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Evaluating the Impact of Sectoral Indices on Stock Market Performance in the National Stock Exchange

R. Pranchana[1], Dr.S. Sudhamathi[2] and S. Benneet[3]

[1]Ph.D Research Scholar, Alagappa Institute of Management, Alagappa University, Karaikudi, India
[2]Associate Professor, Alagappa Institute of Management, Alagappa University, Karaikudi, India
[3]Ph.D Research Scholar, Alagappa Institute of Management, Alagappa University, Karaikudi, India
E-mail: [1]pranchanabba2805@gmail.com, [2]sudhamathis@alagappauniversity.ac.in, [3]benneets92@gmail.com
ORCID: [1]https://orcid.org/0009-0001-8482-460X, [2]https://orcid.org/0009-0007-5044-985X,
[3]https://orcid.org/0000-0002-3513-3060
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***Abstract* - Economic growth can be measured by the stock market index industry survey, which measures the key indicators of a country's economic development. Furthermore, analyzing various indicators assists governments and investors in using them as a reference. This paper aims to explore the capital market efficiency of the NSE sector indexes by analyzing daily stock price returns. The study seeks to evaluate the effectiveness of the weak form of the selected indicators listed in the NSE. The paper will assess market efficiency by utilizing series and autocorrelation tests and testing the selected NSE industry indexes. During the study, there were notable returns of 5% on the NIFTY Banking Index, NIFFY PSU Bank Index, and Nifty Financial Services Index.**

Keywords: **Stock Market, Indices, NSE NIFTY, Sectoral Indices, Run Test, Autocorrelations**

I. INTRODUCTION

Trading platforms for issuing and depositing financial instruments, such as stocks and other securities, are available through exchanges (Ramkumar et al., 2012). There are 23 stock exchanges, with BSE and NSE being the two major organizations, and 21 regional exchanges are also present (Daruwala et al., 2022). The most prominent stock exchanges in India are BSE and NSN, which provide their services to traders (Almansoori & Yasser, 2022). The Bombay Stock Exchange Limited, or BSE, was founded in 1875 and is the oldest stock market in Asia (Bansal et al., 2014). The National Stock Exchange of India was established in Mumbai in 1992 and is jointly owned by several major Indian financial institutions, banks with significant operations across the country (Italy), and insurance companies, among others (FIFA, Deutsche Bank, Lloyds Financial, PFSI, BP, BIC, UBS, World Finance, OMS, IMB, European Banking Corporation) and other intermediaries. Financial Markets are included with the financial transactions related through pervasive thoughts associated with the economic system (Alam et al., 2016). It is also called buying and selling the financial assets, claims, and services (Naik & Reddy, 2025). Dyckman and Morse (1986) describe the security market as the price of the security trading related to the market, reflected in prices (Shetty, 2019). Market efficiency is classified into three levels: weak from efficiency, strong from efficiency, and semi-strong from efficiency (Mukherjee, 2007).

II. BACKGROUND INFORMATION ABOUT SECTORAL INDEX

Investors commonly use sector analysis to select superior stocks for investment. Investors usually pinpoint the most promising sectors and evaluate company performance within those sectors. This allows them to identify and purchase individual stocks that offer higher returns (Hakiminia et al., 2016). Market efficiency is a crucial concept for understanding the functions of capital markets (Mukherjee, 2007). It describes the relationship between information and stock prices (Elangovan et al., 2022). Market efficiency influences investor strategies because, in an efficient market, there are no undervalued or overvalued stocks, meaning stocks do not provide returns beyond what is expected for a given level of risk. Conversely, investors can achieve excess returns in an inefficient market by selecting the right stocks. This study analyzes stock prices of the National Stock Exchange (NSE) sectoral indices to test the market efficiency of the Indian stock market (Shadman & Mousavi, 2017). (Sehgal & Dutt, 2018). Capital markets are deemed efficient when the cost of a security fully reflects all available information. This research focuses on the NSE sector index (Venkatarathnam et al., 2024). As of April 30, 2011, India had 14 indices comprising numerous companies (Babu & Hariharan, 2014). Every metric is significant (Sahoo & Kumar, 2024). Investors, stakeholders, and policymakers invest in the stock market to maximize returns, particularly in industry indices (Das, 2006). The study's sector analysis evaluates market efficiency (sector indices) across economic sectors (Dhayanidhi & Brindha Devi, 2024). This document assesses market efficiency based on the significance of the NSE Sector Index. The NSE provides daily sector indexes for our returns (Shetty, 2019).

