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A Comparative Study on Risk and Return Analysis of Sectoral Indices in the National Stock Exchange of India

A. Bismi[1a], and Dr. K. Devanadhen[2]

[1]Ph.D., Research Scholar (Part-Time), PG & Research Department of Commerce, Arignar Anna Govt. Arts College, Villupuram, Tamil Nadu, India.

[2]Assistant Professor, PG & Research Department of Commerce, Arignar Anna Govt. Arts College, Villupuram, Tamil Nadu, India.

Abstract

For an investor, in deciding on the investment, risk and return plays an important role. The risk and return are interrelated. Usually, if the return is small, the bet will also be low, and the higher risk will be associated with a higher return. Investments in stock markets are risky, as was observed in the performance of several assets. Therefore, it is up to investors what level of risk could be a beard to getting the desired return. Thus, risk and return analysis should be performed before making investments for more thoughtful decisions. In the present study, an attempt is made to analyze and compare the risk and return relationship in the context of the National Stock Exchange using the data of selected Sectoral Indices listed in the S&P NSE 500 Index. The results revealed that the Indices with higher returns had low risk. In comparison, the Indices with lower returns had a higher risk, showing a weak negative linear relationship between the two variables. It was also obtained that there is no significant difference between the Market returns and the monthly returns of the Indices.

Keywords: *Risk, Return, Sectoral Indices, Comparative Analysis, NSE, Market Returns.*

[a] Corresponding Author: bismiazees1803@gmail.com

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Introduction

1.1 National Stock Exchange (NSE)

National Stock Exchange (NSE) was incorporated in 1992 and commenced operations in 1994. It is the leading exchange in India and is ranked 12th in the world by aggregated market capitalization according to the World Federation of Exchange Statistics in August 2020. NSE is also the world's largest derivatives exchange in terms of contracts traded - based on data published by the Futures Industry Association (FIA) in 2019. NSE offers trading in equities, indices, mutual funds, Exchange Traded Funds (ETF), equities, currency, interest rates, commodity derivatives, fixed income and debt, with its benchmark index is NIFTY 50. NSE Group also operates IFSC Ltd, which is a fully owned subsidiary company of NSE and is established as an international exchange, allowing trading in securities in any currency except the Indian Rupee.

Over the past decade from 2015 to 2025, the National Stock Exchange (NSE) Nifty 50 index has shown strong performance, with Indian equities averaging around 13% annual returns and mid-caps performing particularly well, driven by market growth, technology, and efficiency, with significant annual fluctuations, but generally trending upwards, exemplified by Nifty touching 25,000 in 2024. The COVID-19 pandemic caused an immediate, sharp crash in the National Stock Exchange (NSE), followed by a significant recovery and subsequent rally, characterized by heightened volatility and varied performance across different sectors.

Review of Literature

Ashok Bantwa & Faizan Ulhaqq Ansari (2019) has done an enquiry on Risk Return Analysis of Equity Stocks: A Study of Selected Indian IT Companies. the target of this study is geared toward evaluating the financial performance of selected IT companies on the parameters of absolute return, abnormal return, expected rate of return as per CAPM model, volatility of return, systematic risk and risk adjusted return, the study is further geared toward comparing the performance of selected IT companies on above parameters. The yearly absolute return and volatility of absolute return were calculated.

Dr. Pramod Kumar Patjoshi & Dr. Girija Nandini (2020) has done an enquiry on Comparative Risk and Return Analysis of Bombay Stock Exchanges and Steel Sector in India. The target was to check the risks and returns, comprise of Sensex and sample Steel companies in India. They demonstrated the link between risk and return of Sensex and sample Steel businesses in India. The mean, kurtosis, skewness was measured. The analysis discloses that Sensex's average daily returns were positive, but all the sample steel businesses had negative Returns.

Rao et al., (2020) have tried to carry out a detailed analysis of the risk return variables of the companies listed on Bank Nifty. A risk-return comparison is made between the public and private sector banks across two time periods i.e., during the UPA and NDA administrations. It is observed that during the tenure of UPA governance, all the sample stocks have given a positive rate of return. However, during the NDA governance, only 8 out of 12 stocks have rendered a positive rate of return.

A.S. & Bandi, (2021) explained the volatility and return of Nifty Energy Index stocks listed on NSE. The descriptive statistics used for the calculation showcased that the stocks understudy has exhibited positive returns. Further, the application of the GARCH and ARCH model indicates that the NIFTY Energy Index stocks are highly volatile.

M. Praveen Kumar and N.V. Manoj Kumara (2021)," Market capitalization: Pre and post COVID-19 analysis focuses on the impact of COVID-19 on Indian Stock Market and shares performance, The article analyses the market capitalization correlation between the performances of shares and the growth of the share market, using the stock market data of Pre and post COVID-19 status by comparing the data from January 2020 to June 2020. The variables have positive and statistically strong significance on the changes in the market's performance and the value of its market capitalization.

