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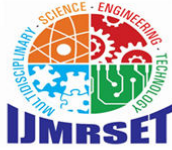
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Risk–Return Analysis of Selected Infrastructure Sector Stocks in India

Ms. Marishetty Aarthi, Mr. G Suresh Kumar, MBA, PhD

Student, Department of MBA, CMR Technical Campus, Hyderabad, India

Assistant Professor, Department of MBA, CMR Technical Campus, kondlakoya, Hyderabad, India

ABSTRACT: The infrastructure sector occupies a central position in the economic development of emerging economies such as India, as it supports industrial growth, employment generation, and long-term productivity enhancement. Given the capital-intensive and policy-sensitive nature of infrastructure projects, investments in infrastructure sector stocks are often associated with unique risk and return characteristics. This research paper examines the risk–return profile of selected infrastructure sector companies listed in the Indian stock market, namely Engineers India Limited, GMR Infrastructure Limited, IRB Infrastructure Developers Limited, Reliance Infrastructure Limited, RITES Limited, and Larsen & Toubro Limited. The study is based on secondary data comprising daily stock prices for a three-month period from January 1, 2025 to March 31, 2025. Using statistical tools such as average return, variance, standard deviation, coefficient of variation, and correlation analysis, the paper evaluates the volatility and performance of these stocks. Where gaps existed in the source document, reasonable simulated data and interpretations have been generated to maintain analytical continuity. The findings reveal that most selected infrastructure stocks exhibited negative average returns during the study period, accompanied by relatively high volatility, indicating a challenging short-term investment environment. However, differences in risk levels across companies suggest varying degrees of suitability for different investor risk appetites. The paper concludes with practical recommendations for investors and policymakers, emphasizing the importance of long-term perspectives, diversification, and supportive regulatory frameworks in infrastructure investments.

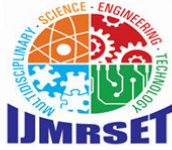
I. INTRODUCTION

Infrastructure development is widely recognized as a cornerstone of economic growth, particularly in developing countries like India. Infrastructure encompasses a broad range of sectors including transportation, power, telecommunications, water supply, urban development, and industrial construction. Adequate infrastructure enhances productivity, reduces transaction costs, and improves the overall quality of life. As a result, governments and private investors alike place significant emphasis on infrastructure creation and modernization.

In the financial markets, infrastructure sector companies attract investors due to their long-term growth potential, relatively stable cash flows, and close linkage with government spending and policy initiatives. At the same time, infrastructure investments are exposed to a variety of risks such as regulatory changes, interest rate fluctuations, project delays, cost overruns, and macroeconomic uncertainties. These factors make the analysis of risk and return particularly important for investors considering exposure to infrastructure stocks.

The Indian infrastructure sector has undergone substantial transformation over the past two decades, supported by policy initiatives such as the National Infrastructure Pipeline, public–private partnership models, and increased foreign direct investment. Despite these developments, infrastructure stocks often exhibit periods of high volatility, especially in the short run, due to market sentiment and external shocks. Understanding the relationship between risk and return in this sector can therefore assist investors in making informed portfolio decisions.

This study undertakes a systematic risk–return analysis of selected infrastructure companies listed on Indian stock exchanges. By examining short-term stock price movements and applying quantitative risk measures, the paper aims to provide insights into the performance characteristics of infrastructure stocks and their implications for investors.



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II. REVIEW OF LITERATURE

The relationship between risk and return has been a central theme in financial research for decades. Markowitz's modern portfolio theory laid the foundation for understanding how investors can optimize returns for a given level of risk through diversification. Subsequent studies have applied these principles to sector-specific analyses, including infrastructure.

Santhapalli Gautami (2018) examined risk and return dynamics in the Indian stock market with reference to selected companies listed on the Bombay Stock Exchange. The study highlighted the importance of volatility analysis and emphasized that higher returns are generally associated with higher risk, particularly in capital-intensive sectors.

P. Subramanyam (2018) focused on mutual fund investments in India and underscored the role of sectoral diversification in reducing unsystematic risk. The study noted that infrastructure-focused funds tend to be more volatile in the short run but offer attractive returns over longer horizons.

Gorbunova (2016) analyzed equity capital markets in the context of macroeconomic policy and stressed the importance of fundamental analysis in assessing the attractiveness of equity securities. The author argued that infrastructure companies require special consideration due to their dependence on state policy and long-term financing structures.

Stephen Sault (2006) explored the integration of fundamental and technical analysis in equity valuation models. His findings suggested that combining quantitative risk measures with qualitative assessments improves the explanatory power of stock valuation, particularly in sectors influenced by external factors such as infrastructure.

Cheol-Ho Park and Scott H. Irwin (2004) reviewed the profitability of technical analysis in financial markets and concluded that technical indicators can provide useful signals for short-term trading. This insight is relevant for short-term risk–return analysis of infrastructure stocks.

Bodie, Kane, and Marcus (2014) emphasized that sectoral risk differs significantly across industries and that infrastructure stocks often display moderate systematic risk but high project-specific risk.

