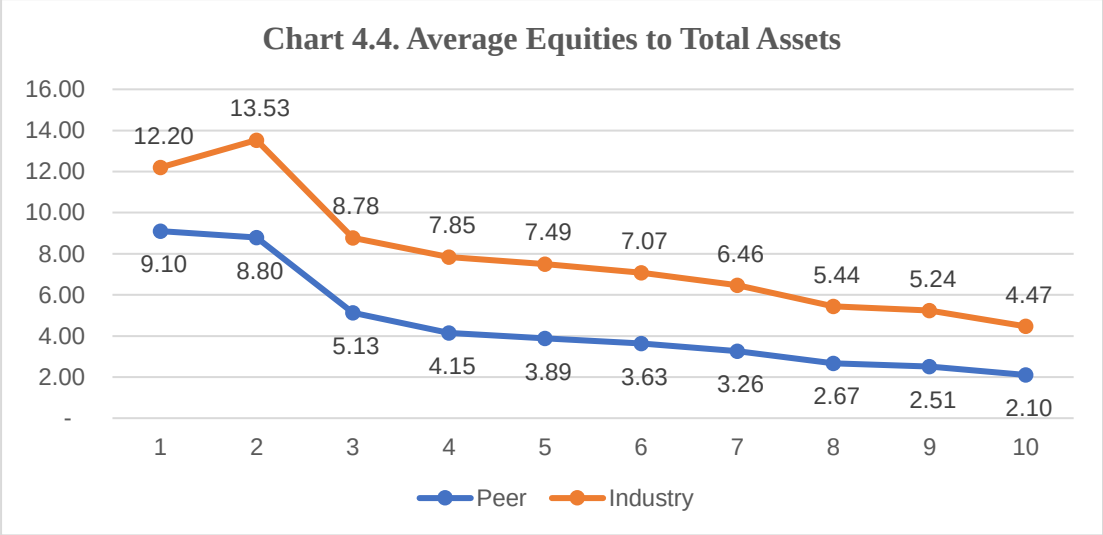
Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	13.03	23.90	4.47	14.22	16.37	9.99	1.11	22.79
2008-09	15.33	26.24	3.90	11.86	17.52	7.13	0.86	13.48
2009-10	9.11	16.29	2.37	7.35	10.88	3.55	0.46	7.16
2010-11	7.05	12.71	2.04	5.85	9.19	2.53	0.38	5.67
2011-12	5.93	11.23	1.99	5.30	8.79	2.13	0.38	5.66
2012-13	4.83	9.47	1.93	4.69	8.20	1.91	0.39	6.19
2013-14	3.90	7.82	1.78	4.23	7.39	1.70	0.38	6.42
2014-15	2.96	6.11	1.45	3.36	6.13	1.38	0.35	6.45
2015-16	2.69	5.33	1.40	3.05	6.03	1.24	0.34	7.54
2016-17	2.19	4.29	1.18	2.45	5.35	1.01	0.31	6.72
Average	**6.70**	**12.34**	**2.25**	**6.24**	**9.58**	**3.26**	**0.50**	**8.81**
CV	**67.22**	**61.91**	**48.31**	**62.48**	**44.10**	**91.02**	**53.69**	**61.48**

Source: Computed from IRDA Handbook of different years

The table 4.6 above depicts equities to total assets from the year 2007-08 to 2016-17. It indicates the level of business risk of insurance companies. Moreover, it is an important tool to check financial strength in process of credit rating.

During the first two years of the study period, all selected companies have reported higher equities to total assets ratio. Thereafter from the year 2009-10, all selected companies have reported significant downfall. The reason behind continuous downfall in the ratio is remarkable increase in assets over a period of time. However, all the selected companies have abided by the IRDA regulation to maintain a minimum equity capital of Rs 100 crores. Higher the ratio indicates greater use of their capital to create assets. In the life insurance business excessive capital leads to increase their business risk. Hence, lower ratio is more favourable.

As regards average equities to capital, Max witnessed the highest ratio 12.34% during the period of study. By contrast, Bajaj had only 0.05% ratio during the study period. On the other hand, seven out of eight selected companies have reported average equities to total assets ratio less than 10%. Gradual decline in the ratio is the indicator of increased business year-on-year.



Source: Computed

The chart 4.4 above depicts a comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with regard to average equities to total assets ratio. The figures have been derived by dividing average equities to total assets for each year of the study period.

Looking at the chart, downward trend has been observed in peer companies as well as industry. Peer companies have reported a downfall from 9.10% to 2.10% during the period of study. Likewise, industry has reported downfall from 12.20% to 4.47% during the study period. This decreasing trend shows a good sign for the life insurance business.

4.2.3 Reinsurance and Actuarial Issues (RA)

"Reinsurance" means insurance for insurers. It is the practice of transferring portions of risk portfolios to other parties, to reduce the paying of large obligation in the form of insurance claim in exchange of agreed premium by both the parties. Though, the "Actuary" is a person who compiles and analyse statistics and uses them to calculate insurance risk and premium. Both these terms are closely associated with each other when focusing on risk and return part. By prudent management of reinsurance and actuarial issues, by framing proper strategy, insurers can minimize their risk and maximize earnings.

The present study has used Reinsurance and Actuarial Issues as key financial soundness indicators adopting two ratios i.e., Risk retention ratio and survival ratio which are calculated in table 4.7 & table 4.8 below.

Table 4.7. Risk Retention Ratio (Net Premium to Gross Premium) (in %)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	99.16	99.19	99.82	98.32	98.95	99.81	99.86	99.62
2008-09	99.17	99.01	99.75	98.49	98.79	99.87	99.78	99.65
2009-10	99.29	98.77	99.68	99.37	98.54	99.77	99.75	99.75
2010-11	99.45	98.69	99.64	98.84	98.55	99.72	99.64	99.65
2011-12	99.49	98.91	99.33	98.48	97.66	99.60	99.33	99.50
2012-13	99.43	98.97	99.11	98.06	96.85	99.35	99.16	99.26
2013-14	99.25	99.08	98.83	98.15	96.11	99.24	98.85	99.38
2014-15	99.55	99.19	99.05	97.94	96.85	99.32	98.85	99.36
2015-16	99.18	99.16	99.14	98.53	96.99	98.99	98.89	99.38
2016-17	99.12	99.07	99.11	98.60	96.67	99.23	99.01	99.32
Average	**99.31**	**99.00**	**99.35**	**98.48**	**97.60**	**99.49**	**99.31**	**99.49**
CV	**0.16**	**0.17**	**0.35**	**0.42**	**1.06**	**0.30**	**0.42**	**0.17**

Source: Computed from IRDA Handbook and public disclosures of different companies

