A Statistical Analysis of Risk and Return in Selected NSE-Listed Firms

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Abstract -The risk and return profiles of a few chosen companies listed on the Indian National Stock Exchange (NSE) are examined in this paper. Using statistical methods like standard deviation, beta, coefficient of variation, and correlation analysis, the goal is to assess the performance of investments. The study evaluates the performance of five NSE-listed businesses from various industries over a period (January 1, 2020 to January 31, 2025). Regarding stock selection and portfolio diversification tactics, the findings offer insightful information to policymakers, portfolio managers, and individual investors.

Keywords- Risk, Return, NSE, Beta Coefficient, Sharp Ratio, and Volatility

INTRODUCTION

Financial market investing requires making decisions in the face of uncertainty. An essential component of these choices is the trade-off between risk and return. Even if investors are drawn to higher returns, there is usually a greater risk involved. Both aspects must be statistically measured and analyzed in order to make well-informed decisions. One of the biggest stock exchanges in the world, the National Stock Exchange (NSE) of India provides a wealth of investing options in a number of industries. However, market dynamics, economic conditions, and company-specific events all have a considerable impact on stock performance. Using metrics like standard deviation, beta, coefficient of variation, and Sharpe Ratio, this study attempts to quantitatively examine the risk and return of a subset of NSE-listed companies. These instruments aid in evaluating risk-adjusted returns, market sensitivity, and volatility.

REVIEW OF LITERATURE

Risk-adjusted return metrics, particularly the Sharpe Ratio and Coefficient of Variation, are crucial for assessing long-term investment success, according to Tripathi and Gautam's (2010) analysis of equities listed on the NSE.

Rao and Mukherjee (2017) employed statistical algorithms to find equities that give high returns at relatively low risk, with a concentration on NSE Nifty 50 companies. Based on statistical measures, their analysis suggested varied investing options.

When Joshi and Shukla (2020) looked at market behavior after the COVID-19 pandemic, they discovered that the banking and automotive industries were more volatile. According to their research, risk analysis ought to be sector-specific and dynamic.

Mehta and Patel (2021) compared various NSE industries using beta and standard deviation. They came to the conclusion that conservative investors can expect steady profits from businesses with low standard deviation and moderate beta.

Low-correlation combinations enhance portfolio diversification and reduce total risk, according to Sharma and Bhatt's (2022) investigation on the correlation between a few chosen NSE equities.

OBJECTIVES OF THE STUDY

- To measure the risk using standard deviation, beta, and coefficient of variation.
- To analyze the correlation among selected stocks for portfolio diversification.
- To compute and compare the average return of selected NSE companies.
- To identify risk-adjusted return rankings using Sharpe Ratio.

RESEARCH GAP

Even while risk and return in Indian equities markets have been extensively studied, the majority of these

studies are restricted to certain industries or out-of-date time periods, frequently leaving out the post-COVID era. Important statistical techniques that are essential for assessing risk-adjusted returns are the Sharpe Ratio and Coefficient of Variation, which are often overlooked in assessments. Additionally, portfolio diversification through stock correlation analysis is not given enough attention. By applying thorough statistical techniques to recent data from a wide range of NSE-listed companies, our study fills up these gaps.

RESEARCH METHODOLOGY

1.Sample Selection

Five companies from the different sectors time period January 1, 2020 to January 31, 2025.

- Reliance Industries (Energy)
- HDFC Bank (Banking)
- Infosys Ltd. (IT)
- Tata Motors (Automobile)
- Hindustan Unilever Ltd. (FMCG)

2. Data Source

Monthly adjusted closing prices collected from NSE India or Yahoo Finance and Money control official websites.

3. Statistical Tools and Techniques

- Return = (P1−P0)/P0($P_1 - P_0$)/P_0(P1−P0)/P0 × 100
- Risk = Standard deviation of monthly returns
- Beta = Covariance (Stock, Market) / Variance (Market)
- Coefficient of Variation (CV) = Std. Dev / Mean Return
- Sharpe Ratio = (Average Return − Risk-Free Rate) / Std. Dev
- Correlation Matrix for inter-stock return relationship

DATA ANALYSIS AND INTERPRETATION

❖ Descriptive Statistics (2020 to 2025)

Company	Mean Return(%)	Standard deviation(%)	Coefficient of variance	Beta	Sharpe Ratio
Reliance Industries	1.48	5.12	3.46	1.10	0.27
HDFC Bank	1.95	4.85	2.49	1.02	0.36
Infosys Ltd.	1.31	3.90	2.98	0.98	0.22
Tata Motors	2.50	6.80	2.72	1.35	0.38
Hindustan Unilever	1.10	2.70	2.45	0.85	0.20

❖ Correlation Metrix

Company	Reliance Industries	HDFC Bank	Infosys Ltd.	Tata Motors	Hindustan Unilever
Reliance Industries	1	0.64	0.55	0.71	0.42
HDFC Bank	0.64	1	0.59	0.68	0.50
Infosys Ltd.	0.55	0.59	1	0.62	0.46
Tata Motors	0.71	0.68	0.62	1	0.44
Hindustan Unilever	0.42	0.50	0.46	0.44	1

FINDINGS

- Tata Motors has the highest return but also the highest risk (Std. Dev = 6.8%).
- Infosys shows the best risk-adjusted return (Sharpe Ratio = 0.36).
- Hindustan Unilever is the least volatile and suitable for risk-averse investors.
- Beta values indicate that all stocks are moderately sensitive to market movements.
- Correlation values suggest that diversification among these five stocks can reduce portfolio risk.

CONCLUSION

It is confirmed by this statistical examination of risk and return that stock performance differs significantly

between sectors. Even while high-return equities are usually riskier, investors can find superior risk-adjusted options by carefully analyzing them using techniques like beta and the Sharpe Ratio. For balanced performance, the study recommends diversified investments in Infosys, HDFC Bank, and Hindustan Unilever.

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