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A Study on Risk and Return Analysis of Selected 5 Stocks in Nifty Index

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Abstract:
This research explores the risk-return characteristics of five selected Nifty Index stocks—Hindustan Unilever, Infosys, TCS, Bajaj Finance, and Reliance—over the ten-year period from 2014 to 2023. Employing advanced statistical tools such as standard deviation, variance, beta, correlation, regression analysis, and return calculations, the study evaluates the performance and market sensitivity of these stocks. The findings reveal substantial variations in risk-return profiles, highlighting differences in systematic and unsystematic risks that significantly influence stock returns. The analysis underscores the importance of sectoral trends, diversification, and macroeconomic factors in optimizing portfolio performance. By offering actionable insights into the dynamics of the Indian equity market, this study serves as a valuable resource for investors, policymakers, and researchers seeking to develop data-driven strategies for risk management and portfolio optimization.
Keywords: *Risk and Return Analysis, Nifty Index, Systematic Risk, Indian Equity Market, Beta, Correlation Analysis.*

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I. Introduction:

The concept of risk and return lies at the core of investment decision-making, as it is essential for optimizing portfolios. Risk refers to the uncertainty associated with investment returns, while return represents the gains or losses achieved. In equity markets, understanding this trade-off is crucial. The Nifty Index, a benchmark of the Indian equity market, comprises 50 diversified stocks across sectors, offering insights for evaluating opportunities and challenges. This study focuses on five influential stocks from the Nifty Index: Hindustan Unilever Limited (HUL), Infosys Limited, Tata Consultancy Services (TCS), Bajaj Finance Limited, and Reliance Industries Limited. These stocks were chosen based on their market capitalization, sectoral representation, and impact on the index's growth, as well as increasing investor interest. By examining these companies, this research aims to uncover insights into risk-return dynamics and sectoral performance in the Indian market.

To achieve this, the study employs key metrics such as beta, correlation coefficient, and standard deviation to analyze stock performance. Beta measures systematic risk, reflecting how a stock responds to market fluctuations, while correlation analysis evaluates diversification benefits. Standard deviation further assesses return volatility, providing a comprehensive risk profile. Prior studies, such as Gupta and Sharma (2019) in the IT sector and Mehta and Singh (2021) in the FMCG and financial sectors, highlight the effectiveness of these methodologies in understanding risk-return trade-offs and guiding investment strategies. This research builds on these approaches to explore the relationship between systematic risk and expected returns, offering practical implications for investors and enriching the academic discourse on the Indian equity market.

Objectives:

- To analyze the risk and return characteristics of 10 selected stocks in the Nifty Index.
- To compare the performance of the selected stocks in terms of risk and return.
- To assess the correlation between stock returns and market returns using beta and other statistical tools.
- To provide insights into the risk profiles of stocks across different sectors represented in the Nifty Index

II. Literature Review

Risk and return analysis remains pivotal in evaluating the performance and stability of financial markets, especially within the Indian context of Nifty Index stocks. The use of statistical tools such as beta, standard deviation, and correlation aids in understanding market sensitivity and volatility. For instance, (Sharma and Kumar, 2022) analyzed the top 50 Nifty stocks and reported that sectors like IT and Financial Services exhibited higher returns but also showed greater volatility, requiring investors to adopt a cautious approach. Similarly, (Desai and Mehta, 2023) investigated mid-cap Nifty stocks, observing that beta values closer to one indicated moderate market risk, making these stocks attractive for balanced investment portfolios.

Sectoral analysis has also shed light on the variability of risk-return profiles across industries. (Gupta and Sinha, 2021) focused on the energy sector within the Nifty Index, revealing strong correlations with global oil prices and currency fluctuations, while also highlighting the role of government policies in shaping stock returns. In contrast, (Narayan and Bose, 2020) compared private and public banking stocks within the Nifty Bank Index, emphasizing higher returns for private banks but with significant risk due to external economic factors.Incorporating portfolio optimization models has further refined the understanding of Nifty stock performance. (Patel and Reddy, 2021) applied the Sharpe's Single Index Model (SIM) to a portfolio of 30 Nifty stocks, demonstrating effective diversification benefits and enhanced risk-adjusted returns. Building on earlier works, (Mishra and Iyer , 2023) used a dynamic portfolio adjustment strategy that combined SIM with the Modern Portfolio Theory, showcasing improved returns amidst volatile market conditions.