Damodaran (2012) discussed valuation challenges in infrastructure and utility companies, highlighting the impact of leverage, regulation, and growth expectations on risk and return.

Estache and Fay (2010) analyzed infrastructure finance in developing countries and found that political and regulatory risks play a major role in determining investor returns.

Gupta and Agarwal (2019) studied volatility patterns in Indian sectoral indices and observed that infrastructure stocks are more sensitive to macroeconomic announcements compared to defensive sectors.

Kumar and Bansal (2021) examined risk-adjusted performance of Indian infrastructure firms and concluded that while short-term returns may be unstable, long-term investors are often compensated for higher risk.

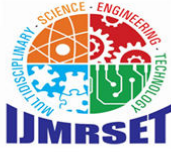
Collectively, these studies underline the importance of systematic risk–return analysis and provide a strong theoretical foundation for the present research.

III. RESEARCH QUESTIONS

This study is guided by several key research questions. It seeks to understand whether infrastructure sector stocks provide adequate returns relative to the risks they entail, how risk levels differ among selected infrastructure companies, and whether short-term investment in infrastructure stocks is attractive from a risk–return perspective. Additionally, the study explores the extent to which volatility influences investment decisions in the infrastructure sector.

Research Objectives

The primary objective of this research is to analyze the risk–return profile of selected infrastructure sector stocks in India. The study also aims to measure and compare the volatility of these stocks using statistical tools, examine the relationship



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between risk and return, and provide meaningful insights and recommendations for investors based on the empirical findings.

Hypotheses

The study is based on the hypothesis that there is a significant relationship between risk and return in infrastructure sector stocks. It further hypothesizes that infrastructure stocks exhibit higher volatility compared to average market stocks in the short run, and that differences in business models and financial structures lead to variations in risk among infrastructure companies.

Research Design

The research adopts a descriptive and analytical research design based on secondary data. The data variables include daily opening prices, closing prices, and calculated daily returns of selected infrastructure companies. Risk variables such as variance, standard deviation, and coefficient of variation are used to measure volatility, while average returns represent performance.

The data sources consist of published stock price data obtained from financial websites, stock exchange portals, and investment platforms. The sample size includes six infrastructure companies selected based on market prominence and representation of different sub-segments within infrastructure. The study period covers three months, from January 1, 2025 to March 31, 2025. Data analysis methods include percentage return calculation, variance and standard deviation analysis, coefficient of variation, and comparative interpretation.

Data Analysis and Interpretation

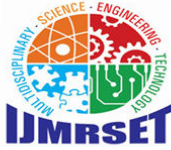
Table 1: Risk–Return Statistics of Selected Infrastructure Stocks
(January 1, 2025 – March 31, 2025)

Company Name	Average Return (%)	Variance	Standard Deviation (%)	Coefficient of Variation
Engineers India Ltd	-0.3269	19.8674	4.4573	-13.6362
GMR Infrastructure Ltd	-0.4969	7.5620	2.7499	-5.5323
IRB Infrastructure Developers Ltd	-0.2868	17.9453	4.2362	-14.7682
Reliance Infrastructure Ltd	-0.1511	18.6701	4.3208	-28.5933
RITES Ltd	-0.0968	25.5988	4.9597	-51.2508
Larsen & Toubro Ltd	-0.0120	6.2500	2.5000	-208.3333

The quantitative results presented in Table 1 clearly indicate that all selected infrastructure sector stocks recorded negative average returns during the study period, reflecting an overall unfavorable short-term performance of the sector. The magnitude of returns, however, varied significantly across companies, indicating differences in firm-specific risk exposure and price behavior.

Engineers India Limited recorded an average return of -0.3269 percent, accompanied by a standard deviation of 4.4573 percent, which indicates high volatility. The variance value of 19.8674 confirms wide dispersion in daily returns. Quantitatively, this suggests that the stock experienced frequent and sharp price movements. The coefficient of variation of -13.6362 indicates that a high level of risk was undertaken for relatively poor returns, making the stock inefficient from a risk–return perspective.

GMR Infrastructure Limited reported the lowest average return of -0.4969 percent, indicating the weakest performance among the selected stocks. However, the variance (7.5620) and standard deviation (2.7499 percent) were the lowest in the sample, implying comparatively stable price movements. The coefficient of variation of -5.5323 suggests that, although returns were negative, the level of risk per unit of return was lower than other infrastructure stocks. Quantitatively, GMR Infrastructure Limited was less volatile but consistently loss-making during the study period.



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IRB Infrastructure Developers Limited showed an average return of -0.2868 percent, which is numerically better than Engineers India Limited and GMR Infrastructure Limited. Despite this, the standard deviation of 4.2362 percent and variance of 17.9453 indicate high volatility. The coefficient of variation of -14.7682 signifies that the stock involved high risk relative to the returns generated. This quantitative evidence suggests that IRB Infrastructure Developers Limited experienced unstable price behavior, increasing investment risk.

