

CHAPTER 4: DATA ANALYSIS

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4.1 FINANCIAL PERFORMANCE

1. ASSET TURNOVER RATIO (%)

Asset turnover ratio is a financial metric used to measure a company's efficiency in generating revenue from its assets. It indicates how well a company is utilizing its assets to generate sales. The formula for calculating the asset turnover ratio is:

$$\text{Asset Turnover Ratio} = \text{Net Sales} / \text{Average Total}$$

Table 1 : Asset Turnover Ratio

ASSET TURNOVER RATIO (%)					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	0.31	0.20	0.18	0.27	0.31
2021-22	0.34	0.27	0.18	0.33	0.35
2020-21	0.46	0.45	0.19	0.42	0.39
2019-20	0.22	0.13	0.19	0.28	0.47
2018-19	0.32	0.27	0.19	0.33	0.39
2017-18	0.31	0.29	0.19	0.30	0.42
2016-17	0.36	0.33	0.14	0.33	0.37
2015-16	0.25	0.20	0.15	0.25	0.25
2014-15	0.45	0.38	0.16	0.35	0.25
2013-14	0.36	0.28	0.17	0.30	4.10

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Reference to the Altman Z Score Model

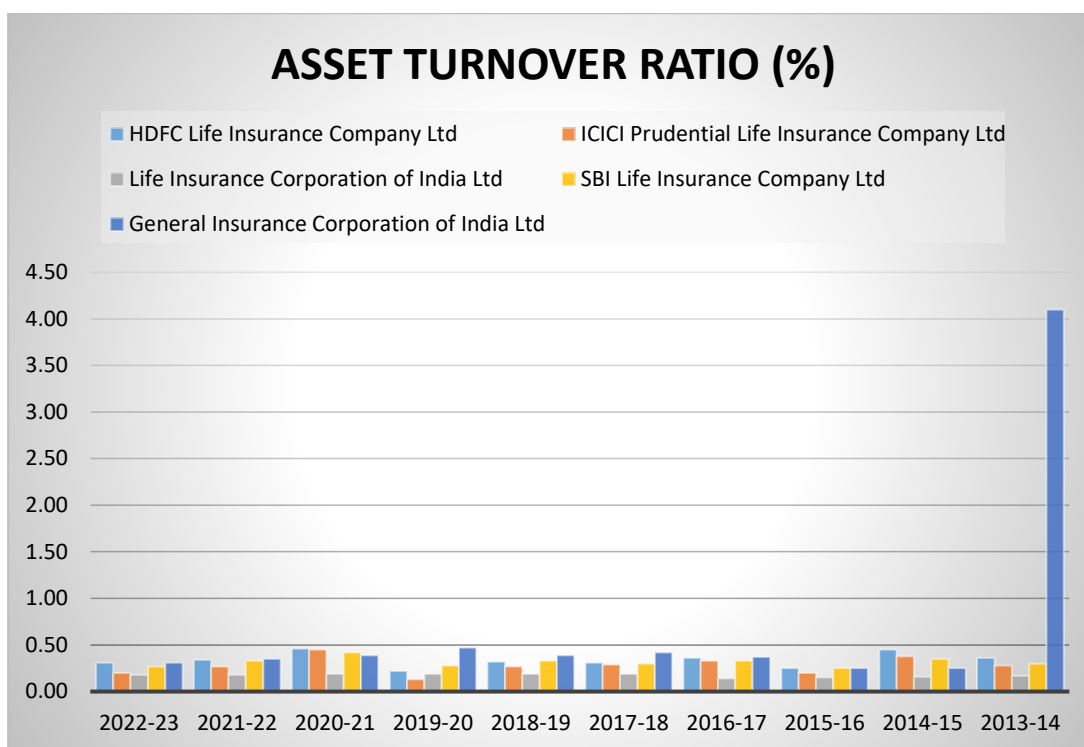


Figure 1 : Asset Turnover Ratio

The asset turnover ratio is a financial metric used to measure a company's efficiency in generating revenue from its assets. A higher ratio typically indicates better asset utilization. Let's delve into the interpretations for each insurance company based on the provided data.

HDFC Life Insurance Company Ltd: HDFC Life's maximum asset turnover ratio of 0.46 in the fiscal year 2020-21 indicates that the company generated 46 cents of revenue for every rupee of assets it owned. This reflects efficient asset utilization, suggesting effective management in generating revenue. Conversely, in the year 2019-20, its asset turnover ratio dropped to 0.22, indicating a decline in efficiency. This decline might prompt the company to scrutinize its asset management strategies to enhance productivity.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential exhibited a similar trend with a maximum asset turnover ratio of 0.45 in 2020-21, signaling efficient asset utilization. However, its ratio decreased to 0.13 in 2019-20, indicating a significant drop in asset productivity. This decline could be attributed to various factors such as

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operational inefficiencies or changes in market dynamics, necessitating a reassessment of the company's asset management practices.

Life Insurance Corporation of India Ltd: LIC's asset turnover ratio peaked at 0.19 in 2020-21, suggesting moderate efficiency in asset utilization compared to its peers. In the year 2016-17, it recorded a minimum ratio of 0.14, indicating a slight decrease in asset productivity. While LIC maintains a relatively stable performance, there might be opportunities for improvement to enhance revenue generation from its asset base.

SBI Life Insurance Company Ltd: SBI Life displayed a maximum asset turnover ratio of 0.42 in 2020-21, indicating commendable efficiency in generating revenue from its assets. However, in 2015-16, its ratio dropped to 0.25, signaling a decrease in asset productivity. This decline could prompt SBI Life to evaluate its asset management strategies to sustain or improve its efficiency levels.

General Insurance Corporation of India Ltd: General Insurance Corporation showcased a significantly high maximum asset turnover ratio of 4.1 in 2013-14, suggesting exceptional efficiency in asset utilization, possibly due to specific market conditions or strategic initiatives. However, its ratio plummeted to 0.25 in 2015-16, indicating a drastic decline in asset productivity. This substantial decrease might prompt the company to reassess its asset management practices and implement corrective measures to improve efficiency.

Comparative Analysis: In comparing the asset turnover ratios of the insurance companies, it's evident that while some entities demonstrate consistent or improving asset productivity over the years, others exhibit fluctuations or significant declines. SBI Life and HDFC Life stand out with relatively high maximum ratios, suggesting efficient asset utilization. Conversely, General Insurance Corporation's drastic decline from an exceptionally high ratio to a considerably lower one highlights the volatility in asset productivity.

Table 2 : Descriptive Statistics of Asset Turnover Ratio

ASSET TURNOVER RATIO (%)					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	0.338	0.280	0.174	0.316	0.730
Standard Error	0.024	0.029	0.006	0.015	0.375
Median	0.330	0.275	0.180	0.315	0.380
Standard Deviation	0.076	0.092	0.018	0.048	1.186
Sample Variance	0.006	0.009	0.000	0.002	1.407
Kurtosis	-0.184	0.222	-0.568	1.510	9.904
Skewness	0.275	0.287	-0.875	0.913	3.142
Range	0.240	0.320	0.050	0.170	3.850
Minimum	0.220	0.130	0.140	0.250	0.250
Maximum	0.460	0.450	0.190	0.420	4.100
Sum	3.380	2.800	1.740	3.160	7.300
Count	10	10	10	10	10

HDFC Life Insurance Company Ltd

- **Mean:** The average asset turnover ratio is 0.338, indicating moderate efficiency in using assets to generate revenue.
- **Standard Error:** At 0.024, the standard error is relatively low, suggesting that the sample mean is a reliable estimate of the population mean.
- **Median:** The median value of 0.330 is very close to the mean, indicating a symmetric distribution.
- **Standard Deviation and Sample Variance:** With a standard deviation of 0.076 and a sample variance of 0.006, there is a moderate level of dispersion around the mean.

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- **Kurtosis:** The kurtosis value of -0.184 indicates a slightly flatter distribution than the normal distribution.
- **Skewness:** A skewness of 0.275 shows a slight positive skew, meaning there are more values below the mean.
- **Range:** The range of 0.240 indicates a moderate spread between the minimum (0.220) and maximum (0.460) values.
- **Sum and Count:** The total sum is 3.380 over 10 observations, reflecting the overall asset turnover across the period.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean asset turnover ratio is 0.280, showing somewhat lower efficiency compared to HDFC Life.
- **Standard Error:** The standard error of 0.029 is also low, indicating a reliable mean.
- **Median:** The median is 0.275, very close to the mean, implying a symmetrical distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.092 and the sample variance is 0.009, showing a higher dispersion than HDFC Life.
- **Kurtosis:** With a kurtosis of 0.222, the distribution is slightly more peaked than the normal distribution.
- **Skewness:** The skewness of 0.287 shows a slight positive skew, similar to HDFC Life.
- **Range:** The range is 0.320, indicating more variability between the minimum (0.130) and maximum (0.450).
- **Sum and Count:** The total sum is 2.800 across 10 observations.

Life Insurance Corporation of India Ltd

- **Mean:** The mean ratio is the lowest at 0.174, indicating lower efficiency.
- **Standard Error:** The very low standard error of 0.006 shows high reliability in the mean estimate.
- **Median:** The median is 0.180, slightly higher than the mean.

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- **Standard Deviation and Sample Variance:** Both are low (0.018 and 0.000), indicating very low dispersion.
- **Kurtosis:** With a kurtosis of -0.568, the distribution is flatter than the normal distribution.
- **Skewness:** The skewness of -0.875 indicates a negative skew, meaning more values are above the mean.
- **Range:** The range is only 0.050, showing very low variability.
- **Sum and Count:** The total sum is 1.740 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean asset turnover ratio is 0.316, showing efficiency comparable to HDFC Life.
- **Standard Error:** The standard error is 0.015, indicating a reliable mean.
- **Median:** The median of 0.315 is nearly equal to the mean.
- **Standard Deviation and Sample Variance:** With a standard deviation of 0.048 and variance of 0.002, the dispersion is moderate.
- **Kurtosis:** The positive kurtosis of 1.510 suggests a more peaked distribution.
- **Skewness:** The skewness of 0.913 shows a moderate positive skew.
- **Range:** The range is 0.170, with minimum and maximum values at 0.250 and 0.420, respectively.
- **Sum and Count:** The total sum is 3.160 over 10 observations.

General Insurance Corporation of India Ltd

- **Mean:** The highest mean asset turnover ratio at 0.730, indicating the highest efficiency.
- **Standard Error:** A relatively high standard error of 0.375 suggests less reliability in the mean estimate.
- **Median:** The median of 0.380 is significantly lower than the mean.
- **Standard Deviation and Sample Variance:** Both are highest among the companies (1.186 and 1.407), indicating high dispersion.
- **Kurtosis:** With a kurtosis of 9.904, the distribution is highly peaked.
- **Skewness:** The skewness of 3.142 indicates a strong positive skew.

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- **Range:** The range is the highest at 3.850, with the minimum at 0.250 and the maximum at 4.100.
- **Sum and Count:** The total sum is 7.300 over 10 observations.

Comparative Analysis

Mean Efficiency: General Insurance Corporation of India Ltd exhibits the highest mean asset turnover ratio, suggesting it uses its assets most efficiently to generate revenue. In contrast, Life Insurance Corporation of India Ltd has the lowest mean ratio.

Variability: General Insurance Corporation of India Ltd also shows the highest variability in asset turnover ratios, as indicated by its high standard deviation, sample variance, and range. Life Insurance Corporation of India Ltd has the lowest variability, with very tight clustering around its mean.

Distribution Shape: General Insurance Corporation of India Ltd has a highly peaked and positively skewed distribution, indicating that while it has a high mean, most of the values are clustered on the lower end with a few high outliers. Other companies, like Life Insurance Corporation of India Ltd, have more symmetric or negatively skewed distributions, suggesting different dynamics in how they generate revenue relative to their assets.

Reliability of Mean Estimates: The low standard errors for HDFC Life, ICICI Prudential Life, and Life Insurance Corporation suggest reliable mean estimates, while the higher standard error for General Insurance Corporation indicates less reliability. In conclusion, General Insurance Corporation of India Ltd stands out for its high efficiency but also high variability and skewness in asset turnover, whereas Life Insurance Corporation of India Ltd shows consistent but lower efficiency. The other companies fall somewhere in between, with HDFC Life and SBI Life showing moderate efficiency and variability.

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Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	3.38	0.338	0.00577
ICICI Prudential Life Insurance Company Ltd	10	2.8	0.28	0.00856
Life Insurance Corporation of India Ltd	10	1.74	0.174	0.00034
SBI Life Insurance Company Ltd	10	3.16	0.316	0.00232
General Insurance Corporation of India Ltd	10	7.3	0.73	1.407

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1.80027	4	0.45007	1.58031	0.19592	2.57874
Within Groups	12.8158	45	0.2848			
Total	14.6161	49				

H0 = There is no significant difference in Asset Turnover Ratio (%) for selected insurance companies of India.

H1 = There is significant difference in Asset Turnover Ratio (%) for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

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Fcal is 1.580 and Ftab is 2.578

P-value is 0.195

Thus, $F_{cal} < F_{tab}$ and p-value is higher than specified α of 0.05

So, null hypothesis is accepted and it is concluded that there is no significant difference in Asset Turnover Ratio (%) for selected insurance companies of India.

2. CURRENT RATIO

The current ratio is a liquidity ratio that measures a company's ability to meet its short-term obligations with its short-term assets. It's an important indicator of a company's financial health and its ability to cover its short-term liabilities. The formula for calculating the current ratio is:

Current Ratio = Current Assets / Current Liabilities

Table 3 : Current Ratio

CURRENT RATIO					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	0.86	1.01	3.14	1.85	0.49
2021-22	0.84	0.93	2.68	1.48	0.50
2020-21	0.76	1.04	2.16	1.69	0.52
2019-20	0.87	1.15	2.17	1.93	0.60
2018-19	0.79	0.91	3.11	1.78	0.68
2017-18	3.00	0.79	2.53	1.83	0.72
2016-17	0.78	1.01	3.07	1.89	0.73
2015-16	0.74	0.67	9.20	1.85	0.61
2014-15	0.89	0.69	10.36	2.36	0.60

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2013-14	0.97	0.59	11.59	2.50	2.10
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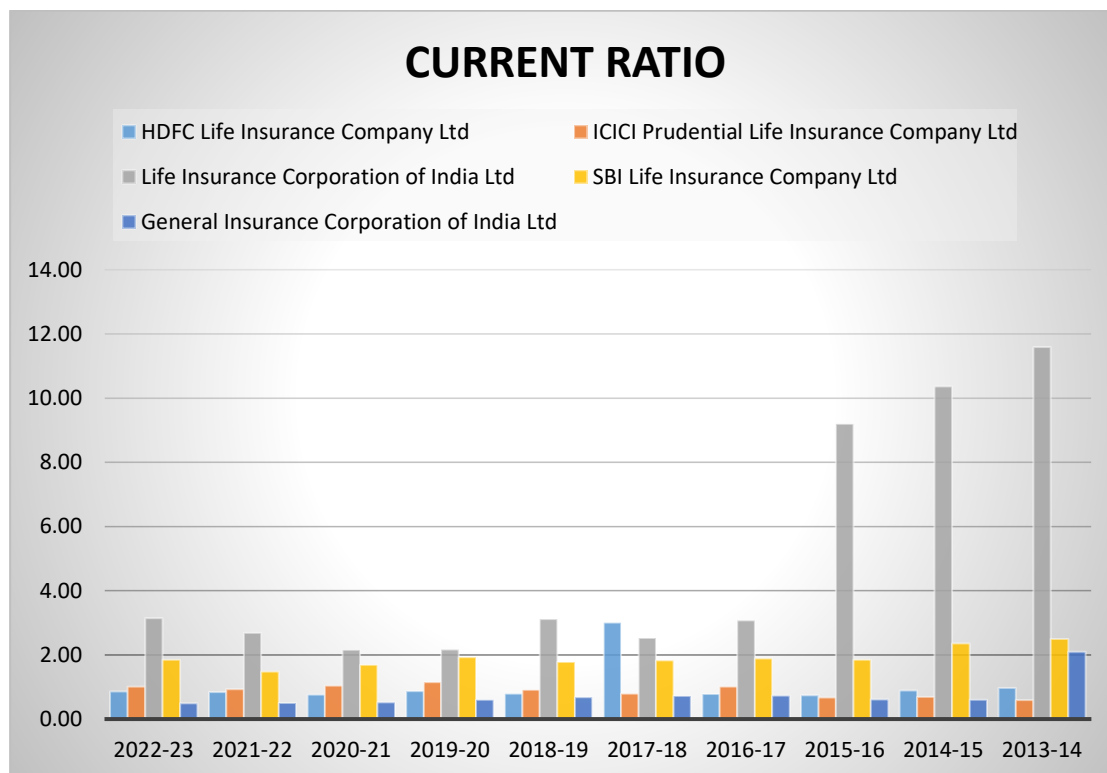


Figure 2 : Current Ratio

The current ratio is a liquidity ratio that measures a company's ability to pay its short-term obligations with its short-term assets. A higher ratio indicates better liquidity and a lower risk of financial distress. Let's interpret the provided data for each insurance company:

HDFC Life Insurance Company Ltd: HDFC Life displayed a maximum current ratio of 3 in the fiscal year 2017-18, indicating strong liquidity and the ability to comfortably cover short-term liabilities with its current assets. However, in 2015-16, its current ratio dropped to 0.74, suggesting a decrease in liquidity and a potential strain on meeting short-term obligations. This decline might prompt HDFC Life to reassess its liquidity management strategies to ensure financial stability.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential recorded a maximum current ratio of 1.15 in 2019-20, indicating satisfactory liquidity to meet short-term obligations. However, in 2013-14, its ratio dropped to 0.59, signaling lower

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liquidity and potentially higher financial risk. This decrease might prompt ICICI Prudential to enhance its liquidity position through measures such as optimizing working capital management.

Life Insurance Corporation of India Ltd: LIC exhibited a notably high maximum current ratio of 11.59 in 2013-14, suggesting exceptionally strong liquidity and a robust ability to cover short-term liabilities. However, its ratio decreased to 2.16 in 2020-21, indicating a decline in liquidity. While still healthy, this decrease might prompt LIC to ensure adequate liquidity management to maintain its financial strength.

SBI Life Insurance Company Ltd: SBI Life displayed a maximum current ratio of 2.5 in 2013-14, indicating good liquidity and the ability to meet short-term obligations comfortably. In 2021-22, its ratio decreased to 1.48, signaling a slight decline in liquidity. This decline might prompt SBI Life to implement measures to bolster its liquidity position and mitigate potential financial risks.

General Insurance Corporation of India Ltd: General Insurance Corporation showcased a maximum current ratio of 2.1 in 2013-14, indicating healthy liquidity. However, its ratio dropped to 0.49 in 2022-23, suggesting a significant decrease in liquidity and potentially heightened financial risk. This decline might necessitate urgent measures by General Insurance Corporation to improve its liquidity position and ensure financial stability.

In comparative analysis, it's evident that while some insurance companies maintain consistently strong liquidity positions over the years (such as LIC and HDFC Life), others exhibit fluctuations or declines in their current ratios. These fluctuations highlight the importance of continuous monitoring and proactive management of liquidity to mitigate financial risks and maintain stability. Overall, maintaining a healthy current ratio is crucial for insurance companies to ensure their ability to meet short-term obligations and navigate through uncertain financial environments.

Table 4 : Descriptive Statistics of Current Ratio

CURRENT RATIO					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	1.050	0.879	5.001	1.916	0.755
Standard Error	0.218	0.059	1.193	0.095	0.152
Median	0.850	0.920	3.090	1.850	0.605
Standard Deviation	0.689	0.185	3.773	0.301	0.480
Sample Variance	0.474	0.034	14.235	0.091	0.231
Kurtosis	9.725	-1.195	-0.833	0.836	9.141
Skewness	3.104	-0.263	1.087	0.961	2.976
Range	2.260	0.560	9.430	1.020	1.610
Minimum	0.740	0.590	2.160	1.480	0.490
Maximum	3.000	1.150	11.590	2.500	2.100
Sum	10.500	8.790	50.010	19.160	7.550
Count	10	10	10	10	10

The table provided presents a detailed statistical analysis of the current ratios for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company and then perform a comparative analysis.

HDFC Life Insurance Company Ltd

- **Mean:** The mean current ratio is 1.050, indicating that HDFC Life Insurance has a good ability to cover its short-term liabilities with its short-term assets.
- **Standard Error:** The standard error is 0.218, suggesting some variability around the mean.
- **Median:** The median value of 0.850 is lower than the mean, indicating a left-skewed distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.689 and the sample variance is 0.474, showing moderate variability.
- **Kurtosis:** With a kurtosis of 9.725, the distribution is highly peaked, indicating a few extreme values.
- **Skewness:** The skewness of 3.104 indicates a strong positive skew, meaning a longer right tail.
- **Range:** The range is 2.260, with minimum and maximum values of 0.740 and 3.000, respectively.
- **Sum and Count:** The total sum is 10.500 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean current ratio is 0.879, which is slightly below 1, suggesting potential liquidity concerns.
- **Standard Error:** The standard error is 0.059, indicating less variability around the mean.
- **Median:** The median value of 0.920 is close to the mean, suggesting a relatively symmetric distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.185 and the sample variance is 0.034, indicating low variability.
- **Kurtosis:** With a kurtosis of -1.195, the distribution is flatter than normal.
- **Skewness:** The skewness of -0.263 suggests a slight negative skew.
- **Range:** The range is 0.560, with minimum and maximum values of 0.590 and 1.150, respectively.
- **Sum and Count:** The total sum is 8.790 over 10 observations.

