

A study on Risk and Return Analysis of Selected Stocks of Insurance Industry

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Abstract: This project work aims to analyse the risk and return characteristics of selected stocks in the insurance industry using well-established performance evaluation measures such as the Sharpe ratio, Jensen's alpha, and the Treynor ratio. The study seeks to provide investors and financial analysts with valuable insights into the performance and investment potential of these stocks.

To conduct this analysis, a carefully curated sample of insurance industry stocks will be selected, representing a diverse range of companies operating within the sector. Historical price and financial data for these stocks will be collected and analysed to calculate key risk and return metrics.

Keywords: Risk and return analysis, Sharpe ratio, Jensen's ratio, Treynor ratio, insurance industry, investment, performance evaluation.

I. INTRODUCTION

Most people currently decide to invest part of their assets through investing. Investments are undertaken at the loss of certain existing assets to gain earnings or benefits in the future. Investment is a delay in present consumption that allows money to be put towards productive assets for a predetermined amount of time. Investments might therefore be seen as a present sacrifice made to reap greater rewards in the future. Real assets and financial assets make up the two categories of investments. Real asset investments are those made in intangible assets like land, buildings, apartments, homes, and other types of property.

II. RETURN

The most crucial factor to consider when making investment selections is the return on investment. The degree of profit earned by investors on a stock investment is referred to as return. Returns may be defined as the outcomes of investments in the most basic sense. Naturally, investors seek a high rate of return because the aim of investing is to make money from the earnings. However, in addition to a

high rate of return, investors should consider the dangers associated with investing.

III. RISK

Risk is the possibility that an investment may generate a lower return than predicted. This risk of loss is connected to the predicted range of return variability on the investment. The possibility that investors may lose money increases as an investment's return becomes unpredictable.

IV. LITERATURE REVIEW

J.C. BUTLER AND R.A. DOHERTY (1992) wrote "A review of risk and return analysis in the insurance industry." - This literature review investigates the insurance industry's risk and return characteristics, concentrating on the variables that determine profitability and the consequences of risk for insurance businesses. The writers also examine the methodologies used in the insurance sector to quantify risk and return, such as standard deviation, beta, and the Capital Asset Pricing Model (CAPM). A. CUMMINS AND R. WEISS (2009) - "Risk and return in the insurance industry: a review and synthesis of the literature" The purpose of this study is to offer an overview of the literature on risk and return analysis in the insurance sector, with an emphasis on the drivers of insurance company profitability and the influence of risk on returns. The authors also explore how risk and return are measured, including accounting-based measurements, market-based metrics, and risk-adjusted performance indicators.

S. SUN & C. WENG (2019) - "Risk and return in the insurance industry: a comprehensive review of the literature" This literature study investigates the insurance industry's risk and return characteristics, with an emphasis on the variables that determine risk and profitability. The authors also cover the many ways used in the insurance sector to quantify

risk and return, including as classic financial measurements, risk-adjusted metrics, and innovative measures like Value at Risk (VAR) and Conditional Value at Risk (CVAR). Furthermore, the review investigates the impact of regulatory and market factors on insurance companies' risk and return.

SWATHIGA P & S POORNIMA (2017) Their examination of the relation between risk and return is based on the capital asset pricing model. Their research is confined to two sectors (automobile and insurance) listed on the NSE, where automobile businesses have fared better and grown faster in the MARKET than insurance companies.

S. NIRMALA and KDEVENDRAN (2017) They noted in their analysis that if an investor wants to make large returns, he or she must accept a corresponding rise in risk. According to their findings, long-term investors might benefit from the market when it is less volatile.

T MALLIKARJUNAPPA and SHAINI NAVEEN (2016) In their analysis of the Bank Nifty, they explained that certain stocks move in the opposite direction of the market, while others move in the same way as the market. Finally, he proposed that investing in banks would be feasible due to their positive returns.

ANINDITA ADHIKARY & BEDANTA BORA (2015) According to their research, investing in the stock market has a variety of risks, and the real returns received by investors through scripts may differ from the predicted return. Thus, when making an investment decision, an investor can consider companies that have a high positive influence on the Sensex.