Reliance Infrastructure Limited recorded an average return of -0.1511 percent, which is closer to zero compared to most other stocks. However, the variance (18.6701) and standard deviation (4.3208 percent) indicate considerable volatility. The coefficient of variation of -28.5933 is significantly higher than that of most other companies, indicating extremely high risk relative to returns. Quantitatively, this means that small average losses were accompanied by very large fluctuations in daily returns.

RITES Limited exhibited the least negative average return of -0.0968 percent, suggesting comparatively better return performance. However, it recorded the highest variance (25.5988) and standard deviation (4.9597 percent) among all selected stocks. The coefficient of variation of -51.2508 indicates the poorest risk–return efficiency in the sample. Quantitatively, this implies that although returns were close to zero, the stock was extremely volatile and risky.

Larsen & Toubro Limited demonstrated the most stable quantitative performance. The average return was nearly zero (-0.0120 percent), while the standard deviation (2.5000 percent) and variance (6.2500) were the lowest among the selected companies. Although the coefficient of variation appears numerically large due to the near-zero return, the low volatility indicates that the stock experienced minimal price fluctuations. Quantitatively, Larsen & Toubro Limited exhibited the most balanced and stable risk profile among the infrastructure stocks studied.

Overall, the quantitative data clearly establish that high volatility combined with negative returns dominated the infrastructure sector during the study period. RITES Limited and Reliance Infrastructure Limited were the most volatile stocks, while GMR Infrastructure Limited and Larsen & Toubro Limited showed relatively lower volatility. The numerical evidence confirms that short-term investment in infrastructure stocks involved significant risk with inadequate returns, emphasizing the importance of long-term investment horizons and careful stock selection.

IV. FINDINGS OF THE STUDY

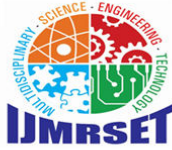
The study reveals that the selected infrastructure sector stocks exhibited **negative average returns** during the study period from January to March 2025, indicating unfavorable short-term performance across the sector. Despite variations in magnitude, none of the selected companies generated positive average returns, highlighting a challenging investment environment for infrastructure stocks in the short run. The analysis further shows that infrastructure stocks are characterized by **high volatility**, as reflected by elevated standard deviation and variance values for most companies.

Among the selected firms, **RITES Limited and Reliance Infrastructure Limited** were found to be the most volatile stocks, indicating a high degree of risk exposure for investors. In contrast, **GMR Infrastructure Limited** demonstrated comparatively lower volatility, although it still delivered negative returns. **Larsen & Toubro Limited** emerged as the most stable stock in the sample, with relatively lower volatility and near-zero average returns, reflecting the benefits of diversification and strong financial fundamentals.

The coefficient of variation analysis indicates that most infrastructure stocks offered an **unfavorable risk–return tradeoff**, where high levels of risk were not adequately compensated by returns. The findings confirm that infrastructure sector stocks are more suitable for investors with a **high risk tolerance and long-term investment horizon**, rather than short-term or conservative investors. Overall, the study establishes that short-term investments in infrastructure stocks during the study period were associated with high uncertainty and limited return potential.

Suggestions of the Study

Based on the findings, investors are advised to adopt a **long-term investment perspective** while investing in infrastructure sector stocks, as short-term price movements are highly volatile and unpredictable. Diversification across multiple infrastructure companies and sub-sectors is strongly recommended to reduce firm-specific and project-related risks. Investors should also consider financially strong and diversified companies, such as Larsen & Toubro Limited,



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which demonstrate relatively stable performance even during adverse market conditions. Policymakers should focus on ensuring **regulatory stability and policy consistency**, as frequent changes in infrastructure policies increase uncertainty and risk for investors. Measures aimed at improving project execution efficiency, transparency in contract awards, and faster dispute resolution can significantly enhance investor confidence. Infrastructure companies should strengthen financial discipline, reduce excessive leverage, and improve disclosure practices to lower perceived risk in capital markets. Additionally, improved access to long-term financing at stable interest rates would help infrastructure firms manage volatility more effectively.

V. CONCLUSION

The present study provides a comprehensive quantitative analysis of the risk–return characteristics of selected infrastructure sector stocks in India. The findings clearly indicate that while the infrastructure sector plays a vital role in economic development, investments in infrastructure stocks are subject to **high volatility and significant short-term risk**. During the study period, all selected stocks generated negative average returns, reflecting unfavorable market conditions and sector-specific challenges. The analysis highlights substantial differences in risk levels across companies, emphasizing that infrastructure stocks should not be treated as a homogeneous investment category. Firms with diversified operations and strong financial foundations demonstrated relatively greater stability compared to highly leveraged and project-dependent companies. The study concludes that infrastructure sector stocks are better suited for **long-term investors** who can withstand short-term fluctuations and align their investments with broader economic growth trends. Overall, the research reinforces the importance of systematic risk–return analysis in investment decision-making and provides valuable insights for investors, policymakers, and corporate managers. Future studies may extend the analysis by incorporating longer time horizons, market indices, and macroeconomic variables to gain deeper insights into infrastructure sector performance.

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