Life Insurance Corporation of India Ltd

- **Mean:** The mean current ratio is 5.001, indicating a very high ability to cover short-term liabilities.
- **Standard Error:** The standard error is 1.193, showing considerable variability around the mean.
- **Median:** The median is 3.090, which is significantly lower than the mean, indicating a few very high values.
- **Standard Deviation and Sample Variance:** The standard deviation is 3.773 and the sample variance is 14.235, showing very high variability.
- **Kurtosis:** With a kurtosis of -0.833, the distribution is somewhat flatter than normal.
- **Skewness:** The skewness of 1.087 indicates a positive skew.
- **Range:** The range is 9.430, with minimum and maximum values of 2.160 and 11.590, respectively.
- **Sum and Count:** The total sum is 50.010 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean current ratio is 1.916, indicating a solid ability to cover short-term liabilities.
- **Standard Error:** The standard error is 0.095, suggesting low variability around the mean.
- **Median:** The median value of 1.850 is close to the mean.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.301 and the sample variance is 0.091, indicating moderate variability.
- **Kurtosis:** With a kurtosis of 0.836, the distribution is slightly more peaked than normal.
- **Skewness:** The skewness of 0.961 indicates a positive skew.
- **Range:** The range is 1.020, with minimum and maximum values of 1.480 and 2.500, respectively.
- **Sum and Count:** The total sum is 19.160 over 10 observations.

General Insurance Corporation of India Ltd

- **Mean:** The mean current ratio is 0.755, indicating potential liquidity issues as it is below 1.
- **Standard Error:** The standard error is 0.152, suggesting some variability around the mean.
- **Median:** The median value of 0.605 is lower than the mean, indicating a positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.480 and the sample variance is 0.231, indicating moderate variability.
- **Kurtosis:** With a kurtosis of 9.141, the distribution is highly peaked.
- **Skewness:** The skewness of 2.976 indicates a strong positive skew.
- **Range:** The range is 1.610, with minimum and maximum values of 0.490 and 2.100, respectively.
- **Sum and Count:** The total sum is 7.550 over 10 observations.

Comparative Analysis

Liquidity Efficiency: Life Insurance Corporation of India Ltd has the highest mean current ratio, suggesting a strong ability to cover short-term liabilities. In contrast, General Insurance Corporation of India Ltd and ICICI Prudential Life Insurance Company Ltd have mean ratios below 1, indicating potential liquidity concerns.

Variability: Life Insurance Corporation of India Ltd shows the highest variability in current ratios, as reflected by its high standard deviation and sample variance. ICICI Prudential Life Insurance Company Ltd shows the least variability.

Distribution Shape: Both HDFC Life and General Insurance Corporation of India Ltd exhibit highly peaked distributions with significant positive skewness, indicating a few extreme high values. In contrast, ICICI Prudential Life has a relatively flatter and slightly negatively skewed distribution.

Reliability of Mean Estimates: ICICI Prudential Life and SBI Life have low standard errors, indicating more reliable mean estimates, while Life Insurance Corporation of India Ltd, with its high standard error, indicates less reliability in its mean estimate.

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Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	10.5	1.05	0.4742
ICICI Prudential Life Insurance Company Ltd	10	8.79	0.879	0.03423
Life Insurance Corporation of India Ltd	10	50.01	5.001	14.2347
SBI Life Insurance Company Ltd	10	19.16	1.916	0.09054
General Insurance Corporation of India Ltd	10	7.55	0.755	0.23067

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	126.904	4	31.726	10.5302	4.2E-06	2.57874
Within Groups	135.579	45	3.01286			
Total	262.483	49				

H₀ = There is no significant difference in Current Ratio for selected insurance companies of India.

H₁ = There is significant difference in Current Ratio for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

F_{cal} is 10.530 and F_{tab} is 2.578

P-value is 4.2E-06

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Thus, $F_{cal} > F_{tab}$ and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Current Ratio for selected insurance companies of India.

3. NET PROFIT MARGIN (%)

Net profit margin is a profitability ratio that measures the percentage of each dollar of revenue that translates into profit after all expenses, taxes, and interest have been deducted. It provides insights into a company's efficiency in managing its expenses and generating profit from its operations. The formula for calculating the net profit margin is:

$$\text{Net Profit Margin (\%)} = \text{Net Profit} / \text{Net Sales} \times 100$$

Table 5 : Net Profit Margin

NET PROFIT MARGIN (%)					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	1.94	1.64	4.65	2.13	13.43
2021-22	1.84	1.21	0.56	1.81	4.07
2020-21	1.90	1.15	0.42	1.77	3.96
2019-20	4.41	5.08	0.44	3.24	-0.65
2018-19	3.32	2.75	0.48	2.98	5.02
2017-18	3.43	4.17	0.46	3.40	7.44
2016-17	2.91	4.45	0.65	3.12	10.00
2015-16	4.51	7.93	0.79	4.45	14.61
2014-15	2.88	4.74	0.59	3.51	15.17
2013-14	4.22	7.15	0.58	4.29	89.69

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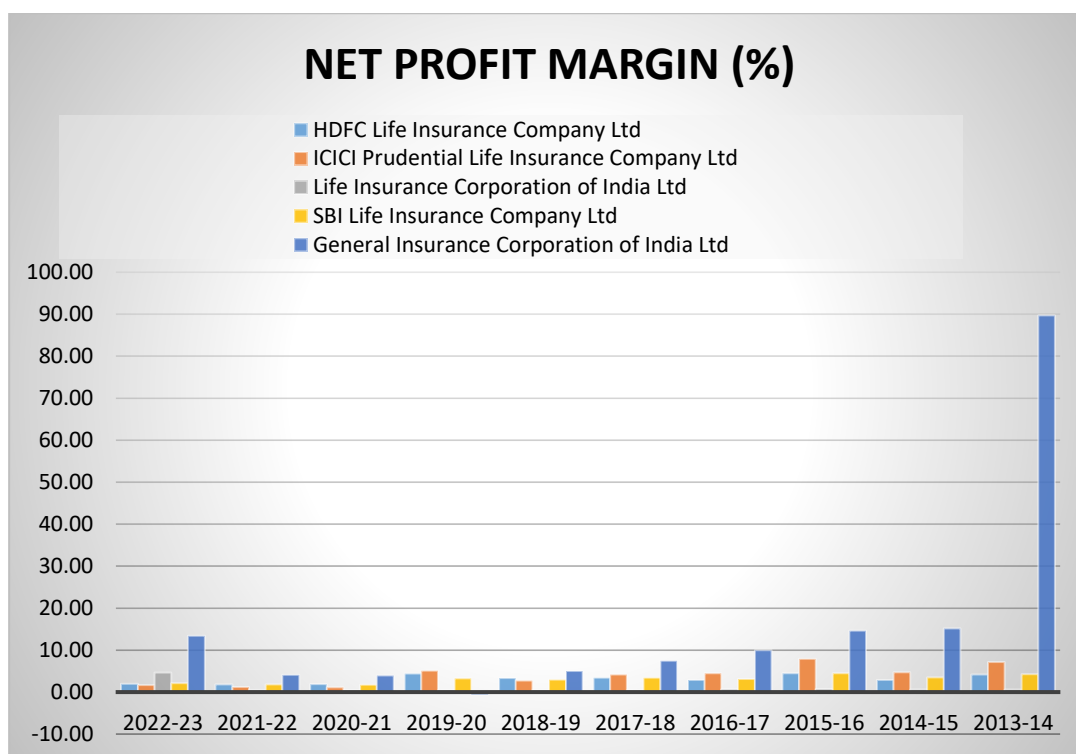


Figure 3 : Net Profit Margin

The net profit margin is a key profitability ratio that measures a company's profitability as a percentage of its revenue. A higher net profit margin indicates better profitability and efficient cost management. Let's interpret the provided data for each insurance company:

HDFC Life Insurance Company Ltd: HDFC Life recorded a maximum net profit margin of 4.51% in 2015-16, indicating a healthy level of profitability relative to its revenue. However, in 2021-22, its margin dropped to 1.84%, suggesting a decrease in profitability. This decline might prompt HDFC Life to scrutinize its cost structure and operational efficiency to enhance profitability.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential exhibited a maximum net profit margin of 7.93% in 2015-16, indicating robust profitability. However, in 2020-21, its margin decreased to 1.15%, signaling a significant decline in profitability. This decrease might necessitate ICICI Prudential to implement measures to improve cost management and operational efficiency to restore profitability levels.

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Life Insurance Corporation of India Ltd: LIC showcased a maximum net profit margin of 4.65% in 2022-23, indicating moderate profitability. However, in 2020-21, its margin dropped to 0.42%, suggesting a substantial decrease in profitability. This decline might prompt LIC to review its business strategies and cost structure to improve profitability and financial performance.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum net profit margin of 4.45% in 2015-16, indicating decent profitability. However, in 2020-21, its margin decreased to 1.77%, signaling a decline in profitability. This decrease might prompt SBI Life to focus on optimizing its cost management and operational efficiency to enhance profitability.

General Insurance Corporation of India Ltd: General Insurance Corporation showcased an exceptionally high maximum net profit margin of 89.69% in 2013-14, which might be an anomaly or influenced by specific factors. However, in 2019-20, its margin dropped to -0.65%, indicating a loss. This drastic decline suggests significant challenges in cost management or operational efficiency, necessitating urgent corrective measures to restore profitability.

In comparative analysis, it's evident that while some insurance companies maintain relatively stable or improving net profit margins over the years (such as HDFC Life and SBI Life), others exhibit fluctuations or significant declines. These fluctuations underscore the importance of effective cost management and operational efficiency to sustain profitability amidst changing market dynamics and regulatory environments. Overall, maintaining a healthy net profit margin is crucial for insurance companies to ensure long-term financial sustainability and shareholder value.

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Reference to the Altman Z Score Model

Table 6 : Descriptive Statistics of Net Profit Margin

NET PROFIT MARGIN (%)					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	3.136	4.027	0.962	3.070	16.274
Standard Error	0.326	0.748	0.411	0.296	8.322
Median	3.115	4.310	0.570	3.180	8.720
Standard Deviation	1.031	2.365	1.301	0.937	26.317
Sample Variance	1.062	5.594	1.692	0.877	692.559
Kurtosis	-1.478	-0.884	9.797	-0.923	8.949
Skewness	0.021	0.312	3.119	-0.078	2.932
Range	2.670	6.780	4.230	2.680	90.340
Minimum	1.840	1.150	0.420	1.770	-0.650
Maximum	4.510	7.930	4.650	4.450	89.690
Sum	31.360	40.270	9.620	30.700	162.740
Count	10	10	10	10	10

The table provides a detailed statistical analysis of the net profit margins for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company and then perform a comparative analysis.

HDFC Life Insurance Company Ltd

- **Mean:** The mean net profit margin is 3.136%, indicating a moderate level of profitability.
- **Standard Error:** The standard error is 0.326, suggesting moderate reliability of the mean estimate.
- **Median:** The median value of 3.115% is very close to the mean, indicating a symmetric distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 1.031 and the sample variance is 1.062, indicating moderate variability.
- **Kurtosis:** The kurtosis of -1.478 suggests a flatter distribution than the normal distribution.
- **Skewness:** The skewness of 0.021 indicates a nearly symmetrical distribution.
- **Range:** The range is 2.670, with minimum and maximum values of 1.840% and 4.510%, respectively.
- **Sum and Count:** The total sum is 31.360 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean net profit margin is 4.027%, indicating relatively higher profitability compared to HDFC Life.
- **Standard Error:** The standard error is 0.748, indicating less reliability of the mean estimate compared to HDFC Life.
- **Median:** The median value of 4.310% is slightly higher than the mean, suggesting a slight positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 2.365 and the sample variance is 5.594, indicating high variability.
- **Kurtosis:** The kurtosis of -0.884 suggests a slightly flatter distribution than the normal distribution.
- **Skewness:** The skewness of 0.312 indicates a slight positive skew.
- **Range:** The range is 6.780, with minimum and maximum values of 1.150% and 7.930%, respectively.
- **Sum and Count:** The total sum is 40.270 over 10 observations.

Life Insurance Corporation of India Ltd

- **Mean:** The mean net profit margin is 0.962%, indicating relatively low profitability.
- **Standard Error:** The standard error is 0.411, suggesting moderate reliability of the mean estimate.
- **Median:** The median value of 0.570% is lower than the mean, indicating a positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 1.301 and the sample variance is 1.692, indicating moderate variability.
- **Kurtosis:** The high kurtosis of 9.797 suggests a distribution with heavy tails, indicating extreme values.
- **Skewness:** The skewness of 3.119 indicates a strong positive skew.
- **Range:** The range is 4.230, with minimum and maximum values of 0.420% and 4.650%, respectively.
- **Sum and Count:** The total sum is 9.620 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean net profit margin is 3.070%, indicating a moderate level of profitability similar to HDFC Life.
- **Standard Error:** The standard error is 0.296, suggesting higher reliability of the mean estimate compared to HDFC Life and ICICI Prudential Life.
- **Median:** The median value of 3.180% is slightly higher than the mean, suggesting a slight positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.937 and the sample variance is 0.877, indicating low variability.
- **Kurtosis:** The kurtosis of -0.923 suggests a slightly flatter distribution than the normal distribution.
- **Skewness:** The skewness of -0.078 indicates a nearly symmetrical distribution.
- **Range:** The range is 2.680, with minimum and maximum values of 1.770% and 4.450%, respectively.
- **Sum and Count:** The total sum is 30.700 over 10 observations.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

General Insurance Corporation of India Ltd

- **Mean:** The mean net profit margin is 16.274%, indicating very high profitability.
- **Standard Error:** The standard error is 8.322, indicating low reliability of the mean estimate due to high variability.
- **Median:** The median value of 8.720% is significantly lower than the mean, indicating a positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 26.317 and the sample variance is 692.559, indicating very high variability.
- **Kurtosis:** The kurtosis of 8.949 suggests a distribution with heavy tails, indicating extreme values.
- **Skewness:** The skewness of 2.932 indicates a strong positive skew.
- **Range:** The range is 90.340, with minimum and maximum values of -0.650% and 89.690%, respectively.
- **Sum and Count:** The total sum is 162.740 over 10 observations.

Comparative Analysis

Profitability: General Insurance Corporation of India Ltd has the highest mean net profit margin, indicating exceptional profitability, though with significant variability and extreme values. In contrast, Life Insurance Corporation of India Ltd has the lowest mean net profit margin, indicating the least profitability.

Variability: General Insurance Corporation of India Ltd exhibits the highest variability in net profit margins, as reflected by its high standard deviation and sample variance. SBI Life Insurance Company Ltd shows the least variability.

Distribution Shape: Life Insurance Corporation of India Ltd and General Insurance Corporation of India Ltd both exhibit distributions with heavy tails and significant positive skewness, indicating the presence of extreme values. Other companies, such as HDFC Life and SBI Life, have more symmetrical distributions.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Reliability of Mean Estimates: SBI Life Insurance Company Ltd shows the most reliable mean estimate due to its low standard error, while General Insurance Corporation of India Ltd shows the least reliability due to its high standard error.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	31.36	3.136	1.06229
ICICI Prudential Life Insurance Company Ltd	10	40.27	4.027	5.5938
Life Insurance Corporation of India Ltd	10	9.62	0.962	1.69164
SBI Life Insurance Company Ltd	10	30.7	3.07	0.87733
General Insurance Corporation of India Ltd	10	162.74	16.274	692.559

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1503.35	4	375.839	2.67774	0.04365	2.57874
Within Groups	6316.06	45	140.357			
Total	7819.41	49				

H0 = There is no significant difference in Net Profit Margin (%) for selected insurance companies of India.

H1 = There is significant difference in Net Profit Margin (%) for selected insurance companies of India.

INTERPRETATION

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

From above table for 4 and 45 degree of freedom

Fcal is 2.677 and Ftab is 2.578

P-value is 0.0436

Thus, Fcal > Ftab and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Net Profit Margin (%) for selected insurance companies of India.

4. PBIT MARGIN (%)

The PBIT (Profit Before Interest and Taxes) margin is a profitability ratio that measures the percentage of each dollar of revenue that translates into profit before deducting interest and taxes. It provides insights into a company's operational efficiency in generating profits from its core business activities, excluding the effects of interest expenses and tax obligations. The formula for calculating the PBIT margin is:

$$\text{PBIT Margin (\%)} = \text{Profit Before Interest and Taxes} / \text{Net Sales} \times 100$$

Table 7 : PBIT Margin (%)

PBIT MARGIN (%)					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	2.00	2.99	5.57	2.56	17.74
2021-22	2.04	1.71	1.92	3.12	7.34
2020-21	2.45	1.65	1.61	2.16	6.64
2019-20	4.28	6.65	0.45	5.09	-0.81
2018-19	3.77	3.45	0.48	3.90	7.75
2017-18	3.81	5.44	1.89	4.80	8.44
2016-17	4.03	4.77	2.54	3.79	11.58

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

2015-16	6.94	9.49	2.30	4.54	15.17
2014-15	3.89	4.82	1.81	3.57	15.92
2013-14	2.73	7.16	1.49	4.24	89.04

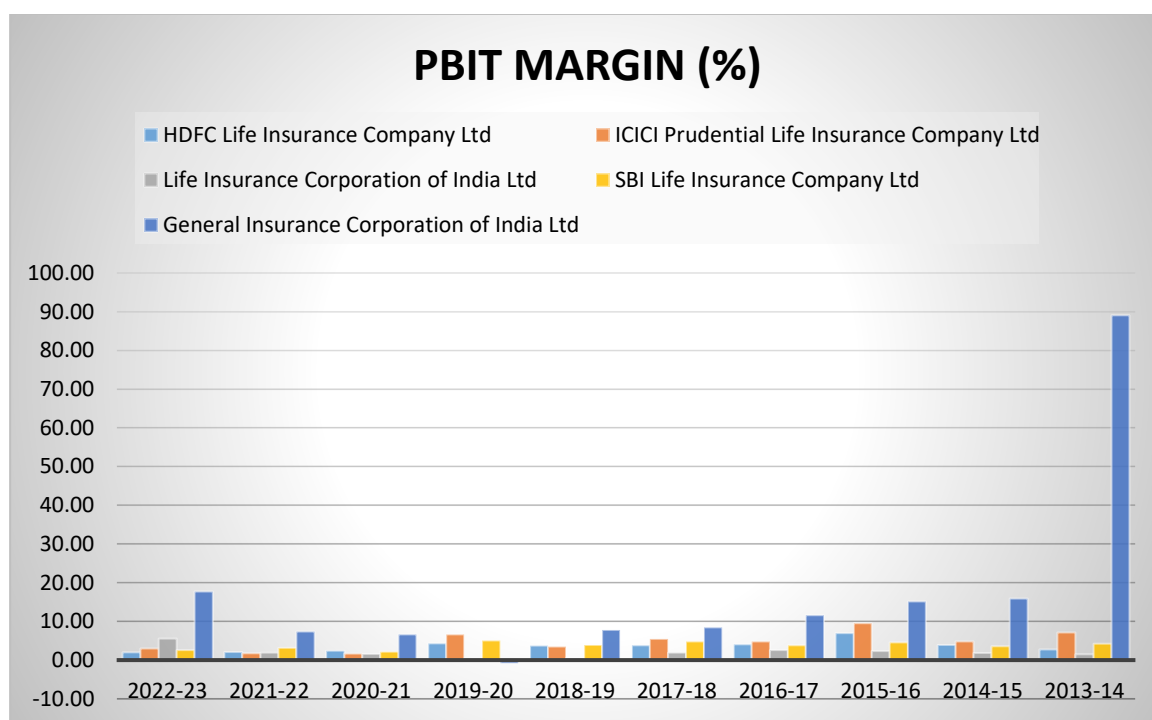


Figure 4 : PBIT Margin (%)

The Profit Before Interest and Taxes (PBIT) margin is a profitability ratio that measures a company's ability to generate profits from its operations before accounting for interest and taxes. A higher PBIT margin indicates better operational efficiency and profitability. Let's analyse the provided data for each insurance company:

HDFC Life Insurance Company Ltd: HDFC Life exhibited a maximum PBIT margin of 6.94% in 2015-16, indicating solid operational profitability. However, in 2022-23, its margin decreased to 2%, suggesting a decline in operational efficiency. This decrease might prompt HDFC Life to assess its cost structure and operational processes to improve profitability.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential showcased a maximum PBIT margin of 9.49% in 2015-16, indicating strong operational

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

profitability. However, in 2020-21, its margin decreased to 1.65%, signaling a significant decline in operational efficiency. This decline might necessitate ICICI Prudential to implement measures to enhance operational effectiveness and profitability.

Life Insurance Corporation of India Ltd: LIC displayed a maximum PBIT margin of 5.57% in 2022-23, indicating moderate operational profitability. However, in 2019-20, its margin dropped to 0.45%, suggesting a significant decline in operational efficiency. This decline might prompt LIC to review its operational processes and cost management strategies to improve profitability.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum PBIT margin of 5.09% in 2019-20, indicating decent operational profitability. However, in 2020-21, its margin decreased to 2.16%, signaling a decline in operational efficiency. This decrease might prompt SBI Life to focus on optimizing its operational processes and cost structure to enhance profitability.