V. NEED FOR THE STUDY

Nowadays, because finance is such a vital part of the economy, every choice is based on it. As previously stated, the primary aim of the study is the potential investor who wants to engage in the securities market but is put off by the perception of unreal danger. As a result, the study will be more important for stock investing exploration and growth. It will also make minimal impact to the growth of the stock market.

VI. SCOPE OF THE STUDY:

The study will concentrate on chosen insurance firms based on their market capitalization and performance in the sector. And the study limited to five selected insurance stocks in insurance sector.

The research will compare the risk and return of the chosen insurance firms' stocks to assess their relative return and risk involved in the investment.

V. OBJECTIVES OF STUDY

- To find the risk and risk analysis of selected stocks of selected stock in insurance sector. i.e., General insurance corporation, HDFC Life insurance, ICICI Lombard General insurance, ICICI Prudential insurance, New India assurance.
- To advise the public in which insurance stocks to be invested.
- Evaluate the performance of the selected insurance stocks, analyse their 5 years returns over a given time periods.

VI LIMITATIONS OF THE STUDY

- The study has time and resources constraints.
- The study mainly relies on the secondary data are collector from annual secondary market here the studies suffer from all those limitations that associated with secondary market.
- This study includes only 5 insurance companies for the period of 5 years.
- this study only analyses the risk and return of selected insurance firms' common stock investments.

VII. RESEARCH DESIGN

Based on the objective of the study, descriptive research has adopted. Descriptive research is one which largely used to draw inferences about the possible relationship between variables. It is designed to gather descriptive information and provide information for formulating more sophisticated studies. Research design framework that states the total pattern of conducting research projects. It blueprints of the research includes calculation, analysis, interpretation, and results.

VIII. DATA COLLECTION

There is only one way to collect data i.e., secondary data. Secondary data is used in this study, with gathering techniques including library research, research findings, websites, and other relevant sources connected to the demands of the data to be investigated.

five selected stocks registered on the Bombay Stock Exchange in the insurance sub-sector from 2018 to

2023, as reported on the Economic and Business Data Centre website.

Insurance sub-sector company reports are made available to the public in their entirety on the Bombay Stock Exchange (BSE) website.

VIII. FRAMEWORK FOR THE DATA ANALYSIS

Stock return = $\frac{\text{current year price} - \text{previous year price}}{\text{Previous year price}} \times 100$

Market return: it is a return on the market portfolio of every traded security.

Market return = $\frac{\text{current year price} - \text{previous year price}}{\text{Previous year price}} \times 100$

Nifty 50 is the benchmark index chosen for the study and nifty 50 is called as return on market.

Arithmetic mean return (AM):

An efficient technique for portfolio design that works with a series of holding period returns is statistics. The requirement that holding periods be equal in length is important. Arithmetic mean return is the name given to the arithmetic average of all of them.

$$AM = \frac{\sum xi}{n}$$

Standard Deviation:

Risk is sometimes involved when the predicted return differs from the actual return on investment. This may be quantified statistically by establishing a standard deviation.

Risk is the possibility of losing an investment due to market uncertainty or poor portfolio management. Standard deviation is used to assess the risk of security.

The standard deviation formula is.

$$\sigma = \sqrt{\frac{\sum (xi - \bar{x})^2}{n}}$$

Performance evaluation of selected funds

Sharpe ratio	= $\frac{r_x - r_f}{sd}$
Treynor measure	= $\frac{r_x - r_f}{\beta}$
Jensen measure	= $r_f + \beta * (r_m - r_f)$

IX. DATA ANALYSIS & INTERPRETATION

TABLE: 1 Table showing Grand average returns and standard deviation for selected time periods.

General Insurance corporation

Year	Yearly average return	Yearly standard deviation/risk
2018-19	-3.1622	5.8869
2019 - 20	-4.4910	21.0657
2020 - 21	6.7009	16.5756
2021 - 22	-4.1970	8.2405
2022 - 23	2.1924	11.6226

Graph: 1 Graph showing grand average return and standard deviation for selected time periods.