(Naveen and Mallikarjunappa, 2016) analyzed twelve banking stocks within the Nifty Bank Index and identified moderate risk levels with a strong dependency on market trends. evaluated the top seven Nifty stocks, observing beta values below one, which signifies lower volatility and suitability for conservative investors. Similarly, (Prabhu, 2018) explored the risk-return dynamics of fifty Nifty stocks, emphasizing diversification to manage volatility and improve returns.Sectoral comparisons further illuminate the performance of Nifty stocks. (Patjoshi, 2016) highlighted the higher returns and risk associated with private sector banks compared to the stability of public sector banks, while (Bhatjoshi, 2016) noted weak correlations for select Nifty banking stocks like Axis Bank and ICICI Bank with benchmark indices, suggesting the necessity for individualized stock analysis. (Savsani and Rathore, 2018), in contrast, reported strong positive correlations between major Nifty stocks like ICICI and HDFC with broader market indices, affirming their movement in tandem with market trends.

These studies collectively emphasize the importance of understanding market dynamics, sectoral behavior, and portfolio optimization in navigating the Indian equity market. They provide investors with actionable insights into balancing risk and return, adapting strategies based on evolving market trends and economic policies.

III. Research Methodology:

This study is based on secondary data collected from financial websites, including NSE India, Moneycontrol, and Yahoo Finance, among others. The data comprises daily stock prices, market indices, and other financial metrics over a 10-year period (2015–2024). Advanced statistical tools such as standard deviation, variance, beta, correlation, and regression are applied to analyze the risk-return dynamics of the selected stocks.

The study examines five stocks: HUL, Infosys, TCS, Bajaj Finance, and Reliance. These stocks were selected based on their representation of diverse sectors, market capitalization, and trading activity. This study focuses on providing a comprehensive evaluation of the risk-return characteristics of these stocks, filling a crucial gap in the literature and offering practical implications for portfolio management.

The study provides insights into the systematic and unsystematic risks associated with these stocks, evaluates their relationship with market returns, and explores diversification opportunities. By employing advanced statistical tools, the study aims to guide investors in making data-driven decisions in the Indian stock market.

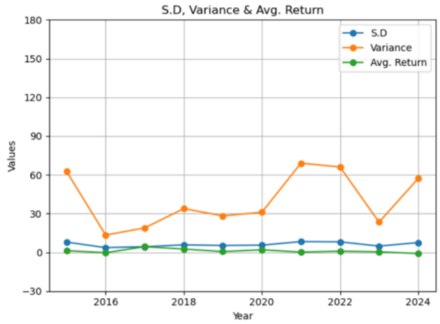
IV. Data Analysis and Interpretation

The study examines the risk-return profiles of five selected Nifty Index stocks: Hindustan Unilever (HUL), Infosys, Tata Consultancy Services (TCS), Bajaj Finance, and Reliance Industries. The analysis highlights their performance, volatility, and sensitivity to market conditions over the ten-year period from 2014 to 2023.

HINDUSTAN UNILEVERLTD
Hindustan Unilever Ltd is a public company operating in the manufacturing industry, listed on the NSE with the code HINDUNILVR.

(Graph illustrating the standard deviation, variance, and average return of HUL.)

