

RISK AND RETURN ANALYSIS OF EQUITY SHARES WITH REFERENCE TO TOP 5 COMPANIES IN BSE SENSEX

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ABSTRACT

This study investigates the risk and return profiles of the top five companies listed on the BSE Sensex—Reliance Industries Ltd., Tata Consultancy Services, HDFC Bank, Infosys, and Hindustan Unilever Ltd.—for the period from January 2022 to December 2023. The primary objective is to evaluate the relationship between risk and return, offering insights to investors for informed decision-making. Key financial metrics such as the Sharpe ratio, Treynor ratio, and Jensen's alpha were employed to assess risk-adjusted performance.

The findings reveal significant differences in the risk-return dynamics across these companies. TCS and HDFC emerged as strong performers in terms of risk-adjusted returns, while Reliance and Infosys demonstrated higher volatility and underperformance relative to market benchmarks. The study highlights the importance of considering risk-adjusted metrics rather than just absolute returns for more accurate assessments of investment performance.

Ultimately, the study suggests that investors should adopt a diversified portfolio strategy, focusing on long-term returns and market conditions. Recommendations include balancing high-growth, volatile stocks with more stable investments to optimize risk management.

Keywords: Risk and Return BSE Sensex, volatility, absolute returns, long term returns, performance assessment.

1. INTRODUCTION

The analysis of risk and return profiles is a cornerstone of modern investment strategies and portfolio management. For investors, understanding the relationship between the risk they are willing to take and the expected return is critical in making informed investment decisions. This research study focuses on the companies listed on the BSE Sensex, the benchmark index of the Bombay Stock Exchange, which represents 30 of the largest and most actively traded stocks in India.

The BSE Sensex serves as a barometer for the Indian economy and provides insights into the financial health of the country's corporate sector. By examining the risk and return profiles of these companies, investors can gain a deeper understanding of their performance characteristics, volatility, and potential for returns. This analysis also helps in identifying the diversification benefits within the Sensex portfolio and aids in constructing optimized portfolios that align with individual risk tolerance and investment goals.

This research involves a comprehensive study of historical stock price data, financial statements, and other relevant metrics to assess the risk-return dynamics. Key financial indicators such as standard deviation, beta, Sharpe ratio and other risk-adjusted return measures will be utilized to evaluate the performance of these companies. Additionally, the study will compare the risk and return profiles of these companies to the overall market and sectoral indices to provide a relative perspective.

2. REVIEW OF LITERATURE

Koh Xin Rui (2014) "The dating among danger and expected results in the Malaysian Stock exchange that CAPM" demonstrates, in most examinations, there should be a few areas that require to discontinue all research documents.

Hussein Abedi Shamsabadi (2012) "Study Evaluation about Relationship Risk-Return and Performance Steps Compare Different Commercial Sectors that" shows, The Importance of dating hazards upheld in numerous tests. The varieties among the listing of costs of backpedal on unmistakable things recommend various degrees of threat for financial backers in the essential property.

Dr. P. Subramanyam and Dr. Nalla Bala Kalyan (2018), analyzed the return and risk assessments of the equity purchased from the secondary market for ten different companies for a period of one month.

Lakshman Raj Kandel (2018), the author made an attempt to analyse the risk and return relationship of two selected commercial banks which are listed on the Nepal stock exchange.

Dr. S Poornima and Swathiga P (2017), analyzed the relationship between risk & return of 5 selected companies. These ten companies are selected from 2 different sectors i.e. automobile and IT sector, which are listed on BSE. The tools like average return, SD and CAPM model are used to perform the analysis.

Dr. M. Muthu Gopalakrishnan & Amal Vijay A K (2017), attempted to analyse the risk return aspects of ten selected pharmaceutical companies which are listed on NSE. The tools which were used to perform the analysis were mean, beta, standard deviation, alpha, correlation and covariance.

The lack of detailed sector- specific analysis, particularly , if these companies span different sectors. Understanding how sectoral dynamics affect individual company performance within Sensex could provide more granular insights. The influence of environmental, social, and governance factors might be underexplored.

The interplay between macroeconomic variables such as inflation, interest rates and GDP growth and their effect on the equity performance may not be thoroughly analyzed. A comparative analysis with previous years to understand trends and deviations might be lacking. This could help in understanding whether 2022-23 was an anomaly or part of a larger trend.