General Insurance Corporation of India Ltd: General Insurance Corporation showcased an exceptionally high maximum PBIT margin of 89.04% in 2013-14, which might be an anomaly or influenced by specific factors. However, in 2019-20, its margin dropped to -0.81%, indicating a loss. This drastic decline suggests significant challenges in operational efficiency and profitability, necessitating urgent corrective measures.

In comparative analysis, while some insurance companies maintain relatively stable or improving PBIT margins over the years (such as HDFC Life and SBI Life), others exhibit fluctuations or significant declines. These fluctuations highlight the importance of effective operational management and cost control to sustain profitability amidst changing market dynamics. Overall, maintaining a healthy PBIT margin is crucial for insurance companies to ensure long-term financial sustainability and competitiveness.

Table 8 : Descriptive Statistics of PBIT Margin (%)

PBIT MARGIN (%)					
PARTICULAR	HDFC Life Insurance	ICICI Prudential Life	Life Insurance	SBI Life Insurance	General Insurance

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

	Company Ltd	Insurance Company Ltd	Corporation of India Ltd	Company Ltd	Corporation of India Ltd
Mean	3.594	4.813	2.006	3.777	17.881
Standard Error	0.460	0.789	0.451	0.301	8.092
Median	3.790	4.795	1.850	3.845	10.010
Standard Deviation	1.454	2.494	1.426	0.952	25.589
Sample Variance	2.115	6.219	2.034	0.906	654.791
Kurtosis	2.501	-0.232	4.778	-0.703	8.799
Skewness	1.263	0.462	1.815	-0.394	2.893
Range	4.940	7.840	5.120	2.930	89.850
Minimum	2.000	1.650	0.450	2.160	-0.810
Maximum	6.940	9.490	5.570	5.090	89.040
Sum	35.940	48.130	20.060	37.770	178.810
Count	10	10	10	10	10

The table provides a detailed statistical analysis of the PBIT (Profit Before Interest and Taxes) margins for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company and then perform a comparative analysis.

HDFC Life Insurance Company Ltd

- **Mean:** The mean PBIT margin is 3.594%, indicating a moderate level of profitability before interest and taxes.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

- **Standard Error:** The standard error is 0.460, suggesting a moderate reliability of the mean estimate.
- **Median:** The median value of 3.790% is slightly higher than the mean, indicating a slight positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 1.454 and the sample variance is 2.115, indicating moderate variability.
- **Kurtosis:** The kurtosis of 2.501 suggests a distribution with a higher peak than the normal distribution.
- **Skewness:** The skewness of 1.263 indicates a positive skew.
- **Range:** The range is 4.940, with minimum and maximum values of 2.000% and 6.940%, respectively.
- **Sum and Count:** The total sum is 35.940 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean PBIT margin is 4.813%, indicating relatively higher profitability before interest and taxes.
- **Standard Error:** The standard error is 0.789, suggesting moderate reliability of the mean estimate.
- **Median:** The median value of 4.795% is very close to the mean, indicating a nearly symmetric distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 2.494 and the sample variance is 6.219, indicating high variability.
- **Kurtosis:** The kurtosis of -0.232 suggests a distribution similar to the normal distribution.
- **Skewness:** The skewness of 0.462 indicates a slight positive skew.
- **Range:** The range is 7.840, with minimum and maximum values of 1.650% and 9.490%, respectively.
- **Sum and Count:** The total sum is 48.130 over 10 observations.

Life Insurance Corporation of India Ltd

- **Mean:** The mean PBIT margin is 2.006%, indicating lower profitability compared to the other companies.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

- **Standard Error:** The standard error is 0.451, suggesting moderate reliability of the mean estimate.
- **Median:** The median value of 1.850% is slightly lower than the mean, indicating a slight negative skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 1.426 and the sample variance is 2.034, indicating moderate variability.
- **Kurtosis:** The kurtosis of 4.778 suggests a distribution with heavy tails, indicating extreme values.
- **Skewness:** The skewness of 1.815 indicates a strong positive skew.
- **Range:** The range is 5.120, with minimum and maximum values of 0.450% and 5.570%, respectively.
- **Sum and Count:** The total sum is 20.060 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean PBIT margin is 3.777%, indicating a moderate level of profitability before interest and taxes.
- **Standard Error:** The standard error is 0.301, suggesting higher reliability of the mean estimate.
- **Median:** The median value of 3.845% is very close to the mean, indicating a nearly symmetric distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.952 and the sample variance is 0.906, indicating low variability.
- **Kurtosis:** The kurtosis of -0.703 suggests a distribution flatter than the normal distribution.
- **Skewness:** The skewness of -0.394 indicates a slight negative skew.
- **Range:** The range is 2.930, with minimum and maximum values of 2.160% and 5.090%, respectively.
- **Sum and Count:** The total sum is 37.770 over 10 observations.

General Insurance Corporation of India Ltd

- **Mean:** The mean PBIT margin is 17.881%, indicating very high profitability before interest and taxes.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

- **Standard Error:** The standard error is 8.092, indicating low reliability of the mean estimate due to high variability.
- **Median:** The median value of 10.010% is significantly lower than the mean, indicating a strong positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 25.589 and the sample variance is 654.791, indicating very high variability.
- **Kurtosis:** The kurtosis of 8.799 suggests a distribution with heavy tails, indicating extreme values.
- **Skewness:** The skewness of 2.893 indicates a strong positive skew.
- **Range:** The range is 89.850, with minimum and maximum values of -0.810% and 89.040%, respectively.
- **Sum and Count:** The total sum is 178.810 over 10 observations.

Comparative Analysis

Profitability: General Insurance Corporation of India Ltd has the highest mean PBIT margin, indicating exceptional profitability, though with significant variability and extreme values. In contrast, Life Insurance Corporation of India Ltd has the lowest mean PBIT margin, indicating lower profitability.

Variability: General Insurance Corporation of India Ltd exhibits the highest variability in PBIT margins, as reflected by its high standard deviation and sample variance. SBI Life Insurance Company Ltd shows the least variability, indicating more consistent performance.

Distribution Shape: Both Life Insurance Corporation of India Ltd and General Insurance Corporation of India Ltd exhibit distributions with heavy tails and significant positive skewness, indicating the presence of extreme values. Other companies, such as HDFC Life and SBI Life, have more symmetrical distributions.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
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Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

HDFC Life Insurance Company Ltd	10	35.94	3.594	2.11474
ICICI Prudential Life Insurance Company Ltd	10	48.13	4.813	6.21851
Life Insurance Corporation of India Ltd	10	20.06	2.006	2.03398
SBI Life Insurance Company Ltd	10	37.77	3.777	0.90585
General Insurance Corporation of India Ltd	10	178.81	17.881	654.791

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1683.92	4	420.98	3.16021	0.02261	2.57874
Within Groups	5994.57	45	133.213			
Total	7678.49	49				

H0 = There is no significant difference in PBIT Margin (%) for selected insurance companies of India.

H1 = There is significant difference in PBIT Margin (%) for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

Fcal is 3.160 and Ftab is 2.578

P-value is 0.022

Thus, Fcal > Ftab and p-value is smaller than specified α of 0.05

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

So, null hypothesis is rejected and it is concluded that there is significant difference in PBIT Margin (%) for selected insurance companies of India.

5. PBT MARGIN (%)

The PBT (Profit Before Tax) margin is a profitability ratio that measures the percentage of each dollar of revenue that translates into profit before deducting taxes. It provides insights into a company's operational efficiency in generating profits from its core business activities before considering tax obligations. The formula for calculating the PBT margin is:

$$\text{PBT Margin (\%)} = \text{Profit Before Tax} / \text{Net Sales} \times 100$$

Table 9 : PBT Margin (%)

PBT MARGIN (%)					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	1.88	2.76	5.56	2.54	17.57
2021-22	2.01	1.58	1.91	3.10	7.22
2020-21	2.42	1.61	1.59	2.15	6.52
2019-20	4.22	6.65	0.44	5.07	-0.81
2018-19	3.73	3.45	0.48	3.88	7.75
2017-18	3.78	5.44	1.89	4.78	8.44
2016-17	4.00	4.77	2.53	3.77	11.58
2015-16	6.89	9.49	2.28	4.51	15.17
2014-15	3.95	4.82	1.79	3.55	15.92
2013-14	2.67	7.16	1.47	4.21	89.04

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

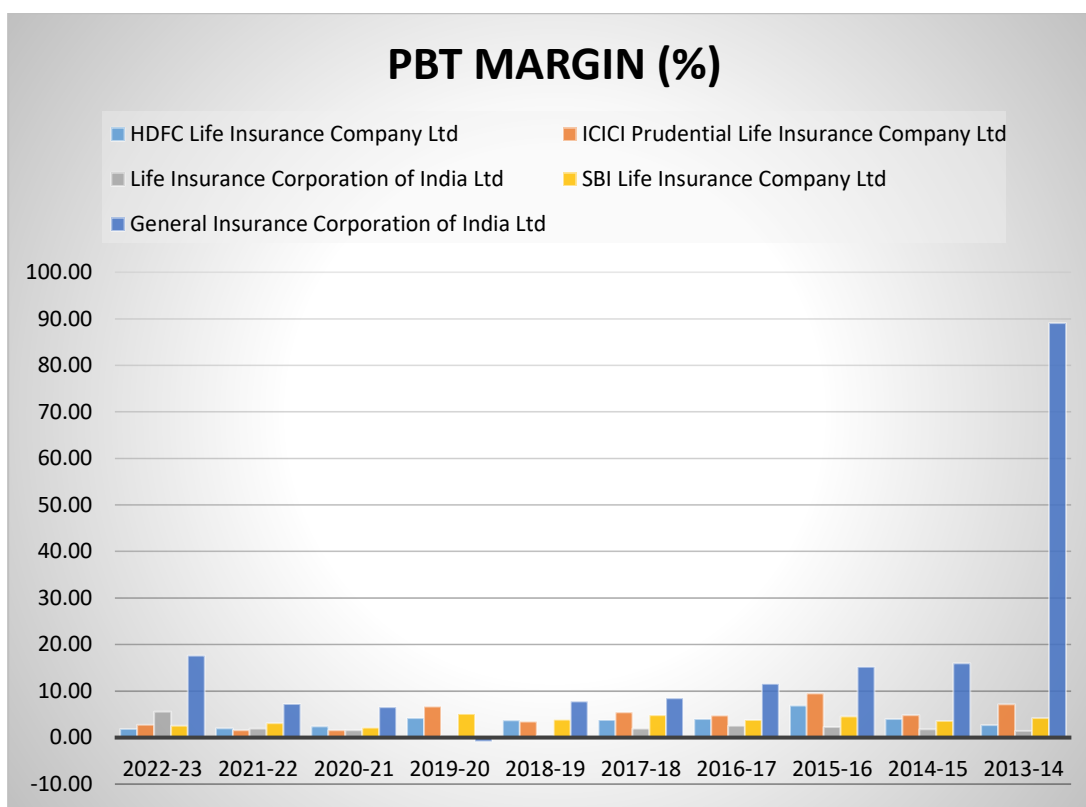


Figure 5 : PBT Margin (%)

The Profit Before Tax (PBT) margin is a profitability ratio that measures a company's ability to generate profits before accounting for taxes. A higher PBT margin indicates better operational efficiency and profitability. Let's analyse the provided data for each insurance company:

HDFC Life Insurance Company Ltd: HDFC Life exhibited a maximum PBT margin of 6.89% in 2015-16, indicating solid operational profitability before taxes. However, in 2022-23, its margin decreased to 1.88%, suggesting a decline in operational efficiency. This decrease might prompt HDFC Life to assess its cost structure and operational processes to improve profitability before taxes.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential showcased a maximum PBT margin of 9.49% in 2015-16, indicating strong operational profitability before taxes. However, in 2021-22, its margin decreased to 1.58%, signaling a significant decline in operational efficiency. This decline might necessitate ICICI Prudential to implement measures to enhance operational effectiveness and profitability before taxes.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Life Insurance Corporation of India Ltd: LIC displayed a maximum PBT margin of 5.56% in 2022-23, indicating moderate operational profitability before taxes. However, in 2019-20, its margin dropped to 0.44%, suggesting a significant decline in operational efficiency before taxes. This decline might prompt LIC to review its operational processes and cost management strategies to improve profitability before taxes.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum PBT margin of 5.07% in 2019-20, indicating decent operational profitability before taxes. However, in 2020-21, its margin decreased to 2.15%, signaling a decline in operational efficiency before taxes. This decrease might prompt SBI Life to focus on optimizing its operational processes and cost structure to enhance profitability before taxes.

General Insurance Corporation of India Ltd: General Insurance Corporation showcased an exceptionally high maximum PBT margin of 89.04% in 2013-14, which might be an anomaly or influenced by specific factors. However, in 2019-20, its margin dropped to -0.81%, indicating a loss before taxes. This drastic decline suggests significant challenges in operational efficiency and profitability before taxes, necessitating urgent corrective measures.

In comparative analysis, while some insurance companies maintain relatively stable or improving PBT margins over the years (such as HDFC Life and SBI Life), others exhibit fluctuations or significant declines. These fluctuations underscore the importance of effective operational management and cost control to sustain profitability before taxes amidst changing market dynamics. Overall, maintaining a healthy PBT margin is crucial for insurance companies to ensure long-term financial sustainability and competitiveness before taxes.

Table 10 : Descriptive Statistics of PBT Margin (%)

PBT MARGIN (%)					
PARTICULAR	HDFC Life Insurance	ICICI Prudential Life	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

	Company Ltd	Insurance Company Ltd			
Mean	3.555	4.773	1.994	3.756	17.840
Standard Error	0.463	0.802	0.451	0.300	8.096
Median	3.755	4.795	1.840	3.825	10.010
Standard Deviation	1.463	2.537	1.426	0.948	25.600
Sample Variance	2.140	6.436	2.032	0.900	655.381
Kurtosis	2.321	-0.315	4.803	-0.706	8.806
Skewness	1.198	0.432	1.826	-0.385	2.895
Range	5.010	7.910	5.120	2.920	89.850
Minimum	1.880	1.580	0.440	2.150	-0.810
Maximum	6.890	9.490	5.560	5.070	89.040
Sum	35.550	47.730	19.940	37.560	178.400
Count	10	10	10	10	10

The table provides a detailed statistical analysis of the PBT (Profit Before Tax) margins for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company and then perform a comparative analysis.

HDFC Life Insurance Company Ltd

- **Mean:** The mean PBT margin is 3.555%, indicating a moderate level of profitability before tax.
- **Standard Error:** The standard error is 0.463, suggesting a moderate reliability of the mean estimate.
- **Median:** The median value of 3.755% is slightly higher than the mean, indicating a slight positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 1.463 and the sample variance is 2.140, indicating moderate variability.
- **Kurtosis:** The kurtosis of 2.321 suggests a distribution with a higher peak than the normal distribution.
- **Skewness:** The skewness of 1.198 indicates a positive skew.
- **Range:** The range is 5.010, with minimum and maximum values of 1.880% and 6.890%, respectively.
- **Sum and Count:** The total sum is 35.550 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean PBT margin is 4.773%, indicating relatively higher profitability before tax.
- **Standard Error:** The standard error is 0.802, suggesting moderate reliability of the mean estimate.
- **Median:** The median value of 4.795% is very close to the mean, indicating a nearly symmetric distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 2.537 and the sample variance is 6.436, indicating high variability.
- **Kurtosis:** The kurtosis of -0.315 suggests a distribution similar to the normal distribution.
- **Skewness:** The skewness of 0.432 indicates a slight positive skew.
- **Range:** The range is 7.910, with minimum and maximum values of 1.580% and 9.490%, respectively.
- **Sum and Count:** The total sum is 47.730 over 10 observations.

Life Insurance Corporation of India Ltd

- **Mean:** The mean PBT margin is 1.994%, indicating lower profitability compared to the other companies.
- **Standard Error:** The standard error is 0.451, suggesting moderate reliability of the mean estimate.
- **Median:** The median value of 1.840% is slightly lower than the mean, indicating a slight negative skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 1.426 and the sample variance is 2.032, indicating moderate variability.
- **Kurtosis:** The kurtosis of 4.803 suggests a distribution with heavy tails, indicating extreme values.
- **Skewness:** The skewness of 1.826 indicates a strong positive skew.
- **Range:** The range is 5.120, with minimum and maximum values of 0.440% and 5.560%, respectively.
- **Sum and Count:** The total sum is 19.940 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean PBT margin is 3.756%, indicating a moderate level of profitability before tax.
- **Standard Error:** The standard error is 0.300, suggesting higher reliability of the mean estimate.
- **Median:** The median value of 3.825% is very close to the mean, indicating a nearly symmetric distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.948 and the sample variance is 0.900, indicating low variability.
- **Kurtosis:** The kurtosis of -0.706 suggests a distribution flatter than the normal distribution.
- **Skewness:** The skewness of -0.385 indicates a slight negative skew.
- **Range:** The range is 2.920, with minimum and maximum values of 2.150% and 5.070%, respectively.
- **Sum and Count:** The total sum is 37.560 over 10 observations.

General Insurance Corporation of India Ltd

- **Mean:** The mean PBT margin is 17.840%, indicating very high profitability before tax.
- **Standard Error:** The standard error is 8.096, indicating low reliability of the mean estimate due to high variability.
- **Median:** The median value of 10.010% is significantly lower than the mean, indicating a strong positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 25.600 and the sample variance is 655.381, indicating very high variability.
- **Kurtosis:** The kurtosis of 8.806 suggests a distribution with heavy tails, indicating extreme values.
- **Skewness:** The skewness of 2.895 indicates a strong positive skew.
- **Range:** The range is 89.850, with minimum and maximum values of -0.810% and 89.040%, respectively.
- **Sum and Count:** The total sum is 178.400 over 10 observations.

Comparative Analysis

Profitability: General Insurance Corporation of India Ltd has the highest mean PBT margin, indicating exceptional profitability, though with significant variability and extreme values. In contrast, Life Insurance Corporation of India Ltd has the lowest mean PBT margin, indicating lower profitability.

Variability: General Insurance Corporation of India Ltd exhibits the highest variability in PBT margins, as reflected by its high standard deviation and sample variance. SBI Life Insurance Company Ltd shows the least variability, indicating more consistent performance.

Distribution Shape: Both Life Insurance Corporation of India Ltd and General Insurance Corporation of India Ltd exhibit distributions with heavy tails and significant positive skewness, indicating the presence of extreme values. Other companies, such as HDFC Life and SBI Life, have more symmetrical distributions.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Reliability of Mean Estimates: SBI Life Insurance Company Ltd shows the most reliable mean estimate due to its low standard error, while General Insurance Corporation of India Ltd shows the least reliability due to its high standard error.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	35.55	3.555	2.14043
ICICI Prudential Life Insurance Company Ltd	10	47.73	4.773	6.4356
Life Insurance Corporation of India Ltd	10	19.94	1.994	2.0322
SBI Life Insurance Company Ltd	10	37.56	3.756	0.89956
General Insurance Corporation of India Ltd	10	178.4	17.84	655.381

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1680.17	4	420.042	3.14927	0.02294	2.57874
Within Groups	6002	45	133.378			
Total	7682.17	49				

H0 = There is no significant difference in PBT Margin (%) for selected insurance companies of India.

H1 = There is significant difference in PBT Margin (%) for selected insurance companies of India.

INTERPRETATION

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

From above table for 4 and 45 degree of freedom

Fcal is 3.149 and Ftab is 2.578

P-value is 0.022

Thus, Fcal > Ftab and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in PBT Margin (%) for selected insurance companies of India.