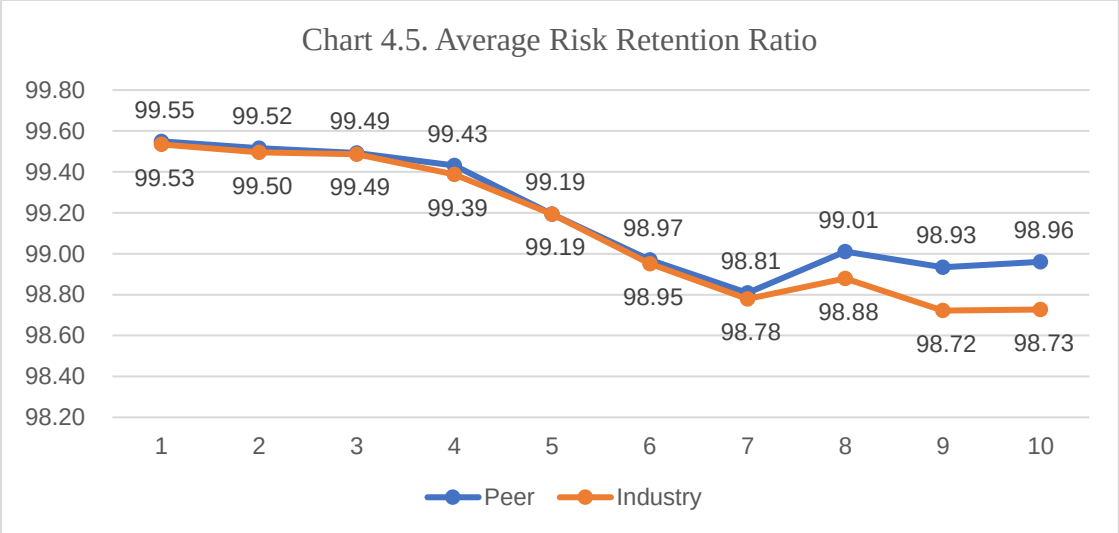
The table 4.7 above highlights the Risk Retention Ratio from the year 2007-08 to 2016-17 indicating risk-taking capacity of the insurance companies. Total premium received by the insurance company against the risk taken by them is known as gross premium. If the insurers are unable to bear risk, they may transfer to a reinsurer with agreed amount to pay, is called reinsurance ceded. It will reduce the amount of premiums. On the contrary, reinsurance accepted is the acceptance of the business, it will lead to increase in the premium income. Thus, after adjusting to the reinsurance ceded and accepted amount available is called net premium.

The risk retention ratio represents the insurer's overall underwriting strategy. It refers to the amount of risk that is passed on to reinsurers.

The figures in table above revealed that all the selected companies have the capacity to retain the risk. SBI and Reliance have greater risk-taking capacity as they have transferred only 0.51% business to reinsurers on aggregate basis. Likewise, ICICI, HDFC & Bajaj have higher risk-taking capacity as they have transferred about 0.69% to the reinsurer on aggregate basis.

MAX, Kotak & Birla have maintained their business with low risk. These companies have transferred on an average 1%, 1.52% and 2.4% of their business to reinsurers, respectively.

Overall, based on outcomes of this ratio, the life insurance sector is found to retain the major proportion of the risk and pass on a negligible proportion to reinsurers. In other words, the life insurers passed on to reinsurers only about 1 % of the total direct premium on an average.



Source: Computed

The chart 4.5 above illustrates a comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with respect to risk retention ratio. The figures have been derived by dividing average net premium to gross premium for each year of the study period. Peer companies and industry are found to be moving almost in the same direction from 2007-08 to 2016-17. The gradual decline in the average risk retention ratio indicates that companies are trying to get more business with sacrificing little share of premium.

Table 4.8. Net Technical Reserves to Average of Net Premium Received in last three years (Survival Ratio) (in %)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	1.81	0.45	27.69	4.84	-	0.15	17.49	24.77
2008-09	1.26	-	27.37	3.17	3.80	-	12.40	51.95
2009-10	0.96	3.56	22.23	2.29	10.94	3.34	10.03	36.89
2010-11	3.09	2.82	20.32	1.93	9.27	6.17	19.94	32.05
2011-12	2.53	3.24	21.79	3.55	8.59	9.31	36.02	35.44
2012-13	2.17	2.94	22.35	10.25	8.78	13.88	59.08	41.13
2013-14	1.94	2.72	25.49	19.29	5.21	20.28	85.61	47.98
2014-15	4.73	1.31	25.20	27.32	5.45	26.38	106.66	51.26
2015-16	8.42	1.17	23.52	31.80	5.32	28.32	127.83	6.88
2016-17	10.80	6.30	25.04	32.98	5.03	27.17	139.51	7.02
Average	**3.77**	**2.45**	**24.10**	**13.74**	**6.24**	**13.50**	**61.46**	**33.54**
CV	**87.49**	**74.60**	**10.17**	**93.61**	**51.28**	**83.86**	**81.33**	**48.97**

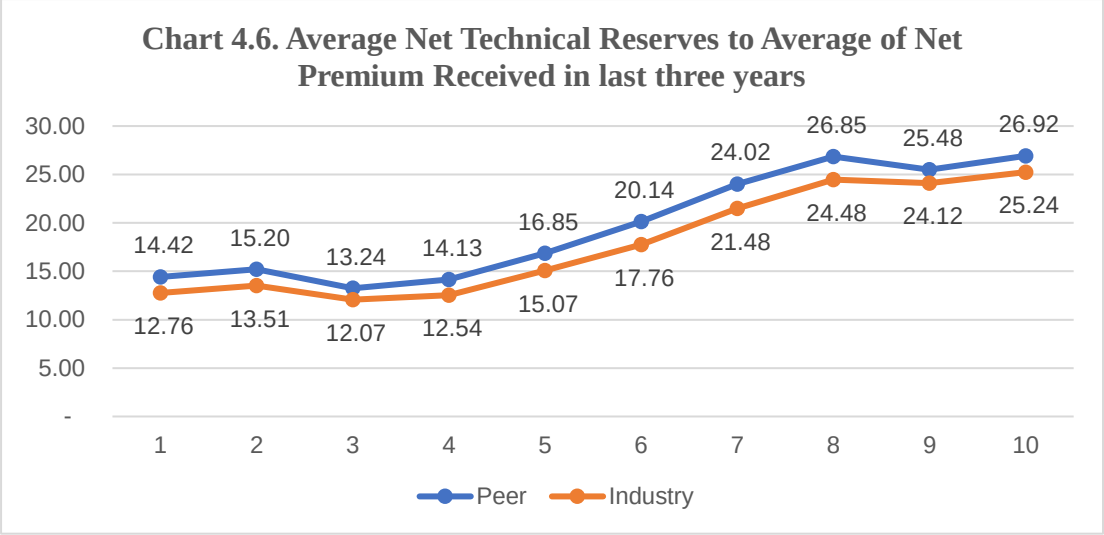
Source: Computed from IRDA Handbook of different years

The table 4.8 above highlights net technical reserves to average net premium received (in the last three years) from the year 2007-08 to 2016-17. The adequacy of technical reserves is known as the survival ratio. Net technical reserve comprises capital reserves, capital redemption reserve, share premium, revaluation reserve, adjusted general reserves, catastrophe reserve, other reserve, and balance of profit in profit and loss account. Net premium received in the last three years indicates long term life insurance business from shifts in business composition. When compared to the average net premium earned over the last three years, the greater ratio indicates better technical reserves. It indicates good financial soundness of the life insurance business. However, Bajaj has reported highest average survival ratio at 61.46% with high fluctuations. Looking at the data in more detail, it has reported significant decline in net premium during the last three years of the study period. It is not favourable situation for business of the company. Reliance has reported higher average survival ratio at 33.54% during the period of study. Although, significant decline has been observed in reserves during the last two years of the study period.

As regards survival ratio, ICICI stabilised between 20% to 27% during the study period and its average ratio abided at 24.10% with minimal 10.17% CV. It shows gradual and steady growth in the survival ratio under the period considered. Kotak and SBI have reported about 13% average survival ratio during the study period.

