

A Study on Risk and Return Analysis of NIFTY 50 Stocks: An Empirical Study Based on 5-Year Data

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Abstract

The present study examines the risk and return of NIFTY 50 stocks over the five-year period from 2021 to 2025, providing insights into the performance behaviour of India's leading large-cap companies. Using historical secondary data from reliable financial databases, the study calculates daily returns from closing prices and measures risk through standard deviation. The research evaluates stock performance, with a focus on identifying high-performing and low-performing stocks based on risk-return profiles. The study further ranks the NIFTY 50 stocks to assist investors in portfolio construction and decision-making.

Key Words: Nifty 50, Risk, Return, Rank, Daily Return, Daily Risk, Standard deviation

Introduction

One of the fundamental financial activities of individuals is saving, followed by the investing of these savings into suitable investment avenues. Among the different investment options available in the financial system, the stock market has become one of the most important and widely preferred avenues for long-term wealth creation. When selecting an investment option, it is essential to understand its risk and return characteristics (1). These two elements form the basis of all investment decisions and play a central role in evaluating the performance and suitability of any investment. Return refers to the additional income or gain generated from an investment over a specific period. Risk, on the other hand, refers to the uncertainty associated with these returns and is commonly understood as the difference between the expected return and the actual return, indicating the degree of fluctuation an investor may face.

There are two major types of risk involved in investment decisions: systematic risk and unsystematic risk. Systematic risk arises from broad external factors such as economic conditions, inflation, interest rate movements, political instability, or global developments. Since these factors influence the entire market, systematic risk cannot be avoided or eliminated through diversification. In contrast, unsystematic risk is specific to a particular company and may arise from factors such as operational performance, management decisions, industry-related issues, or internal policies (2). Unlike systematic risk, unsystematic risk can be reduced or eliminated through diversification because it affects only individual companies or sectors.

The National Stock Exchange (NSE) is one of India's leading stock markets and provides a wide range of investment opportunities to investors. The NSE classifies its listed companies into three major categories like large-cap, mid-cap, and small-cap stocks. The large-cap segment consists of 100 companies, the mid-cap segment includes 150 companies, and the small-cap segment comprises more than 4,800 companies. This classification is based on the market capitalization of the companies, which determines whether a company is categorized as large-cap, mid-cap, or small-cap.

Nifty is one of the major stock market indices in India. The Nifty 50 represents the top 50 large-cap companies listed on the National Stock Exchange (NSE) and reflects their combined market capitalization. Market capitalization of a company is calculated by multiplying the current market price of a single share by the total number of outstanding shares of the company and it represents the total market value of the company's equity. Nifty 50 index accounts for nearly ₹180–190 trillion of the total market capitalization of the NSE, making it a key indicator of the overall performance of the Indian equity market (3).

Literature Review

Malayappan (2025) constructed portfolios using 1 to 10 year historical data of NIFTY 50 stocks and evaluated their performance against the index. Results indicated that short-term portfolios (1–3 years) often outperformed the NIFTY 50 in the subsequent year. The study validates the Single Index Model for dynamic portfolio optimization. It highlights how risk-return trade-offs change with different historical horizons. Investors are encouraged to consider recent trends for portfolio weighting (4).

Reddy and Baskaran (2024) examined 10 NIFTY 50 companies to evaluate their risk and return characteristics. The study calculated standard deviation, beta, and Sharpe ratio for each stock to measure systematic and unsystematic risk. Findings show substantial variation in risk and return across firms, with some stocks exhibiting high volatility despite moderate returns. The study emphasizes the importance of risk-adjusted performance measures rather than focusing solely on raw returns. It provides foundational insight into how individual stock characteristics affect investment decisions (5).

Sen and Dutta (2022) compared Hierarchical Risk Parity (HRP) and Eigen portfolio approaches using NIFTY 50 stock data from 2016–2020. Their back-testing revealed that HRP portfolios consistently outperformed Eigen portfolios in both in-sample and out-of-sample periods. The study emphasizes the importance of accounting for correlation structures and sectoral risk clusters in portfolio construction. It demonstrates that classical mean-variance approaches may underperform under changing market conditions. The findings offer modern techniques for better risk management in Indian equity portfolios (6).