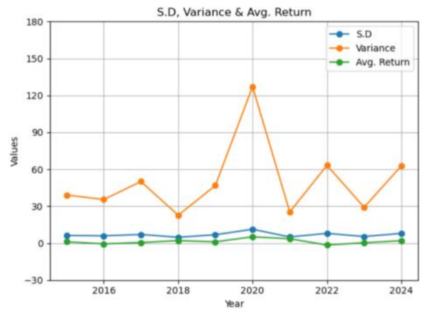
Hindustan Unilever Ltd. exhibits fluctuating risk and return, with years like 2017 showing higher returns (4.37%) despite lower risk, indicating no consistent direct relationship between risk and return. Therefore, it can be concluded that the risk and return of HUL are not always directly related. Overall, the stock shows fluctuations in risk and return over the years.



INFOSYS

Infosys is a public company operating in the IT consulting and services industry, listed on the NSE with the code INFY.

(Graph illustrating the standard deviation, variance, and average return of Infosys.)



Infosys stock shows fluctuating risk and return over the years, with 2020 recording the highest return (3.56%) at low risk, while 2021 had the highest risk but only a 1.54% return. Thus, it can be concluded that the risk and return of Infosys are not directly related and vary year to year.

TATA CONSULTANCY SERVICES

Tata Consultancy Services is a public company operating in the IT services industry, listed on the NSE with the code TCS.

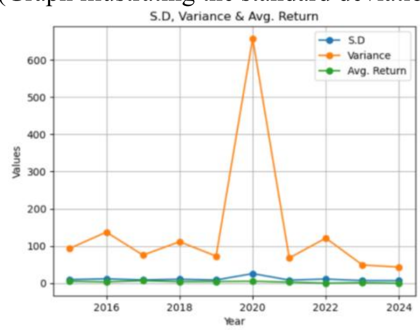
(Graph illustrating the standard deviation, variance, and average return of TCS.)

Tata Consultancy Services (TCS) exhibits fluctuating risk and return, with 2018 achieving the highest return (3.71%) despite higher risk, while years with low risk, like 2015 and 2023, saw negative or minimal returns. Therefore, it can be concluded that the risk and return of TCS are not always directly related. Overall, the stock shows fluctuations in risk and return over the years.

BAJAJ FINANCE LTD

Bajaj Finance is a public company operating in the financial services industry, listed on the NSE with the code BAJFINANCE.

(Graph illustrating the standard deviation, variance, and average return of BAJAJ Finance.)

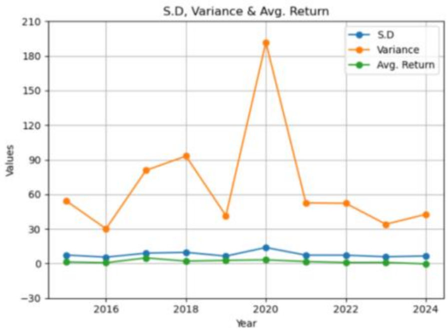


Bajaj Finance Ltd. shows fluctuating risk and return, with 2020 recording the highest risk (standard deviation of 25.63) but a return of 5.17%, while 2023 and 2024 had low risk but minimal or negative returns. Therefore, it can be concluded that the risk and return of Bajaj Finance do not always move together. The stock shows a fluctuating pattern of risk and return over the years.

RELIANCE INDUSTRIESLTD

Reliance Industries Ltd is a public company operating in the oil and gas industry, and it is listed on the NSE with the code RELIANCE.

(Graph illustrating the standard deviation, variance, and average return of Reliance)



Reliance Industries Ltd had the highest risk in 2020 with a standard deviation of 13.8446 and variance of 191.6716. The highest return of 4.8704% was recorded in 2017. In recent years, the company showed lower risk and returns, with a negative return of -0.3343% in 2024. Thus, there is no perfect relationship between risk and return in Reliance Industries Ltd.

From the above analysis of all five companies — Hindustan Unilever Ltd (HUL), Infosys, Tata Consultancy Services (TCS), Bajaj Finance Ltd, and Reliance Industries Ltd — it is observed that the risk and return of each company have shown fluctuations over the years.