On the other hand, HDFC, Max and Birla demonstrated less than 10% average survival ratio with higher fluctuations. Overall, selected companies have enhanced their proportion of the reserves with increasing business in terms of net premium.

The chart 4.6 highlights comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with respect to survival ratio. The figures have been derived by dividing average net technical reserves to net premium received for each year of the study period. Peer companies have demonstrated upward trend from 14.43% to 26.92% during the study period. Similar trend has been observed in the industry from 12.76% to 25.24%. However, the performance of selected companies is quite better than the industry.



Source: Computed

4.2.4 Management Soundness (M)

Management soundness signifies efficient operation of life insurance business, wherein premium and management of expenses play a vital role. By considering management of expenses and premium two ratios i.e., first year premium to gross premium and operating expense to gross premium have been proposed by IMF. Both of these ratios have been calculated in table 4.9 and 4.10 below.

Table 4.9. First Year Premium to Gross Premium (in %)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	55.27	58.86	59.25	65.44	60.33	85.25	68.63	85.29
2008-09	47.64	47.78	44.36	57.32	61.70	74.69	42.27	71.24
2009-10	46.50	38.04	38.32	46.51	53.76	69.68	38.98	59.36
2010-11	45.08	35.46	43.97	42.12	36.64	58.63	36.06	46.19
2011-12	37.81	29.76	31.67	39.64	32.73	49.73	36.31	32.91
2012-13	39.18	28.61	35.52	42.77	35.21	49.60	43.35	34.03
2013-14	33.48	31.07	30.25	47.09	35.12	47.17	44.36	45.15
2014-15	37.03	31.48	34.84	50.70	37.03	42.97	44.91	44.79
2015-16	39.77	31.27	35.30	55.64	39.79	44.91	48.91	35.43
2016-17	44.72	34.01	35.18	55.45	44.27	48.27	53.21	26.11
Average	**42.65**	**36.63**	**38.87**	**50.27**	**43.66**	**57.09**	**45.70**	**48.05**
SD	**6.40**	**9.58**	**8.51**	**8.13**	**10.94**	**14.52**	**9.65**	**18.68**

Source: Computed from IRDA Handbook of different years

Table 4.9 above highlights the efforts made by the companies in terms of new business. The given ratio shows the relationship between new business and total business. In the computation of this ratio, single premium is also considered as a part of new business premium.

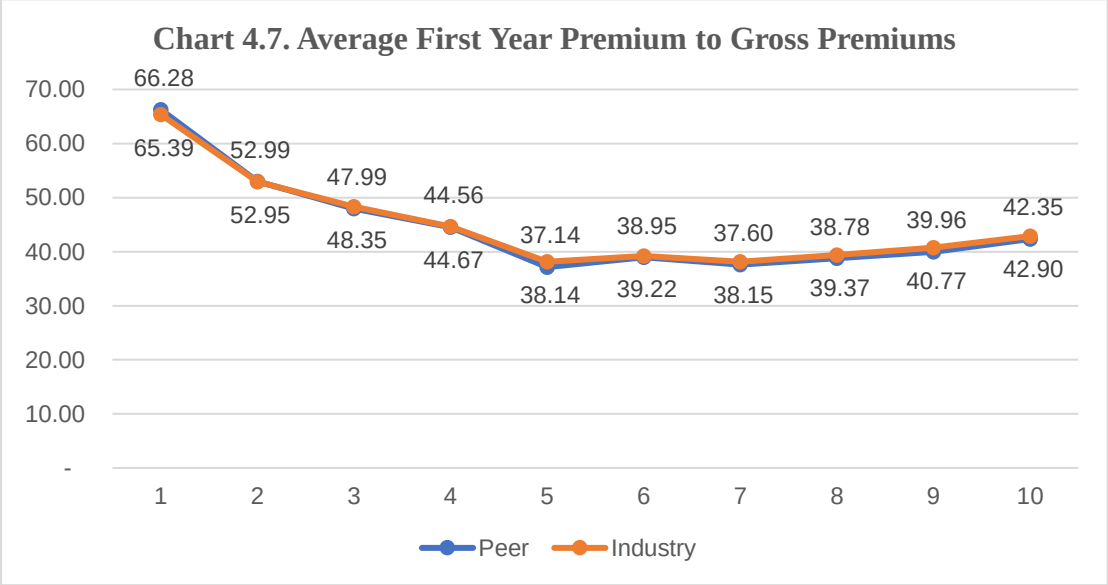
A higher ratio indicates that company is able to generate more business in terms of premium. On the contrary, excessive high ratio indicates that companies are striving

hard to acquire fresh business but at the same time fail to retain existing policyholders.

All the selected companies have reported average first year premium to gross premium ratio more than 35%. It can be said that companies have earning about 35% of business every year on aggregate basis. A close look at the table reveals that, during the first two years of the study period companies have maintained higher ratio. Afterward gradual decline in the ratios have been observed in all selected companies.

SBI has a capacity to earn on an average 57.09% new business premium against the gross premium which is highest among the selected companies. Likewise, Kotak has a capacity to earn on an average 50.27% during the study period. However, HDFC, Birla, Bajaj and Reliance have earned new business premium to gross premium in the range of 42.65% to 50.27% during the period under consideration, from which Bajaj has shown increasing trend after two years of the study period.

On the other hand, MAX and ICICI have generated 36% and 38% average new business premium to gross premium respectively.



Source: Computed

The chart 4.7 above demonstrates a comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with regard to first year premium to gross premium ratio. The figures have been derived by dividing average first year premium to gross premium for each year of the study period. During the period of the study, new private players have entered in the market. Its number has been increased from 17 to 23. New companies have started their contribution in the form of premium. On account of increased number in private

players downward trend has been observed in the given ratio. Peer companies have reported downfall from 66.28% to 42.35%, likewise, industry has also reported downfall from 65.35% to 42.90% during the study period.

4.10. Operating Expenses to Gross Premium (in %)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	20.85	31.88	21.53	25.12	20.59	7.95	20.61	31.96
2008-09	31.63	41.71	17.85	25.93	27.31	8.60	17.66	38.99
2009-10	21.54	30.95	15.54	20.01	24.10	7.45	15.51	24.78
2010-11	16.61	24.78	12.23	19.49	21.20	6.82	16.72	23.78
2011-12	12.45	19.40	14.29	18.88	20.65	7.80	18.79	23.31
2012-13	11.87	18.51	15.00	20.64	22.23	11.01	23.22	31.52
2013-14	10.62	16.54	13.01	20.47	18.99	10.28	23.04	30.98
2014-15	10.04	15.20	10.79	22.02	16.64	9.14	18.64	32.03
2015-16	11.47	13.56	9.85	19.99	16.21	9.21	18.80	31.52
2016-17	12.27	14.76	10.54	18.06	13.45	7.83	17.08	19.37
Average	**15.93**	**22.73**	**14.06**	**21.06**	**20.14**	**8.61**	**19.01**	**28.82**
CV	**43.25**	**41.15**	**25.80**	**12.28**	**20.06**	**15.21**	**13.55**	**20.17**