Basanna and Konnur (2019) applied the Single Index Model (SIM) to all 50 NIFTY stocks to identify an optimal portfolio. Treynor, Sharpe, and Jensen's ratios were calculated to rank stocks by risk-adjusted performance. The study demonstrated how diversification across large-cap NIFTY stocks can reduce unsystematic risk. It highlights the practical use of SIM in portfolio construction and decision-making. The findings guide investors in selecting high-efficiency stocks for long-term wealth creation (7).

Anwar and Kumar (2018) tested the Capital Asset Pricing Model (CAPM) on NIFTY 50 companies between 2009 and 2016. The study concluded that CAPM poorly explains individual stock returns but performs better for portfolios. While beta captures some market risk, alpha remains non-zero in many cases, suggesting additional factors affect returns. The research highlights the limitations of relying solely on systematic risk measures. It emphasizes the need for hybrid models in the Indian equity context (8).

Objectives of the Study

The objectives of the study are as follows,

1. To identify the average risk and average return of individual NIFTY 50 stocks for the five-year period (2021–2025).
2. To determine the total average risk and total average return of the NIFTY 50 stocks for the five-year period (2021–2025).
3. To rank the NIFTY 50 stocks based on their risk and return.

Scope of the study

The present study focuses on analysing the average risk and return of the NIFTY 50 stocks over a five-year period from 2021 to 2025. The scope of the study is limited to the companies listed under the NIFTY 50 index, which represents large-cap stocks and serves as a benchmark for the Indian equity market. The study includes all companies that are currently part of the Nifty 50 index. However, for Jio, only three years of data were available and therefore used in the analysis. The study evaluates individual stock performance using statistical measures such as average return and standard deviation

to determine risk levels. The research further extends to comparing and ranking the NIFTY 50 stocks based on their risk–return profiles, enabling the identification of high-performing and low-performing companies within the index.

The study is analytical in nature and uses historical secondary data collected from reliable financial databases. This study is restricted to market-based factors and does not cover macroeconomic variables, global economic influences, or sector-specific policies that may affect stock performance. It is intended to assist investors, researchers, and policymakers in understanding stock behaviour and making informed investment decisions within the Indian equity market.

Research Methodology

The present study adopts a descriptive and analytical research design. The study is based entirely on secondary data. The study includes all 50 companies listed under the NIFTY 50 index. The study covers a five-year period from January 2021 to November 2025. Risk is measured using Standard Deviation. The daily return is calculated by using the closing prices of current day and previous day. The current day price will be selling price and pervious day price is purchase price. The total average return and risk of the NIFTY 50 stocks are computed by aggregating individual stock results.

Data analysis

Table number 1 – Daily risk analysis of the Nifty 50 shares during the 2021 to 2025 and its rank based on the total daily risk (Values in %)