Interpretation:

Return on Investment:

- The yearly average return fluctuated over the years, ranging from -4.4910% to 6.7009%.
- In 2018-2019 and 2021-2022, the returns were negative, indicating a loss on investment.
- In 2020-2021 and 2022-2023, the returns were positive, suggesting a gain on investment.

Risk Assessment:

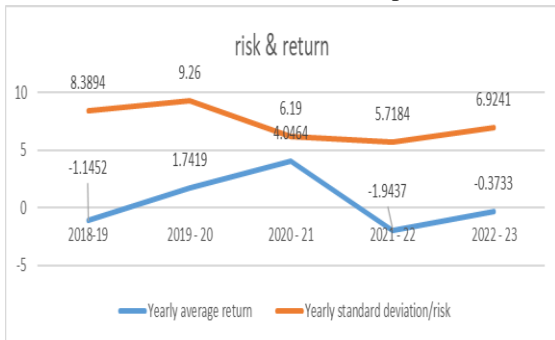
- The standard deviation/risk values varied between 5.8869 and 21.0657.
- Higher standard deviation indicates higher volatility and risk in investment returns.
- The highest risk was observed in 2019-2020, with a standard deviation of 21.0657.
- The lowest risk was observed in 2018-2019, with a standard deviation of 5.8869.
- The standard deviation decreased in 2020-2021 and 2022-2023 compared to the previous years, indicating a decrease in volatility and risk.

TABLE: 2 Table showing Grand average returns and standard deviation for selected time periods.

HDFC Life insurance		
Year	Yearly average return	Yearly standard deviation/risk
2018-19	-1.1452	8.3894
2019 - 20	1.7419	9.2600
2020 - 21	4.0464	6.1900

2021 - 22	-1.9437	5.7184
2022 - 23	-0.3733	6.9241

Graph: 2 Chart showing grand average return and standard deviation for selected time periods.



Interpretation:

Return on Investment:

- The yearly average return fluctuated over the years, ranging from -1.9437% to 4.0464%.
- In 2018-2019 and 2022-2023, the returns were negative, indicating a loss on investment.
- In 2019-2020, 2020-2021, and 2021-2022, the returns were positive, suggesting a gain on investment.

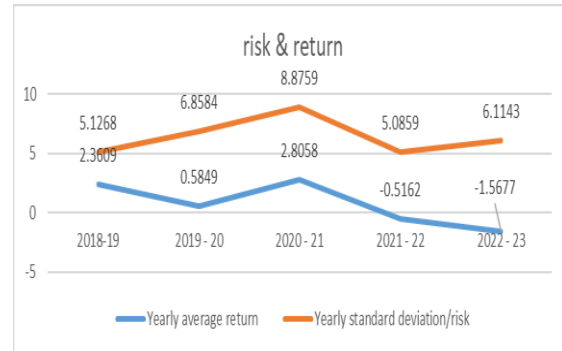
Risk Assessment:

- The standard deviation/risk values varied between 5.7184 and 9.2600.
- Higher standard deviation indicates higher volatility and risk in investment returns.
- The highest risk was observed in 2019-2020, with a standard deviation of 9.2600.
- The lowest risk was observed in 2021-2022, with a standard deviation of 5.7184.
- The standard deviation in 2020-2021 and 2022-2023 increased compared to the previous years, indicating an increase in volatility and risk.

TABLE: 18 Table showing Grand average returns and standard deviation for selected time periods.

ICICI Lombard General insurance		
Year	Yearly average return	Yearly standard deviation/risk
2018-19	2.3609	5.1268
2019 - 20	0.5849	6.8584
2020 - 21	2.8058	8.8759
2021 - 22	-0.5162	5.0859
2022 - 23	-1.5677	6.1143

Graph: 3 Chart showing grand average return and standard deviation for selected time periods.



Interpretation:

Return on Investment:

- The yearly average return fluctuated over the years, ranging from -1.5677% to 2.8058%.
- In 2021-2022 and 2022-2023, the returns were negative, indicating a loss on investment.
- In 2018-2019, 2019-2020, and 2020-2021, the returns were positive, suggesting a gain on investment.