Source: Computed from IRDA Handbook of different years

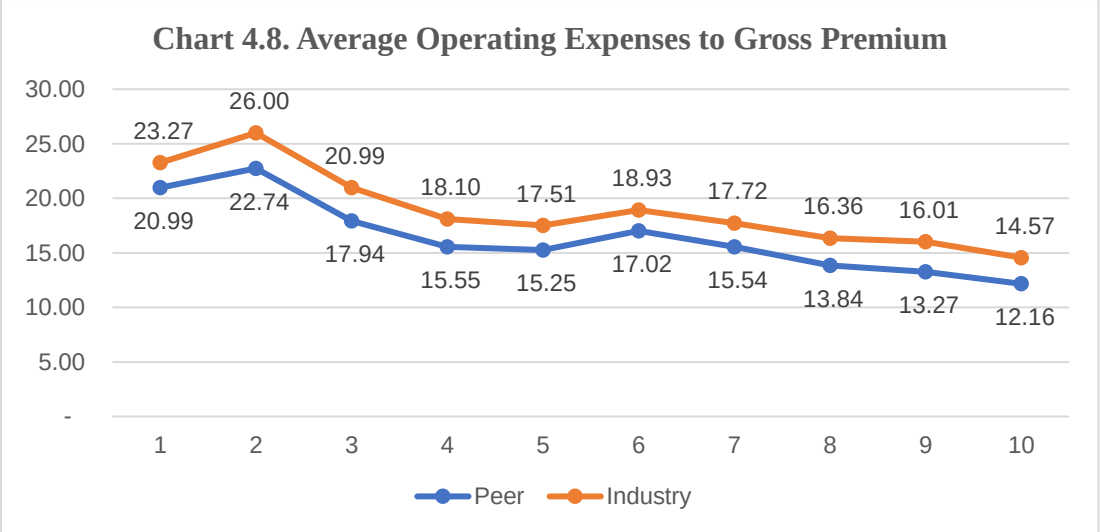
The table 4.10 above demonstrates operating expense to gross premium ratio for the period under consideration. Operating expenses are directly related to the operation of the business. The above computed ratio revels required operating expense to generate premium income. It exhibits the management efficiency of the business.

Low ratio indicates lower amount of operating expenses incurred to generate premium. However, during the business expansion period the ratio tends to become higher.

In the initial years of the study period, high proportion of operating expenses have been observed in selected companies. During the study period, a gradual increase in operating expenses have been observed. However, companies have focused more on generation of premium during the study period. All selected companies have expanded their business in terms of gross premium over a period of time.

SBI has recorded comparatively lowest average ratio 8.61%, indicating better management efficiency. ICICI and HDFC have recorded near to 15% average ratio during the study period.

On the other hand, MAX, Kotak, Birla, Bajaj and Reliance have reported average ratio between 19% to 29% under the period consideration.



Source: Computed

The chart 4.8 above highlights comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with regard to operating expense to gross premium. The figures have been derived by dividing average operating expense to average gross premium for each year of the study period. The ratio of peer companies and industry is moving in the same direction. Peer companies have reported downward trend from 20.99% to 12.16% during the study period. Industry has also reflected decreasing trend from 23.27% to 14.57% during the period of the study.

The above chart clearly indicates that peer companies have managed to enhance their premium by lower operating expenses. It can be said that these companies are more efficient in management as compared to industry.

4.2.5 Earnings & Profitability (E)

Earnings and profitability are considered as key financial indicators in assessment of financial soundness. It evaluates the possibility for earning to offset losses relative to capital or claims and asset portfolio. It highlights whether the company's profitability is effectively managed. In life insurance business, rapid growth in earnings or profit may signal excessive risk. However, Low profitability can indicate underlying issues with an insurer and can be used as a precursor to a solvency issue. The present study has undertaken Return on Equity (ROE) and Return on Assets (ROA) for earnings and profitability as prescribed by IMF in encouraged set. The computation of both these ratios have been presented in table 4.11 and table 4.12 below.

Table 4.11. ROE (Net Income to Equity) (in %)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	-19.16	-15.20	-99.57	-14.96	-34.94	3.44	-141.92	-66.92
2008-09	-28.01	-22.05	-54.63	2.81	-37.36	-2.63	-46.90	-93.34
2009-10	-13.98	-1.14	18.06	13.56	-22.11	27.65	359.82	-24.37
2010-11	-4.96	10.54	56.54	20.08	15.49	36.63	701.37	-11.09
2011-12	13.59	23.65	96.87	39.83	23.39	55.58	870.02	31.14
2012-13	22.63	21.77	104.69	37.18	27.49	62.22	853.06	31.80
2013-14	36.36	22.42	109.61	46.86	19.50	74.01	679.84	30.00
2014-15	39.38	21.59	114.15	44.85	15.01	82.00	581.43	11.30
2015-16	41.02	22.88	115.23	49.14	7.36	86.10	583.26	-16.49
2016-17	44.64	34.39	117.20	59.43	6.46	95.47	554.92	-5.11
Average	**13.15**	**11.89**	**57.82**	**29.88**	**2.03**	**52.05**	**499.49**	**-11.31**
CV	**210.36**	**156.79**	**135.70**	**79.00**	**1,196.26**	**66.33**	**69.41**	**-372.12**

Source: Computed from IRDA Handbook of different years

The table 4.11 above demonstrates return on equity where equity means ownership or capital of the business whereas net income means profit after tax. Higher ratio indicates higher returns to equity shareholders; it may be considered as a reward for the investors. This ratio measures effective utilisation of equity capital to generate income for equity shareholders.

Generally, utility sector should have ROE 10% or less, technology or retail sector should have ROE 18% or more. As a general rule for insurance companies, ROE should remain between 10% to 15% but as such no specific standard for it. A good rule of thumb is to target ROE equal to or just above the average of industry.

In accordance with present study average industry ROE has been noted at 5.43%. The amount derived from dividing average net income to net equity of industry for each years of the study period. Reliance and Birla have reported below industry average. Birla has reported 2.03% whereas Reliance has reported significantly lower -11.31%.

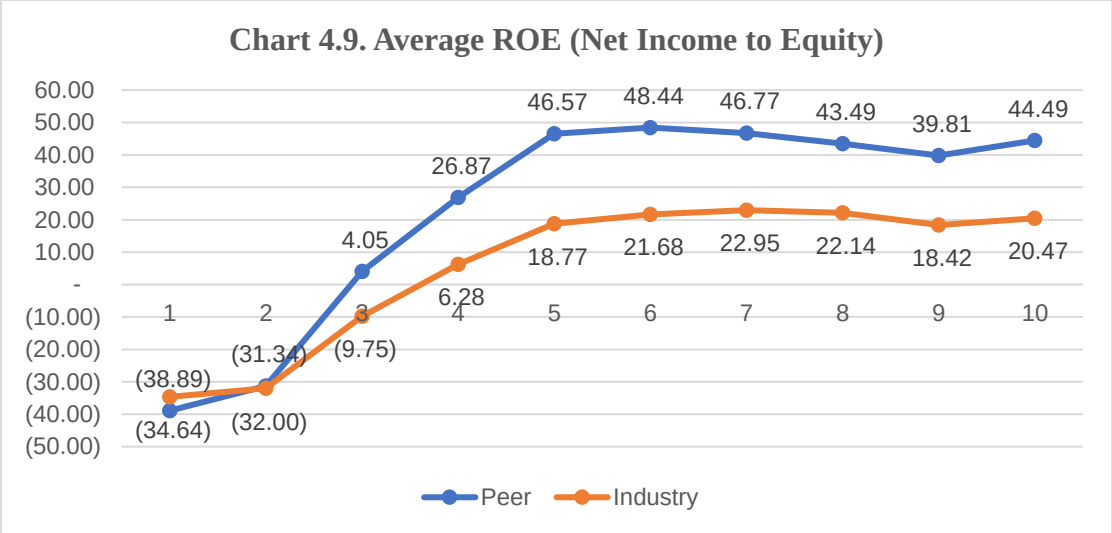
In initial three – four years of the study, all selected companies were facing hard time, they have not be able to generate a good amount of profit. Subsequently, all selected companies have gradually started generation of returns on equity.