Sl No	Company Name	2021	2022	2023	2024	2025	Total of 5 Years	Rank
1	Adani Enterprise	2.97	2.35	4.82	2.83	2.05	15.03	1
2	Adani Ports	2.59	2.18	2.96	2.58	1.63	11.92	3
3	Apollo Hospital	2.51	2.04	1.35	1.39	1.35	8.64	18
4	Asian Paints	1.71	1.69	1.06	1.31	1.30	7.06	41
5	Axis Bank	1.91	1.83	1.17	1.56	1.35	7.82	25
6	Bajaj Auto	1.56	1.50	1.37	1.78	1.50	7.71	26
7	Bajaj Finance	2.09	2.05	1.52	1.61	1.74	9.01	15
8	Bajaj FinServ	2.16	2.13	1.40	1.40	1.62	8.71	17
9	Bharat Elec	2.26	1.99	1.72	2.41	1.88	10.24	9
10	Bharti Airtel	1.77	1.48	1.07	1.47	1.31	7.09	40
11	Cipla	1.56	1.42	1.41	1.63	1.32	7.33	33
12	Coal India	2.11	2.20	1.52	2.12	1.24	9.20	13
13	Dr Reddys Labs	1.58	1.51	1.16	1.28	1.33	6.87	42
14	Eicher Motors	1.75	1.88	1.50	1.52	1.51	8.15	21
15	Eternal	3.30	4.25	2.48	2.39	2.46	14.87	2
16	Grasim	1.73	1.80	1.09	1.51	1.38	7.51	32
17	HCL Tech	1.63	1.64	1.29	1.40	1.68	7.64	29
18	HDFC Bank	1.51	1.62	1.07	1.41	1.01	6.62	45
19	HDFC Life	1.37	1.81	1.70	1.47	1.34	7.69	27
20	Hindalco	2.64	2.62	1.64	2.01	1.69	10.60	8
21	HUL	1.26	1.57	0.97	1.28	1.16	6.24	49
22	ICICI Bank	1.97	1.44	0.98	1.30	1.06	6.74	44
23	Infosys	1.32	1.75	1.49	1.44	1.64	7.64	28
24	Interglobal Avi	2.23	2.36	1.50	1.88	1.67	9.65	12
25	ITC	1.64	1.37	1.23	1.53	0.99	6.77	43

26	Jio Financial			1.98	2.34	1.94	6.25	48
27	JSW Steel	2.33	2.31	1.29	1.71	1.48	9.12	14
28	Kotak Mahindra	1.71	1.57	1.08	1.47	1.49	7.31	34
29	Larsen	1.59	1.59	1.21	1.77	1.39	7.56	30
30	M&M	1.98	1.81	1.45	1.98	1.75	8.97	16
31	Maruti Suzuki	1.68	1.79	1.00	1.44	1.33	7.24	38
32	Max Healthcare	2.55	2.28	2.03	2.44	2.14	11.44	4
33	Nestle	1.12	1.26	1.05	1.19	1.27	5.90	50
34	NTPC	1.78	1.66	1.34	1.99	1.37	8.14	22
35	ONGC	2.29	2.42	1.29	2.34	1.52	9.86	11
36	Power Grid Corp	1.88	1.65	1.38	1.93	1.47	8.33	20
37	Reliance	1.64	1.68	1.10	1.43	1.28	7.13	39
38	SBI Life Insurance	1.51	1.61	1.34	1.55	1.29	7.30	36
39	Shriram Finance	2.83	2.33	1.86	2.18	2.20	11.41	5
40	SBI	2.13	1.65	1.34	1.85	1.16	8.13	24
41	Sun Pharma	1.63	1.44	0.96	1.21	1.31	6.56	46
42	TCS	1.32	1.46	1.15	1.32	1.27	6.53	47
43	TATA Cons. Prod	1.47	1.72	1.11	1.57	1.41	7.27	37
44	TMPV	3.21	2.24	1.52	1.82	1.92	10.71	7
45	Tata Steel	2.63	2.51	1.33	1.87	1.80	10.15	10
46	Tech Mahindra	1.82	1.92	1.56	1.64	1.58	8.53	19
47	Titan Company	1.81	1.78	1.11	1.47	1.35	7.53	31
48	Trent	2.13	2.18	1.61	2.38	2.52	10.82	6
49	Ultra Tech Cement	1.62	1.73	1.17	1.46	1.33	7.30	35
50	Wipro	1.77	1.71	1.24	1.75	1.67	8.13	23

Sources: investing.com

The 5-year analysis of NIFTY 50 stocks shows wide variation in performance and volatility across sectors. Adani Enterprises ranks first with a total score of 15.03%, followed by Eternal and Adani Ports, indicating strong and consistent multi-year performance. In contrast, Nestle shows the lowest cumulative score of 5.90 %, making it the most stable and least volatile stock in the list. The financial and healthcare sectors display notable strength, with Max Healthcare and Shriram Finance securing positions among the top five performers. Similarly, energy and metal companies such as Hindalco, Tata Steel, and ONGC perform strongly, reflecting sector-wide growth momentum during the period.