III. Literature Review

Table I shows the related work in the existing versions. An Author (Banas & Kaur,2020) describes a test to determine whether the sectoral indices on NSE are weak in efficiency. The mixed results show that some sectoral indices show inefficiency with short run time (Chari & Razavi, 2017; Taneja, 2012). This research uses the methodology of time series analysis. Various indices are used to examine the efficiency of sectoral indices in India directly (Sajna & Dharmaraj, 2024). (Sharma & Kumar, 2021) described for analyzing the efficiency with the various sector indices followed by NSE. A cross-sectional analysis followed this research of the results to provide the sector-specific efficiency within the NSE (Mitter, 2012). (Gupta & Ghosh, 2022) analysis the influence of macroeconomic factors such as inflation and interest rates. The results of these sectoral indices explore how the external factors should affect the efficiency among the sectoral indices (Sharma & Kumar, 2021; Jain & Patal, 2023). Analyzing the volatility among the efficiency in various sectoral indices in NSE, the proposed work used the methodology of GARCH and volatility analysis. It mainly focused on how the sector specifically defined volatility and how it should affect market efficiency (Bansal & Kaur, 2020). (Verma& Mehra, 2024) should analyze how global economic events impact sectoral index efficiency in India. Global factors are affecting efficiency in the financial sectors (Hashim et al., 2022). Time series and regression analysis are used for this approach. This research results in how the external influences in the NSE Context (Jain & Patel, 2023). (Yadev& Singh, 2025) This is described to check the weak efficiency of the hypothesis for NSE over the last decades. These types of findings are relevant to check whether a sector is weak from the efficiency over the time (Gupta & Ghosh, 2022; Yadav & Singh, 2025).

TABLE I COMPARISON TABLE FOR RELATED WORK

Author name	Research Objective	Findings/Result	Sectoral Indices
(Bansal & Kaur, 2020)	Test the weak efficiency from the sectorial indices	The results are mixed, which shows inefficiency for a short running time.	Directly analyze the efficiency among the indices in India.
(Sharma& Kumar, 2021)	Analysis of the efficiency of various indices on NSE	Technology and pharma indices are more efficient compared to others.	Sector specific indices with NSE.
Gupta & Ghosh, 2022	Analyze the influence of macroeconomic factors with index efficiency.	Indices significantly impact macro-economic factors such as inflation & interest rates	External factors affect the efficiency among sectoral indices.
(Jain & Patal, 2023)	To determine the volatility among the sectoral indices on NSE	Identify the indices as Nifty IT and Nifty Bank shows the higher value of efficiency under the stable market conditions	Specific types of volatility affect the market indices.
(Verma & Mehra, 2024)	Analysis of global economic events and their impact on sectorial index values in India.	Global factors such as oil prices and geopolitical events affect efficiency and financial sectors.	External influence in NSE context.
(Yadav & Singh, 2025)	NSE sectoral indices over the last decades.	Observed sectors like pharmaceuticals during the high volatility periods.	Relevant for testing with sectorial indices from efficiency.

Statement of the Problem

Economic development is facilitated by capital markets, which are significant institutions. Many individuals are keen on scrutinizing the efficiency of capital markets. A low cost of securities is the determining factor for small and medium-sized investors to save and invest. Many individuals are unaware of how to invest in the appropriate domestic stock market indices (Shahani & Sharma, 2020). Additionally, investors often do not understand the companies or indices that perform best in India. Previous studies have examined efficiency in global stock markets and tested random walks in the Palestinian and Russian Stock Markets, among others. However, few studies have investigated daily, weekly, and monthly returns of Indian stock markets, particularly indices like the CNX Nifty (Verma & Mehra, 2024). Consequently, a primary concern for investors is the lack of knowledge regarding performance-oriented index investments. Moreover, there have been no comprehensive studies on the efficiency of various sectors and sector indices within the Indian Stock Exchange. Therefore, this research proposal aims to analyze the efficiency of actively traded sectoral indices using the National Stock Exchange (NSE) and their respective returns (Pranchana & Sudhamathi, 2023).