The gap in understanding the behavioral finance aspects such as investor sentiment and its effect on the risk and return of these equities. The role of technological advancements and innovations in these companies risk and return policies might not be adequately covered. There may be limited research on how the recovery phase from the COVID 19 pandemic specifically affected the risk and return dynamics of these top companies in the BSE Sensex.

3. SCOPE OF THE STUDY

The scope of this study is centered around providing valuable insights for investment decision-making and portfolio management by analyzing the risk-return profiles of the top 5 BSE Sensex companies. Investors can use this analysis to select stocks that align with their risk tolerance and investment objectives, while portfolio managers can leverage these findings to assess the risk contribution of each stock to an overall portfolio. This allows for better asset allocation strategies aimed at maximizing returns for a given level of risk.

This study aims to helps the investors, research scholars,academicians from which they can apply for different companies as per their preferences for the risk and return analysis.

4. OBJECTIVES OF THE STUDY

- 1] To identify the return generated by all the stocks for a period of two years taken for the study.
- 2] To determine the variation in the stock returns for the study period of two years stock price.
- 3] To offer meaningful suggestions to the investors based on the study.

Limitations for the study

- There is no primary data used for this study.
- The study is limited to only top 5 companies.
- Only two years data have been used for the study.
- The suggestions have been made based on the analysis of risk and return

5. RESEARCH METHODOLOGY

Convenient sampling is indeed a suitable method for analyzing risk and return profiles of Sensex companies. The companies are chosen based on the performance during the study period from January 2022- December 2023.The sample size for this study includes some companies listed in the BSE Sensex, there are 30 companies listed over there and in that 5 companies are selected to analyze risk and return. The analysis starts with the collection of monthly stock prices, including both starting and closing prices, from January 2022 to December 2023.

In this context, the population would be all the companies included in the Sensex index.BSE has 30 top performing companies of prominent sectors. The sampling unit is the individual element or member of the population that is selected for inclusion in the sample. In this case, the sampling unit would be top 5 companies during the study period of 2022-2023.

Sources and data collection

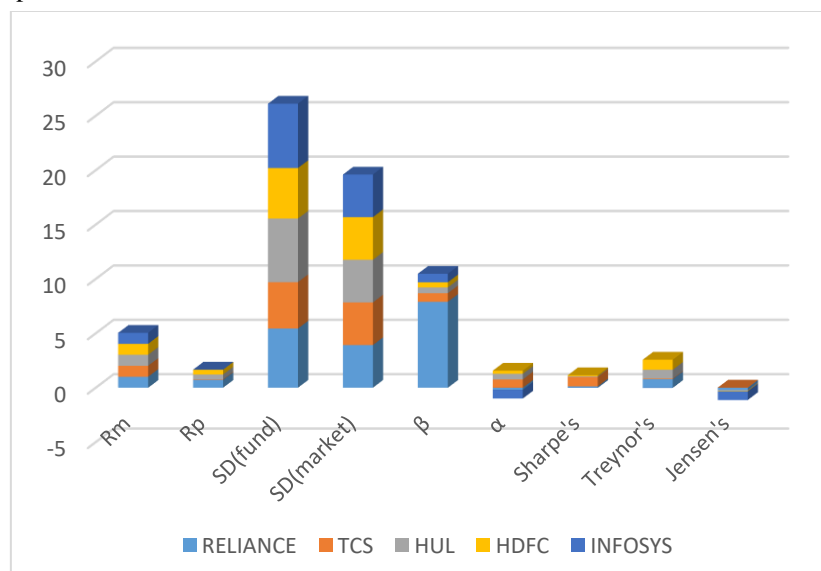
- Bombay Stock Exchange (BSE) India: Offers similar data as NSE. Financial Websites
- Yahoo Finance: Provides historical stock prices, financial data, and news for various companies.
- Annual reports, quarterly reports, and other financial disclosures of individual companies. These can be accessed through company websites or regulatory filings.
- Research papers on risk and return analysis, particularly those focused on the Indian stock market, can provide valuable insights and methodologies.
- Data from Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI), and other regulatory bodies can be useful for analysis and industry-specific information.