Bajaj has posted highest 499.49% average returns on equity. The reason behind high ROE is low amount of capital base. All companies are required to maintain adequate capital for their contingencies and other liability. The company may be at risk if they fail to maintain adequate capital. However, no specific guidelines issued by the IRDA except the limit of 100 crore capital requirement at the time of registration.

As regards average ROE, ICICI and SBI have posted 57.82% and 52.05% respectively under the period consideration. Kotak has posted 29.88% average ROE

during the study period. On the other hand, HDFC and MAX have posted 13.15% and 11.89% respectively.

Overall, companies under review have observed satisfactory performance of ROE in the last five years.



Source: Computed

The chart 4.9 above shows a comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with regard to ROE. The figures have been derived by dividing average net income to average equity for each year of the study period. Looking at the chart, peer companies have posted robust growth during 2011-12 to 2014-15. Peer companies shifted upward as compared to industry ranging -34.64% to 44.49% whereas industry ranging from -38.89% to 20.47%. The above chart clearly indicates that peer companies have managed to accelerate earnings in relation to equity.

Table 4.12. Net Profits to Assets (ROA) (in %)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	-2.50	-3.63	-4.45	-2.13	-5.72	0.34	-1.57	-15.25
2008-09	-4.29	-5.79	-2.13	0.33	-6.55	-0.19	-0.40	-12.59
2009-10	-1.27	-0.19	0.43	1.00	-2.41	0.98	1.64	-1.74
2010-11	-0.35	1.34	1.15	1.18	1.42	0.93	2.69	-0.63
2011-12	0.81	2.66	1.93	2.11	2.06	1.18	3.32	1.76
2012-13	1.09	2.06	2.02	1.74	2.25	1.19	3.35	1.97
2013-14	1.42	1.75	1.96	1.98	1.44	1.25	2.61	1.93
2014-15	1.17	1.32	1.65	1.51	0.92	1.14	2.01	0.73
2015-16	1.11	1.22	1.61	1.50	0.44	1.07	1.98	-1.24
2016-17	0.98	1.48	1.38	1.46	0.35	0.96	1.69	-0.34
Average	**-0.18**	**0.22**	**0.55**	**1.07**	**-0.58**	**0.89**	**1.73**	**-2.54**
CV	**-1,045**	**1,235**	**388**	**115**	**-554**	**52**	**91**	**-243**

Source: Computed from IRDA Handbook of different years

The table 4.12 above depicts net profit to assets from the year 2007-08 to 2016-17. It is also known as Return on Assets (ROA). ROA is an indicator of effective assets utilisation.

Higher the ratio indicates greater the efficiency in management of resources to generate profit and vice versa. In the composition of assets, investment of shareholders and policyholders perform an important role. It may infuse the revenue in the business and improve the financial efficiency of life insurance companies.

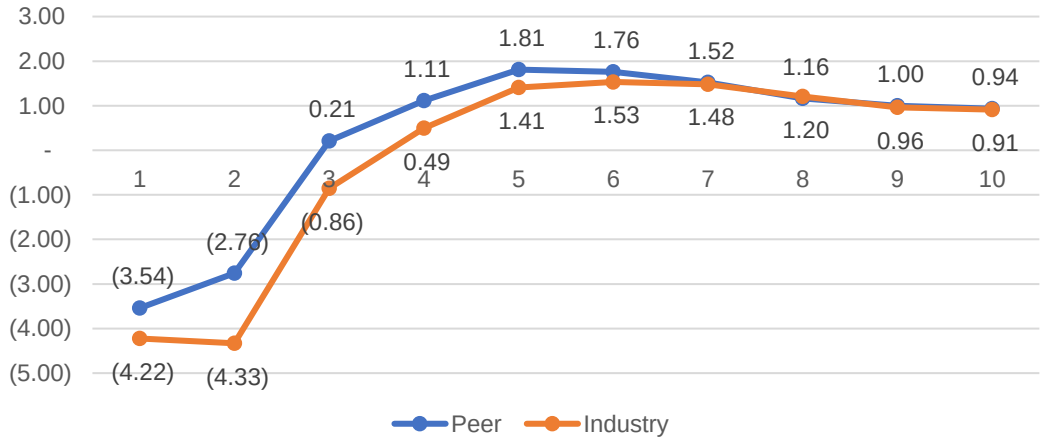
In the initial three-four years of the study return on assets ratio was negative. Subsequently, gradual growth in the same has been observed in all selected companies. During the study period, all selected companies have increased their assets base in higher proportion as compared to their net profit.

Industry average ROA has been noted -0.14 during the period under consideration. All the companies except Reliance, Birla and HDFC have posted higher average ratio as compared to industry average. The reason behind low average in these three companies is the huge loss suffered by them in the initial three years of the study.

Kotak and Bajaj have reported higher average ratio as compare to all selected companies i.e., 1.07% and 1.73% respectively. On the other hand, SBI, ICICI and Max have reported positive average ROA during the period of study.

Overall, companies under review have observed satisfactory performance of ROA in the last seven years.

Chart 4.10. Average Net Profits to Assets (ROA)



Source: Computed

The chart 4.10 above demonstrates a comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with regard to ROA. The figures have been derived by dividing average net income to

average assets for each year of the study period. Looking at the chart in detail, it has been observed that during the initial six years of the study period, selected companies have performed better than industry. After that, industry and peer companies have been found moving in the same direction with almost same growth. Average ROA has increase from -3.54 to 0.94% in peer companies. Likewise, average ROA has increased from -4.22 to 0.91% for industry. The above chart clearly indicates gradual increase in the return on assets ratio during the period under consideration. It reveals that companies have managed to utilise its assets and generate profit.

4.2.6 Liquidity (L)

Liquidity is the last indicator of financial soundness under the CARAMEL Framework. Liquidity is important in life insurance because it allows an insurance company to satisfy the policyholder's obligations quickly. An insurer’s liquidity depends on the degree to which it can satisfy its financial obligations by holding cash and investments. Investments should be diversified, sound and liquid. The high degree of liquidity allows an insurer to meet the sudden cash requirements. Untimely sales of investments may result in substantial losses due to temporary market conditions or tax consequences. The present study has considered only one ratio of current assets to current liability as liquidity indicator which is presented below in table 4.13 for the year 2007-08 to 2016-17.

Liquidity is important in life insurance because it allows an insurance company to satisfy the policyholder's obligations quickly. The ability of an insurer to meet its financial obligations by keeping cash and investments determines its liquidity. Diversified, safe, and liquid investments are essential. An insurer's high liquidity allows them to fulfil unforeseen cash obligations.