Need of the Study

The efficiency of the stock market has direct consequences for investors in the market through the wealth of countries. To investigate the various indices influenced by stock market efficiency followed by policymakers, we need to identify the latest information through the performance of the appropriate policies. Several indices are indicated by the performance of a business in a country. This study mainly checks the sectorial efficiency and provides valuable information about government policymakers. It aims to identify the efficient sector and check the available channel through various resources in profitable sectors.

Scope of the Study

The efficient types of stock market hypotheses are tested and used by different statistical techniques. This research study mainly focused on the efficiency of the Indian stock market for 4 years for BSE and NSE sectorial indices. This research study mainly evaluates the normality, randomness, and efficiency among BSE and NSE sectorial indices daily. This study mainly identifies the investors who want to invest the money and earn the maximum returns of BSE and NSE sectorial indices. This study should evaluate the market

efficiency with BSE and NSE, providing a comprehensive analysis of the Indian Stock Market.

Research Objective

The main objective of this study is to evaluate the randomness of price returns of BSE and NSE sectoral indices and the market efficiency of NSE and BSE with several indices.

IV. METHODOLOGY

Sample Selection

The present research is used to test the performance of sectorial indices in various indices, such as BSE and NSE. The turnover values of indices are used as the sample study. In March 2014, there were 13 sectorial indices in the BSE and 11 indices in the NSE. Out of the 13 BSE sectorial-defined indices, 5 were selected as the sample size, followed by the turnover values through the market. Here, the 5 indices are collected by both BSE and NSE. Table I shows the details of the sample indices.

TABLE II BSE AND NSE SAMPLE SECTORIAL INDICES

Name of the stock exchange	Name of the sectoral indices
BSE	Bankex (BSE)
	IT Index (BSE)
	PSU Index (BSE)
	Power Index (BSE)
	Teck Index (BSE)
NSE	Bankex (CNX)
	Energy Index (CNX)
	Finance Index (CNX)
	IT Index (CNX)
	PSU Bank Index (CNX)

Sources of Data

This research study is based on secondary data, such as BSE and NSE noted in Table II. These are all collected from the official websites of BSE and NSE. Other information is collected from websites, journals, and books. Then, various tools and techniques, such as Descriptive statistics, run tests, and autocorrelations, are analyzed.

Descriptive Statistics

This method is used to identify the measure of average return or risk. The central tendency measure includes mean, standard deviation, skewness, and kurtosis. This method provides a helpful summary of security returns and historical information about return behavior. The mean is the average value series obtained divided by the number of observations. Standard deviation is the square root of mean values. Kurtosis is defined as the representation of the peakedness of distributions. Run tests are used to measure market performances. Autocorrelation is the statistical tool used to measure the indices in various successive terms of price challenges (Duan et al., 2024).

Run Test

It is used to measure market performance and does not require the specifications of probability distributions. It depends upon the share price, which is essentially connected to the direction of changes in prices. To test the randomness of the sample used by run test, which contains the sequence of identical occurrences of elements (Sajna & Dharmaraj, 2024).

$$M = \frac{N(N+1) - \sum_{i=1}^{3} n_i^2}{N} \quad (1)$$

From Eqn (1) describes M is the expected number of runs, n_i^2 changes in price level varies from (i=1,2,3). N is the total number of price changes.

Autocorrelation

It is a statistical tool used to measure indices in various types of successive terms with periods followed by dependences. One way of test analysis is to relate randomness in stock price changes to serial correlations. Various studies contain different stocks and different time lags in different periods.

$$P_k = \frac{\sum_{t=1}^{n-k}(R_i - R)\ (R_{t+k}{}^{-R})}{\sum_{t=1}^{n}(R_t - R)1^2} \quad (2)$$

From the Above Eqn (2) K also represents the number of lags, R_t is the real rate of return, n is total number of observations and P_k is the sample autocorrelation for Lag K.