Dr. Deepa Joshi (2022) an attempt to diagnose the risk return profile of equity stocks of Infosys IT company listed on IT Index of NSE. The risk return profile of Infosys IT company has been examined on various parameters including the absolute return, abnormal return, required rate of return as per CAPM model, volatility of return, systematic risk and risk adjusted return. This study concludes alternative investments in management of the investors' assets.

2.1 Objectives of the Study

This study consists of following objectives:

1) The primary objective of this study is to analyze the risk and return of selected sectoral indices from NSE.
2) Compare the Sectoral indices with the market index.
3) To Examine the correlation between Nifty Index and Sectoral Index.
4) Test hypothesis based on Nifty Index with Sectoral Index.

2.2 Pre and Post Impact of COVID

In the initial months of 2020, the Indian stock market, including the Nifty 50, was performing well and reached all-time highs in January and February. This followed a generally favorable market condition in 2019, primarily driven by the strong performance of blue-chip companies. The market volatility was relatively low, and investor's sentiment was positive. As the COVID-19 virus spread globally and the World Health Organization (WHO) declared it a pandemic in March 2020, fear and uncertainty caused a severe market crash. The Nifty 50 index experienced a sharp decline, falling by approximately 38% from its peaks in March 2020. On March 23, 2020, the NSE, along with the BSE, witnessed some of their worst single-day losses in history, leading to the use of circuit breakers to suspend trading. The market became extremely volatile, with a significant increase in the India VIX (Volatility Index). Most sectors experienced sharp declines in stock prices. However, the pharmaceutical/healthcare sector was an exception, showing positive or only slightly negative returns due to the surge in demand for medical supplies and services. A nationwide lockdown in India (starting March 24, 2020) brought many economic activities to a standstill, impacting industries like aviation, hospitality, tourism, and real estate, leading to widespread layoffs and supply chain disruptions. According to SEBI press reports, the financial markets were particularly turbulent in March 2020. As a result of market uncertainty and the associated concern of a financial crisis caused by the COVID-19 pandemic problem, SEBI introduced remedial measures on both the BSE and the NSE, such as an adequate risk management framework. Anxiety and misunderstanding of investing could influence investors.

The market began a recovery phase starting in June 2020, in response to government stimulus packages (like the Atmanirbhar Bharat Abhiyan) and liquidity-boosting measures by the Reserve Bank of India (RBI). The Nifty 50 and Sensex recovered rapidly and continued to rally throughout the second half of 2020, reaching new all-time highs in 2021 and 2022. The market demonstrated an ability to bounce back faster than expected, a pattern observed in previous crises.: While the initial shock subsided, volatility remained elevated compared to pre-pandemic levels, driven by ongoing news about new COVID-19 variants and economic uncertainties. For top blue-chip companies, the post-COVID period actually showed an improvement in liquidity and profitability ratios (e.g., current ratio, net profit margin) in subsequent years compared to the pre-COVID period. Overall, the NSE experienced a "black swan" event, where an unprecedented external shock led to a major but short-lived crash, followed by a robust, policy-aided recovery that ultimately saw the market achieve new milestones, albeit with higher underlying volatility.

Some of the important indicators of the National Stock Exchange (NSE) are market size, market liquidity, market turnover, price earnings, price to book, and dividend yield.

A. Market Size (Size Ratio):

The size of a capital market as measured by stock market capitalisation is positively correlated with the ability to mobilise capital and diversify risk on an economy –wide basis. The size of the Indian capital market can be assessed by employing the stock market capitalization to GDP ratio.

B. Market Liquidity (Liquidity Ratio):

Market Liquidity refers to the ability to buy and sell securities easily. Liquid capital market allows companies on the one hand, to have a permanent access to capital through equity issues and on the other hand, to allow investors to witch out of equity if they need to access funds or if they want to change the composition of their portfolios. The market liquidity is measured by the ratio of total value of shares traded to GDP.

C. Market Turnover (Turnover Ratio):

The market turnover gives the total value of shares traded in relation to the size of the market. It is the most important indicator of market activity. It is calculated as the ratio of total value of shares traded to the market capitalisation.

D. Price Earnings Ratio:

This ratio helps the investor in deciding whether to buy the equity share of a company at a particular market price. It is mainly dependent on market factors. It can also use to predict the market price of equity shares at some future date. It indicates the number of times the earning per share is covered by its market price.

E. Price to Book Ratio:

It is a ratio used to compare the stock market value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share.