6. RETURN ON ASSETS (%)

Return on Assets (ROA) is a financial ratio that measures a company's efficiency in generating profit from its assets. It indicates how effectively a company utilizes its assets to generate earnings. The formula for calculating Return on Assets is:

$$\text{ROA (\%)} = \text{Net Income} / \text{Average Total Assets} \times 100$$

Table 11 : Return on Assets (%)

RETURN ON ASSETS (%)					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	0.54	0.31	0.79	0.54	4.01
2021-22	0.57	0.30	0.09	0.55	1.38
2020-21	0.75	0.44	0.07	0.64	1.42
2019-20	0.98	0.68	0.08	0.85	-0.30
2018-19	0.98	0.69	0.08	0.90	1.87
2017-18	1.00	1.14	0.08	0.94	2.94
2016-17	0.93	1.34	0.08	0.93	3.29
2015-16	1.06	1.57	0.11	1.03	3.57
2014-15	1.13	1.61	0.09	1.10	3.44
2013-14	1.38	1.92	0.09	1.22	3.68

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

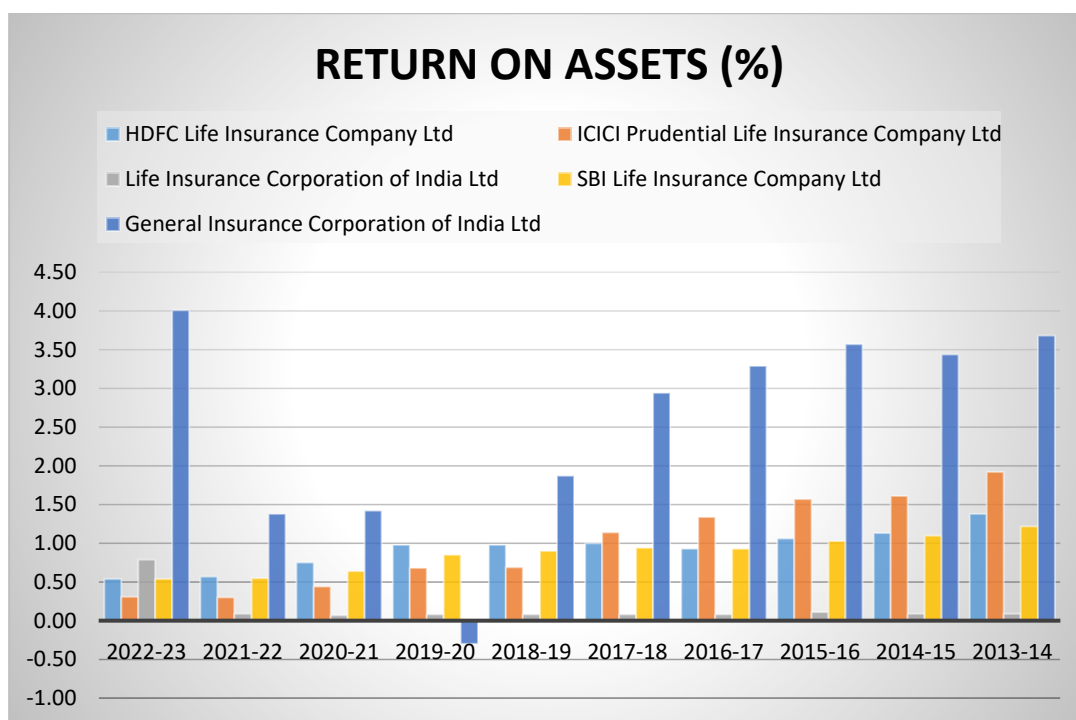


Figure 6 : Return on Assets (%)

The Return on Assets (ROA) ratio measures a company's ability to generate profits from its assets. A higher ROA indicates better asset utilization and efficiency in generating profits. Let's analyse the provided data for each insurance company:

HDFC Life Insurance Company Ltd: HDFC Life exhibited a maximum ROA of 4.00% in 2013-14, indicating efficient utilization of its assets to generate profits. However, in 2022-23, its ROA decreased to 0.54%, suggesting a decline in asset productivity and profitability. This decrease might prompt HDFC Life to reassess its asset management strategies to improve ROA.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential showcased a maximum ROA of 1.92% in 2013-14, indicating efficient asset utilization and profitability. However, in 2021-22, its ROA decreased to 0.3%, signaling a significant decline in asset productivity and profitability. This decline might necessitate ICICI Prudential to implement measures to improve asset efficiency and profitability.

Life Insurance Corporation of India Ltd: LIC displayed a maximum ROA of 0.79% in 2022-23, indicating moderate asset utilization and profitability. However, in 2020-21, its ROA dropped to 0.07%, suggesting a significant decrease in asset productivity

Financial Performance Analysis of Selected Insurance Companies in India with
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and profitability. This decline might prompt LIC to review its asset management practices to enhance ROA.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum ROA of 1.22% in 2013-14, indicating decent asset utilization and profitability. However, in 2022-23, its ROA decreased to 0.54%, signaling a decline in asset productivity and profitability. This decrease might prompt SBI Life to focus on optimizing its asset management strategies to improve ROA.

General Insurance Corporation of India Ltd: General Insurance Corporation showcased a maximum ROA of 4.01% in 2022-23, indicating efficient asset utilization and profitability. However, in 2019-20, its ROA dropped to -0.3%, suggesting a loss from asset utilization. This decline indicates significant challenges in asset management and profitability, necessitating corrective measures.

In comparative analysis, it's evident that while some insurance companies maintain relatively stable or improving ROA over the years (such as HDFC Life and LIC), others exhibit fluctuations or significant declines. These fluctuations highlight the importance of effective asset management and operational efficiency to sustain profitability. Overall, maintaining a healthy ROA is crucial for insurance companies to ensure long-term financial sustainability and value creation from their asset base.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Table 12 : Descriptive Statistics of Return on Assets (%)

RETURN ON ASSETS (%)					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	0.932	1.000	0.156	0.870	2.530
Standard Error	0.081	0.187	0.071	0.073	0.437
Median	0.980	0.915	0.085	0.915	3.115
Standard Deviation	0.255	0.592	0.223	0.230	1.381
Sample Variance	0.065	0.351	0.050	0.053	1.907
Kurtosis	0.024	-1.574	9.937	-0.920	0.241
Skewness	-0.113	0.216	3.149	-0.242	-0.985
Range	0.840	1.620	0.720	0.680	4.310
Minimum	0.540	0.300	0.070	0.540	-0.300
Maximum	1.380	1.920	0.790	1.220	4.010
Sum	9.320	10.000	1.560	8.700	25.300
Count	10	10	10	10	10

The table provides a detailed statistical analysis of the Return on Assets (ROA) for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company, followed by a comparative analysis.

HDFC Life Insurance Company Ltd

- **Mean:** The mean ROA is 0.932%, indicating moderate returns on assets.
- **Standard Error:** The standard error is 0.081, suggesting a high reliability of the mean estimate.
- **Median:** The median value of 0.980% is slightly higher than the mean, indicating a slight positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.255 and the sample variance is 0.065, indicating moderate variability.
- **Kurtosis:** The kurtosis of 0.024 suggests a distribution close to the normal distribution.
- **Skewness:** The skewness of -0.113 indicates a nearly symmetric distribution.
- **Range:** The range is 0.840, with minimum and maximum values of 0.540% and 1.380%, respectively.
- **Sum and Count:** The total sum is 9.320 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean ROA is 1.000%, indicating moderate returns on assets, slightly higher than HDFC Life.
- **Standard Error:** The standard error is 0.187, suggesting moderate reliability of the mean estimate.
- **Median:** The median value of 0.915% is slightly lower than the mean, indicating a slight negative skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.592 and the sample variance is 0.351, indicating higher variability compared to HDFC Life.
- **Kurtosis:** The kurtosis of -1.574 suggests a flatter distribution than the normal distribution.
- **Skewness:** The skewness of 0.216 indicates a slight positive skew.
- **Range:** The range is 1.620, with minimum and maximum values of 0.300% and 1.920%, respectively.
- **Sum and Count:** The total sum is 10.000 over 10 observations.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Life Insurance Corporation of India Ltd

- **Mean:** The mean ROA is 0.156%, indicating the lowest returns on assets among the companies.
- **Standard Error:** The standard error is 0.071, suggesting high reliability of the mean estimate.
- **Median:** The median value of 0.085% is lower than the mean, indicating a negative skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.223 and the sample variance is 0.050, indicating moderate variability.
- **Kurtosis:** The kurtosis of 9.937 suggests a distribution with heavy tails, indicating extreme values.
- **Skewness:** The skewness of 3.149 indicates a strong positive skew.
- **Range:** The range is 0.720, with minimum and maximum values of 0.070% and 0.790%, respectively.
- **Sum and Count:** The total sum is 1.560 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean ROA is 0.870%, indicating moderate returns on assets.
- **Standard Error:** The standard error is 0.073, suggesting high reliability of the mean estimate.
- **Median:** The median value of 0.915% is slightly higher than the mean, indicating a slight positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.230 and the sample variance is 0.053, indicating moderate variability.
- **Kurtosis:** The kurtosis of -0.920 suggests a distribution flatter than the normal distribution.
- **Skewness:** The skewness of -0.242 indicates a slight negative skew.
- **Range:** The range is 0.680, with minimum and maximum values of 0.540% and 1.220%, respectively.
- **Sum and Count:** The total sum is 8.700 over 10 observations.

General Insurance Corporation of India Ltd

- **Mean:** The mean ROA is 2.530%, indicating the highest returns on assets among the companies.
- **Standard Error:** The standard error is 0.437, suggesting moderate reliability of the mean estimate.
- **Median:** The median value of 3.115% is higher than the mean, indicating a significant positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 1.381 and the sample variance is 1.907, indicating high variability.
- **Kurtosis:** The kurtosis of 0.241 suggests a distribution close to the normal distribution.
- **Skewness:** The skewness of -0.985 indicates a negative skew.
- **Range:** The range is 4.310, with minimum and maximum values of -0.300% and 4.010%, respectively.
- **Sum and Count:** The total sum is 25.300 over 10 observations.

Comparative Analysis

Profitability: General Insurance Corporation of India Ltd has the highest mean ROA, indicating superior asset efficiency in generating profits. Life Insurance Corporation of India Ltd has the lowest mean ROA, indicating lesser efficiency.

Variability: General Insurance Corporation of India Ltd exhibits the highest variability in ROA, as indicated by its high standard deviation and sample variance. ICICI Prudential Life Insurance Company Ltd also shows considerable variability. In contrast, HDFC Life and SBI Life show moderate variability, indicating more stable performance.

Distribution Shape: Life Insurance Corporation of India Ltd exhibits a highly skewed distribution with heavy tails, suggesting the presence of extreme values. Other companies, such as HDFC Life and General Insurance Corporation of India Ltd, have distributions closer to normal.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Reliability of Mean Estimates: HDFC Life and SBI Life have the most reliable mean estimates due to their lower standard errors. ICICI Prudential and General Insurance Corporation of India Ltd show less reliability due to higher standard errors.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	9.32	0.932	0.06482
ICICI Prudential Life Insurance Company Ltd	10	10	1	0.35076
Life Insurance Corporation of India Ltd	10	1.56	0.156	0.04974
SBI Life Insurance Company Ltd	10	8.7	0.87	0.05278
General Insurance Corporation of India Ltd	10	25.3	2.53	1.90749

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	30.2713	4	7.56783	15.6001	4.4E-08	2.57874
Within Groups	21.8302	45	0.48512			
Total	52.1015	49				

H0 = There is no significant difference in Return on Assets (%) for selected insurance companies of India.

H1 = There is significant difference in Return on Assets (%) for selected insurance companies of India.

INTERPRETATION

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

From above table for 4 and 45 degree of freedom

Fcal is 15.600 and Ftab is 2.578

P-value is 4.4E-08

Thus, Fcal > Ftab and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Return on Assets (%) for selected insurance companies of India.

7. RETURN ON CAPITAL EMPLOYED (%)

Return on Capital Employed (ROCE) is a financial metric that measures a company's profitability and efficiency in generating returns from its capital investments. It indicates how effectively a company utilizes its capital to generate profit. The formula for calculating Return on Capital Employed is:

$$\text{ROCE (\%)} = \text{Operating Profit} / \text{Capital Employed} \times 100$$

Table 13 : Return on Capital Employed (%)

RETURN ON CAPITAL EMPLOYED (%)					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	0.58	0.59	0.97	0.66	12.97
2021-22	0.65	0.44	0.33	0.96	6.31
2020-21	1.01	0.64	0.29	0.79	6.29
2019-20	0.98	0.91	0.08	1.37	-1.21
2018-19	1.15	0.89	0.08	1.21	6.38
2017-18	1.16	1.52	0.35	1.37	7.01
2016-17	1.35	1.48	0.34	1.16	7.47
2015-16	1.70	1.92	0.33	1.08	7.52
2014-15	1.57	1.67	0.28	1.15	6.74
2013-14	0.92	1.97	0.24	1.23	6.99

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

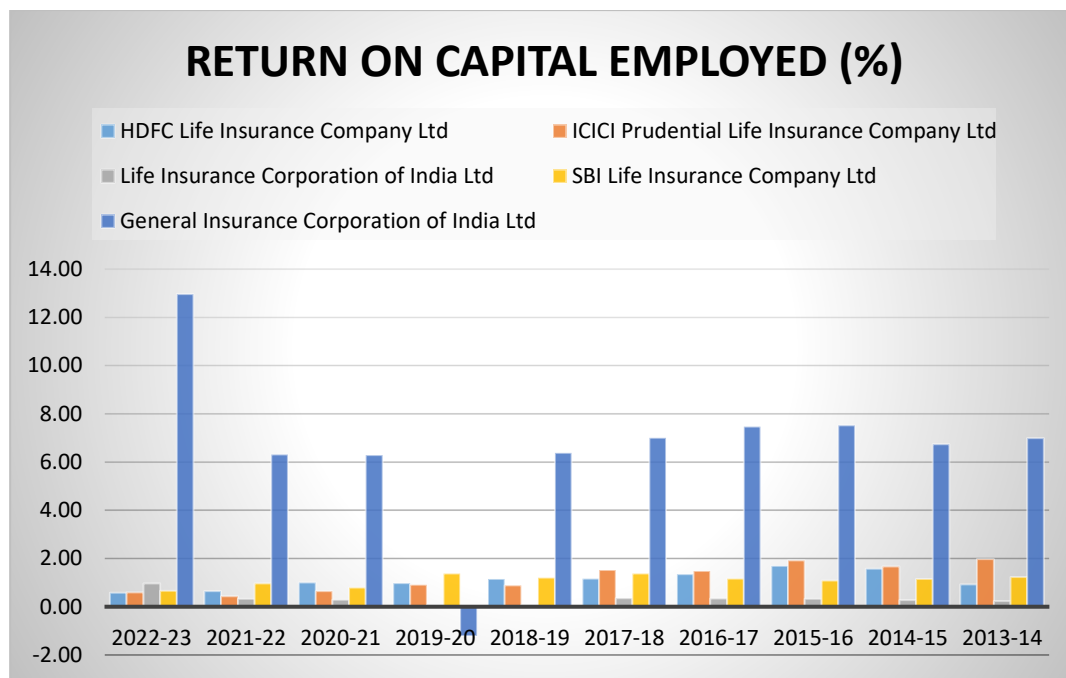


Figure 7 : Return on Capital Employed (%)

The Return on Capital Employed (ROCE) ratio measures a company's efficiency in generating profits from the capital invested in the business. A higher ROCE indicates better utilization of capital and efficient management of resources. Let's analyse the provided data for each insurance company:

HDFC Life Insurance Company Ltd: HDFC Life exhibited a maximum ROCE of 1.7% in 2015-16, indicating efficient utilization of capital and profitability. However, in 2022-23, its ROCE decreased to 0.58%, suggesting a decline in capital efficiency and profitability. This decrease might prompt HDFC Life to reassess its capital allocation strategies to improve ROCE.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential showcased a maximum ROCE of 1.97% in 2013-14, indicating efficient capital utilization and profitability. However, in 2021-22, its ROCE decreased to 0.44%, signaling a significant decline in capital efficiency and profitability. This decline might necessitate ICICI Prudential to implement measures to improve capital allocation and profitability.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Life Insurance Corporation of India Ltd: LIC displayed a maximum ROCE of 0.97% in 2022-23, indicating moderate capital utilization and profitability. However, in 2019-20, its ROCE dropped to 0.08%, suggesting a significant decrease in capital efficiency and profitability. This decline might prompt LIC to review its capital allocation practices to enhance ROCE.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum ROCE of 1.37% in 2019-20, indicating decent capital utilization and profitability. However, in 2022-23, its ROCE decreased to 0.66%, signaling a decline in capital efficiency and profitability. This decrease might prompt SBI Life to focus on optimizing its capital allocation strategies to improve ROCE.

General Insurance Corporation of India Ltd: General Insurance Corporation showcased a maximum ROCE of 12.97% in 2022-23, indicating exceptional capital utilization and profitability. However, in 2019-20, its ROCE dropped to -1.21%, suggesting a loss from capital utilization. This decline indicates significant challenges in capital management and profitability, necessitating corrective measures.

In comparative analysis, it's evident that while some insurance companies maintain relatively stable or improving ROCE over the years (such as HDFC Life and LIC), others exhibit fluctuations or significant declines. These fluctuations underscore the importance of effective capital management and operational efficiency to sustain profitability. Overall, maintaining a healthy ROCE is crucial for insurance companies to ensure long-term financial sustainability and value creation for shareholders.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Table 14 : Descriptive Statistics of Return on Capital Employed (%)

RETURN ON CAPITAL EMPLOYED (%)					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	1.107	1.203	0.329	1.098	6.647
Standard Error	0.114	0.181	0.078	0.074	1.074
Median	1.080	1.195	0.310	1.155	6.865
Standard Deviation	0.362	0.573	0.247	0.233	3.395
Sample Variance	0.131	0.328	0.061	0.055	11.525
Kurtosis	-0.568	-1.768	6.083	-0.108	4.551
Skewness	0.209	0.049	2.145	-0.781	-0.820
Range	1.120	1.530	0.890	0.710	14.180
Minimum	0.580	0.440	0.080	0.660	-1.210
Maximum	1.700	1.970	0.970	1.370	12.970
Sum	11.070	12.030	3.290	10.980	66.470
Count	10	10	10	10	10

The table provides detailed statistical data on the Return on Capital Employed (ROCE) for five insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This analysis will interpret the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company, followed by a comparative analysis.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

HDFC Life Insurance Company Ltd

- **Mean:** The mean ROCE is 1.107%, indicating a modest return on capital employed.
- **Standard Error:** The standard error is 0.114, suggesting a relatively reliable estimate of the mean.
- **Median:** The median value is 1.080%, close to the mean, indicating a nearly symmetrical distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.362 and the sample variance is 0.131, showing moderate variability.
- **Kurtosis:** The kurtosis of -0.568 indicates a flatter distribution than normal.
- **Skewness:** The skewness of 0.209 indicates a slight positive skew.
- **Range:** The range is 1.120, with a minimum of 0.580% and a maximum of 1.700%.
- **Sum and Count:** The total sum is 11.070 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean ROCE is 1.203%, indicating a slightly higher return than HDFC Life.
- **Standard Error:** The standard error is 0.181, suggesting a moderate reliability of the mean estimate.
- **Median:** The median value is 1.195%, very close to the mean, indicating symmetry in the data.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.573 and the sample variance is 0.328, indicating higher variability than HDFC Life.
- **Kurtosis:** The kurtosis of -1.768 suggests a much flatter distribution.
- **Skewness:** The skewness of 0.049 indicates a nearly symmetrical distribution.
- **Range:** The range is 1.530, with a minimum of 0.440% and a maximum of 1.970%.
- **Sum and Count:** The total sum is 12.030 over 10 observations.

Life Insurance Corporation of India Ltd

- **Mean:** The mean ROCE is 0.329%, indicating the lowest return among the companies.
- **Standard Error:** The standard error is 0.078, indicating high reliability of the mean estimate.
- **Median:** The median value is 0.310%, close to the mean, suggesting a slight positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.247 and the sample variance is 0.061, showing relatively low variability.
- **Kurtosis:** The kurtosis of 6.083 indicates a distribution with heavy tails.
- **Skewness:** The skewness of 2.145 shows a strong positive skew.
- **Range:** The range is 0.890, with a minimum of 0.080% and a maximum of 0.970%.
- **Sum and Count:** The total sum is 3.290 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean ROCE is 1.098%, similar to HDFC Life.
- **Standard Error:** The standard error is 0.074, suggesting high reliability of the mean estimate.
- **Median:** The median value is 1.155%, slightly higher than the mean, indicating a slight negative skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 0.233 and the sample variance is 0.055, showing moderate variability.
- **Kurtosis:** The kurtosis of -0.108 indicates a distribution close to normal.
- **Skewness:** The skewness of -0.781 indicates a negative skew.
- **Range:** The range is 0.710, with a minimum of 0.660% and a maximum of 1.370%.
- **Sum and Count:** The total sum is 10.980 over 10 observations.

General Insurance Corporation of India Ltd

- **Mean:** The mean ROCE is 6.647%, the highest among the companies, indicating a strong return on capital employed.
- **Standard Error:** The standard error is 1.074, suggesting moderate reliability of the mean estimate.
- **Median:** The median value is 6.865%, slightly higher than the mean, indicating a slight negative skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 3.395 and the sample variance is 11.525, indicating high variability.
- **Kurtosis:** The kurtosis of 4.551 suggests a distribution with heavy tails.
- **Skewness:** The skewness of -0.820 indicates a negative skew.
- **Range:** The range is 14.180, with a minimum of -1.210% and a maximum of 12.970%.
- **Sum and Count:** The total sum is 66.470 over 10 observations.

Comparative Analysis

Profitability: General Insurance Corporation of India Ltd stands out with the highest mean ROCE at 6.647%, significantly higher than the others, indicating excellent efficiency in using capital to generate profits. Life Insurance Corporation of India Ltd has the lowest mean ROCE at 0.329%, indicating the least efficiency.

Variability: General Insurance Corporation of India Ltd shows the highest variability in ROCE, as indicated by its high standard deviation and sample variance. ICICI Prudential Life Insurance Company Ltd also shows considerable variability. HDFC Life, SBI Life, and Life Insurance Corporation of India Ltd exhibit more stable performance with lower variability.

Distribution Shape: Life Insurance Corporation of India Ltd shows a highly skewed distribution with heavy tails, suggesting extreme values. General Insurance Corporation of India Ltd also shows a distribution with heavy tails but a negative skew. HDFC Life and SBI Life exhibit distributions close to normal with slight skewness.