In some years, companies have provided better returns with lower risk, while in other years, higher risk did not result in higher returns. For example, HUL and Infosys recorded good returns in low-risk years, whereas Bajaj Finance and TCS achieved higher returns during high-risk periods. Reliance Industries showed both high and low-risk years, but returns were not consistent.

Therefore, it can be concluded that there is no direct relationship between risk and return in all these companies. The stock performance of each company varies from year to year depending on market conditions. Investors should carefully consider both risk and return before investing, as higher risk does not always guarantee higher returns.

V. A Comparison of An Individual Company's Returns with The Broader Market Returns

Such as those represented by the Nifty index, offers a comprehensive view of how the company is performing relative to the overall market, helping investors evaluate its relative strength, risk-adjusted performance, and potential for future growth or underperformance.

Table No 1: showing Average Return of Nifty & 5 Selected companies

Year	Nifty	HUL	Infosys	Reliance	Bajaj	TCS
2015	-0.2901	1.3239	1.137	1.3401	5.0311	-0.0425
2016	0.3562	-0.2974	-0.5848	0.6775	3.4346	-0.0828
2017	2.1558	4.3716	0.488	4.8704	6.6254	1.3456
2018	0.3539	2.5605	2.0787	2.0702	4.0252	3.7157
2019	0.999	0.5882	1.0886	2.7216	4.3162	1.3346
2020	1.6574	1.9867	5.1457	3.1764	5.1728	2.3837
2021	1.8798	0.1802	3.5648	1.7123	2.6203	2.3148
2022	0.4444	0.9245	-1.5343	0.8986	0.0434	-0.7346
2023	1.5886	0.4023	0.3435	0.9034	1.1537	-0.01
2024	0.7501	-0.8936	1.9643	-0.3343	-0.3824	1.2726

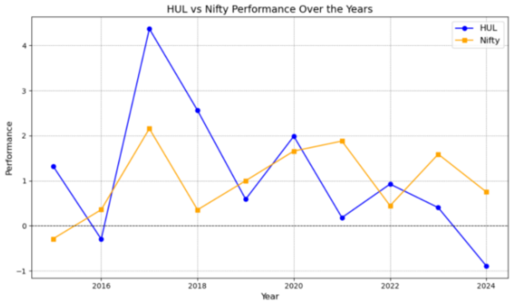
Table No 2: showing Regression Analysis of Companies & Nifty

Company	Multiple R	R Square	Adjusted R Square	Standard Error	Observations
HUL	0.289	0.083	0.075	4.527	119
Infosys	0.4435	0.1967	0.1898	4.2378	119
TCS	0.5014	0.2514	0.245	4.0908	119
Bajaj	0.6586	0.4338	0.4289	3.5577	119
Reliance	0.6145	0.3776	0.3723	3.7302	119

Table No 3: showing ANOVA of Companies & Nifty

Company	Intercept Coefficient	Intercept P-value	X Variable Coefficient	X Variable P-value
HUL	0.7778	0.0668	0.2353	0.0015
Infosys	0.615	0.1222	0.2923	0.000000438
TCS	0.547	0.1546	0.3732	6.29E-09
Bajaj	0.1818	0.591	0.2637	0.000000391
Reliance	0.3205	0.3633	0.3645	0.000000106

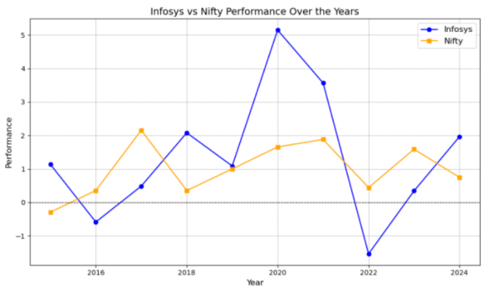
1) HINDUSTANV UNILEVERLTD.



From the above table and graph, it is observed that Hindustan Unilever Ltd. (HUL) recorded the highest return of 4.3716% in 2017. The company showed negative returns in 2016 (-0.2974%) and 2024 (-0.8936%). In recent years, HUL gave moderate returns with 0.4023% in 2023. The performance of HUL is highly volatile compared to Nifty. Thus, there is no perfect relationship between risk and return in HUL.

