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A Study on Inter-Relation and Comparison of Select Sectorial Indices of NSE and BSE

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Abstract: *The stock market allow companies raise to money for their performance, a well-established and profitable companies contribute to the economy. So here the study aim for the inter-relation and inter-comparison for selected sectorial indices of NSE and BSE for the past ten year. JJ Co-integration test is used for the purpose test the integration between the variables. VECM is used for to find the presences for long run relationship between the variables.*

Keywords: BSE, JJ Co-integration test, NSE, Sectorial Indices, VECM**.**

I. INTRODUCTION

The stock market have a major impact of the economic stability of the country. The stock market will fluctuate on many internal and external changes of the economy and the economy also unstable due to the influence of stock market. Which meaning that there is an interdepending relationship among them. India have many stock exchanges are running for the several past years, more over BSE and NSE are the major and well reputed stock market of India. Moreover they have some similarities in the way of operation and stocks values. The BSE was the very oldest stock exchange of India. Additionally, numerous studies demonstrate that the stock market is crucial for enhancing stock capital development, sustaining economic growth, and balancing share price movement. One of the key components of a free market economy is the stock market, which provides financial support for holding companies in return for investor-held shares. Companies can raise more capital by buying or selling their equities on the stock market to the general public.

II. REVIEW OF LITERATURE

Pramod Kumar Naik& Puja Padhi (2012) Using Johansen's co-integration and VECM framework, this study looked at the relationships between the Indian stock market index and five macroeconomic variables, including the industrial production index, the wholesale price index to represent inflation, the broad money supply, the risk free interest rate, and the real effective exchange rate. The analysis made use of monthly data for the period of April 1994 to June 2011 that were gathered from the official websites of the Bombay Stock Exchange and the RBI's Hand Book of Statistics on Indian Economy. The stock market index may have co-integrated with the macroeconomic variables, according to the results of the Johansen's co-integration test.

RanjanDasgupta (2012) By applying various insights, ADF tests, Johansen and Juselius' cointegration test, and Granger causality test, this analysis has attempted to analyse the long-run and short-run relationships between BSE SENSEX and four important macroeconomic parameters of the Indian economy. From April 2007 to March 2012, monthly data was used for all the factors, including the BSE SENSEX, discount value file, list of modern creation, conversion scale, and call cash rate. The findings demonstrated that each factor has a unit root and is coordinated with request 1. Since a very long time ago, links have been running between the BSE SENSEX with the file of mechanical creation and call cash rate, as indicated by Johansen and Juselius' cointegration test, which identified approximately one cointegration vector. The Granger causality test was then applied at that time. No short-run one-sided or reciprocal causal relationships between BSE SENSEX and macroeconomic factors have been identified by the Granger causality test. Thus, it can be concluded that Indian financial exchanges were not informative.

Girbal Singh Lodhi & Kaustubh Jain (2014) this paper compares and contrasts the National Stock Exchange with the Bombay Stock Exchange from 2001 to 2013. The creation of the Stock Exchange was prompted by the urgent need for

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a ready market for investments. The expansion of the stock market is a good indicator of the state of the economy. The Indian stock markets have grown more robust over time. Currently, the combined turnover of the Bombay Stock Exchange Limited and National Stock Exchange of India Limited is 80%, compared to 10% for the other stock exchanges. Therefore, the researcher decided to compare these two leading Indian stock exchanges.

Muazu Ibrahim & Alhassan Musah (2014) has used vector error correction model and the Johansen multivariate cointegration approach to investigate the effects of macroeconomic variables on stock market performance (VECM). The data was gathered between September 2000 and September 2010. Results indicate that among the macroeconomic factors, shocks to inflation, money supply, and exchange rate not only explain a sizable percentage of the variance error of stock returns but also have long-lasting impacts. This is supported by both impulse response functions and variance decomposition.

Attahir Babaji Abubakar (2016) the analysis of the study looked into how the stock market affects economic growth. India's development According to the ADF Unit Root test, all variables are found to be equal. After taking the first order, which was integrated, they stopped moving. The Johansen Co-integration test is used to show the existence of a lengthy run. There is a link between the variables. The outcome of the long-term estimation showed a positive and significant association between investment, labour, and the economy. The relationship between GDP and education has been uncovered, however there is still no information about the relationship between GDP and the stock market. negatively related Temporary VECM (Vector Error Correction Model) According to the dynamics, the stock market had a favourable short-term effect on the economy. The Impulse Response Function illustrates the GDP response to a stock market and interest rate shock (IRF). negative but with a positive reaction to labour, investment, and other shocks. Education was advantageous. One of the policy recommendations is to implement policies. Put in place procedures to lessen stock market shocks and make sure they have a positive effect on India's economic expansion.

2.1 Objective of Study

- To examine the co-integration between the sectorial indices of NSE and BSE.
- To study the long-run relationship between sectorial indices of NSE and BSE.

2.2 Hypothesis of the Study

- **H01:** there is no long-run co-integration exists between sectorial indices of NSE and BSE.
- **H02:** there are no long-run relationships exist between sectorial indices of NSE and BSE.

III. RESEARCH METHODOLOGY

The entire research work is based on secondary data were collected from the NSE and BSE websites and other journals. The period of the study consist of past ten year's data from 2010-2011 to 2020-2021. The stationarity test is check to analysis the time series data are stationary or not for that ADF test is used. The JJ Co-Integration test is used for the purpose to determine if more than 3 variables are inter-related for the time series data. And VECM model is run to find the presence of long run relationship between the sectorial indices BSE and NSE.