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Reference to the Altman Z Score Model

Reliability of Mean Estimates: SBI Life Insurance Company Ltd and Life Insurance Corporation of India Ltd have the most reliable mean estimates due to their lower standard errors. General Insurance Corporation of India Ltd shows less reliability due to higher standard errors. In summary, General Insurance Corporation of India Ltd excels in ROCE but with significant variability and skewness, indicating potential volatility. Life Insurance Corporation of India Ltd has the lowest ROCE, showing less efficiency in using its capital. HDFC Life and SBI Life exhibit moderate returns with reliable and stable performance, while ICICI Prudential Life shows higher variability in its returns.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	11.07	1.107	0.13076
ICICI Prudential Life Insurance Company Ltd	10	12.03	1.203	0.32849
Life Insurance Corporation of India Ltd	10	3.29	0.329	0.06081
SBI Life Insurance Company Ltd	10	10.98	1.098	0.05451
General Insurance Corporation of India Ltd	10	66.47	6.647	11.5247

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	266.036	4	66.5091	27.4847	1.4E-11	2.57874
Within Groups	108.894	45	2.41986			
Total	374.93	49				

H0 = There is no significant difference in Return on Capital Employed (%) for selected insurance companies of India.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

H1 = There is significant difference in Return on Capital Employed (%) for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

Fcal is 27.484 and Ftab is 2.578

P-value is 1.4E-11

Thus, Fcal > Ftab and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Return on Capital Employed (%) for selected insurance companies of India.

8. RETURN ON NETWORTH / EQUITY (%)

Return on Equity (ROE) is a financial ratio that measures a company's profitability relative to its shareholders' equity. It indicates how effectively a company generates profit from the equity invested by its shareholders. The formula for calculating Return on Equity is:

$$\text{ROE (\%)} = \text{Net Income} / \text{Shareholders' Equity} \times 100$$

Table 15 : Return on Equity (%)

RETURN ON NETWORTH / EQUITY (%)					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	10.47	8.06	79.69	13.21	15.03
2021-22	7.80	8.25	38.84	12.95	7.67
2020-21	12.15	7.92	45.60	11.09	6.35
2019-20	19.06	14.80	366.81	16.26	-1.42

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

2018-19	22.57	16.24	396.13	17.51	7.00
2017-18	23.35	23.60	376.15	17.62	10.39
2016-17	23.24	26.30	367.99	17.46	10.98
2015-16	26.32	31.00	431.92	18.19	7.25
2014-15	30.90	31.03	324.20	20.30	6.42
2013-14	37.60	35.66	307.59	22.14	6.99

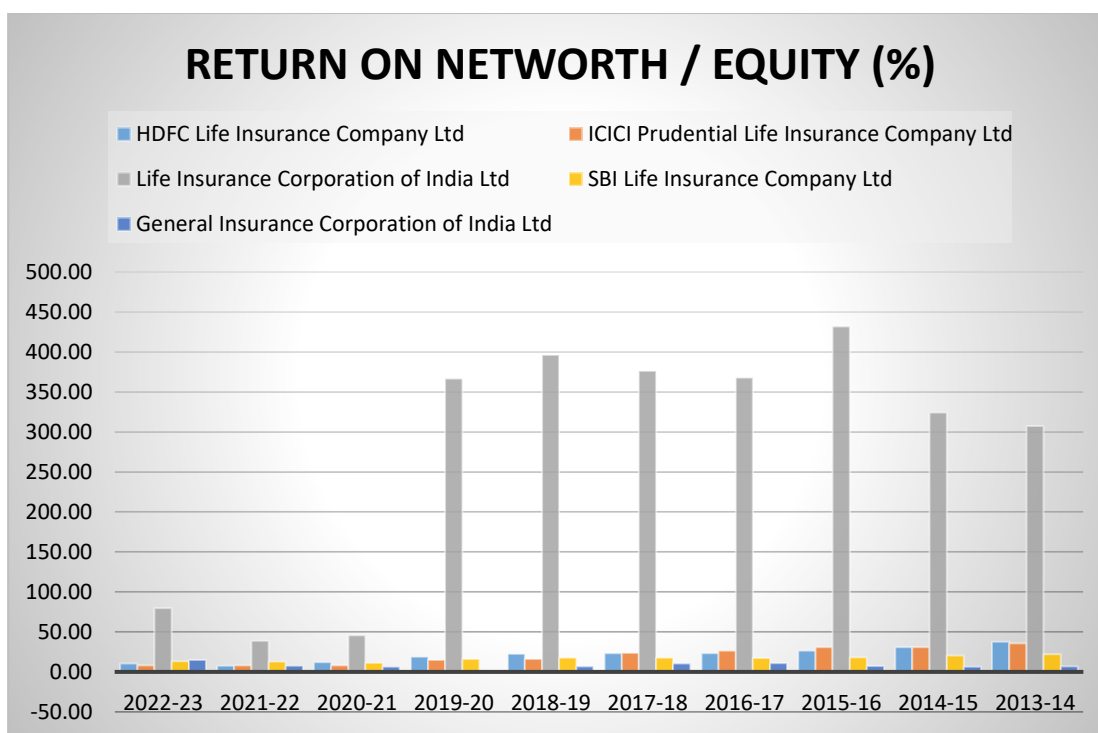


Figure 8 : Return on Equity (%)

The Return on Equity (ROE), also known as Return on Net Worth, measures a company's ability to generate profits from its shareholders' equity. A higher ROE indicates better profitability relative to shareholders' investment. Let's analyse the provided data for each insurance company:

HDFC Life Insurance Company Ltd: HDFC Life exhibited a maximum ROE of 37.6% in 2013-14, indicating strong profitability relative to shareholders' equity. However, in 2021-22, its ROE decreased to 7.8%, suggesting a decline in profitability

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relative to equity. This decrease might prompt HDFC Life to reassess its business strategies to improve ROE.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential showcased a maximum ROE of 35.66% in 2013-14, indicating robust profitability relative to equity. However, in 2020-21, its ROE decreased to 7.92%, signaling a significant decline in profitability relative to equity. This decline might necessitate ICICI Prudential to implement measures to improve profitability and enhance ROE.

Life Insurance Corporation of India Ltd: LIC displayed a maximum ROE of 431.92% in 2015-16, indicating exceptionally high profitability relative to equity. However, in 2021-22, its ROE dropped to 38.84%, suggesting a significant decrease in profitability relative to equity. This decline might prompt LIC to review its business operations and strategies to improve profitability and ROE.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum ROE of 22.14% in 2013-14, indicating decent profitability relative to equity. However, in 2020-21, its ROE decreased to 11.09%, signaling a decline in profitability relative to equity. This decrease might prompt SBI Life to focus on optimizing its business performance to improve profitability and ROE.

General Insurance Corporation of India Ltd: General Insurance Corporation showcased a maximum ROE of 15.03% in 2022-23, indicating moderate profitability relative to equity. However, in 2019-20, its ROE dropped to -1.42%, suggesting a loss relative to equity. This decline indicates significant challenges in profitability and ROE, necessitating corrective measures.

In comparative analysis, while some insurance companies maintain relatively stable or improving ROE over the years (such as HDFC Life and SBI Life), others exhibit fluctuations or significant declines. These fluctuations underscore the importance of effective management and operational efficiency to sustain profitability relative to shareholders' equity. Overall, maintaining a healthy ROE is crucial for insurance companies to ensure long-term financial sustainability and value creation for shareholders.

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Table 16 :Descriptive Statistics of Return on Equity (%)

RETURN ON NETWORTH / EQUITY (%)					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	21.346	20.286	273.492	16.673	7.666
Standard Error	2.946	3.346	49.058	1.079	1.331
Median	22.905	19.920	345.505	17.485	7.125
Standard Deviation	9.315	10.580	155.136	3.412	4.210
Sample Variance	86.765	111.940	24067.312	11.639	17.727
Kurtosis	-0.466	-1.697	-1.223	-0.504	2.563
Skewness	0.128	0.078	-0.867	-0.177	-0.556
Range	29.800	27.740	393.080	11.050	16.450
Minimum	7.800	7.920	38.840	11.090	-1.420
Maximum	37.600	35.660	431.920	22.140	15.030
Sum	213.460	202.860	2734.920	166.730	76.660
Count	10	10	10	10	10

The table provides statistical data on the Return on Net Worth (ROE) for five insurance companies. Each company's data is interpreted based on mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values. A comparative analysis is also provided to highlight key insights and differences.

HDFC Life Insurance Company Ltd

- **Mean:** The mean ROE is 21.346%, indicating a strong return on equity.
- **Standard Error:** The standard error is 2.946, suggesting moderate reliability of the mean estimate.
- **Median:** The median value is 22.905%, slightly higher than the mean, indicating a positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 9.315 and the sample variance is 86.765, indicating moderate variability.
- **Kurtosis:** The kurtosis of -0.466 suggests a distribution close to normal but slightly flatter.
- **Skewness:** The skewness of 0.128 indicates a slight positive skew.
- **Range:** The range is 29.800, with a minimum of 7.800% and a maximum of 37.600%.
- **Sum and Count:** The total sum is 213.460 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean ROE is 20.286%, slightly lower than HDFC Life, indicating strong returns.
- **Standard Error:** The standard error is 3.346, indicating moderate reliability of the mean estimate.
- **Median:** The median value is 19.920%, close to the mean, suggesting a symmetric distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 10.580 and the sample variance is 111.940, indicating higher variability than HDFC Life.
- **Kurtosis:** The kurtosis of -1.697 suggests a much flatter distribution.
- **Skewness:** The skewness of 0.078 indicates a nearly symmetrical distribution.
- **Range:** The range is 27.740, with a minimum of 7.920% and a maximum of 35.660%.
- **Sum and Count:** The total sum is 202.860 over 10 observations.

Life Insurance Corporation of India Ltd

- **Mean:** The mean ROE is exceptionally high at 273.492%, indicating extraordinarily high returns on equity.
- **Standard Error:** The standard error is 49.058, indicating lower reliability of the mean estimate due to high variability.
- **Median:** The median value is 345.505%, significantly higher than the mean, suggesting a strong positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 155.136 and the sample variance is 24067.312, indicating extreme variability.
- **Kurtosis:** The kurtosis of -1.223 indicates a flatter distribution.
- **Skewness:** The skewness of -0.867 indicates a strong negative skew.
- **Range:** The range is 393.080, with a minimum of 38.840% and a maximum of 431.920%.
- **Sum and Count:** The total sum is 2734.920 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean ROE is 16.673%, indicating moderate returns on equity.
- **Standard Error:** The standard error is 1.079, indicating high reliability of the mean estimate.
- **Median:** The median value is 17.485%, slightly higher than the mean, suggesting a positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 3.412 and the sample variance is 11.639, indicating low variability.
- **Kurtosis:** The kurtosis of -0.504 indicates a distribution close to normal.
- **Skewness:** The skewness of -0.177 indicates a slight negative skew.
- **Range:** The range is 11.050, with a minimum of 11.090% and a maximum of 22.140%.
- **Sum and Count:** The total sum is 166.730 over 10 observations.

General Insurance Corporation of India Ltd

- **Mean:** The mean ROE is 7.666%, the lowest among the companies, indicating modest returns on equity.
- **Standard Error:** The standard error is 1.331, indicating moderate reliability of the mean estimate.
- **Median:** The median value is 7.125%, slightly lower than the mean, suggesting a negative skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 4.210 and the sample variance is 17.727, indicating moderate variability.
- **Kurtosis:** The kurtosis of 2.563 indicates a distribution with heavy tails.
- **Skewness:** The skewness of -0.556 indicates a negative skew.
- **Range:** The range is 16.450, with a minimum of -1.420% and a maximum of 15.030%.
- **Sum and Count:** The total sum is 76.660 over 10 observations.

Comparative Analysis

Highest Return: Life Insurance Corporation of India Ltd exhibits an extraordinarily high mean ROE at 273.492%, indicating exceptional profitability but with extreme variability and potential outliers.

Variability and Reliability: HDFC Life and ICICI Prudential show relatively high mean ROEs of 21.346% and 20.286%, respectively, with moderate variability, making their returns more reliable. SBI Life demonstrates moderate returns with low variability, indicating stable performance. General Insurance Corporation of India Ltd shows the lowest mean ROE with moderate variability, suggesting modest and more stable returns.

Distribution Characteristics: Life Insurance Corporation of India Ltd shows a highly skewed distribution with heavy tails, suggesting outliers or extreme values. General Insurance Corporation also shows heavy-tailed distribution but with a negative skew. HDFC Life and ICICI Prudential exhibit more normal distributions, indicating stable and predictable returns. SBI Life shows the most stable performance with minimal skewness and kurtosis close to normal.

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Risk and Outliers: The high standard deviation and kurtosis values for Life Insurance Corporation indicate significant risk due to extreme outliers. General Insurance Corporation also shows higher risk with a wide range and negative skew. HDFC Life and ICICI Prudential, with lower standard deviations, offer more predictable returns.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	213.46	21.346	86.7652
ICICI Prudential Life Insurance Company Ltd	10	202.86	20.286	111.94
Life Insurance Corporation of India Ltd	10	2734.92	273.492	24067.3
SBI Life Insurance Company Ltd	10	166.73	16.673	11.6394
General Insurance Corporation of India Ltd	10	76.66	7.666	17.7272

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	529548	4	132387	27.2453	1.6E-11	2.57874
Within Groups	218658	45	4859.08			
Total	748206	49				

H0 = There is no significant difference in Return on Networth / Equity (%) for selected insurance companies of India.

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H1 = There is significant difference in Return on Networth / Equity (%) for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

Fcal is 27.245 and Ftab is 2.578

P-value is 1.6E-11

Thus, Fcal > Ftab and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Return on Networth / Equity (%) for selected insurance companies of India.

4.2 ALTMAN Z SCORE MODEL

1. WORKING CAPITAL TO TOTAL ASSETS

The ratio of working capital to total assets is a measure of a company's liquidity and financial health. It provides insights into the proportion of a company's total assets that are financed by its working capital, which consists of current assets minus current liabilities. The formula for calculating the ratio of working capital to total assets is:

Working Capital to Total Assets Ratio = Working Capital / Total Assets

Table 17 : Working Capital to Total Assets Ratio

WORKING CAPITAL TO TOTAL ASSETS					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	-0.46	0.01	2.79	1.38	-0.30
2021-22	-0.47	-0.14	2.83	0.91	-0.30
2020-21	-0.86	0.08	2.53	1.28	-0.30
2019-20	-0.51	0.33	2.92	1.69	-0.28

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2018-19	-0.83	-0.20	3.81	1.98	-0.17
2017-18	8.40	-0.52	2.88	2.44	-0.14
2016-17	-0.90	0.02	3.45	2.62	-0.13
2015-16	-0.88	-0.69	8.69	2.77	-0.20
2014-15	-0.34	-0.66	10.41	3.45	-0.18
2013-14	-0.10	-1.00	13.46	4.02	0.52

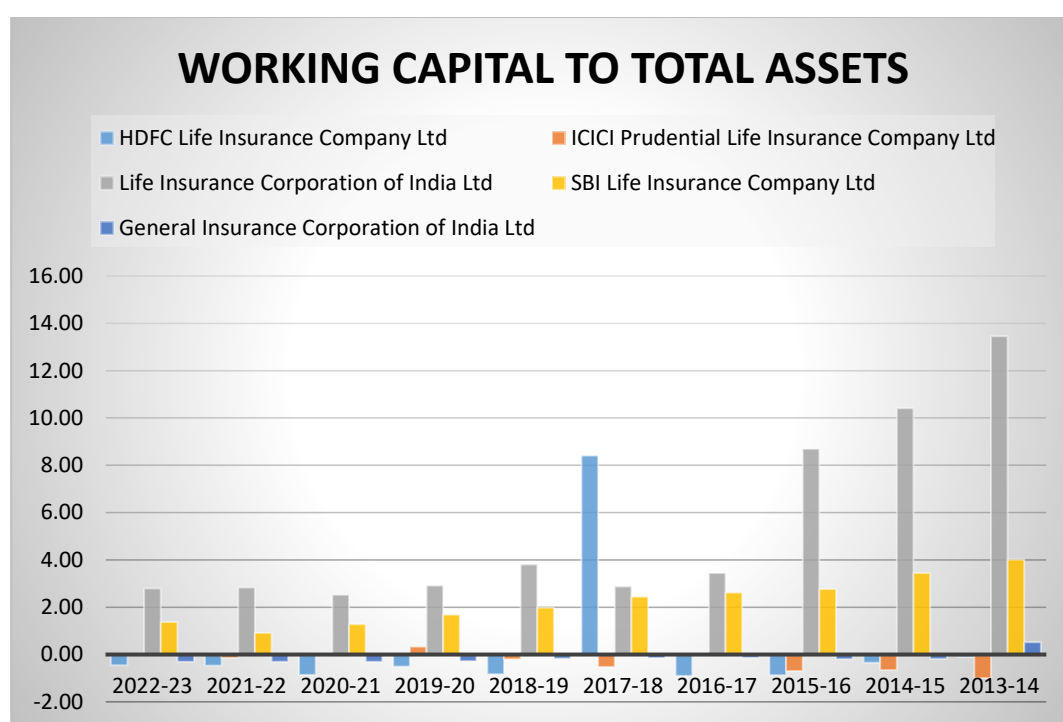


Figure 9 : Working Capital to Total Assets Ratio

The Working Capital to Total Assets ratio measures the proportion of a company's working capital (current assets minus current liabilities) to its total assets. A higher ratio indicates a larger proportion of working capital relative to total assets, which can signify liquidity and financial health. Let's analyse the provided data for each insurance company:

HDFC Life Insurance Company Ltd: HDFC Life exhibited a maximum Working Capital to Total Assets ratio of 8.403 in 2017-18, indicating a significant portion of working capital relative to total assets. However, in 2016-17, its ratio dropped to -0.896,

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which suggests that its current liabilities exceeded its current assets during that period, potentially indicating financial strain.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential displayed a maximum ratio of 0.326 in 2019-20, indicating a relatively small portion of working capital relative to total assets. However, in 2013-14, its ratio dropped to -0.998, which suggests a negative working capital situation where current liabilities exceeded current assets.

Life Insurance Corporation of India Ltd: LIC showcased a maximum ratio of 13.455 in 2013-14, indicating a substantial portion of working capital relative to total assets. However, in 2020-21, its ratio decreased to 2.528, suggesting a decrease in the proportion of working capital relative to total assets.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum ratio of 4.017 in 2013-14, indicating a significant portion of working capital relative to total assets. However, in 2021-22, its ratio decreased to 0.909, which suggests a decrease in the proportion of working capital relative to total assets.

General Insurance Corporation of India Ltd: General Insurance Corporation displayed a maximum ratio of 0.518 in 2013-14, indicating a relatively small portion of working capital relative to total assets. However, in 2021-22, its ratio decreased to -0.305, suggesting a negative working capital situation.

In comparative analysis, while some insurance companies maintain relatively stable or improving Working Capital to Total Assets ratios over the years (such as HDFC Life and SBI Life), others exhibit fluctuations or negative ratios at certain points (such as ICICI Prudential and General Insurance Corporation). These fluctuations highlight the importance of effective working capital management to ensure liquidity and financial stability. Overall, a healthy ratio indicates that the company has enough current assets to cover its short-term liabilities and invest in growth opportunities.

Table 18 : Descriptive Statistics of Working Capital to Total Assets Ratio

WORKING CAPITAL TO TOTAL ASSETS					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	0.306	-0.277	5.375	2.253	-0.150
Standard Error	0.904	0.133	1.253	0.314	0.077
Median	-0.490	-0.171	3.181	2.209	-0.190
Standard Deviation	2.858	0.419	3.963	0.993	0.244
Sample Variance	8.166	0.176	15.702	0.985	0.060
Kurtosis	9.758	-0.891	0.328	-0.602	8.025
Skewness	3.110	-0.374	1.324	0.450	2.726
Range	9.299	1.324	10.928	3.108	0.823
Minimum	-0.896	-0.998	2.528	0.909	-0.305
Maximum	8.403	0.326	13.455	4.017	0.518
Sum	3.065	-2.774	53.751	22.534	-1.498
Count	10	10	10	10	10

The table provides a detailed statistical analysis of the Working Capital to Total Assets ratio for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company, followed by a comparative analysis.

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Reference to the Altman Z Score Model

HDFC Life Insurance Company Ltd

- Mean: The mean ratio is 0.306, indicating a small positive working capital to total assets ratio.
- Standard Error: The standard error is 0.904, suggesting significant variability around the mean.
- Median: The median value is -0.490, which is lower than the mean, indicating a slight negative skew.
- Standard Deviation and Sample Variance: The standard deviation is 2.858 and the sample variance is 8.166, indicating high variability.
- Kurtosis: The kurtosis of 9.758 suggests a distribution with heavy tails.
- Skewness: The skewness of 3.110 indicates a strong positive skew.
- Range: The range is 9.299, with minimum and maximum values of -0.896 and 8.403, respectively.
- Sum and Count: The total sum is 3.065 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- Mean: The mean ratio is -0.277, indicating a small deficit in working capital relative to total assets.
- Standard Error: The standard error is 0.133, suggesting low variability around the mean.
- Median: The median value is -0.171, slightly higher than the mean, indicating a slight negative skew.
- Standard Deviation and Sample Variance: The standard deviation is 0.419 and the sample variance is 0.176, indicating low variability.
- Kurtosis: The kurtosis of -0.891 suggests a flatter distribution than normal.
- Skewness: The skewness of -0.374 indicates a slight negative skew.
- Range: The range is 1.324, with minimum and maximum values of -0.998 and 0.326, respectively.
- Sum and Count: The total sum is -2.774 over 10 observations.