Comparison between different companies

Particulars	RELIANCE	TCS	HUL	HDFC	INFOSYS
Rm	1.01	1.01	1.01	1.01	1.01
Rp	0.73	0.047	0.4416	0.4416	0.0046
SD(fund)	5.44	4.27	5.84	4.65	5.915
SD(market)	3.92	3.92	3.92	3.92	3.92
β	7.9	0.792	0.53	0.471	0.784
α	-0.18	0.763	0.517	0.291	-0.8022
Sharpe's	0.13	0.864	0.0635	0.0935	-0.00048
Treynor's	0.79	0.0466	0.8208	0.9227	-0.00362
Jensen's	-0.193	0.0139	-0.097	-0.037	-0.789

Analysis:

- Market Return (Rm = 1.01):** All stocks are compared against the same market return, set at 101% for analysis.
- Portfolio Returns (Rp):** Reliance has the highest return (73%), followed by HUL and HDFC (44.16%), TCS (4.7%), and Infosys with the lowest (0.46%).
- SD (Risk):** Reliance is the most volatile with a SD of 5.44, while HDFC is the least volatile at 4.65. TCS, HUL, and Infosys have moderate volatility.
- Beta (Market Sensitivity):** Reliance has an extremely high beta of 7.9, indicating high market sensitivity, while HDFC has the lowest beta (0.471), suggesting the least market sensitivity.
- Alpha (Excess Return):** TCS (0.763), HUL (0.517), and HDFC (0.291) show positive alphas, indicating outperformance. Reliance (-0.18) and Infosys (-0.8022) show negative alphas, indicating underperformance.
- Sharpe Ratios:** TCS has the highest Sharpe ratio (0.864), reflecting the best risk-adjusted return, while Infosys has the lowest (-0.00048), showing poor risk-adjusted returns.
- Treynor Ratios:** HDFC (0.9227) has the best market risk-adjusted return, while Infosys has a negative Treynor ratio (-0.00362), indicating poor performance relative to market risk.
- Jensen's Alpha:** TCS (0.0139) shows slight outperformance when adjusted for risk, while Infosys (-0.789) and Reliance (-0.193) exhibit significant underperformance.
- HUL and HDFC:** Both have positive Sharpe, Treynor, and alpha values, but HUL's risk-adjusted performance is slightly weaker than HDFC.
- Infosys:** Shows the worst performance across all key metrics, with negative Sharpe, Treynor, and Jensen's ratios, and the lowest alpha.



Graph no 1

Interpretation:

1. **Reliance:** While it provides the highest return (73%), its high volatility and beta make it extremely risky, and its negative alpha and Jensen's ratios indicate underperformance relative to the market.
2. **TCS:** Despite lower absolute returns (4.7%), TCS exhibits strong risk-adjusted performance with a high Sharpe ratio (0.864) and positive alpha, making it an attractive stock for risk-averse investors.
3. **HUL:** With a moderate return (44.16%), low beta (0.53), and positive alpha (0.517), HUL balances risk and return well but could improve in risk-adjusted performance (low Sharpe ratio of 0.0635).
4. **HDFC:** Provides good risk-adjusted performance with a Sharpe ratio (0.0935) and the best Treynor ratio (0.9227), making it a strong performer relative to market risk.
5. **Infosys:** Poor performance is evident, with almost zero returns, negative alpha, and poor risk-adjusted metrics (Sharpe, Treynor, and Jensen's ratios), suggesting underperformance both in absolute and relative terms.
6. **Overall Comparison:** TCS is the most efficient on a risk-adjusted basis, while Reliance and Infosys, despite high market engagement, struggle with excessive risk and underperformance.
7. **Risk Evaluation:** Reliance's high risk and market sensitivity make it suitable for high-risk, high-reward investors, whereas HUL, TCS, and HDFC provide more stable, risk-efficient options.
8. **Outperformance:** Stocks with positive alpha values (TCS, HUL, HDFC) outperformed the market when it is adjusted for risk, making them potentially better investments.
9. **Underperformance:** Reliance and Infosys both underperformed the market, as indicated by their negative alpha and Jensen's ratios, making them less attractive for investors focused on risk-adjusted returns.
10. **Investment Strategy:** Investors should favor stocks like TCS and HDFC for lower risk and better risk-adjusted returns, while Reliance and Infosys require caution due to their high volatility and underperformance.

HYPOTHESIS TESTING

Hypothesis on average returns

- **Null Hypothesis (H_0):** There is a significant difference in risk of stocks of different companies.
- **Alternative Hypothesis (H_1):** There is a significant difference in difference in risk of stocks of different companies.