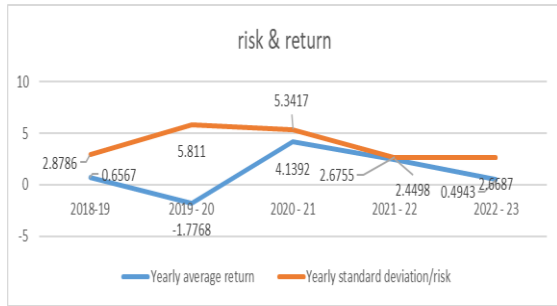
Risk Assessment:

- The standard deviation/risk values varied between 5.0859 and 8.8759.
- Higher standard deviation indicates higher volatility and risk in investment returns.
- The highest risk was observed in 2020-2021, with a standard deviation of 8.8759.
- The lowest risk was observed in 2021-2022, with a standard deviation of 5.0859.
- The standard deviation in 2020-2021 and 2022-2023 increased compared to the previous years, indicating an increase in volatility and risk.

TABLE: 4 Table showing Grand average returns and standard deviation for selected time periods.

ICICI Prudential Life		
Year	Yearly average return	Yearly standard deviation/risk
2018-19	0.6567	2.8786
2019 - 20	-1.7768	5.8110
2020 - 21	4.1392	5.3417
2021 - 22	2.4498	2.6755
2022 - 23	0.4943	2.6687

Graph: 4 Chart showing grand average return and standard deviation for selected time periods.



Interpretation:

Return on Investment:

- The yearly average return fluctuated over the years, ranging from -1.7768% to 4.1392%.
- In 2018-2019, 2019-2020, and 2022-2023, the returns were negative, indicating a loss on investment.
- In 2020-2021 and 2021-2022, the returns were positive, suggesting a gain on investment.

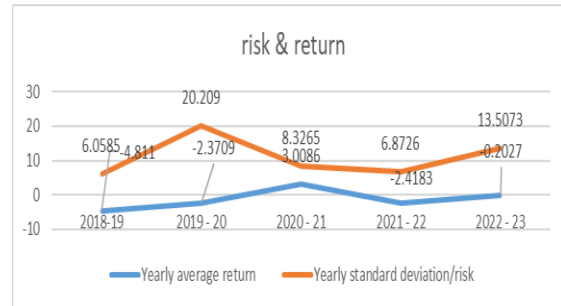
Risk Assessment:

- The standard deviation/risk values varied between 2.6687 and 5.8110.
- Higher standard deviation indicates higher volatility and risk in investment returns.
- The highest risk was observed in 2019-2020, with a standard deviation of 5.8110.
- The lowest risk was observed in 2021-2022 and 2022-2023, both with a standard deviation of 2.6687.
- The standard deviation decreased in 2020-2021 and remained relatively low in the subsequent years, indicating a decrease in volatility and risk.

TABLE: 5 Table showing Grand average returns and standard deviation for selected time periods.

The New India assurance		
Year	Yearly average return	Yearly standard deviation/risk
2018-19	-4.8110	6.0585
2019 - 20	-2.3709	20.2090
2020 - 21	3.0086	8.3265
2021 - 22	-2.4183	6.8726
2022 - 23	-0.2027	13.5073

Graph: 5 Chart showing grand average return and standard deviation for selected time periods.



Interpretation:

Return on Investment:

- The yearly average return fluctuated over the years, ranging from -4.8110% to 3.0086%.
- In 2018-2019, 2019-2020, and 2021-2022, the returns were negative, indicating a loss on investment.
- In 2020-2021, the return was positive, suggesting a gain on investment.