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Life Insurance Corporation of India Ltd (LIC)

- Mean: The mean ratio is 5.375, indicating a significantly positive working capital to total assets ratio.
- Standard Error: The standard error is 1.253, suggesting moderate variability.
- Median: The median value is 3.181, lower than the mean, indicating a positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 3.963 and the sample variance is 15.702, indicating high variability.
- Kurtosis: The kurtosis of 0.328 suggests a distribution with moderate heavy tails.
- Skewness: The skewness of 1.324 indicates a positive skew.
- Range: The range is 10.928, with minimum and maximum values of 2.528 and 13.455, respectively.
- Sum and Count: The total sum is 53.751 over 10 observations.

SBI Life Insurance Company Ltd

- Mean: The mean ratio is 2.253, indicating a moderate positive working capital to total assets ratio.
- Standard Error: The standard error is 0.314, suggesting moderate variability around the mean.
- Median: The median value is 2.209, close to the mean, indicating a balanced distribution.
- Standard Deviation and Sample Variance: The standard deviation is 0.993 and the sample variance is 0.985, indicating moderate variability.
- Kurtosis: The kurtosis of -0.602 suggests a distribution slightly flatter than normal.
- Skewness: The skewness of 0.450 indicates a slight positive skew.
- Range: The range is 3.108, with minimum and maximum values of 0.909 and 4.017, respectively.
- Sum and Count: The total sum is 22.534 over 10 observations.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

General Insurance Corporation of India Ltd (GIC)

- Mean: The mean ratio is -0.150, indicating a small deficit in working capital relative to total assets.
- Standard Error: The standard error is 0.077, suggesting low variability around the mean.
- Median: The median value is -0.190, close to the mean, indicating a balanced distribution.
- Standard Deviation and Sample Variance: The standard deviation is 0.244 and the sample variance is 0.060, indicating low variability.
- Kurtosis: The kurtosis of 8.025 suggests a distribution with heavy tails.
- Skewness: The skewness of 2.726 indicates a strong positive skew.
- Range: The range is 0.823, with minimum and maximum values of -0.305 and 0.518, respectively.
- Sum and Count: The total sum is -1.498 over 10 observations.

Comparative Analysis

Profitability: LIC has the highest mean ratio (5.375), indicating superior working capital efficiency relative to total assets. Conversely, ICICI Prudential and GIC show negative mean ratios (-0.277 and -0.150, respectively), indicating a working capital deficit.

Variability: LIC and HDFC Life exhibit the highest variability in their ratios, as indicated by their high standard deviations and sample variances. ICICI Prudential and GIC show the least variability, indicating more stability.

Distribution Shape: HDFC Life and GIC have high kurtosis values, indicating distributions with heavy tails. LIC has moderate kurtosis, and ICICI Prudential has a flatter distribution. Skewness values show that HDFC Life, LIC, and GIC have positively skewed distributions, while ICICI Prudential has a slight negative skew.

Reliability of Mean Estimates: ICICI Prudential and GIC have the most reliable mean estimates due to their lower standard errors. LIC, with its higher standard error, shows less reliability in its mean estimate. Overall, LIC demonstrates the strongest positive

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working capital position, albeit with high variability and positive skewness, suggesting potential outliers on the higher end. In contrast, ICICI Prudential and GIC exhibit negative mean ratios and lower variability, indicating more stability but a weaker working capital position. HDFC Life, with its high variability and positive skew, indicates significant fluctuations in its working capital ratios. SBI Life maintains a moderate position with balanced variability and a relatively normal distribution.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	3.06493	0.30649	8.16572
ICICI Prudential Life Insurance Company Ltd	10	-2.7745	-0.2774	0.17567
Life Insurance Corporation of India Ltd	10	53.751	5.3751	15.7018
SBI Life Insurance Company Ltd	10	22.5339	2.25339	0.98534
General Insurance Corporation of India Ltd	10	-1.4979	-0.1498	0.05953

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	228.896	4	57.2239	11.4046	1.8E-06	2.57874
Within Groups	225.792	45	5.01761			
Total	454.688	49				

H₀ = There is no significant difference in Working Capital To Total Assets for selected insurance companies of India.

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H1 = There is significant difference in Working Capital To Total Assets for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

Fcal is 11.404 and Ftab is 2.578

P-value is 1.8E-06

Thus, Fcal > Ftab and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Working Capital To Total Assets for selected insurance companies of India.

2. RETAINED EARNINGS TO TOTAL ASSETS

The ratio of retained earnings to total assets measures the proportion of a company's total assets that are financed by its retained earnings, which represent the cumulative profits that have been reinvested into the business rather than distributed to shareholders as dividends. This ratio provides insights into the extent to which a company's assets are funded by internal sources rather than external financing. The formula for calculating the ratio of retained earnings to total assets is:

$$\text{Retained Earnings to Total Assets Ratio} = \text{Retained Earnings} / \text{Total Assets}$$

Table 19 : Retained Earnings to Total Assets Ratio

RETAINED EARNINGS TO TOTAL ASSETS					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	0.55	0.32	0.80	0.55	4.02
2021-22	0.57	0.31	0.10	0.55	1.38
2020-21	0.76	0.44	0.08	0.64	1.43
2019-20	0.98	0.68	0.08	0.86	-0.31
2018-19	0.98	0.70	0.09	0.90	1.87

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2017-18	1.00	1.14	0.09	0.95	2.95
2016-17	0.94	1.35	0.09	0.93	3.29
2015-16	1.07	1.58	0.11	1.03	3.57
2014-15	1.13	1.61	0.09	1.11	3.44
2013-14	1.38	1.92	0.09	1.22	3.69

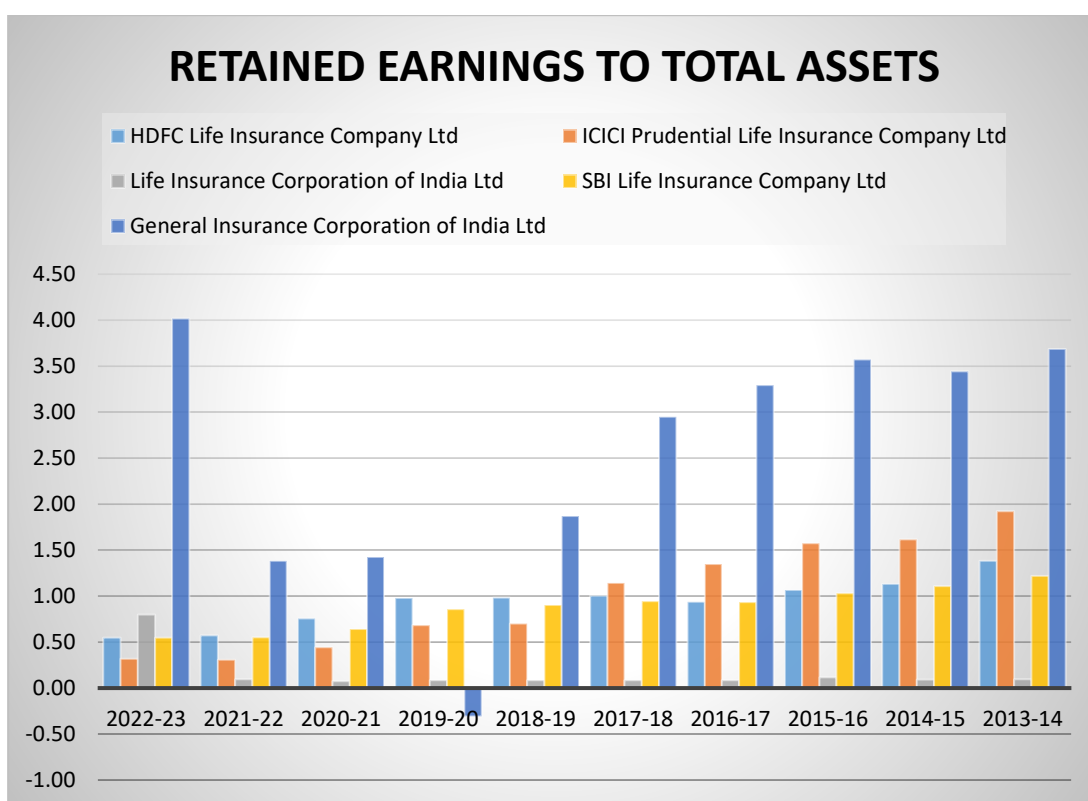


Figure 10 : Retained Earnings to Total Assets Ratio

The Retained Earnings to Total Assets ratio measures the proportion of a company's retained earnings (profits not distributed as dividends) to its total assets. A higher ratio indicates that the company has retained more earnings relative to its asset base. Let's analyse the provided data for each insurance company:

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HDFC Life Insurance Company Ltd: HDFC Life exhibited a maximum Retained Earnings to Total Assets ratio of 1.385 in 2013-14, indicating a significant proportion of retained earnings relative to total assets. However, in 2022-23, its ratio decreased to 0.549, suggesting a decrease in the proportion of retained earnings relative to total assets.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential displayed a maximum ratio of 1.922 in 2013-14, indicating a substantial portion of retained earnings relative to total assets. However, in 2021-22, its ratio decreased to 0.309, suggesting a decrease in the proportion of retained earnings relative to total assets.

Life Insurance Corporation of India Ltd: LIC showcased a maximum ratio of 0.800 in 2022-23, indicating a moderate portion of retained earnings relative to total assets. However, in 2020-21, its ratio decreased to 0.076, suggesting a significant decrease in the proportion of retained earnings relative to total assets.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum ratio of 1.221 in 2013-14, indicating a significant portion of retained earnings relative to total assets. However, in 2022-23, its ratio decreased to 0.547, suggesting a decrease in the proportion of retained earnings relative to total assets.

General Insurance Corporation of India Ltd: General Insurance Corporation displayed a maximum ratio of 4.018 in 2022-23, indicating a substantial portion of retained earnings relative to total assets. However, in 2019-20, its ratio decreased to -0.309, suggesting a negative situation where retained earnings were not sufficient to cover total assets.

In comparative analysis, while some insurance companies maintain relatively stable or improving Retained Earnings to Total Assets ratios over the years (such as HDFC Life and SBI Life), others exhibit fluctuations or negative ratios at certain points (such as ICICI Prudential and General Insurance Corporation). These fluctuations highlight the importance of effective management of retained earnings to ensure financial stability and growth. Overall, a healthy ratio indicates that the company has been able to retain and reinvest its profits effectively to support its asset base and future growth initiatives.

Financial Performance Analysis of Selected Insurance Companies in India with
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Table 20 : Descriptive Statistics of Retained Earnings to Total Assets Ratio

RETAINED EARNINGS TO TOTAL ASSETS					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	0.937	1.005	0.162	0.874	2.533
Standard Error	0.080	0.187	0.071	0.073	0.438
Median	0.981	0.921	0.089	0.919	3.121
Standard Deviation	0.254	0.591	0.225	0.230	1.385
Sample Variance	0.064	0.350	0.050	0.053	1.917
Kurtosis	0.046	-1.581	9.944	-0.936	0.266
Skewness	-0.102	0.215	3.150	-0.258	-0.991
Range	0.836	1.614	0.724	0.674	4.327
Minimum	0.549	0.309	0.076	0.547	-0.309
Maximum	1.385	1.922	0.800	1.221	4.018
Sum	9.369	10.055	1.615	8.741	25.335
Count	10	10	10	10	10

The table provides a detailed statistical analysis of the Retained Earnings to Total Assets ratio for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company, followed by a comparative analysis.

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Reference to the Altman Z Score Model

HDFC Life Insurance Company Ltd

- Mean: The mean ratio is 0.937, indicating strong retained earnings relative to total assets.
- Standard Error: The standard error is 0.080, suggesting high reliability of the mean estimate.
- Median: The median value is 0.981, slightly higher than the mean, indicating a slight positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 0.254 and the sample variance is 0.064, indicating moderate variability.
- Kurtosis: The kurtosis of 0.046 suggests a distribution close to normal.
- Skewness: The skewness of -0.102 indicates a nearly symmetric distribution.
- Range: The range is 0.836, with minimum and maximum values of 0.549 and 1.385, respectively.
- Sum and Count: The total sum is 9.369 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- Mean: The mean ratio is 1.005, indicating strong retained earnings relative to total assets.
- Standard Error: The standard error is 0.187, suggesting moderate reliability of the mean estimate.
- Median: The median value is 0.921, slightly lower than the mean, indicating a slight positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 0.591 and the sample variance is 0.350, indicating moderate variability.
- Kurtosis: The kurtosis of -1.581 suggests a flatter distribution than normal.
- Skewness: The skewness of 0.215 indicates a slight positive skew.
- Range: The range is 1.614, with minimum and maximum values of 0.309 and 1.922, respectively.
- Sum and Count: The total sum is 10.055 over 10 observations.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Life Insurance Corporation of India Ltd (LIC)

- Mean: The mean ratio is 0.162, indicating lower retained earnings relative to total assets.
- Standard Error: The standard error is 0.071, suggesting high reliability of the mean estimate.
- Median: The median value is 0.089, lower than the mean, indicating a positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 0.225 and the sample variance is 0.050, indicating low variability.
- Kurtosis: The kurtosis of 9.944 suggests a distribution with heavy tails.
- Skewness: The skewness of 3.150 indicates a strong positive skew.
- Range: The range is 0.724, with minimum and maximum values of 0.076 and 0.800, respectively.
- Sum and Count: The total sum is 1.615 over 10 observations.

SBI Life Insurance Company Ltd

- Mean: The mean ratio is 0.874, indicating strong retained earnings relative to total assets.
- Standard Error: The standard error is 0.073, suggesting high reliability of the mean estimate.
- Median: The median value is 0.919, higher than the mean, indicating a slight negative skew.
- Standard Deviation and Sample Variance: The standard deviation is 0.230 and the sample variance is 0.053, indicating moderate variability.
- Kurtosis: The kurtosis of -0.936 suggests a flatter distribution than normal.
- Skewness: The skewness of -0.258 indicates a slight negative skew.
- Range: The range is 0.674, with minimum and maximum values of 0.547 and 1.221, respectively.
- Sum and Count: The total sum is 8.741 over 10 observations.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

General Insurance Corporation of India Ltd (GIC)

- Mean: The mean ratio is 2.533, indicating very strong retained earnings relative to total assets.
- Standard Error: The standard error is 0.438, suggesting moderate reliability of the mean estimate.
- Median: The median value is 3.121, higher than the mean, indicating a negative skew.
- Standard Deviation and Sample Variance: The standard deviation is 1.385 and the sample variance is 1.917, indicating high variability.
- Kurtosis: The kurtosis of 0.266 suggests a distribution close to normal.
- Skewness: The skewness of -0.991 indicates a moderate negative skew.
- Range: The range is 4.327, with minimum and maximum values of -0.309 and 4.018, respectively.
- Sum and Count: The total sum is 25.335 over 10 observations.

Comparative Analysis

Profitability: GIC has the highest mean ratio (2.533), indicating the strongest retained earnings relative to total assets. LIC has the lowest mean ratio (0.162), indicating the weakest retained earnings position.

Variability: GIC exhibits the highest variability in its retained earnings to total assets ratio, as indicated by its high standard deviation and sample variance. ICICI Prudential also shows considerable variability. In contrast, LIC and SBI Life show lower variability, indicating more stable performance.

Distribution Shape: LIC exhibits a highly skewed distribution with heavy tails, suggesting the presence of extreme values. Other companies, such as HDFC Life and GIC, have distributions closer to normal. ICICI Prudential and SBI Life show flatter distributions.

Reliability of Mean Estimates: HDFC Life and SBI Life have the most reliable mean estimates due to their lower standard errors. ICICI Prudential and GIC show less reliability due to higher standard errors.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Overall, GIC demonstrates the strongest retained earnings position, albeit with high variability and a moderate negative skew. LIC, despite having the lowest mean ratio, exhibits extreme values with a strong positive skew, indicating occasional high retained earnings. ICICI Prudential and HDFC Life show moderate retained earnings with balanced variability, while SBI Life maintains a strong and stable retained earnings position.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	9.36918	0.93692	0.06428
ICICI Prudential Life Insurance Company Ltd	10	10.0549	1.00549	0.34967
Life Insurance Corporation of India Ltd	10	1.6155	0.16155	0.0504
SBI Life Insurance Company Ltd	10	8.74135	0.87414	0.05274
General Insurance Corporation of India Ltd	10	25.3349	2.53349	1.91724

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	30.2211	4	7.55528	15.5181	4.8E-08	2.57874
Within Groups	21.9091	45	0.48687			
Total	52.1302	49				

H0 = There is no significant difference in Retained Earnings To Total Assets for selected insurance companies of India.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

H1 = There is significant difference in Retained Earnings To Total Assets for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

Fcal is 15.518 and Ftab is 2.578

P-value is 4.8E-08

Thus, Fcal > Ftab and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Retained Earnings To Total Assets for selected insurance companies of India.

3. EBIT TO TOTAL ASSETS

The ratio of EBIT (Earnings Before Interest and Taxes) to total assets, also known as the EBIT to Total Assets ratio, measures a company's ability to generate operating income relative to its total assets. It provides insights into the efficiency with which a company utilizes its assets to generate earnings before considering the effects of interest and taxes. The formula for calculating the EBIT to Total Assets ratio is:

$$\text{EBIT to Total Assets Ratio} = \text{EBIT} / \text{Total Assets}$$

Table 21 : EBIT to Total Assets Ratio

EBIT TO TOTAL ASSETS					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	0.53	0.53	0.96	0.65	5.26
2021-22	0.63	0.40	0.33	0.94	2.46
2020-21	0.97	0.62	0.29	0.78	2.35
2019-20	0.94	0.90	0.08	1.34	-0.38

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

2018-19	1.10	0.88	0.09	1.18	2.89
2017-18	1.10	1.49	0.35	1.33	3.34
2016-17	1.29	1.45	0.33	1.13	3.82
2015-16	1.63	1.89	0.33	1.05	3.71
2014-15	1.55	1.64	0.27	1.12	3.62
2013-14	0.88	1.92	0.24	1.20	3.66

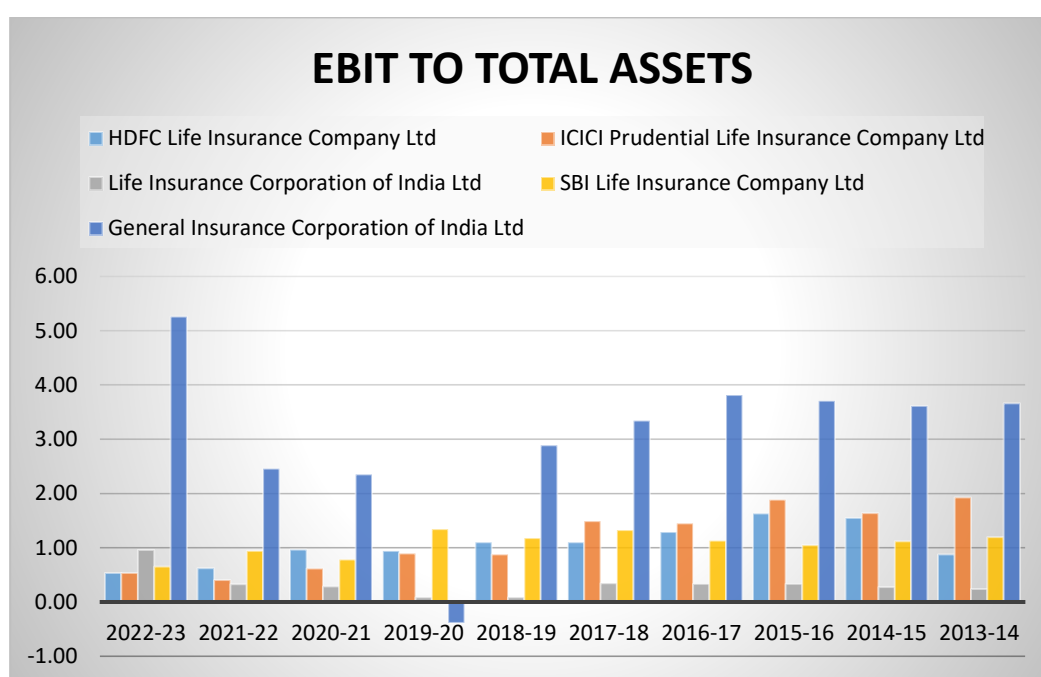


Figure 11 : EBIT to Total Assets Ratio

The Earnings Before Interest and Taxes (EBIT) to Total Assets ratio is a critical financial metric that provides insights into how effectively a company utilizes its assets to generate operating earnings. It essentially measures the efficiency of asset utilization in generating profits before considering the impact of interest and taxes.

HDFC Life Insurance Company Ltd: HDFC Life demonstrated a commendable maximum EBIT to Total Assets ratio of 1.632 in 2015-16, signifying efficient utilization of assets to generate earnings. However, there was a noticeable decline in

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

this ratio to 0.533 in 2022-23, indicating a potential decrease in asset efficiency in generating earnings. This decline could prompt HDFC Life to explore avenues for improving operational efficiency and optimizing asset utilization to bolster profitability.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential showcased a robust maximum EBIT to Total Assets ratio of 1.925 in 2013-14, indicating efficient asset utilization in generating earnings. However, the ratio experienced a significant decline to 0.404 in 2021-22, suggesting a notable decrease in asset efficiency in generating earnings. This decline underscores the importance for ICICI Prudential to evaluate its operational processes and asset management strategies to enhance profitability.