Company	SD
Reliance	5.44
TCS	4.27
HUL	5.84
HDFC	4.65
Infosys	5.915

Chi-Square Test Frequencies

SD

Observed N		Expected N	Residual
4.27	1	1.0	.0
4.65	1	1.0	.0
5.44	1	1.0	.0
5.84	1	1.0	.0
5.92	1	1.0	.0
Total	5		

The observed frequency could be the observed standard deviation (SD) of the stock returns for each of the top companies, as listed in your analysis (e.g., Reliance, TCS, HUL, etc.).

The expected frequency for the standard deviation was based on an assumption that all stocks should follow the same risk distribution.

Analysis:

The table supplied is a Chi-Square test of goodness-of-fit, with the observed and expected frequencies for five categories of standard deviation (SD) value. In each category, both the observed and expected values are identical and the residuals for each category are 0. The value for the Chi-Square statistic is 0 since it reveals no differences between observed and expected values.

The degrees of freedom (df) for the test is 4, which is determined by the formula (number of categories - 1). Since the Chi-Square value is 0 and the associated p-value (Asymp. Sig.) is 1.000, it indicates that there is no significant difference between the observed and expected frequencies. This means the observed distribution perfectly matches the expected one.

Test Statistics

SD

Chi-Square	.000 ^a
df	4
Asymp. Sig.	1.000

a. 5 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 1.0.

Interpretation:

With the Chi-Square test, the standard deviation values are distributed in such a manner that no variation from the expected pattern is identified, for both observed and expected values are the same. This therefore implies a value of 0 for the Chi-Square, indicating no difference between the two distributions.

With a p-value of 1.000, there is strong evidence to fail to reject the null hypothesis. This means the observed frequencies do not significantly differ from the expected frequencies, and the distribution of the standard deviation values follows the expected pattern exactly. Hence, the test shows no evidence of any variation in the SD distribution.

There is no significant deviation, and the test fails to reject the null hypothesis. The values of the stock prices are indifferent from one another indicating that the investor is safe to invest in these companies with less risk expectancy.

6. SUMMARY OF FINDINGS

- Reliance: High return (73%) but poor risk-adjusted performance due to high beta (7.9) and negative alpha (-0.18).
- TCS: Moderate return (4.7%), best risk-adjusted performance (Sharpe ratio: 0.864, positive alpha: 0.0139).
- HUL: Return of 44.16%, low beta (0.53), but inadequate risk compensation (Sharpe ratio: 0.0635).
- HDFC: Stable return (44.16%), positive risk-adjusted returns (Sharpe ratio: 0.0935, Treynor ratio: 0.9227).
- Infosys: Poor performance with negligible returns (0.0046) and negative risk metrics (Sharpe ratio: -0.00048, alpha: -0.8022)

Findings of Hypothesis:

- Chi-Square Test: No significant difference between observed and expected SD values, indicating minimal risk.
- One-Sample t-Test: Results close to significance, but further investigation is needed. Confidence interval shows uncertainty in returns.

7. CONCLUSION

On the other hand, Reliance Industries and Infosys showcased underperformance when adjusted for risk. Despite Reliance's high returns, its negative alpha and high volatility suggest that it struggles to outperform the market on a risk-adjusted basis. Infosys, meanwhile, exhibited poor performance across all the metrics, indicating that investors may need to reassess their investment strategies in this company. TCS and HDFC show efficient risk management, while Reliance and Infosys underperform in risk-adjusted metrics.

8. SUGGESTIONS

- Caution with Reliance due to high volatility.
- Maintain or increase holdings in TCS for moderate-risk investors.
- Diversify portfolios to manage HUL's volatility.
- Re-evaluate HDFC based on its mixed performance.
- Consider reducing positions in Infosys due to underperformance.

9. REFERENCE

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- [1] Koh Xin Rui (2014) "The dating among danger and expected results in the Malaysian Stock exchange that CAPM"
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- [3] Lakshman Raj Kandel (2018), the author made an attempt to analyse the risk and return relationship of two selected commercial banks which are listed on the Nepal stock exchange.
- [4] Dr. S Poornima and Swathiga P (2017), analyzed the relationship between risk & return of 5 selected companies. These ten companies are selected from 2 different sectors i.e. automobile and IT sector,

Web links

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