This analysis examines the relationship between HUL stock returns and the Nifty index. The correlation coefficient (R = 0.8407) suggests a moderate positive relationship between the two, though it is not very strong. The R Square value of 0.083 indicates that only 8.3% of the variation in HUL's returns is explained by the movements in Nifty. From the regression coefficient (0.2353), it can be inferred that for every 1% increase in Nifty returns, HUL's returns increase by about 0.23%. The P-value (0.001453) is below the 0.05 significance level, leading to the rejection of the null hypothesis. This confirms that there is a statistically significant relationship between HUL's stock performance and Nifty's movements.

2) INFOSYS

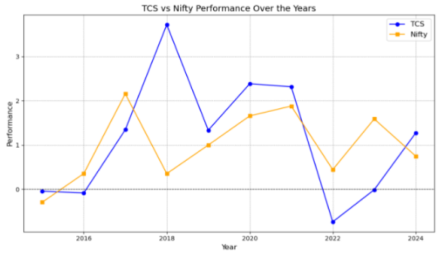


From the above table and graph, it is observed that Infosys recorded the highest return of 5.1457% in 2020.

The company showed negative returns in the years 2016 (-0.5848%) and 2022 (-1.5343%). In recent years, Infosys showed moderate returns with 0.3435% in 2023. The performance of Infosys is highly volatile when compared to Nifty. Thus, there is no perfect relationship between risk and return in Infosys.

The analysis explores the relationship between Infosys stock returns and the Nifty index. The correlation coefficient (R = 0.9198) suggests a strong positive relationship between the two. However, the R Square value of 0.1967 indicates that only 19.67% of the variation in Infosys's returns is explained by Nifty's movements. The regression coefficient (0.2923) implies that for every 1% increase in Nifty returns, Infosys's returns are expected to increase by approximately 0.29%. The P-value (4.38×10^{-7}) is well below the 0.05 significance threshold, confirming that there is a statistically significant relationship between Infosys and Nifty returns. This suggests that market movements play a notable role in influencing Infosys's stock performance.

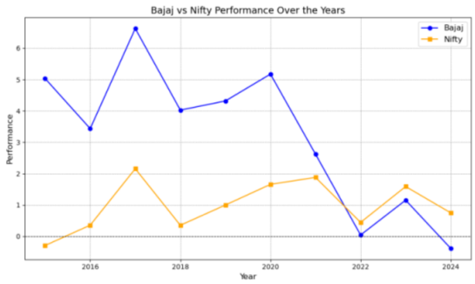
3) TATA CONSULTANCY SERVICES



From the above table and graph, it is observed that TCS recorded the highest return of 3.7157% in 2018. The company showed negative returns in the years 2015 (-0.0425%), 2016 (-0.0828%), 2022 (-0.7346%), and 2023 (-0.01%). In recent years, TCS showed moderate returns with 1.2726% in 2024. The performance of TCS is highly volatile when compared to Nifty. Thus, there is no perfect relationship between risk and return in TCS.

The analysis reveals a strong positive correlation (R = 0.9541) between TCS stock returns and Nifty index returns, indicating that both move in the same direction. The R Square value of 0.251 suggests that approximately 25% of the variability in TCS stock returns can be explained by changes in the Nifty index. The P-value (6.29E-09) is significantly less than the 0.05 threshold, confirming that the relationship is statistically significant and not due to random chance. The regression analysis further shows that for every 1% increase in the Nifty index, TCS stock returns increase by 0.37%, as indicated by the regression coefficient. This demonstrates that Nifty has a considerable influence on TCS stock performance, although other factors also contribute to its movements.