3.1 Research Analysis

Testing stationarity for the National Stock Exchange and Bombay Stock Exchange in India for the period of 2010-2020

Table 1.1

Augmented dickey fuller test - Intercept						
Data series	**At level**		**In the first order of difference**		**In the second order of difference**	
	t-statistics	**prob**	**t-statistics**	**prob**	**t-statistics**	**prob**
BSE Energy	1.746585	0.9984	-1.689613	0.4035	-4.377758	**0.0160**
BSE FMCG	-1.054059	0.6880	-2.389756	0.1713	-3.636380	**0.0331**
BSE IT	3.716343	1.0000	-0.430473	0.8679	-3.170343	**0.0568**
NSE Energy	-2.045305	0.2659	-2.634338	0.1251	-1.06455	**0.003**

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NSE FMCG	-0.686874	0.8062	-2.799712	0.1002	-3.569362	**0.0361**
NSE IT	-2.947318	0.0821	-3.142275	0.0688	6.5357	**0.011**

Source: *compiled and computed from secondary data through E-Views*

Table 1.1 shows that the stationarity test of select sectorial indices of NSE and BSE. From the table it is showing that none of the variable is staionarity at level and first difference. The select sectorial indices was staionarity at second order of difference.

Analysis of Co-Integration between Sectorial Indices of Bombay Stock Exchange

H0: there are no long-run co-integration exits between sectorial indices of Bombay Stock Exchange indices.

Table 1.2: Co-integration Rank Test between sectorial indices of Bombay Stock Exchange –Trace

Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None	0.092227	17.37653	29.79707	0.6122
At most 1	0.036091	4.797600	15.49471	0.8299
At most 2	0.000146	0.018990	3.841466	0.8903
The trace test indicates no cointegration at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: *compiled and computed from secondary data through E-Views*

The value of selected indices from the BSE Energy, BSE FMCG, and BSE IT sectors for the period from 2010 to 2020 monthly data are shown in Table 1.2 along with the Co-Integration Rank Trace used to determine whether there is any long run Co-Integration among the variables. Table demonstrates that the co-integration trace's probability value is more than 0.05 and that the trace statistic value is below the crucial value.

Trace statistics' results, which demonstrate that there is a long-term causal relationship between the BSE selected indexes, are at most 1 and at most 2. Accept the null hypothesis, it says. Therefore, it is concluded that BSE Energy, BSE IT, and BSE FMCG do not co-integrate over the long term**.**

Table 1.3: Co integration Rank Test sectorial indices of Bombay Stock Exchange -Maximum Eigen value

Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None	0.092227	12.57893	21.13162	0.4917
At most 1	0.036091	4.778609	14.26460	0.7695
At most 2	0.000146	0.018990	3.841466	0.8903
Max-eigenvalue test indicates no cointegration at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: *compiled and computed from secondary data through E-Views*

The co-integration test with the highest eigenvalue of BSE energy, BSE IT, and BSE FMCG is shown in Table 1.3. This indicates that the null hypothesis is accepted because the probability value is larger than 0.05 and the trace statistic value is below the crucial value. We accept the null hypothesis in the cases of At most 1 and At most 2, concluding that there is at least one co-integrating equation in the long run.

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Analysis of co-integration between sectorial indices of National Stock Exchange

- **H0:** there is no long-run co-integration exit between sectorial indices of the National Stock Exchange.

Table 1.4: Co-integration Rank Test between sectorial indices of National Stock Exchange –Trace

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.045619	11.55354	29.79707	0.9462
At most 1	0.041302	5.483528	15.49471	0.7555
At most 2	2.24E-06	0.000291	3.841466	0.9885
The trace test indicates no co-integration at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: *compiled and computed from secondary data through E-Views*

The Co-Integration Rank Trace value of chosen indices from the NSE Energy, NSE FMCG, and NSE IT sectors is shown in Table 1.4 below for the months of 2010 to 2020. According to Table, the co-integration trace's probability value is greater than 0.05 at the null hypothesis, and the trace statistic value is less than the critical value. The results of trace statistics, which demonstrate that there is a long-term causal relationship between the BSE selected indexes, are at most 1 and at most 2. It declares the null hypothesis to be true. Thus, it is determined that there is no long-term co-integration between NSE Energy, NSE IT, and NSE FMCG.

Table 1.5: Co integration Rank Test sectorial indices of National Stock Exchange -Maximum Eigen value

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.045619	6.070016	21.13162	0.9815
At most 1	0.041302	5.483237	14.26460	0.6800
At most 2	2.24E-06	0.000291	3.841466	0.9885
Max-eigenvalue test indicates no cointegration at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: *compiled and computed from secondary data through E-Views*

The co-integration test with the highest eigenvalue for NSE energy, NSE IT, and NSE FMCG is displayed in Table 1.5. Because the trace statistic value is less than the critical value and the probability value is more than 0.05, it can be stated that the null hypothesis is accepted. As a result, there won't be any long-term co-integration between the NSE energy, NSE IT, and NSE FMCG sectors between 2010 and 2020.

3.2 Finding of the Study

- ADF Test revealed the stationarity at the level of National Stock Exchange and Bombay Stock Exchange and further showed Stationary at the first order then second order of difference.
- The co-integration result of selected indices of NSE shows that there is no long-term relationship between NSE Energy, NSE IT, and NSE FMCG sectors.
- The co-integration result of selected indices of BSE shows that there is no long-term relationship between BSE Energy, BSE IT, and BSE FMCG sectors.
- There is no long-run relationship between BSE Energy and NSE Energy.
- There is no long-run relationship between BSE IT and NSE IT.
- There is no long-run relationship between BSE FMCG and NSE FMCG.

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IV. CONCLUSION

The aim of the study is to examine the inter-relation and inter-comparison of sectorial indices of NSE and BSE for the period of past 10 years. According to the finding of the study it is concluding that there is no inter-relation between the sectorial indices of BSE as well as NSE. And also there is no relationship among the indices.

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