V. RESULTS & DISCUSSION

Analysis- Descriptive Statistics for BSE and NSE Sample Sectoral Indices During the Study Period from 2009 to 2014

TABLE III DESCRIPTIVE ANALYSIS

Name of the Indices	Mean	SD	Skewness	Kurtosis
BSE Sectoral Indices				
Bankex	0.044	1.6083	0.22	1.73
IT Index	0.061	1.4068	0.49	8.57
PSU Index	-0.028	1.1373	-0.04	0.58
Power Index	-0.05	1.2628	-0.21	0.87
TECK Index	0.047	1.216	-0.48	5.38
NSE Sectoral Indices				
Bankex	0.042	1.862	0	1.69
Energy Index	-0.0004	1.2329	0.0009	0.46
Finance Index	0.045	1.5213	0.13	1.29
IT Index	0.056	1.4079	-0.62	9.55
PSU Bank Index	-0.001	1.63	0.1	1.2

To interpret the table III analysis, the mean value of the BSE sectoral indices Bankex is 0.044, which is 4.4%. The standard deviation is 1.608, which is related to volatile fluctuations of 1.61%. Skewness is 0.22, and its distribution is slightly positive, which means there is a slight tendency to have positive returns rather than negative returns. Kurtosis is 1.73, compared to other values below 3, which indicates the return of distribution as platykurtic and having the extreme values of the standard distributions. IT Index's mean value is 0.061,

compared to Bankex's high. SD value is 1.406, which is a moderate value compared to Bankex. Skewness as 0.49 also indicates the distribution has more values. Kurtosis is 8.57, which is mentioned in the more extreme values with normal distributions. PSU Index mean value as -0.028, which suggests the overall loss followed by this period. SD has an index value of 1.1373, which is low compared to other indices. The power index mean value is -0.05, and slow represents the other indices.

Analysis- Market Efficiency in Run Test

TABLE IV MARKET EFFICIENCY IN RUN TEST

Indices Name	Z	Significant value
NIFTY Bankex	-4.111	0
NIFTY Financial Services	-1.425	0
NIFTY PSU Index	-3.697	0.154

Significant value as 5%

After analyzing the run test result used by the NSE sector index, table IV represents the NIFTY Bankex Z value as -4.111, with a significant value of 0. It also suggests that significant values are noted as download trends. If the value is 0, the result is good. It should be indicated by harmful data followed by the NIFTY Bankex index. It contains the value as random, mentioning the movement declined as genuine. NIFTY Financial Services noted the z value as -1.425, and we suggest that the lower value compared to the NIFTY Bankex index should indicate weaker values. The value 0 should indicate the result as statistically significant. NIFTY PSU index value is -3.697, and the significant value is 0.154, which indicates a downward trend. A significant value of 0.154, commonly noted as 0.05, suggests the trend is negative. It is not a significant value used as a confidence level.

Analysis- Market Efficiency of Autocorrelation

TABLE V MARKET EFFICIENCY OF AUTOCORRELATION

Indices Name	Lag1	Lag2	Lag3	Lag4	Lag5	Lag6	lag7	lag8	lag9	lag10
NIFTY Bankex	0	0	0	0	0	0	0	0	0	0
NIFTY Financial Services	0.433	0.469	0.565	0.706	0.731	0.826	0.687	0.78	0.84	0.849
NIFTY PSU Index	0	0	0	0	0	0	0	0	0	0

Autocorrelation measures the correlation between a time series and its past values, indicating Table V past values can help assess market efficiency for predicting the index. An autocorrelation lag value of 0 suggests that past values of the NIFTY Bankex do not provide a relationship or correlation with future values. This implies that the NIFTY Bankex index values exhibit efficient patterns for predicting index returns. Nifty financial services lag values as 1 to 10, and autocorrelation values are positive, which means they gradually reached 0.849 at lag 10. The positive correlation also suggests a predictable pattern for the return of the financial service index. Nifty PSU index contains all lags as 0, which is similar to the NIFTY Bankex index, with autocorrelation all lags as 0, Which also suggests that there are no correlations between the past and future values—the market for the NIFTY PSU index is efficiently related to the market hypothesis.