This ratio indicates an insurer’s ability to settle its current liabilities without prematurely selling long term investment or borrowing money. The life insurance business includes a longer period contract but, at the same time, the risk is very high. Insurance is the business of uncertainty, where in management of liquid fund is a prime importance as the claims may arise at any point of time.

Table 4.13. Current Assets to Current Liabilities (in times)

Years	HDFC	MAX	ICICI	Kotak	Birla	SBI	Bajaj	Reliance
2007-08	1.37	0.64	0.59	0.92	0.85	0.61	0.48	0.83
2008-09	1.06	0.82	0.57	0.90	0.81	0.40	0.63	0.80
2009-10	0.63	0.75	0.38	0.70	0.82	0.45	0.47	0.86
2010-11	0.80	0.62	0.42	0.72	0.86	0.46	0.78	0.79
2011-12	0.85	0.64	0.54	0.67	0.86	2.42	0.81	0.75
2012-13	0.76	0.77	0.65	0.75	0.84	2.40	1.04	0.37
2013-14	0.97	0.90	0.59	0.83	0.97	2.50	1.11	0.35
2014-15	0.89	1.01	0.69	0.84	1.15	2.36	0.86	0.75
2015-16	0.74	0.95	0.67	0.69	1.16	1.85	0.93	0.71
2016-17	0.78	1.04	1.01	0.80	1.66	1.89	1.12	1.25
Average	**0.88**	**0.81**	**0.61**	**0.78**	**1.00**	**1.53**	**0.82**	**0.75**
CV	**23.66**	**19.17**	**28.43**	**11.64**	**26.63**	**60.86**	**28.74**	**33.82**

Source: Computed from IRDA Handbook of different years

Following are the components of current assets and current liabilities of life insurance companies.

Components of Current assets:

Cash and bank balance

Advances: prepayments, advance taxes, capital advance, adjusted security deposits, advance to directors, officers, or employee etc.

Other assets: income accrued from investments, outstanding premium, due from other entities carrying on insurance business (including reinsurers), due from subsidiaries/ holding company if any, fund management charges receivable from UL scheme, service tax and utilised credits, deposits, investment sold awaiting settlement etc.

Components of Current liabilities:

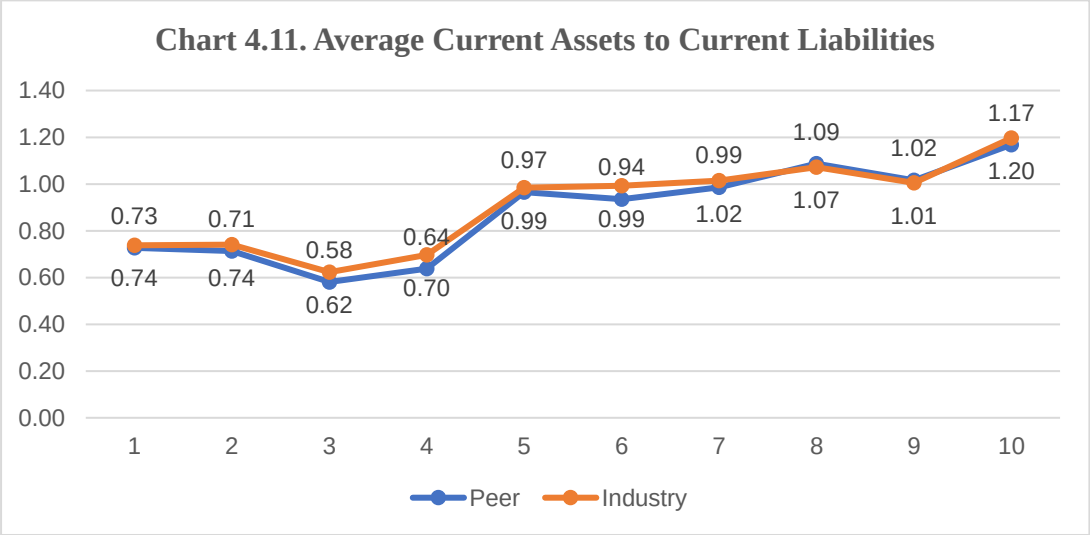
Agents' balances, balances due to other insurance companies, deposits held on re-insurance ceded, premium received in advance, unallocated premium, sundry creditors, claims outstanding, annuities due, due to subsidiaries or holding company, due to directors, unclaimed amount of policyholders, unclaimed dividend payable, investment purchased to be settled etc.

If this ratio is less than 1, then the insurer's liquidity becomes vulnerable to the cash flow from premium collections. As regards average liquidity, SBI demonstrates at 1.53 times current assets against current liability of rupee 1. It indicates that company is in good financial health and less likely to face financial hardship.

Birla has reported on an average equal current asset to current liabilities i.e., 1:1. It shows sufficient safety margin during the study period. Industry's average ratio has

been noted 0.91:1 for the ten years of the study period. In comparison with industry average all selected companies except SBI and Birla have reported lower average. However, performance of these companies has been improved during last two years of the study period.

Overall, it has been observed fluctuations in the liquidity of all selected companies during the study period from 2007-08 to 2016-17.



Source: Computed

The chart 4.11 above highlights a comparison between selected companies i.e., peer companies and Industry (except LIC) from the year 2007-08 to 2016-17 with regard to current assets to current liabilities. The figures have been derived by dividing average current assets to average current liabilities for each year of the study period. Overall, an upward trend can be observed in peer companies and industry. Peer companies have increased average liquidity from 0.73 to 1.17. Likewise, industry has increased average liquidity from 0.74 to 1.20 during the period under consideration. It reveals that all companies are gradually improving safety margin to meet short term obligations.

4.3 Objective Justification

Objective: To identify and evaluate factors responsible for financial soundness.

The present chapter has evaluated financial soundness using the CARAMEL framework and it has been developed by IMF. This framework comprises 11 attributes describing financial soundness of the selected private life insurance companies. The study has made an attempt to reduce attributes and figure out important attributes affecting financial soundness. Based on the purpose of the study,

Factor Analysis and Principal Component Analysis are appropriate tools to justify the present objective. However, in accordance with nature of data, principal component analysis (PCA) is found to be an appropriate tool. Factor analysis ascertains the presence of latent variables which explains the pattern of observed variables, it cannot be directly measured with single variable. On the other hand, PCA is a linear combination of variables which is directly measured with single variable.

Mathematical formulation under PCA

Let $x_1, x_2, x_3 \dots \dots x_q$ are original variables, then principal components can be defined as:

$$P_1 = a_{11}x_1 + a_{12}x_2 + a_{13}x_3 + \dots \dots + a_{1q}x_q$$

$$P_2 = a_{21}x_1 + a_{22}x_2 + a_{23}x_3 + \dots \dots + a_{2q}x_q$$

$$P_3 = a_{31}x_1 + a_{32}x_2 + a_{33}x_3 + \dots \dots + a_{3q}x_q$$

$$\dots \dots \dots \dots \dots \dots$$

$$\dots \dots \dots \dots \dots \dots$$

$$P_q = a_{q1}x_1 + a_{q2}x_2 + a_{q3}x_3 + \dots \dots + a_{qq}x_q$$

Where a_{ij} are components or factor loading such that

$a_{i1}^2 + a_{i2}^2 + \dots \dots . . + a_{iq}^2 = 1, \qquad i = 1,2,3 \dots , q$

Principal components Pi'^s are uncorrelated (Orthogonal)

The present study has computed PCA using SPSS version 21 statistical software.