On the other hand, defensive and low-risk companies like HUL and HDFC Bank show minimal performance variation, indicating steady and predictable stock behaviour. Jio Financial, despite being a recent entrant, maintains moderate stability with a relatively lower score. The automobile sector shows mixed performance, as seen in M&M, Eicher Motors, and Maruti Suzuki, each displaying different risk-return patterns. IT companies including Infosys, HCL Tech, TCS, and Tech Mahindra demonstrate moderate volatility, influenced largely by global technology and economic cycles. Meanwhile, major banks such as Axis Bank, ICICI Bank, SBI, and Kotak Mahindra reflect balanced and stable performance trends, contributing positively to the overall risk-return structure of the NIFTY 50 index.

Table number 2 – Daily Return analysis of the Nifty 50 shares during the 2021 to 2025 and its rank based on the total daily Return (Values in %)

Sl No	Company Name	2021	2022	2023	2024	2025	Total of 5 Years	Rank
1	Adani Enterpris	0.55	0.35	-0.01	-0.01	0.00	0.88	3
2	Adani Ports	0.18	0.07	0.13	0.10	0.10	0.58	10
3	Apollo Hospital	0.32	-0.02	0.11	0.11	0.01	0.54	13
4	Asian Paints	0.09	-0.02	0.05	-0.15	0.11	0.08	46
5	Axis Bank	0.05	0.14	0.07	0.00	0.09	0.35	31
6	Bajaj Auto	-0.02	0.05	0.27	0.13	0.02	0.44	25
7	Bajaj Finance	0.13	-0.02	0.05	-0.01	0.18	0.33	33
8	Bajaj FinServ	0.27	-0.02	0.04	-0.02	0.13	0.40	29
9	Bharat Elec	0.23	0.16	0.26	0.21	0.17	1.03	1
10	Bharti Airtel	0.14	0.08	0.11	0.19	0.15	0.66	6
11	Cipla	0.07	0.07	0.08	0.09	0.00	0.32	34
12	Coal India	0.05	0.17	0.23	0.02	0.00	0.47	22
13	Dr Reddys Labs	-0.01	-0.04	0.14	0.08	-0.03	0.13	44
14	Eicher Motors	0.02	0.09	0.11	0.09	0.18	0.49	19
15	Eternal	0.01	-0.25	0.32	0.36	0.07	0.51	17
16	Grasim	0.23	0.04	0.09	0.07	0.06	0.49	18
17	HCL Tech	0.15	-0.08	0.15	0.12	-0.06	0.27	37
18	HDFC Bank	0.02	0.04	0.02	0.03	0.06	0.18	40
19	HDFC Life	-0.01	-0.04	0.07	-0.01	0.11	0.11	45
20	Hindalco	0.29	0.03	0.11	0.01	0.14	0.58	9
21	HUL	0.00	0.04	0.02	-0.04	0.03	0.05	49
22	ICICI Bank	0.15	0.08	0.05	0.11	0.03	0.43	26
23	Infosys	0.17	-0.08	0.02	0.10	-0.08	0.14	43
24	Interglobal Avi	0.08	0.03	0.16	0.19	0.12	0.59	8
25	ITC	0.02	0.16	0.15	0.02	-0.05	0.29	36
26	Jio Financial			-0.04	0.07	-0.02	0.01	50
27	JSW Steel	0.23	0.08	0.06	0.02	0.12	0.52	15
28	Kotak Mahindra	-0.02	0.01	0.02	-0.01	0.07	0.07	47
29	Larsen	0.16	0.05	0.22	0.02	0.05	0.51	16
30	M&M	0.07	0.19	0.14	0.25	0.10	0.75	5
31	Maruti Suzuki	-0.01	0.06	0.09	0.03	0.17	0.34	32
32	Max Healthcare	0.48	0.04	0.19	0.24	0.04	1.00	2
33	Nestle	0.03	0.01	0.13	-0.09	0.08	0.16	41
34	NTPC	0.12	0.13	0.27	0.05	0.00	0.56	12
35	ONGC	0.19	0.03	0.14	0.08	0.03	0.48	21
36	Power Grid Corp	0.17	0.03	0.17	0.12	-0.04	0.46	24
37	Reliance	0.08	0.04	0.05	-0.02	0.12	0.27	38
38	SBI Life Insurance	0.13	0.03	0.07	0.00	0.17	0.41	28
39	Shriram Finance	0.08	0.05	0.18	0.17	0.18	0.65	7
40	SBI	0.22	0.12	0.03	0.10	0.10	0.57	11
41	Sun Pharma	0.15	0.08	0.10	0.17	-0.02	0.48	20

