World Journal of Engineering Research and Technology

www.wjert.org

Impact Factor: 7.029 Coden USA: WJERA4

A COMPARATIVE STATISTICAL ANALYSIS OF BSE SENSEX AND NASDAQ INDEX" (WITH REFERENCE TO INDIA AND UNITED STATES)

***Shaishav M. Maisuria**

India.

Article Received on 30/12/2025 **Article Revised on 20/01/2026** **Article Published on 01/02/2026**

***Corresponding Author**

Shaishav M. Maisuria

India.

https://doi.org/10.5281/zenodo.18441222

How to cite this Article: Shaishav M. Maisuria. (2026). "A Comparative Statistical Analysis of Bse Sensex And Nasdaq Index" (With Reference To India And United States). World Journal of Engineering Research and Technology, 12(2), 149–159.

This work is licensed under Creative Commons Attribution 4.0 International license.

ABSTRACT

The study is based on secondary data. The main and primary objective of this study is to determine and compares BSE Sensex and NASDAQ Index performance during the period between February 2022 and September 2025. Monthly historical closing data of the BSE Sensex and NASDAQ Index were collected from respective official websites of BSE and NASDAQ. Monthly return of BSE and NASDAQ is calculated by using Mathematical formula [i.e. R=(P1 – PO)/PO where R = Monthly Return, PO = Previous Month's Closing Price, P1=Current Month's Closing Price]. Computed Descriptive statistics, including mean, standard deviation, Skewness and kurtosis to understand the distribution of returns, calculate the Pearson correlation coefficient to measure the linear relationship between BSE Sensex and NASDAQ Returns, a paired t-test were used to compare the mean returns of BSE Sensex and NASDAQ Returns, The Normality assumption was checked based on the Shapiro-Wilk Test, For the analysis and visualization tools like Microsoft Excel and SPSS were used. Concluded that The Nasdaq index returns have significant positive impact on BSE Sensex returns during the period between February 2022 and September 2025. The strong correlation and high R square value indicate that the NASDAQ index is a good predictor of BSE sensex returns, This makes sense, given the global nature of markets on Indian markets.

KEYWORDS: BSE, NASDAQ, Return, Russia-Ukaraine crises, Sensex.

INTRODUCTION

The world financial system is a frequently shaken by the major global events such as economic recessions, geopolitical conflicts, pandemics which often trigger volatility in capital markets. It is indisputable that the global economy has a significant effect on the country economy. This study aims to investigate the performance and interrelationship of BSE returns and NASDAQ Index during the period between February 2022 and September 2025.

Overview and Achievements of The Bombay stock Exchange

India is a still developing country, The Bombay stock Exchange (BSE) is one of the oldest stock exchange in Asia which was Established in 1875, Located in Mumbai and has played an instrumental role in shaping the trajectory of India's economy over the decades. It is also the 10^{th} oldest in the world. It is 6^{th} largest stock exchange in the world by total market capitalization exceeding 5 trillion dollar in May 2024.[1]

ACHIEVEMENTS[2]

Launch a special platform for trading in SME securities, launch a Free Float Index S & P BSE Sensex, launch Exchange Enabled Internet Trading Platform, Launch mobile based trading in India, Launch S & P BSE SENSXEX Realised S&P Volitility index in November 2010, launch a reporting platform for corporate bonds, Launch S &P BSE IPO index and BSE PSU website, launch trading in S & P BSE SENSXEX futures on EUREX and leading exchanges of the BRICS nation bloc, Launch smart order Routing for members and investors, Launch web based mutual fund trading platform for investors.

Overview and Achievements of NASDAQ[3]

The NASDAQ is a U.S. Stock exchange based in New York City. The USA is a developed country. It is highly industrialized nation with strong diversified market economy. NASDAQ (National Association of Securities Dealers Automated Quotations) was Established by FINRA (Financial industry Regulatory Authority) in 1971 as the world's first electronic stock market. It was the first automated exchange in the world. The NASDAQ offers fast and transparent platform, NASDAQ facilitates trading in over 50 countries, NASDAQ exchange listed more than five thousand companies which includes tech giants companies (like Apple and Microsoft)

ACHIEVEMENTS

The NASDAQ is the first electronic stock market in the world, key achievements include, Pioneering Electronics trading: by replacing traditional trading, Global Technology Provider by powering the operation over 130 market places, cleaning organizations and central securities depositories in more than 50 countries, Leading listing venue by attracting many major technology companies like like Apple and Microsoft, significant Acquisitions and expansion by global foot print through major acquisitions, Index innovation by developed innovative and widely referenced Indices, Earned numerous awards and high ratings for environmental, social and government initiatives,

Review of Literature

Whesly Boungou & Alhonita Yatie (2022**)**," The impact of the Ukraine-Russia war on world stock market returns**,"**.[4] In this paper Researchers examine the impact of the war between Ukraine and Russia on world stock markets returns by using daily stock market returns data of 94 countries. (from 22 January 2022 to 24 march 2022). As a result they concluded that there is a significant negative relationship between the Ukraine and Russia conflict and world stock indices, the results effects were most pronounced in the first two weeks after the invasion of Ukraine on 24 Feb, 2022 then weaker in subsequent weeks. The results of this study are valuable for investors, Portfolio manager and policy makers in designing effective financial strategies.