Before application of PCA, it is advisable to check the sampling adequacy and sphericity. Generally, Kaiser-Meyer-Olkin (KMO) test is used for measuring sampling adequacy whereas Bartlett's Test is used for measuring sphericity. KMO measures of sampling adequacy represent a correlation matrix that states whether it is acceptable for computation of PCA. Data for PCA is not acceptable if KMO Measure of Sampling Adequacy is less than 0.5 and vice versa.

Table 4.14. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.589
Bartlett's Test of Sphericity	Approx. Chi-Square	611.354
	Df.	55
	Sig.	.000

Table 4.14 above highlights the result of KMO Measures of Sampling Adequacy and Bartlett's Test of Sphericity. The result of KMO reveals sampling adequacy 0.589, which is higher than 0.5. Therefore, correlation in data has been acceptable for PCA. Moreover, Bartlett's test of sphericity was 0.000 significance value, which is less than

0.05. It indicates no scope for reductions in dimensionality. On the basis of this results, it can be said that the value is statistically significant and Correlation matrix suits for the PCA. The computation of PCA is stated in table 4.15 to 4.17 as under.

Outcomes of Principal Component Analysis

Table 4.15 Total Variance Explained

*Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.640	33.093	33.093	3.640	33.093	33.093	3.176	28.876	28.876
2	2.419	21.986	55.080	2.419	21.986	55.080	2.625	23.867	52.743
3	1.360	12.360	67.439	1.360	12.360	67.439	1.563	14.208	66.951
4	1.088	9.890	77.329	1.088	9.890	77.329	1.142	10.378	77.329
5	.996	9.056	86.385						
6	.588	5.343	91.728						
7	.320	2.912	94.640						
8	.294	2.670	97.310						
9	.177	1.612	98.922						
10	.096	.876	99.797						
11	.022	.203	100.000						

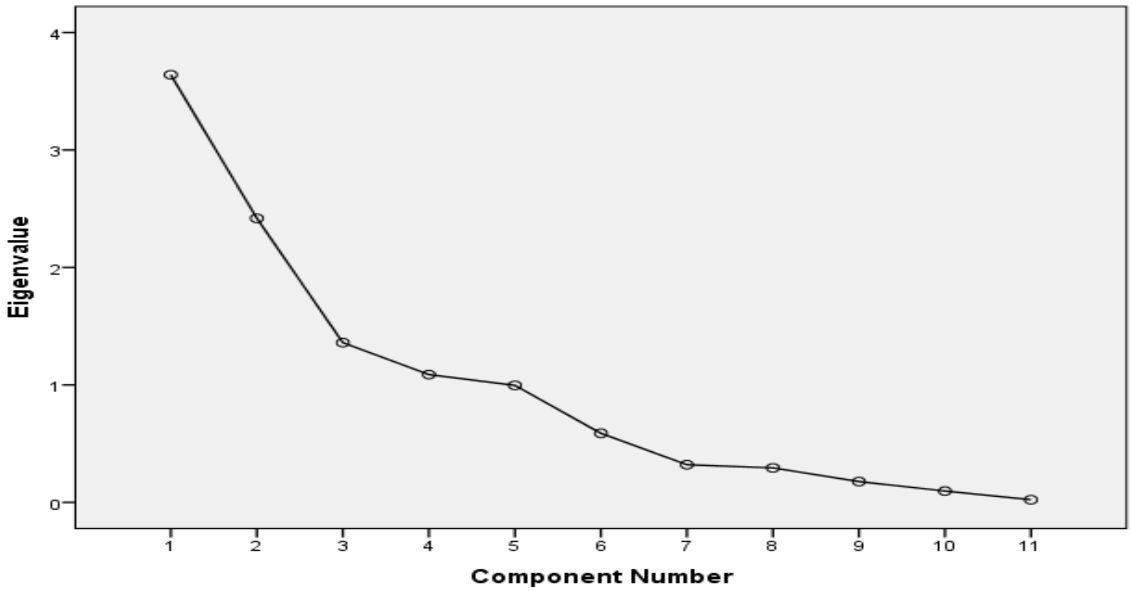
Extraction Method: Principal Component Analysis.

*Components obtained under Principal Component Analysis

The table 4.15 above highlights amount of variance explained by each component individually as well as cumulative basis in terms of percentage. The high variance carried by component indicates their greater contribution to financial soundness. Although, the calculation of variance is based on Initial Eigenvalues. It is the linear algebra concept that need to calculate variance of the component in order to determine principal components.

Looking at the table, it has been observed that eigenvalues of first four components were higher. As regards component wise variance, component 1 has explained highest variance at 33.093% whereas component 2 has explained 21.986%, component 3 has explained 12.360% and component 4 has explained 9.890%. These four components explained the variance of 77.33% altogether. On the other hand, rest of the components have contributed insignificant part to the financial soundness. The result above clearly indicates that first four components have contributed significantly towards the financial soundness of the life insurance companies. Diagram 4.1 below describes component wise eigenvalue.

Diagram 4.1 Scree Plot Component Wise Eigenvalue



The scree plot above demonstrates the appropriate number of principal components. It can be used to finalise the number of principle components in the study. The component(s) having eigenvalue less than 1 is considered as not stable for the study and it is accounted for less variability (Ellen R. Girden, 2011). The diagram above shows the point where the slop of the curve is clearly levelling off indicating the appropriate first four components that should retain in analysis. The first four components have observed eigenvalue 1 or more. These retained four components have explained in detail with the help of rotated component matrix and extracted communalities.

Table 4.16 Rotated Component Matrix & Extracted Communalities

Particulars (Variable)	**Component**				**Extracted Communalities**
	1	**2**	**3**	**4**	
Capital to Total Assets	.941				0.963
Operating Expenses to Gross Premium	.899				0.423
Equities to Total Assets	.811	-.409			0.772
Net Profits to Assets (ROA)	-.758		-.412		0.862
Net Technical Reserves to Average of Net Premium Received in last three years		.890			0.621
Solvency Ratio		.853			0.856
ROE (Net Income to Equity)		.844			0.754
First Year Premium to Gross Premiums			.754		0.883
Risk Retention Ratio (Net Premium to Gross Premium)			.746		0.755

Particulars (Variable)	Component				Extracted Communalities
	1	2	3	4	
Current Assets to Current Liabilities				-.854	0.864
Capital to Technical Reserves			.426	.432	0.754

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization
a. Rotation converged in 5 iterations.

The rotated component matrix estimates correlations between each of the variables and the components, these correlations are commonly referred to as loading. However, communalities are the proportions of each variable's variance that can be explained by the components.

The table 4.16 above indicates that extracted communalities are accepted and all criteria are fit for the component analysis as their extraction values are large enough. Result of rotated component analysis has been extracted into four new components based on high correlation among the components, by using Varimax rotation method with Kaiser Normalization converged in 5 iterations i.e., variables & component 1 to 4. In accordance with component loading, closer to 1 indicates higher correlation whereas, closer to 0 indicates weak correlation. On the basis of correlation and variance, extracted four components have been classified as under.