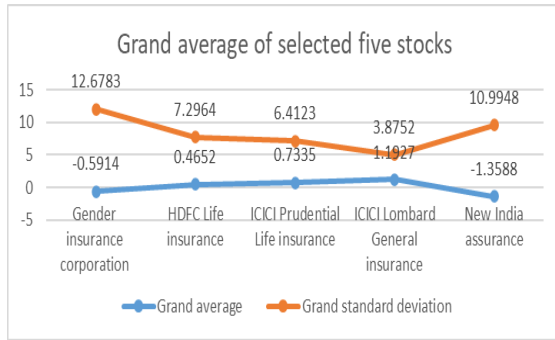
Risk Assessment:

- The standard deviation/risk values varied between 6.0585 and 20.2090.
- Higher standard deviation indicates higher volatility and risk in investment returns.
- The highest risk was observed in 2019-2020, with a standard deviation of 20.2090.
- The lowest risk was observed in 2018-2019, with a standard deviation of 6.0585.
- The standard deviation in 2022-2023 increased compared to the previous years, indicating an increase in volatility and risk.

TABLE: 6 TABLE SHOWING GRAND AVERAGE OF SELECTED 5 STOCKS

Selected stocks	Grand average	Grand standard deviation
Gender insurance corporation	-0.5914	12.6783
HDFC Life insurance	0.4652	7.2964
ICICI Prudential Life insurance	0.7335	6.4123
ICICI Lombard General insurance	1.1927	3.8752
The New India assurance	-1.3588	10.9948

Graph: 6 Graph showing grand average of selected five stocks.



Interpretation:

The above graph shows that there is high risk in both stocks i.e., The New India assurance stock and General insurance corporation with low returns. There is moderate risk and return in both stocks i.e., HDFC Life insurance and ICICI Prudential Life insurance. The ICICI Lombard General insurance given high return and low risk. So, among five stocks ICICI Lombard General insurance is given a better return while compare with other five stocks. ICICI Lombard General insurance will give a better return to the investor. So, the comparison of five stocks the ICICI Lombard General insurance given a best performance in returns.

TABLE: 7 Table showing performance evaluation of selected stocks using Sharp ratio, Traynor ratio, Jensen ratio.

Selected stocks	Fund return	Market return	beta	Standard deviation
Gender insurance corporation	-0.5914	1.0601	1.3625	12.6783
HDFC Life insurance	0.4652	1.0601	0.3314	7.2964
ICICI Prudential Life insurance	0.7335	1.0601	0.4031	6.4123
ICICI Lombard General insurance	1.1927	1.0601	0.8581	3.8752
The New India assurance	-1.3588	1.0601	0.6703	10.9948

Risk free rate = 0.067

Sharpe ratio	$=\frac{r_x - r_f}{s_d}$
Treynor measure	$=\frac{r_x - r_f}{\beta}$
Jensen measure	$=r_f + \beta * (r_m - r_f)$

Sharpe ratio: The Sharpe ratio is a measure of risk-adjusted return, indicating how much excess return an investment generates relative to its volatility.

Treynor measure: The Treynor ratio is a measure of risk-adjusted return that considers the systematic risk or beta of an investment.

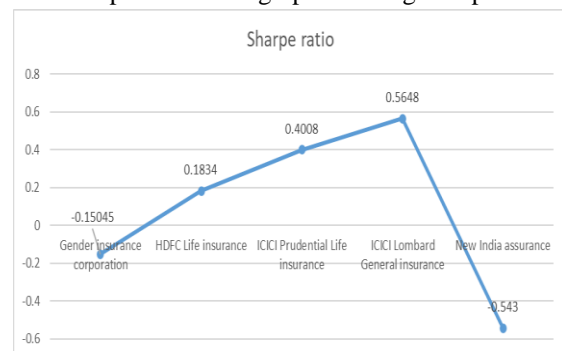
Jensen measure: The Jensen ratio, also known as the excess return ratio, measures the risk-adjusted performance of an investment by comparing its actual returns with the expected returns based on a risk-free rate and the stock's beta.

SHARPE MEASURE

Table No: 8 Table showing Calculation of Sharpe ratio for 5 selected stocks.