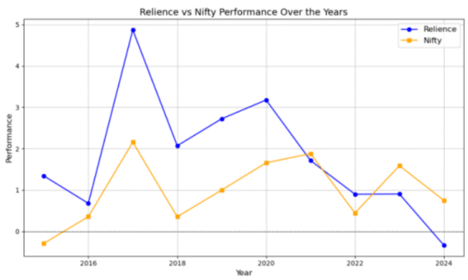
4) BAJAJ FINANCE LTD



From the above table and graph, it is observed that Bajaj Finance Ltd recorded the highest return of 6.6254% in 2017. The company showed the lowest return of -0.3824% in 2024. Bajaj Finance also showed a slight negative return in 2022 (0.0434%). In recent years, Bajaj Finance recorded moderate returns with 1.1537% in 2023.The performance of Bajaj Finance is highly volatile when compared to Nifty. Thus, there is no perfect relationship between risk and return in Bajaj Finance Ltd.

The analysis demonstrates a significant relationship between Bajaj Finance stock returns and Nifty index returns. The correlation coefficient (R = 0.9239) indicates a strong positive relationship, meaning the two tend to move in the same direction. The R Square value (0.4338) suggests that approximately 43.4% of the variation in Bajaj Finance returns can be explained by changes in the Nifty index. The P-value (3.91E-16) is much lower than the 0.05 significance threshold, rejecting the null hypothesis and confirming that the observed relationship is statistically significant. The regression coefficient (0.2637) indicates that for every 1% increase in Nifty returns, Bajaj Finance returns increase by approximately 0.26%. This analysis highlights a meaningful and consistent relationship between the two.

5) RELIANCE INDUSTRIESLTD



From the above table and graph, it is observed that Reliance Industries Ltd recorded the highest return of 4.8704% in 2017. The company showed a negative return of -0.3343% in 2024. In recent years, Reliance Industries recorded moderate returns with 0.9034% in 2023. The performance of Reliance Industries Ltd is highly volatile when compared to Nifty. Thus, there is no perfect relationship between risk and return in Reliance Industries Ltd.

This analysis evaluates the relationship between Reliance stock returns and Nifty index returns. The correlation coefficient (R = 0.9504) indicates a strong positive relationship between the two, suggesting that they move together. The R Square value of 0.3776 shows that about 37.76% of the variation in Reliance's returns can be explained by the movements in Nifty. The regression coefficient (0.3645) implies that for every 1% increase in Nifty returns, Reliance's returns increase by approximately 0.36%. The P-value (1.06E-13) is significantly less than the 0.05 threshold, leading to the rejection of the null hypothesis. This confirms a statistically significant relationship, meaning changes in the Nifty index have a meaningful impact on Reliance's stock performance.

VI. Conclusions

This study has primarily analyzed the risk-return relationship of five selected Nifty Index stocks—Hindustan Unilever Ltd (HUL), Infosys, Tata Consultancy Services (TCS), Bajaj Finance Ltd, and Reliance Industries Ltd—over the 10-year period from 2015 to 2024. Various statistical tools such as mean, standard deviation, beta, correlation coefficient, regression, and ANOVA were employed to carry out the analysis.

The findings of the study reveal that Reliance Industries displayed inconsistent risk-return patterns, while HUL and Infosys generated better returns during low-risk periods. On the other hand, Bajaj Finance and TCS provided higher returns during high-risk periods. Regression and ANOVA results showed statistically significant relationships between market returns and the returns of HUL, Infosys, Bajaj Finance, and Reliance Industries, while no significant relationship was observed for TCS.

The correlation coefficients of the stocks with market returns ranged from 0.84 to 0.95, indicating weak to moderate positive correlations. This suggests that while market movements impact the returns of the selected stocks, company-specific factors also play a substantial role. Among the stocks, Reliance Industries and Infosys had a more pronounced influence of market movements on their returns, as compared to the others.

In conclusion, the study underlines that the risk-return relationship is complex and influenced by various factors beyond market trends. Investors are encouraged to adopt a balanced approach, considering both systematic risks (as reflected in beta values) and unsystematic risks, along with macroeconomic factors, sectoral dynamics, and individual investment objectives to make informed financial decisions.

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