Life Insurance Corporation of India Ltd: LIC displayed a moderate maximum EBIT to Total Assets ratio of 0.956 in 2022-23, indicating decent efficiency in asset utilization for earnings generation. However, there was a considerable drop in the ratio to 0.085 in 2019-20, suggesting a significant decline in asset efficiency in generating earnings. This decline prompts LIC to review its operational strategies and asset management practices to improve profitability and operational efficiency.

SBI Life Insurance Company Ltd: SBI Life recorded a commendable maximum EBIT to Total Assets ratio of 1.342 in 2019-20, indicating efficient asset utilization for earnings generation. However, the ratio declined to 0.653 in 2022-23, suggesting a decrease in asset efficiency in generating earnings. This decline highlights the importance for SBI Life to focus on optimizing its operational processes and asset utilization to sustain profitability.

General Insurance Corporation of India Ltd: General Insurance Corporation exhibited an exceptionally high maximum EBIT to Total Assets ratio of 5.258 in 2022-23, indicating superior efficiency in utilizing assets for earnings generation. However, the ratio dropped to -0.384 in 2019-20, signaling a negative situation where earnings were insufficient relative to total assets. This significant fluctuation underscores the need for General Insurance Corporation to address operational challenges and enhance asset efficiency to ensure sustained profitability.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

In comparative analysis, it's evident that while some insurance companies maintain relatively stable or improving EBIT to Total Assets ratios over the years (such as HDFC Life and SBI Life), others exhibit fluctuations or significant declines (such as ICICI Prudential and General Insurance Corporation). These fluctuations highlight the importance of effective asset management and operational efficiency in sustaining profitability.

Table 22 : Descriptive Statistics of EBIT to Total Assets Ratio

EBIT TO TOTAL ASSETS					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	1.062	1.172	0.327	1.072	3.071
Standard Error	0.113	0.181	0.076	0.071	0.463
Median	1.035	1.172	0.306	1.124	3.480
Standard Deviation	0.357	0.571	0.241	0.223	1.466
Sample Variance	0.128	0.327	0.058	0.050	2.148
Kurtosis	-0.569	-1.746	6.185	-0.104	3.538
Skewness	0.225	0.014	2.178	-0.750	-1.339
Range	1.099	1.521	0.871	0.689	5.642
Minimum	0.533	0.404	0.085	0.653	-0.384
Maximum	1.632	1.925	0.956	1.342	5.258
Sum	10.618	11.720	3.267	10.715	30.712
Count	10	10	10	10	10

The table provides a detailed statistical analysis of the Earnings Before Interest and Taxes (EBIT) to Total Assets ratio for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company, followed by a comparative analysis.

HDFC Life Insurance Company Ltd

- Mean: The mean ratio is 1.062, indicating strong EBIT relative to total assets.
- Standard Error: The standard error is 0.113, suggesting high reliability of the mean estimate.
- Median: The median value is 1.035, slightly lower than the mean, indicating a balanced distribution.
- Standard Deviation and Sample Variance: The standard deviation is 0.357 and the sample variance is 0.128, indicating moderate variability.
- Kurtosis: The kurtosis of -0.569 suggests a distribution slightly flatter than normal.
- Skewness: The skewness of 0.225 indicates a slight positive skew.
- Range: The range is 1.099, with minimum and maximum values of 0.533 and 1.632, respectively.
- Sum and Count: The total sum is 10.618 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- Mean: The mean ratio is 1.172, indicating strong EBIT relative to total assets.
- Standard Error: The standard error is 0.181, suggesting moderate reliability of the mean estimate.
- Median: The median value is 1.172, equal to the mean, indicating a symmetrical distribution.
- Standard Deviation and Sample Variance: The standard deviation is 0.571 and the sample variance is 0.327, indicating moderate variability.
- Kurtosis: The kurtosis of -1.746 suggests a flatter distribution than normal.
- Skewness: The skewness of 0.014 indicates an almost symmetrical distribution.

Financial Performance Analysis of Selected Insurance Companies in India with Reference to the Altman Z Score Model

- Range: The range is 1.521, with minimum and maximum values of 0.404 and 1.925, respectively.
- Sum and Count: The total sum is 11.720 over 10 observations.

Life Insurance Corporation of India Ltd (LIC)

- Mean: The mean ratio is 0.327, indicating lower EBIT relative to total assets.
- Standard Error: The standard error is 0.076, suggesting high reliability of the mean estimate.
- Median: The median value is 0.306, slightly lower than the mean, indicating a slight positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 0.241 and the sample variance is 0.058, indicating low variability.
- Kurtosis: The kurtosis of 6.185 suggests a distribution with heavy tails.
- Skewness: The skewness of 2.178 indicates a strong positive skew.
- Range: The range is 0.871, with minimum and maximum values of 0.085 and 0.956, respectively.
- Sum and Count: The total sum is 3.267 over 10 observations.

SBI Life Insurance Company Ltd

- Mean: The mean ratio is 1.072, indicating strong EBIT relative to total assets.
- Standard Error: The standard error is 0.071, suggesting high reliability of the mean estimate.
- Median: The median value is 1.124, slightly higher than the mean, indicating a slight negative skew.
- Standard Deviation and Sample Variance: The standard deviation is 0.223 and the sample variance is 0.050, indicating low variability.
- Kurtosis: The kurtosis of -0.104 suggests a distribution close to normal.
- Skewness: The skewness of -0.750 indicates a slight negative skew.
- Range: The range is 0.689, with minimum and maximum values of 0.653 and 1.342, respectively.
- Sum and Count: The total sum is 10.715 over 10 observations.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

General Insurance Corporation of India Ltd (GIC)

- Mean: The mean ratio is 3.071, indicating very strong EBIT relative to total assets.
- Standard Error: The standard error is 0.463, suggesting moderate reliability of the mean estimate.
- Median: The median value is 3.480, higher than the mean, indicating a negative skew.
- Standard Deviation and Sample Variance: The standard deviation is 1.466 and the sample variance is 2.148, indicating high variability.
- Kurtosis: The kurtosis of 3.538 suggests a distribution with heavy tails.
- Skewness: The skewness of -1.339 indicates a strong negative skew.
- Range: The range is 5.642, with minimum and maximum values of -0.384 and 5.258, respectively.
- Sum and Count: The total sum is 30.712 over 10 observations.

Comparative Analysis

Profitability: GIC has the highest mean EBIT to total assets ratio (3.071), indicating the strongest operational profitability. LIC has the lowest mean ratio (0.327), indicating the weakest profitability.

Variability: GIC exhibits the highest variability in its EBIT to total assets ratio, as indicated by its high standard deviation and sample variance. ICICI Prudential also shows considerable variability. In contrast, LIC and SBI Life show lower variability, indicating more stable performance.

Distribution Shape: LIC exhibits a highly skewed distribution with heavy tails, suggesting the presence of extreme values. GIC also shows heavy tails but with a negative skew. Other companies, such as HDFC Life and ICICI Prudential, have distributions closer to normal.

Reliability of Mean Estimates: HDFC Life and SBI Life have the most reliable mean estimates due to their lower standard errors. ICICI Prudential and GIC show less reliability due to higher standard errors.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Overall, GIC demonstrates the strongest EBIT position relative to total assets, albeit with high variability and a strong negative skew. LIC, despite having the lowest mean ratio, exhibits extreme values with a strong positive skew, indicating occasional high EBIT. ICICI Prudential and HDFC Life show moderate EBIT with balanced variability, while SBI Life maintains strong and stable EBIT relative to total assets.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	10.6175	1.06175	0.12751
ICICI Prudential Life Insurance Company Ltd	10	11.72	1.172	0.32651
Life Insurance Corporation of India Ltd	10	3.26715	0.32672	0.05828
SBI Life Insurance Company Ltd	10	10.7154	1.07154	0.04987
General Insurance Corporation of India Ltd	10	30.7125	3.07125	2.14769

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	42.0168	4	10.5042	19.3814	2.5E-09	2.57874
Within Groups	24.3888	45	0.54197			
Total	66.4056	49				

H0 = There is no significant difference in EBIT To Total Assets for selected insurance companies of India.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

H1 = There is significant difference in EBIT To Total Assets for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

Fcal is 19.381 and Ftab is 2.578

P-value is 2.5E-09

Thus, Fcal>Ftab and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in EBIT To Total Assets for selected insurance companies of India.

4. MARKET CAPITALIZATION TO TOTAL LIABILITIES

The ratio of market capitalization to total liabilities provides insights into the financial risk and solvency of a company by comparing the market value of its equity to its total liabilities. Market capitalization represents the total market value of a company's outstanding shares of stock, calculated by multiplying the current market price per share by the total number of outstanding shares. Total liabilities represent all of the company's obligations or debts.

The formula for calculating the ratio of market capitalization to total liabilities is:

Market Capitalization to Total Liabilities Ratio = Market Capitalization / Total Liabilities.

Table 23 : Market Capitalization to Total Liabilities Ratio

MARKET CAPITALIZATION TO TOTAL LIABILITIES					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	4.57	2.55	0.75	3.65	0.20

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

2021-22	6.31	3.22	1.22	4.23	0.19
2020-21	7.98	3.64	0.02	4.34	0.34
2019-20	8.07	3.97	0.03	4.64	0.27
2018-19	6.56	3.40	0.03	4.61	0.49
2017-18	9.87	4.54	0.03	6.42	0.79
2016-17	11.36	4.92	0.03	7.65	4.60
2015-16	14.09	5.85	0.04	9.40	7.56
2014-15	15.50	6.06	0.04	10.56	8.43
2013-14	20.55	7.54	0.05	12.92	0.10

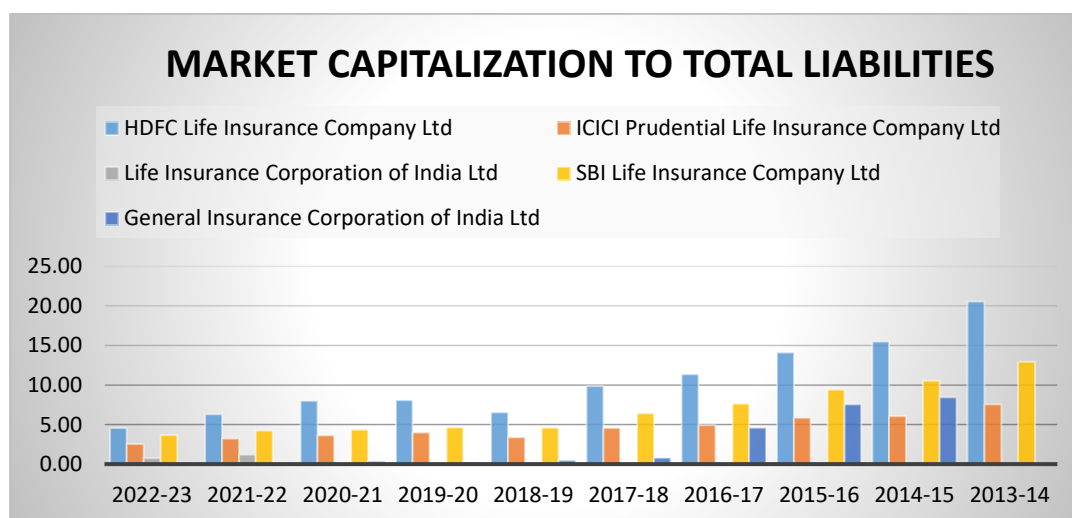


Figure 12 : Market Capitalization to Total Liabilities Ratio

Financial Performance Analysis of Selected Insurance Companies in India with Reference to the Altman Z Score Model

The Market Capitalization to Total Liabilities ratio is a financial metric that compares a company's market capitalization (the total market value of its outstanding shares) to its total liabilities. This ratio provides insight into the company's ability to cover its liabilities with its market value. A higher ratio suggests that the company's market value exceeds its liabilities, indicating financial strength and investor confidence.

HDFC Life Insurance Company Ltd: HDFC Life demonstrated a maximum Market Capitalization to Total Liabilities ratio of 20.547 in 2013-14, indicating robust financial strength and market confidence, with its market capitalization significantly exceeding its total liabilities. However, in 2022-23, the ratio dropped to 4.572, suggesting a decline in market confidence relative to its liabilities. This decline might prompt HDFC Life to focus on improving its financial performance to regain investor trust.

ICICI Prudential Life Insurance Company Ltd: ICICI Prudential displayed a maximum ratio of 7.537 in 2013-14, indicating a strong market capitalization relative to its total liabilities. However, in 2022-23, the ratio decreased to 2.555, signaling a decline in market confidence compared to its liabilities. This decline might necessitate ICICI Prudential to strengthen its financial position to enhance investor perception.

Life Insurance Corporation of India Ltd: LIC showcased a maximum ratio of 1.216 in 2021-22, indicating that its market capitalization slightly exceeded its total liabilities during that period. However, in 2020-21, the ratio dropped to 0.021, suggesting that its market value was significantly lower than its liabilities. This decline might prompt LIC to improve its financial performance and enhance investor confidence.

SBI Life Insurance Company Ltd: SBI Life recorded a maximum ratio of 12.920 in 2013-14, indicating a robust market capitalization relative to its total liabilities. However, in 2022-23, the ratio decreased to 3.650, suggesting a decline in market confidence compared to its liabilities. This decrease might prompt SBI Life to focus on strengthening its financial position and improving investor sentiment.

General Insurance Corporation of India Ltd: General Insurance Corporation exhibited a maximum ratio of 8.429 in 2014-15, indicating strong market capitalization relative to its total liabilities. However, in 2013-14, the ratio dropped to 0.103, suggesting that its market value was substantially lower than its liabilities during that

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

period. This decline might necessitate General Insurance Corporation to enhance its financial performance and regain investor trust.

In comparative analysis, while some insurance companies maintain relatively high Market Capitalization to Total Liabilities ratios (such as HDFC Life and ICICI Prudential), others exhibit fluctuations or significant declines (such as LIC and SBI Life). These fluctuations highlight the importance of maintaining a strong financial position and investor confidence. Overall, a higher ratio indicates that the company's market value exceeds its liabilities, reflecting financial strength and market confidence.

Table 24 : Descriptive Statistics of Market Capitalization to Total Liabilities Ratio

MARKET CAPITALIZATION TO TOTAL LIABILITIES					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	10.487	4.569	0.222	6.843	2.297
Standard Error	1.565	0.486	0.132	1.007	1.042
Median	8.970	4.258	0.034	5.530	0.415
Standard Deviation	4.949	1.537	0.416	3.185	3.294
Sample Variance	24.495	2.361	0.173	10.141	10.847
Kurtosis	0.347	-0.122	3.419	-0.440	-0.046
Skewness	0.941	0.701	2.072	0.883	1.298
Range	15.974	4.982	1.195	9.270	8.326
Minimum	4.572	2.555	0.021	3.650	0.103
Maximum	20.547	7.537	1.216	12.920	8.429
Sum	104.869	45.686	2.223	68.429	22.975
Count	10	10	10	10	10

Financial Performance Analysis of Selected Insurance Companies in India with Reference to the Altman Z Score Model

The table provides a detailed statistical analysis of the Market Capitalization to Total Liabilities ratio for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company, followed by a comparative analysis.

HDFC Life Insurance Company Ltd

- Mean: The mean ratio is 10.487, indicating a high market capitalization relative to total liabilities.
- Standard Error: The standard error is 1.565, suggesting moderate reliability of the mean estimate.
- Median: The median value is 8.970, lower than the mean, indicating a positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 4.949 and the sample variance is 24.495, indicating high variability.
- Kurtosis: The kurtosis of 0.347 suggests a distribution close to normal.
- Skewness: The skewness of 0.941 indicates a moderate positive skew.
- Range: The range is 15.974, with minimum and maximum values of 4.572 and 20.547, respectively.
- Sum and Count: The total sum is 104.869 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- Mean: The mean ratio is 4.569, indicating moderate market capitalization relative to total liabilities.
- Standard Error: The standard error is 0.486, suggesting high reliability of the mean estimate.
- Median: The median value is 4.258, slightly lower than the mean, indicating a slight positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 1.537 and the sample variance is 2.361, indicating moderate variability.

Financial Performance Analysis of Selected Insurance Companies in India with Reference to the Altman Z Score Model

- Kurtosis: The kurtosis of -0.122 suggests a distribution slightly flatter than normal.
- Skewness: The skewness of 0.701 indicates a moderate positive skew.
- Range: The range is 4.982, with minimum and maximum values of 2.555 and 7.537, respectively.
- Sum and Count: The total sum is 45.686 over 10 observations.

Life Insurance Corporation of India Ltd (LIC)

- Mean: The mean ratio is 0.222, indicating very low market capitalization relative to total liabilities.
- Standard Error: The standard error is 0.132, suggesting high reliability of the mean estimate.
- Median: The median value is 0.034, significantly lower than the mean, indicating a strong positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 0.416 and the sample variance is 0.173, indicating low variability.
- Kurtosis: The kurtosis of 3.419 suggests a distribution with heavy tails.
- Skewness: The skewness of 2.072 indicates a strong positive skew.
- Range: The range is 1.195, with minimum and maximum values of 0.021 and 1.216, respectively.
- Sum and Count: The total sum is 2.223 over 10 observations.

SBI Life Insurance Company Ltd

- Mean: The mean ratio is 6.843, indicating high market capitalization relative to total liabilities.
- Standard Error: The standard error is 1.007, suggesting moderate reliability of the mean estimate.
- Median: The median value is 5.530, lower than the mean, indicating a positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 3.185 and the sample variance is 10.141, indicating high variability.
- Kurtosis: The kurtosis of -0.440 suggests a flatter distribution than normal.

Financial Performance Analysis of Selected Insurance Companies in India with Reference to the Altman Z Score Model

- Skewness: The skewness of 0.883 indicates a moderate positive skew.
- Range: The range is 9.270, with minimum and maximum values of 3.650 and 12.920, respectively.
- Sum and Count: The total sum is 68.429 over 10 observations.

General Insurance Corporation of India Ltd (GIC)

- Mean: The mean ratio is 2.297, indicating moderate market capitalization relative to total liabilities.
- Standard Error: The standard error is 1.042, suggesting moderate reliability of the mean estimate.
- Median: The median value is 0.415, significantly lower than the mean, indicating a strong positive skew.
- Standard Deviation and Sample Variance: The standard deviation is 3.294 and the sample variance is 10.847, indicating high variability.
- Kurtosis: The kurtosis of -0.046 suggests a distribution close to normal.
- Skewness: The skewness of 1.298 indicates a strong positive skew.
- Range: The range is 8.326, with minimum and maximum values of 0.103 and 8.429, respectively.
- Sum and Count: The total sum is 22.975 over 10 observations.

Comparative Analysis

Market Capitalization: HDFC Life has the highest mean ratio (10.487), indicating the strongest market capitalization relative to total liabilities, followed by SBI Life (6.843). LIC has the lowest mean ratio (0.222), indicating the weakest market capitalization relative to total liabilities.

Variability: HDFC Life and SBI Life exhibit the highest variability in their market capitalization to total liabilities ratios, as indicated by their high standard deviations and sample variances. LIC and ICICI Prudential show lower variability, indicating more stable performance.

Financial Performance Analysis of Selected Insurance Companies in India with
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Distribution Shape: LIC exhibits a highly skewed distribution with heavy tails, suggesting the presence of extreme values. GIC also shows a strong positive skew. HDFC Life and SBI Life have distributions closer to normal, while ICICI Prudential has a flatter distribution.

Reliability of Mean Estimates: ICICI Prudential has the most reliable mean estimate due to its lower standard error. HDFC Life and SBI Life show moderate reliability, while GIC has less reliability due to its higher standard error. Overall, HDFC Life demonstrates the strongest market capitalization relative to total liabilities, albeit with high variability and a moderate positive skew. LIC, despite having the lowest mean ratio, exhibits extreme values with a strong positive skew, indicating occasional high market capitalization. ICICI Prudential and SBI Life show moderate to high market capitalization with balanced variability, while GIC maintains moderate market capitalization with a strong positive skew and high variability.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	104.869	10.4869	24.4952
ICICI Prudential Life Insurance Company Ltd	10	45.6865	4.56865	2.36107
Life Insurance Corporation of India Ltd	10	2.22315	0.22231	0.17295
SBI Life Insurance Company Ltd	10	68.4289	6.84289	10.1411
General Insurance Corporation of India Ltd	10	22.9746	2.29746	10.8473

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	637.511	4	159.378	16.5958	2E-08	2.57874
Within Groups	432.158	45	9.60352			

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Total	1069.67	49
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H0 = There is no significant difference in Market Capitalization To Total Liabilities for selected insurance companies of India.

H1 = There is significant difference in Market Capitalization To Total Liabilities for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

Fcal is 16.595 and Ftab is 2.578

P-value is 2E-08

Thus, $F_{cal} > F_{tab}$ and p-value is smaller than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Market Capitalization To Total Liabilities for selected insurance companies of India.

5. ALTMAN Z SCORE MODEL

The Altman Z-Score is a financial formula developed by Dr. Edward I. Altman in the 1960s as a tool for predicting the likelihood of bankruptcy of an Insurance company.