Table 4.17 Component Classification

Sr. No.	Component			
	I	II	III	IV
	Managing Capital & Expenses (28.88 %)*	**Solvency & Profitability (23.87%)***	**New Business & Reinsurance (14.21%)***	**Contingencies (10.38%)***
1	Capital to Total Assets	Net Technical Reserves to Average of Net Premium Received in last three years	First Year Premium to Gross Premiums	Capital to Technical Reserves
2	Operating Expenses to Gross Premium	Solvency Ratio	Risk Retention Ratio (Net Premium to Gross Premium)	
3	Equities to Total Assets	ROE (Net Income to Equity)		

*component loading (% of variance) presented into bracket

These new four components are linear combinations of original eleven variables. Component I comprise capital to total assets, operating expenses to gross premium

and equities to total assets with component loading 28.88%. It has described as management of capital and expense of the company.

Component II includes net technical reserves to average of net premium received in last three years, solvency ratio, and ROE (net income to equity) with component loading 23.87%. It has recited as solvency and profitability of the company.

Component III incorporates only two variables i.e., first year premium to gross premiums and risk retention ratio (net premium to gross premium) with component loading 14.21%. It is related to new business and reinsurance.

Component IV consist of capital to technical reserves only with component loading 10.38%. It is narrated as contingencies.

All these four components together contribute 77% of variance indicating positive influence towards the financial soundness of the life insurance companies in India. However, ROA (net profit to total assets) and current assets to current liabilities influenced negative to financial soundness of the company. Based on the correlation component matrix 9 out of 11 variables positively influenced the financial soundness in the following order.

Table 4.18 Extracted Variables

No.	Variables	Extraction
1	Capital to Total Assets	.941
2	Operating Expenses to Gross Premium	.899
3	Net Technical Reserves to Average of Net Premium Received in last three years	.890
4	Solvency Ratio	.853
5	ROE (Net Income to Equity)	.844
6	Equities to Total Assets	.811
7	First Year Premium to Gross Premiums	.754
8	Risk Retention Ratio (Net Premium to Gross Premium)	.746
9	Capital to Technical Reserves	.426

The table 4.18 above highlights the original variables in decreasing order of importance. Hence, it can be said that the capital to total assets variable accounts for significant influence on the financial soundness of life insurance companies whereas capital to technical reserves influenced relatively insignificant to the financial soundness.

4.4 Summing up

The present chapter has used CARAMEL framework to study financial soundness of the selected companies where in performance of companies have been analysed on the

basis of capital adequacy, assets quality, reinsurance & actuarial issues, management soundness, earning and profitability and liquidity. By computing eleven (11) ratios, comparison has been carried out among the selected companies based on basic statistics such as average and CV for the 10 consecutive years. Furthermore, comparison between selected companies and industry has taken place on the basis of their average ratios. Subsequently, these eleven (11) ratios have been evaluated in respect of its influence on financial soundness of the life insurance companies using principal component analysis.

The result of PCA reveals new four components with linear combinations of eleven variables (ratios). Managing Capital & Expenses, Solvency & Profitability, New Business & Reinsurance, and Contingencies are the extracted four components under PCA. These four components influence significantly to the financial soundness of the private life insurance companies in India.

References

Ansari, V. A., & Fola, W. (2014, September). Financial Soundness and Performance of Life Insurance Companies in India. *International Journal of Research (IJR), 1*(8).

Bardhan, M. R., Dey, N. B., & Adhikari, K. (2015). Capital structure of life insurance companies in India- An Analytical Study. *EPRA international journal of economic and business review*, 58-65.

Chakraborty, J. (2016). Financial Efficiency of the Public-sector General Insurance Firms in India. *Pacific Business Review International, 1*(1).

Chandrapal, J. D. (2017). Evaluation of Financial Soundness Indicators of Indian life insurance industry: LIC of India vs. Private Life Insurance Companies. *International Journal of Research in Computer Application & Management, 7*(7), 68-75.

Cumminsa, D. J., Rubio-Misasb, M., & Vencappaca, D. (2016). Competition, Efficiency and Soundness in European Life Insurance Markets. *Journal of Financial Stability*, 66-78.

Dar, S. A., & Bhat, J. A. (2015). A Comparative Evaluation of Financial Performance and Soundness of Selected Public and Private Life Insurers in India. *Pacific Business Review International, 7*(10), 55-64.

Dar, S. A., & Thaku, I. A. (2015). A Comparative Analysis of Financial Performance of Public and Private Non-Life Insurers in India. *International Journal of Management*, pp. 507-526.

Darzi, T. A. (2012). Financial Performance of Insurance Industry in Post Liberalization Era in India. *Ph.D Thesis Submitted to University of Kashmir*.

Das, U. S., Nigel Davies, N., & Podpiera, R. (2003, July). Insurance and Issues in Financial Soundness. *IMF Working Paper*. International Monetary Fund. Retrieved February 25, 2018, from https://www.imf.org/external/pubs/ft/wp/2003/wp03138.pdf

Ellen R. Girden, R. I. (2011). *Evaluating research articles from start to finish.* Thousand Oaks, California: Sage Publications.

Financial Sector Assessment: A Handbook. (2005). Washington: The International Bank for Reconstruction and Development/The World Bank/The International Monetary Fund.

Ghimire, R. (2013, July). Financial Efficiency of Non Life Insurance Industries in Nepal. *The Lumbini Journal of Business and Economics, III*(2).

IMF. (2003, May 14). Financial Soundness Indicators—Background Paper. Retrieved February 18, 2018, from https://www.imf.org/external/np/sta/fsi/eng/2003/051403b.htm

IMF. (2004). *Compilation Guide on Financial Soundness Indicators.* Retrieved March 09, 2018, from https://www.imf.org/external/np/sta/fsi/eng/2004/guide/index.htm

International Monetory Fund. (2006). *Financial Soundness Indicators: Compilation Guide.* Washington: International Monetary Fund.

Jena, A. B. (2014). Financial Performance of Selected Indian LifeInsurance Companies: An Analysis. *International Journal of Computer Science & Management Studies, 14*(07). Retrieved February 25, 2018, from http://www.ijcsms.com/journals/Volume%2014,%20Issue%2007,%20July%202014_IJCSMSJuly2014_9_21_ABJena.pdf

Parekh, A. (2009, July). Risk Based Capital for Life Insurers: Implications for India. *IRDA Journal, VII*(7), 14-16. Retrieved March 27, 2018, from http://www.irdaonline.org/irdacontent/journals/irda_july09.pdf

Popat, K. H. (2015). A Comparative Study of Financial Performance Evaluation of Selected Non-Life Insurance Companies of India. *Ph.D Thesis Submitted to Saurastra University Rajkot*.

Shinde, S. R. (2011). A Comparative Study of Life Insurance Corporation of India and Private Life Insurance Companies in India. *Ph.D Thesis Submitted to Veer Narmad South Gujarat University, Surat*.

Smajla, N. (2014). Measuring Financial Soundness of Insurance Companies by Using Caramels Model - Case of Croatia. *Interdisciplinary Management Research, 10* , 600-609. Retrieved February 26, 2018, from ftp://ftp.repec.org/opt/ReDIF/RePEc/osi/journl/PDF/InterdisciplinaryManagementResearchX/IMR10a44.pdf

Varvadiya , J. S. (2014). *A Comparative Study of Financial Performance Appraisal of Selected Private Life Insurance Companies of India.* Patan: A Ph.D. Thesis submitted to Hemchandracharya North Gujarat University.

World Bank & International Monetory Fund. (2005). *Financial Sector Assessment: A Handbook.* World Bank & International Monetory Fund.