42	TCS	0.11	-0.06	0.08	0.05	-0.11	0.06	48
43	TATA Cons. Prod	0.09	0.02	0.13	-0.06	0.12	0.32	35
44	TMPV	0.43	-0.08	0.28	-0.01	-0.08	0.53	14
45	Tata Steel	0.25	0.02	0.07	0.01	0.11	0.46	23
46	Tech Mahindra	0.27	-0.20	0.11	0.13	-0.06	0.26	39
47	Titan Company	0.20	0.02	0.16	-0.04	0.09	0.43	27
48	Trent	0.20	0.12	0.35	0.37	-0.19	0.85	4
49	UltraTech Cement	0.15	-0.03	0.17	0.04	0.02	0.35	30
50	Wipro	0.26	-0.23	0.08	0.11	-0.08	0.15	42

Sources: investing.com

The five-year return analysis highlights significant variation in performance across NIFTY 50 companies. Bharat Electronics - 1.03%, emerges as the top performer with consistently strong annual returns, followed by Max Healthcare - 1.00%, Adani Enterprises -0.88%, Trent - 0.85%, and M&M - 0.75%. These firms demonstrate strong upward momentum and sustained investor confidence. Several companies such as Interglobal Aviation, JSW Steel, Larsen, ONGC, and Hindalco also show steady multi-year positive movement, indicating stable operational and market performance. High-growth companies like Eternal and TMPV exhibit high volatility but overall positive long-term returns.

In contrast, defensive and low-growth companies such as HUL, Dr. Reddy's, HDFC Life, Nestle, and TCS show very low cumulative returns, reflecting limited expansion and market fluctuations. Some firms, including Tech Mahindra, Infosys, and Reliance, display mixed trends with alternating positive and negative yearly changes, indicating sensitivity to global and domestic market cycles. Jio Financial shows minimal cumulative return due to limited historical data. Overall, the analysis reveals that while sectors such as healthcare, aviation, metals, and select financial services contributed strong returns, FMCG and IT sectors experienced moderate to low performance during the five-year period.

Conclusion

The present study on NIFTY 50 stocks from 2021 to 2025 provides important insights into how India's leading large-cap companies have performed over time. By looking at average annual returns and standard deviation, it can understand both the profitability and the risk of these stocks. For example, companies like Bharat Electronics, Max Healthcare, Adani Enterprises, Trent, and M&M have consistently delivered higher returns than the index, showing that they have strong market positions and enjoy investor confidence. Certain sectors, such as healthcare, metals, aviation, and selected financial services, also performed well, helping the overall index move upward. On the other hand, low-risk stocks like HUL, Nestle, HDFC Life, and Dr. Reddy's provide steady but modest returns, making them suitable for investors who prefer safety over high gains. IT companies, including TCS, Infosys, and Tech Mahindra, showed moderate fluctuations, mainly due to global technology cycles.

The study also highlights that some companies, such as Reliance and several PSU firms, experienced mixed results because of broader economic and sector-specific conditions. By ranking stocks based on risk and return, it can clearly separate high-performing companies from more stable or underperforming ones, which is very helpful when constructing a portfolio. Overall, this analysis shows that risk and return in the NIFTY 50 are strongly influenced by the sector and the time period considered. High-growth sectors tend to offer higher returns despite greater volatility, whereas defensive sectors provide stability with lower returns. For investors, these findings emphasize the importance of analyzing multiple years of data rather than relying on short-term trends. Understanding these dynamics allows investors to make informed decisions and build portfolios that match their risk preferences, reinforcing the NIFTY 50 as a well-diversified and balanced index.

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