Comparison Table for Indian Stock Market Investment in Various Sectors

TABLE VI COMPARISON TABLE FOR INDIAN STOCK MARKET INVESTMENT IN VARIOUS SECTORS

Sectors	Percentage
IT	35%
Pharmacy	20%
Consumer Goods	15%
Financial	30%

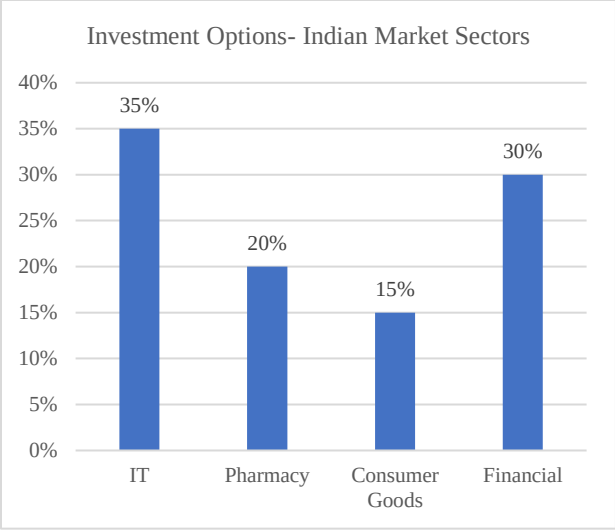

Fig. 1 Indian Stock Market Investments in Various Sectors

Following a comparison analysis, Table VI and Fig. 1 show different sectors invested in Indian stock markets. 35% of IT sectors are invested in Indian stock markets. Infosys, Wipro, and TCS are interested in investing in the Indian market sector. 20% of pharmacy companies (Cipla, Sun, Dr.Reddy Lab) are invested in Indian Stock markets. 15% of consumer goods companies (ITC, Nestle India, and Hindustan Unilever) invested in Indian Market sectors. 30% of financial companies (HDFC, ICICI, SBI) are invested in Indian stock markets (Sajna & Dharmaraj, 2024).

Comparison Between Indian Market Vs Leading Global Exchanges

TABLE VII COMPARISON BETWEEN INDIAN MARKET VS LEADING GLOBAL EXCHANGES

Exchange	Country	Market Gap	Rank
NSE	India	3.18	6
BSE	India	3.46	5
Tokyo	Japan	6.86	4
Shanghai	China	9.46	3
Nasdaq	USA	22.23	2
NYSE	USA	30.14	1

To interpret the above table VII, the US Stock market dominates in terms of Market cap in Japan and China. India got the fifth, sixth, and seventh ranks for BSE and NSE to highlight the size and market gap. In India, the NSE has a market gap of 3.18, and the BSE has a value of 3.46. In Japan, Tokyo has a Market value of 6.86, and in China, Shanghai has a market value of 9.46. In the USA, Nasdaq has a value of 22.23, and the NYSE has a value of 30.14 (Mitter, 2012).

VI. Discussion

In past decades, the Indian economy has combined the leaps and bounds, and the economies at the worldwide level should be integrated. Consider the imperative study that contains the movement of the Indian capital market, which contains various circumstances, to understand and analyze the trends. The development of financial markets has a significant impact on economic growth. The regulators of policymakers should pay attention to improving market efficiency in the future to help retail investors. This type of study also analyzes the weaknesses from the efficiency in the Indian stock market by determining the 5 samples of sectoral indices as BSE and NSE using run test, auto correlation, and descriptive analysis.

VII. Conclusion

The analysis of this research report mainly focused on the market efficiency of the sector indices followed by NSE, which was returned as Nifty Bankex and Nifty PSU index. These indices are related to normal distribution and achieved the better value of 5%. To analyze the two types of indices, we define good performance. The development of the financial markets has significant impacts on economic growth. Relators and decision makers are providing the pay attention through market efficiency along with Indian Stock market. Policy makers are helping to improve the deep financial analysis and the market efficiency for retail in the future. This research suggests that the best index values find that investors invest for money. To get the maximum return values in the NSE sector index, assess the successful one. From the efficiency of the NSE sector, the index should provide a comprehensive analysis of the Indian stock market.

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