Selected stocks	Sharpe ratio	rank
Gender insurance corporation	-0.15045	4
HDFC Life insurance	0.1834	3
ICICI Prudential Life insurance	0.4008	2
ICICI Lombard General insurance	0.5648	1
The New India assurance	-0.5430	5

Graph No: 7 The graph showing Sharpe ratio.



Interpretation:

Among the selected insurance stocks, ICICI Lombard General Insurance has the highest Sharpe ratio of 0.5648, suggesting that it has achieved a relatively higher return per unit of risk compared to the other insurance companies. ICICI Prudential Life Insurance also demonstrates a favourable Sharpe ratio of 0.4008, indicating a relatively good risk-adjusted performance. HDFC Life Insurance follows with a positive Sharpe ratio of 0.1834, suggesting a moderate risk-adjusted return. However, both The New India assurance and Gender Insurance Corporation have negative Sharpe ratios, -0.5430 and -0.15045 respectively, indicating that their returns have not adequately compensated for the level of risk taken. Therefore, ICICI Lombard General Insurance and ICICI Prudential Life

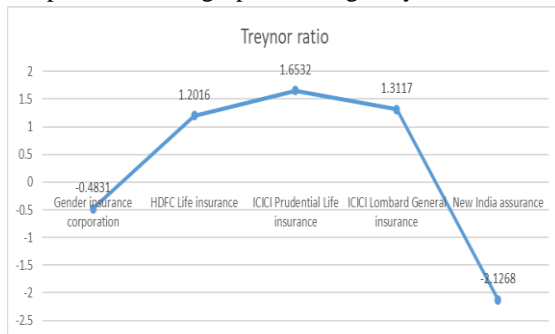
Insurance could be considered as potentially attractive investment options due to their positive and comparatively higher Sharpe ratios.

TREYNOR MEASURE

Table No: 9 Table showing Calculation Treynor ratio for 5 selected stocks.

Selected stocks	Treynor ratio
Gender insurance corporation	-0.4831
HDFC Life insurance	1.2016
ICICI Prudential Life insurance	1.6532
ICICI Lombard General insurance	1.3117
The New India assurance	-2.1268

Graph No: 8 The graph showing Treynor ratio.



Interpretation:

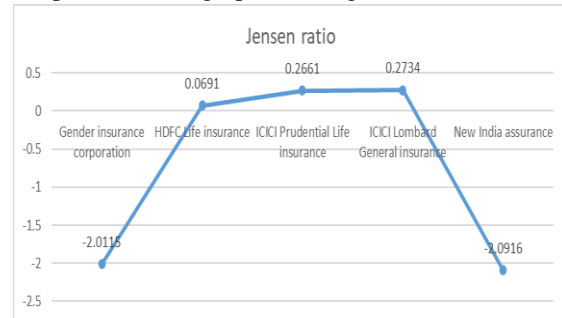
Among the selected insurance stocks, ICICI Prudential Life Insurance has the highest Treynor ratio of 1.6532, indicating that it has generated a relatively higher return per unit of systematic risk compared to the other insurance companies. ICICI Lombard General Insurance follows closely with a Treynor ratio of 1.3117, suggesting a strong risk-adjusted performance. HDFC Life Insurance also demonstrates a favourable Treynor ratio of 1.2016, indicating a relatively good risk-adjusted return. However, both Gender Insurance Corporation and The New India assurance have negative Treynor ratios, -0.4831 and -2.1268 respectively, suggesting that their returns have not adequately compensated for the systematic risk taken. Therefore, ICICI Prudential Life Insurance, ICICI Lombard General Insurance, and HDFC Life Insurance could be considered as potentially attractive investment options due to their positive and comparatively higher Treynor ratios, indicating strong risk-adjusted performance.

JENSEN MEASURE

Table No 10 Table showing calculation of Jensen ratio for 5 selected stocks.

Selected stocks	Jensen ratio
Gender insurance corporation	-2.0115
HDFC Life insurance	0.0691
ICICI Prudential Life insurance	0.2661
ICICI Lombard General insurance	0.2734
The New India assurance	-2.0916

Graph No: 9 The graph showing Jensen ratio.