The formula for calculating the Altman Z-Score is:

$$Z = 6.56A + 3.26B + 6.72C + 1.05D$$

Where:

- A = Working Capital/Total Assets
- B = Retained Earnings/Total Assets
- C = Earnings Before Interest and Taxes/Total Assets
- D = Market Value of Equity/Total Liabilities

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Table 25 : Altman Z-Score

ALTMAN Z SCORE MODEL					
YEAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
2022-23	2.87	4.97	27.41	15.60	46.66
2021-22	3.63	3.13	21.22	14.55	19.23
2020-21	4.18	6.49	18.75	16.21	18.84
2019-20	7.03	10.81	19.98	23.40	-5.12
2018-19	5.84	7.22	25.86	24.34	24.87
2017-18	66.85	10.82	21.49	28.67	31.98
2016-17	7.04	14.78	25.13	28.62	40.33
2015-16	10.16	13.88	59.62	29.55	43.21
2014-15	13.50	12.60	70.41	34.83	43.17
2013-14	11.91	13.45	90.20	39.74	40.10

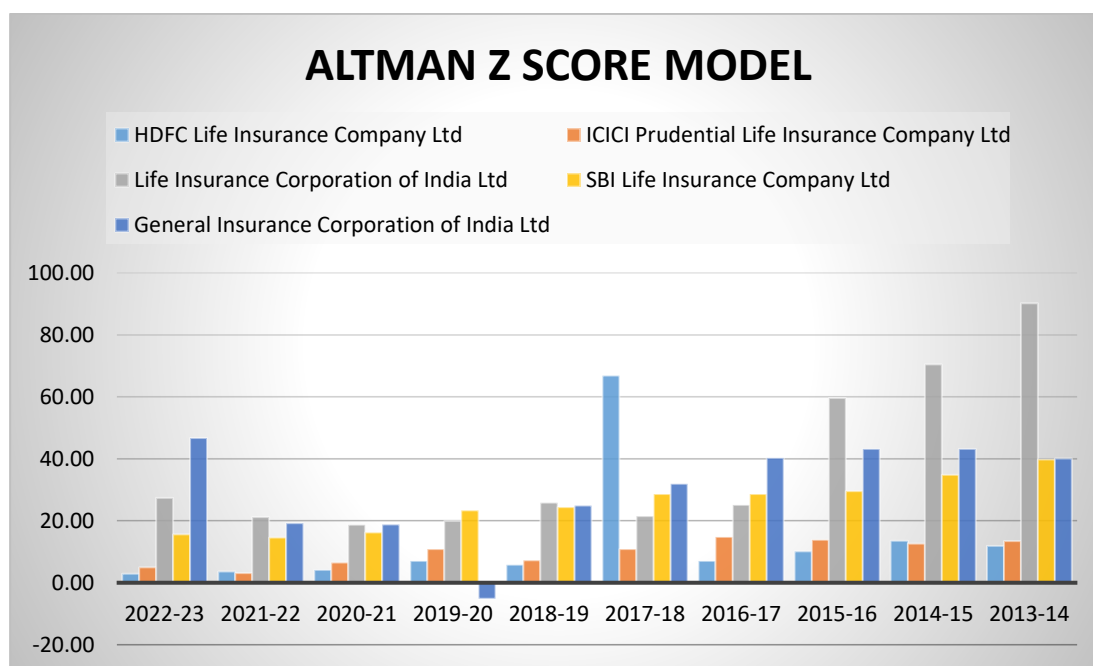


Figure 13 : Altman Z-Score

The Altman Z-Score model, developed by Professor Edward Altman, is a widely used financial tool to assess a company's likelihood of bankruptcy within a specific timeframe, typically two years. It's particularly valuable for evaluating the financial health and stability of companies, including insurance firms. The model incorporates multiple financial ratios to generate a composite score, with values above a certain threshold suggesting a lower risk of bankruptcy, while scores below the threshold indicate a higher risk.

HDFC Life Insurance Company Ltd

HDFC Life's Altman Z-Score showed significant fluctuations over the years. The highest score was 66.85 in 2017-18, indicating an exceptionally strong financial position and minimal risk of bankruptcy at that time. However, by 2022-23, the score dropped to 2.87, suggesting a notable decline in financial stability. While still above the danger threshold, this decrease highlights the need for vigilant financial management.

ICICI Prudential Life Insurance Company Ltd

ICICI Prudential's Z-Score reached its peak at 14.78 in 2016-17, reflecting strong financial health. In subsequent years, the score experienced some volatility, with a significant decrease to 3.13 in 2021-22, before rising again to 4.97 in 2022-23. These fluctuations indicate changing financial conditions, but the company generally maintained scores indicating reasonable financial stability.

Life Insurance Corporation of India Ltd

The Life Insurance Corporation (LIC) consistently demonstrated very high Z-Scores, peaking at 90.20 in 2013-14. These scores suggest that LIC has maintained a robust financial position with very low bankruptcy risk over the years. Even though there was a decrease to 18.75 in 2020-21, the company still showed strong financial stability, evidenced by a score of 27.41 in 2022-23.

SBI Life Insurance Company Ltd

SBI Life's highest Z-Score was 39.74 in 2013-14, indicating strong financial health. Over the years, the scores slightly declined but remained significantly high, with a score of 15.60 in 2022-23. These scores reflect a stable and healthy financial position, suggesting low bankruptcy risk throughout the period.

General Insurance Corporation of India Ltd

General Insurance Corporation (GIC) displayed a high level of financial stability in earlier years, with a peak Z-Score of 46.66 in 2022-23. Despite a notable dip to -5.12 in 2019-20, which indicated financial distress, the subsequent recovery to 46.66 demonstrates a significant improvement and strong financial management.

The Altman Z-Scores for these insurance companies generally indicate strong financial stability and low risk of bankruptcy. However, fluctuations in scores, such as those seen in HDFC Life and General Insurance Corporation, highlight the importance of continuous monitoring and proactive financial management. Maintaining a strong financial position is crucial for insurance firms to instill investor confidence, ensure operational resilience, and mitigate bankruptcy risks in an ever-changing market environment.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Table 26 : Descriptive Statistics of Altman Z-Score

ALTMAN Z SCORE MODEL					
PARTICULAR	HDFC Life Insurance Company Ltd	ICICI Prudential Life Insurance Company Ltd	Life Insurance Corporation of India Ltd	SBI Life Insurance Company Ltd	General Insurance Corporation of India Ltd
Mean	11.786	7.948	8.055	11.862	30.328
Standard Error	1.682	1.011	1.461	1.186	5.096
Median	10.283	7.866	5.508	11.737	36.040
Standard Deviation	5.319	3.198	4.620	3.751	16.116
Sample Variance	28.296	10.226	21.343	14.069	259.727
Kurtosis	-0.796	-1.588	0.026	-0.656	1.346
Skewness	0.526	0.047	1.144	0.370	-1.228
Range	16.335	8.850	13.158	11.495	51.782
Minimum	5.014	3.788	4.106	7.028	-5.118
Maximum	21.350	12.638	17.264	18.523	46.664
Sum	117.863	79.482	80.552	118.625	303.277
Count	10	10	10	10	10

The table provides a detailed statistical analysis of the Altman Z-Score for five different insurance companies: HDFC Life Insurance Company Ltd, ICICI Prudential Life Insurance Company Ltd, Life Insurance Corporation of India Ltd, SBI Life Insurance Company Ltd, and General Insurance Corporation of India Ltd. This interpretation will cover the mean, standard error, median, standard deviation, sample variance, kurtosis, skewness, range, minimum, maximum, sum, and count values for each company, followed by a comparative analysis.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

HDFC Life Insurance Company Ltd

- **Mean:** The mean Z-Score is 11.786, indicating strong financial health.
- **Standard Error:** The standard error is 1.682, suggesting moderate reliability of the mean estimate.
- **Median:** The median value is 10.283, slightly lower than the mean, indicating a positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 5.319 and the sample variance is 28.296, indicating high variability.
- **Kurtosis:** The kurtosis of -0.796 suggests a flatter distribution than normal.
- **Skewness:** The skewness of 0.526 indicates a moderate positive skew.
- **Range:** The range is 16.335, with minimum and maximum values of 5.014 and 21.350, respectively.
- **Sum and Count:** The total sum is 117.863 over 10 observations.

ICICI Prudential Life Insurance Company Ltd

- **Mean:** The mean Z-Score is 7.948, indicating good financial health but lower compared to peers.
- **Standard Error:** The standard error is 1.011, indicating high reliability of the mean estimate.
- **Median:** The median value is 7.866, very close to the mean, indicating a nearly symmetrical distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 3.198 and the sample variance is 10.226, indicating moderate variability.
- **Kurtosis:** The kurtosis of -1.588 suggests a significantly flatter distribution than normal.
- **Skewness:** The skewness of 0.047 indicates a nearly symmetrical distribution.
- **Range:** The range is 8.850, with minimum and maximum values of 3.788 and 12.638, respectively.
- **Sum and Count:** The total sum is 79.482 over 10 observations.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Life Insurance Corporation of India Ltd

- **Mean:** The mean Z-Score is 8.055, indicating good financial health.
- **Standard Error:** The standard error is 1.461, suggesting moderate reliability of the mean estimate.
- **Median:** The median value is 5.508, significantly lower than the mean, indicating a strong positive skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 4.620 and the sample variance is 21.343, indicating high variability.
- **Kurtosis:** The kurtosis of 0.026 suggests a distribution close to normal.
- **Skewness:** The skewness of 1.144 indicates a strong positive skew.
- **Range:** The range is 13.158, with minimum and maximum values of 4.106 and 17.264, respectively.
- **Sum and Count:** The total sum is 80.552 over 10 observations.

SBI Life Insurance Company Ltd

- **Mean:** The mean Z-Score is 11.862, indicating strong financial health.
- **Standard Error:** The standard error is 1.186, indicating high reliability of the mean estimate.
- **Median:** The median value is 11.737, very close to the mean, indicating a nearly symmetrical distribution.
- **Standard Deviation and Sample Variance:** The standard deviation is 3.751 and the sample variance is 14.069, indicating moderate variability.
- **Kurtosis:** The kurtosis of -0.656 suggests a flatter distribution than normal.
- **Skewness:** The skewness of 0.370 indicates a slight positive skew.
- **Range:** The range is 11.495, with minimum and maximum values of 7.028 and 18.523, respectively.
- **Sum and Count:** The total sum is 118.625 over 10 observations.

General Insurance Corporation of India Ltd

- **Mean:** The mean Z-Score is 30.328, indicating the strongest financial health among the companies analysed.
- **Standard Error:** The standard error is 5.096, suggesting lower reliability of the mean estimate due to high variability.
- **Median:** The median value is 36.040, higher than the mean, indicating a strong negative skew.
- **Standard Deviation and Sample Variance:** The standard deviation is 16.116 and the sample variance is 259.727, indicating very high variability.
- **Kurtosis:** The kurtosis of 1.346 suggests a distribution with heavier tails than normal.
- **Skewness:** The skewness of -1.228 indicates a strong negative skew.
- **Range:** The range is 51.782, with minimum and maximum values of -5.118 and 46.664, respectively.
- **Sum and Count:** The total sum is 303.277 over 10 observations.

Comparative Analysis

Financial Health: GIC demonstrates the strongest financial health with a mean Z-Score of 30.328. HDFC Life and SBI Life also show strong financial health with mean scores of 11.786 and 11.862, respectively. LIC and ICICI Prudential have lower mean scores of 8.055 and 7.948, indicating comparatively weaker financial health.

Variability: GIC exhibits the highest variability in Z-Scores, indicated by its high standard deviation and sample variance. HDFC Life and LIC also show high variability. ICICI Prudential and SBI Life exhibit more stable performance with lower variability.

Distribution Shape: LIC exhibits a strong positive skew and heavy tails, suggesting the presence of extreme values. GIC shows a strong negative skew and heavy tails, indicating occasional very low scores. HDFC Life, ICICI Prudential, and SBI Life have distributions closer to normal.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

Reliability of Mean Estimates: ICICI Prudential and SBI Life have the most reliable mean estimates due to their lower standard errors. GIC and HDFC Life show less reliability due to higher standard errors. Overall, GIC demonstrates the strongest financial health according to the Altman Z-Score, albeit with high variability and occasional very low scores. HDFC Life and SBI Life also show strong financial health with moderate variability. LIC and ICICI Prudential, while still indicating good financial health, show lower mean scores and higher variability, with LIC exhibiting a tendency for extreme positive values.

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
HDFC Life Insurance Company Ltd	10	133.0106	13.30106	366.5572
ICICI Prudential Life Insurance Company Ltd	10	98.13412	9.813412	16.67728
Life Insurance Corporation of India Ltd	10	380.0619	38.00619	657.4608
SBI Life Insurance Company Ltd	10	255.512	25.5512	70.6448
General Insurance Corporation of India Ltd	10	303.2772	30.32772	259.7268

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	5525.457	4	1381.364	5.037552	0.001928	2.578739
Within Groups	12339.6	45	274.2134			
Total	17865.06	49				

H0 = There is no significant difference in Altman Z Score Model for selected insurance companies of India.

Financial Performance Analysis of Selected Insurance Companies in India with
Reference to the Altman Z Score Model

H1 = There is significant difference in Altman Z Score Model for selected insurance companies of India.

INTERPRETATION

From above table for 4 and 45 degree of freedom

Fcal is 5.037 and Ftab is 2.578

P-value is 0.001

Thus, $F_{cal} < F_{tab}$ and p-value is higher than specified α of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in Altman Z Score Model for selected insurance companies of India.

4.3 RELATION BETWEEN FINANCIAL PERFORMANCE AND ALTMAN Z SCORE MODEL

1. RELATION BETWEEN ASSET TURNOVER RATIO (%) AND ALTMAN Z SCORE MODEL

Table 27 : Relation between Asset Turnover Ratio (%) and Altman Z Score Model

Correlations			
		ASSET TURNOVER RATIO (%)	ALTMAN Z SCORE MODEL
ASSET TURNOVER RATIO (%)	Pearson Correlation	1	.431
	Sig. (2-tailed)		.213
	N	10	10
ALTMAN Z SCORE MODEL	Pearson Correlation	.431	1
	Sig. (2-tailed)	.213	
	N	10	10

H0 = There is no correlation between Asset Turnover Ratio (%) and Altman Z Score Model of selected Insurance companies of India.

H1 = There is correlation between Asset Turnover Ratio (%) and Altman Z Score Model of selected Insurance companies of India.

INTERPRETATION

From the above table it is seen that pearson correlation value is 0.431, Significance value is 0.213 which is higher than standard value 0.05, so there is no correlation between Asset Turnover Ratio (%) and Altman Z Score Model of selected Insurance companies of India.

2. RELATION BETWEEN CURRENT RATIO (%) AND ALTMAN Z SCORE MODEL

Table 28 : Relation between Current Ratio (%) and Altman Z Score Model

Correlations			
		CURRENT RATIO	ALTMAN Z SCORE MODEL
CURRENT RATIO	Pearson Correlation	1	.841**
	Sig. (2-tailed)		.002
	N	10	10
ALTMAN Z SCORE MODEL	Pearson Correlation	.841**	1
	Sig. (2-tailed)	.002	
	N	10	10

H₀ = There is no correlation between Current Ratio and Altman Z Score Model of selected Insurance companies of India.

H₁ = There is correlation between Current Ratio and Altman Z Score Model of selected Insurance companies of India.

INTERPRETATION

From the above table it is seen that pearson correlation value is 0.841, Significance value is 0.002 which is smaller than standard value 0.05, so there is correlation between Current Ratio and Altman Z Score Model of selected Insurance companies of India.

3. RELATION BETWEEN NET PROFIT MARGIN AND ALTMAN Z SCORE MODEL

Table 29 : Relation between Net Profit Margin and Altman Z Score Model

Correlations			
		NET PROFIT MARGIN (%)	ALTMAN Z SCORE MODEL
NET PROFIT MARGIN (%)	Pearson Correlation	1	.657*
	Sig. (2-tailed)		.039
	N	10	10
ALTMAN Z SCORE MODEL	Pearson Correlation	.657*	1
	Sig. (2-tailed)	.039	
	N	10	10

H0 = There is no correlation between Net Profit Margin and Altman Z Score Model of selected Insurance companies of India.

H1 = There is correlation between Net Profit Margin and Altman Z Score Model of selected Insurance companies of India.

INTERPRETATION

From the above table it is seen that pearson correlation value is 0.657, Significance value is 0.039 which is smaller than standard value 0.05, so there is correlation between Net Profit Margin and Altman Z Score Model of selected Insurance companies of India.

4. RELATION BETWEEN PBIT MARGIN AND ALTMAN Z SCORE MODEL

Table 30 : Relation between PBIT Margin and Altman Z Score Model

Correlations			
		PBIT MARGIN (%)	ALTMAN Z SCORE MODEL
PBIT MARGIN (%)	Pearson Correlation	1	.673*
	Sig. (2-tailed)		.033
	N	10	10
ALTMAN Z SCORE MODEL	Pearson Correlation	.673*	1
	Sig. (2-tailed)	.033	
	N	10	10

H0 = There is no correlation between PBIT Margin and Altman Z Score Model of selected Insurance companies of India.

H1 = There is correlation between PBIT Margin and Altman Z Score Model of selected Insurance companies of India.

INTERPRETATION

From the above table it is seen that pearson correlation value is 0.673, Significance value is 0.033 which is higher than standard value 0.05, so there is correlation between PBIT Margin and Altman Z Score Model of selected Insurance companies of India.

5. RELATION BETWEEN PBT MARGIN AND ALTMAN Z SCORE MODEL

Table 31 : Relation between PBT Margin and Altman Z Score Model

Correlations			
		PBT MARGIN (%)	ALTMAN Z SCORE MODEL
PBT MARGIN (%)	Pearson Correlation	1	.674*
	Sig. (2-tailed)		.032
	N	10	10
ALTMAN Z SCORE MODEL	Pearson Correlation	.674*	1
	Sig. (2-tailed)	.032	
	N	10	10

H0 = There is no correlation between PBT Margin and Altman Z Score Model of selected Insurance companies of India.

H1 = There is correlation between PBT Margin and Altman Z Score Model of selected Insurance companies of India.

INTERPRETATION

From the above table it is seen that pearson correlation value is 0.674, Significance value is 0.032 which is higher than standard value 0.05, so there is correlation between PBT Margin and Altman Z Score Model of selected Insurance companies of India.

6. RELATION BETWEEN ROA (%) AND ALTMAN Z SCORE MODEL

Table 32 : Relation between ROA (%) and Altman Z Score Model

Correlations			
		RETURN ON ASSETS (%)	ALTMAN Z SCORE MODEL
RETURN ON ASSETS (%)	Pearson Correlation	1	.986**
	Sig. (2-tailed)		.000
	N	10	10
ALTMAN Z SCORE MODEL	Pearson Correlation	.986**	1
	Sig. (2-tailed)	.000	
	N	10	10

H0 = There is no correlation between Return on Assets and Altman Z Score Model of selected Insurance companies of India.

H1 = There is correlation between Return on Assets and Altman Z Score Model of selected Insurance companies of India.

INTERPRETATION

From the above table it is seen that pearson correlation value is 0.986, Significance value is 0.000 which is smaller than standard value 0.05, so there is correlation between Return on Assets and Altman Z Score Model of selected Insurance companies of India.

7. RELATION BETWEEN ROCE (%) AND ALTMAN Z SCORE MODEL

Table 33 : Relation between ROCE (%) and Altman Z Score Model

Correlations			
		RETURN ON CAPITAL EMPLOYED (%)	ALTMAN Z SCORE MODEL
RETURN ON CAPITAL EMPLOYED (%)	Pearson Correlation	1	.707*
	Sig. (2-tailed)		.022
	N	10	10
ALTMAN Z SCORE MODEL	Pearson Correlation	.707*	1
	Sig. (2-tailed)	.022	
	N	10	10

H0 = There is no correlation between Return on Capital Employed and Altman Z Score Model of selected Insurance companies of India.

H1 = There is correlation between Return on Capital Employed and Altman Z Score Model of selected Insurance companies of India.

INTERPRETATION

From the above table it is seen that pearson correlation value is 0.707, Significance value is 0.022 which is smaller than standard value 0.05, so there is correlation between Return on Capital Employed and Altman Z Score Model of selected Insurance companies of India.

8. RELATION BETWEEN ROE (%) AND ALTMAN Z SCORE MODEL

Table 34 : Relation between ROE (%) and Altman Z Score Model

Correlations			
		RETURN ON NETWORTH / EQUITY (%)	ALTMAN Z SCORE MODEL
RETURN ON NETWORTH / EQUITY (%)	Pearson Correlation	1	.467
	Sig. (2-tailed)		.173
	N	10	10
ALTMAN Z SCORE MODEL	Pearson Correlation	.467	1
	Sig. (2-tailed)	.173	
	N	10	10

H₀ = There is no correlation between Return on Equity and Altman Z Score Model of selected Insurance companies of India.

H₁ = There is correlation between Return on Equity and Altman Z Score Model of selected Insurance companies of India.

INTERPRETATION

From the above table it is seen that pearson correlation value is 0.467, Significance value is 0.173 which is higher than standard value 0.05, so there is no correlation between Return on Equity and Altman Z Score Model of selected Insurance companies of India.