F. Dividend Yield Ratio:

This ratio measures the return in relation to the market price per share and is generally used by the investors who are mainly interested in dividend income. It refers the percentage or ratio of dividend paid per share to the market price per share.

The following chart clearly shows the major indicators of National Stock Exchange (NSE)

Table 1 - Major Indicator of NSE

Year	Size Ratio (%)	Turnover Ratio (%)	Price Earnings Ratio	Price to Book value Ratio	Dividend Yield Ratio	Traded Value Ratio
2014-15	79.6	43.6	22.70	3.65	1.49	45.5
2015-16	67.6	45.5	20.89	3.10	1.21	42.2
2016-17	77.8	42.2	23.26	3.50	1.29	51.5
2018-19	82.2	51.5	24.66	3.42	1.13	53.2
2019-20	79.0	53.2	29.01	3.71	1.72	80.0
2020-21	55.9	80.0	19.38	2.45	0.96	75.9
2021-22	102.2	75.9	33.20	4.20	1.13	63.2

2022-23	111.1	63.2	22.92	4.46	1.44	51.9
2023-24	95.1	51.9	20.44	4.06	1.20	52.3
2024-25	130.1	52.3	22.88	3.94	1.32	68.5

Source: SEBI Annual Reports

The Table depicts the indictors of liquidity based on size, liquidity, turnover, price earnings, and price to book ratio and dividend yield ratio. The size shows a fluctuating trend ratio over the period under study. It ranges from 79.6 in the year 2014-15 to 80 in 2024-25, averaging at 88.09 from 2014-15 to 2024-25. The Turnover ratio shows a fluctuating trend ratio over the period under study. It ranges from 43.6 in the year 2014-15 to 130.1 in 2024-25, averaging at 55.93 from 2014-15 to 2024-25. It is clear from the above Table that the price earnings, price to book ratio, dividend yield ratio and traded value ratio shows a fluctuating trend over the study period.

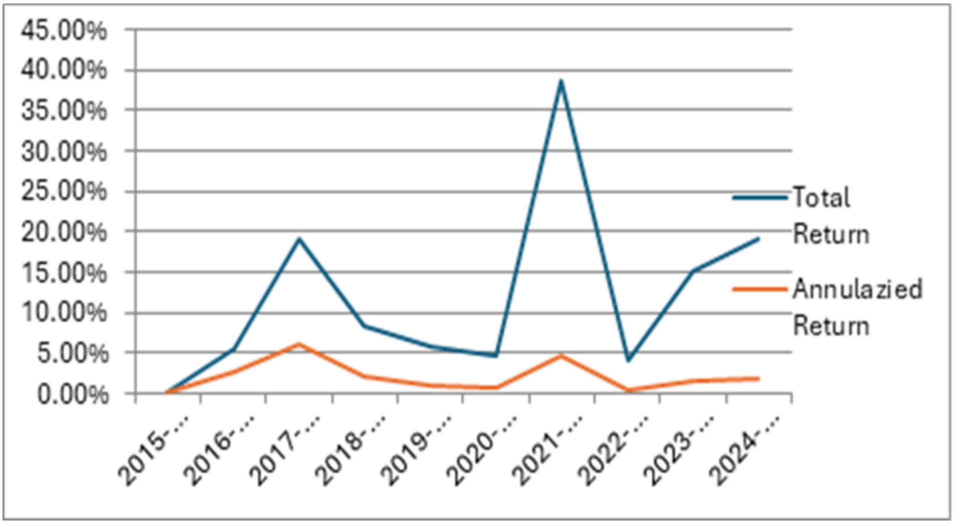
Table 2 - Return and Volatility

Year	Total Return	Annualized Return	Volatility
2015-16	0.21%	0.21%	12.73
2016-17	5.48%	2.70%	16.59
2017-18	19.11%	6.00%	11.91
2018-19	8.27%	2.01%	9.59
2019-20	5.79%	1.13%	12.06
2020-21	4.60%	0.75%	27.36
2021-22	38.66%	4.78%	22.15
2022-23	4.04%	0.50%	15.72
2023-24	15.24%	1.59%	15.07
2024-25	19.01%	1.76%	9.89

Source: SEBI Annual Reports

From the Table, it is observed that return of S&P CNX Nifty ranges from 0.21 to 19.01 from 2014-15 to 2024-25 and volatility ranges from 12.73 to 9.89 in the same period. Because the SEBI floated various Regulatory policy measures aimed at strengthening regulatory architecture, fostering market development and facilitating ease of doing business for the market participants and Electronic Book Provider (EBP) platform have a strong impact on the functioning of secondary market of securities. Alliances mergers and cross border link have occupied center stage of securities industry.

Chart



Hypothesis

The extent of relationship between return, and business and financial risk of the selected companies are measured by the following hypothesis.