Interpretation:

Among the selected insurance stocks, ICICI Lombard General Insurance has the highest Jensen ratio of 0.2734, indicating that it has generated excess returns above the expected returns given its systematic risk. ICICI Prudential Life Insurance follows closely with a Jensen ratio of 0.2661, suggesting a favourable risk-adjusted performance. HDFC Life Insurance also demonstrates a positive Jensen ratio of 0.0691, indicating a relatively good risk-adjusted return. However, both Gender Insurance Corporation and The New India assurance have negative Jensen ratios, -2.0115 and -2.0916 respectively, suggesting that their returns have fallen short of the expected returns given their systematic risk. Therefore, ICICI Lombard General Insurance, ICICI Prudential Life Insurance, and HDFC Life Insurance could be considered as potentially attractive investment options with positive Jensen ratios, indicating better-than-expected risk-adjusted performance.

X. FINDINGS

- It was found from the results that General Insurance Corporation experienced fluctuations in its yearly returns, with both gains and losses. The highest risk was observed in 2019-2020, while the lowest risk was in 2018-2019.
- It was found from the results that HDFC Life Insurance experienced fluctuations in its yearly returns, with both gains and losses. The highest risk was observed in 2019-2020, while the lowest risk was in 2021-2022.

- It was found from the results that ICICI Lombard General Insurance experienced fluctuations in its yearly returns, with both gains and losses. The highest risk was observed in 2020-2021, while the lowest risk was in 2021-2022.
- It was found from the results that ICICI Prudential Life experienced fluctuations in its yearly returns, with both gains and losses. The highest risk was observed in 2019-2020, while the lowest risk was in 2021-2022 and 2022-2023.
- It was found from the results that The New India assurance experienced fluctuations in its yearly returns, with both gains and losses. The highest risk was observed in 2019-2020, while the lowest risk was in 2018-2019.
- It was found from the results of Sharpe ratio ICICI Lombard General Insurance and ICICI Prudential Life Insurance could be considered as potentially attractive investment options due to their positive and comparatively higher Sharpe ratios.
- It was found from the results of Treynor ratio ICICI Prudential Life Insurance, ICICI Lombard General Insurance, and HDFC Life Insurance could be considered as potentially attractive investment options due to their positive and comparatively higher Treynor ratios, indicating strong risk-adjusted performance.
- It was found from the results of Jensen ratio ICICI Lombard General Insurance, ICICI Prudential Life Insurance, and HDFC Life Insurance could be considered as potentially attractive investment options with positive Jensen ratios, indicating better-than-expected risk-adjusted performance.

CONCLUSION

Since Risk and Returns analysis are important in the evaluation of investment the investment in capital market. Initially investors evaluated securities almost entirely based on the rate of return and risk. In conclusion, the analysis of various insurance companies' yearly returns reveals that General Insurance Corporation, HDFC Life Insurance, ICICI Lombard General Insurance, ICICI Prudential Life Insurance, and The New India Assurance all experienced fluctuations in their returns, with both gains and losses. The highest risk was observed

during the 2019-2020 period for most companies, while the lowest risk varied across different years for each company.

Based on the evaluation of Sharpe ratio, ICICI Lombard General Insurance and ICICI Prudential Life Insurance stand out as potentially attractive investment options due to their positive and comparatively higher Sharpe ratios, indicating a better risk-adjusted performance. Additionally, when considering the Treynor ratio, ICICI Prudential Life Insurance, ICICI Lombard General Insurance, and HDFC Life Insurance exhibit strong risk-adjusted performance, making them potentially attractive investments. Moreover, based on the Jensen ratio, ICICI Lombard General Insurance, ICICI Prudential Life Insurance, and HDFC Life Insurance also demonstrate better-than-expected risk-adjusted performance, further highlighting their potential as attractive investment options.

These findings suggest that investors seeking insurance companies with favourable risk-adjusted performance should consider ICICI Lombard General Insurance, ICICI Prudential Life Insurance, and HDFC Life Insurance. However, it is important to note that investment decisions should be made after considering various other factors, such as the investors' risk tolerance, financial goals, and market conditions.

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