- **H_0:** There is no significant relationship between Return, Business and financial Risks of the selected companies in the selected industries in India.
- **H_A:** There is a significant relationship between Return, Business and financial risks of the selected companies in the selected industries in India.

Table 3 - Systematic Risk of Cement Industry

Company	*Average Return*	*Beta*	*Results*
ACC Ltd.	-0.002	0.072	Less risk than the market
Ambuja Cements Ltd.	-0.002	-0.194	Less risk than the market and indicates an inverse relationship with the market
JK Cement	-0.002	1.012	More risk than the market
Dalmia Bharat	0.003	-0.038	Less risk than the market and indicates an inverse relationship with the market
Ultra Tech Cement	-0.014	-0.014	Less risk than the market and indicates an inverse relationship with the market

The Table reveals that the values of beta for different companies are not stable during the study period. The beta value of most of the companies is less than one. Considering both the values of average return and Beta, JK Cements is under more risk category. The other cement companies are under less risk category. Only the beta value of JK Cements is more than one. The stock of JK Cement is more volatile as compared to the market. The one per cent change in the price of the index results a change of 1.012 per cent change in the price of the stock of JK Cement. Similarly, the change of one per cent in the index creates a price change of less than one per cent in the stock of other companies under study. However, considering the range of return only Dalmia Bharat is under positive category.

Table 4 - Business Risk and Financial Risk of Cement Industry

Company	Business Risk		Financial Risk		Total Risk	
	Ratio	Rank	Ratio	Rank	Ratio	Rank
ACC Ltd.	0.67	4	0.10	3	0.62	4
Ambuja Cements Ltd.	0.62	3	-0.09	4	0.41	5
JK Cement	0.42	5	2.34	1	3.01	1
Dalmia Bharat	1.24	2	1.01	2	2.01	2
Ultra Tech Cement	2.07	1	-0.79	5	1.29	3

The Table shows that business risk of the Ultra Tech Cement is the highest, followed by Dalmia Bharat, Ambuja Cements, ACC Ltd and JK Cement. The degree of financial risk is the highest in JK Cement, followed by Dalmia Bharat., ACC Ltd, Ambuja Cements and Ultra Tech Cement. Regarding total risk i.e., contribution of business risk and financial risk, JK Cement is at the topmost level, followed by Dalmia Bharat, Ultra Tech Cement, ACC Ltd and Ambuja Cements Ltd. Thus, risk is lesser in Ambuja Cement than any other cement companies.

Table 5 - Correlation between Business, Financial and Total Risks of selected Cement Companies

Variables	Correlation Coefficient
Business Risk and Total Risk	0.378 (1.879)**
Financial Risk and Total Risk	0.841 (2.098)**

Note: * denotes significance at 5% level

The Table reveals the extent of relationship between business and financial risks and total risk associated with the selected companies in Cement Industry through correlation coefficient considering their magnitudes by Pearson's simple correlation coefficient. To test whether the coefficient is statistically significant or not the t-test has been applied. The Table reveals that correlation coefficient of business risk and total risk, financial risk and total risk are positive, and are found to be statistically significant. Thus, changes in business risk directly affects the total risk. Similarly, the change in financial risk directly affects total risk.

Table 6 - Business Risk and Operating Profitability of Cement Industry

Business risk	OPEC		
	High (≥ 30%)	**Moderate (≥15% but ≤30%)**	**Low (≤15%)**
High (≥ 0.40)			
Moderate (≥0.40 but ≤0.40)			ACC Ltd. Ambuja Cements Ltd. Dalmia Bharat Ultra Tech Cement
Low (≤0.25)		JK Cement	

Note: OPEC-Operating Profit on Capital Employed

The Table reveals the risk and returns status of the selected cement companies in India with reference to business risk and operating profitability. The ratio of Operating Profit on Capital Employed (OPCE) indicates operating profitability. It is observed that JK Cement is under moderate condition i.e., preferable for short-term investment. ACC, Ambuja, Dalmia Bharat and Ultra Tech Cement companies are placed in the poor condition i.e., high risk and low return class.

Conclusion

Risk and return are interrelated concepts and essential before making investment decisions. An investor should perform the risk and return analysis to make the decision better. The present study compared and analyzed the risk and return relationship in the Indian stock market using the data of selected Industry. By this analysis, we can conclude that though the industry is performing so well in the context of return, they are having a high-risk factor. Cement industry, Automobile industry, Paper industry, Paint industry, pharmaceutical industry is performing well in earning higher returns. But sectors are having higher risk rates. This is because of many reasons and investors can choose any combination depending on their will. But any investor looks for the combination of higher returns and lower risk. Hence, there is May that is an impact of market performance on sectoral wise performance, and they are related to each other to some extent.

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