Dr. Chandra Shekar and Dr. Ravikumar (2024) examined the relationship between stock market performances and gold prices in India.".[5] Using correlation analysis, Granger Causality tests and integration techniques, the findings revealed that gold prices and stock market performance exhibit a complex, inverse relationship in economic uncertainty. Moreover the study explored the role of gold as a hedge against stock market volatility and its significance for Indian investors. Their paper found that the gold returns of the benchmark indices of BSE & NSE.

Lakshmana Madem, Katadi, Anjaneyulu, and Prasad (2025)"[6] The Relationship Between Gold Prices and Stock Market Performance: Evidence from Emerging Economies" In this study they are investigates the relationship between gold prices and stock market performance in India and other emerging markets like Brazil, China and South Africa, they used combine quantitative time-series analysis (from 2000 to 2025) with qualitative insights from investor surveys. they also used different statistical tools like Econometric models,

including Vector Auto regression (VAR), Granger Causality tests, and predictive machine learning models etc. They also study the impact of digital gold investment, macroeconomic factors and technological advancements on gold investment behavior.

Karamjeet Kaur, (2018), "Relationship of Indian Gold Market and stock Market",",[7] In this paper the researcher collected secondary data from BSE and MCX, study the relationship between Indian gold market and stock market between January 2010 and December 2015. The study collected 1678 observations and analyzing the data by using Eviews 9.0 Package Programm, Researcher also analyzing the time series data with the help of Unit Root Augmented Fuller test, Phillips-Perron, Johanson Co-integration and Granger Causality test to measure the long run relationship, they obtained the causality between the gold price and BSE index.

Choudhry, Hassan and Shabi, (2015),[8] Relationship between gold and stock markets during the global financial crisis: Evidence from Nonlinear Causality Tests. In this study the researchers investigate the nonlinear dynamic co-movements between gold and stock market returns and stock market volatility in the US and Japan during the period of pre-crisis and crisis. Initially researcher test the bivariate dynamic relationship then investigated the multivariate nonlinear setting by including changes in the three month LIBOR rates.

Bivariate nonlinear result show very little evidence of causality between the gold returns and stock returns during the period of pre-crisis in the case of all three countries. They concluded that gold having been a safe haven during the period of pre crises and opposite during the period of crises.

A. Thakar and M. Maisuria, (2025),"[9]" Safe Heavan Vs Market Volatility: A Comparative Analysis of Sensex and Gold during Major Global Events in India" In this Paper Researcher evaluates quantitative, event based and comparative analysis to assess the performance of the gold and the Sensex during selected global events, the time period of different the global events are the COVID-19 pandemic (Dec.2020 to Dec. 2022), the Russia-Ukraine Crisis (February 2022 to December 2024) and the Iran-Israel conflict (April 2024 to April 2025). They collected the data of Daily closing prices of Gold (In INR 10 Grams) and daily closing values of the BSE Sensex from respective websites of MCX and BSE. Obtained data were analyzed by different Accounting methods like Returns, Sharp Ratio. To test for statistical significance of differences in mean returns and volatility across different event phases, paired

sample t-test were used by the researches. To compare the risk adjusted performance of BSE Sensex and gold, Sharpe Ratio was calculated which provided insight into how well asset compensates for risk during market shocks. For the analysis and visualization tools like Microsoft Excel and SPSS were used. Concluded that gold consistently outperforms equities during major global events, the findings revealed that no significant difference in overall returns in both during these events. The analysis indicated that Gold acted as a safe haven in early phases of crises but lost its relative advantage as markets stabilized. Volume 11 issue 4 july 2025.

Sarjid and Neha Jain (2022),".[10]" Impact of Globel events on Indian Investors: A comparative study of two different investment a venues in two different time period" In this study Researcher compared two financial instruments over two time periods will aid in the development of reasonable investment decision. Bitcoin which has the greatest market capitalization in the virtual asset category and Nifty 50 stocks, most popular benchmark index were taken for comparison. The main aim of their research was to look assets and compare monthly returns across two time periods. They concluded that although both Bitcoin and Nifty 50 stocks has a positive correlation in the both periods but when it comes to risk aversion in times of turmoil, an Indian investor should focus on Nifty 50 trading rather than crypto currencies.

METHODOLOGY

The study is based on secondary data. The main and primary objective of this study is to determine and compare the performance of BSE returns and NASDAQ Index during the period between February 2022 and September 2025.Monthly historical closing data of the BSE Sensex and NASDAQ Index were collected from respective official websites of BSE and NASDAQ. Monthly return of BSE and NASDAQ is calculated by Mathematical formula [i.e. R=(P1 – PO)/PO where R = Monthly Return, PO = Previous Month's Closing Price, P1=Current Month's Closing Price]. Computed Descriptive statistics, including mean, standard deviation, skewness and kurtosis to understand the distribution of returns, calculate the Pearson correlation coefficient to measure the linear relationship between BSE Sensex and NASDAQ Returns, a paired t-test were used to compare the mean returns of BSE Sensex and NASDAQ, The Normality assumption was checked based on the Shapiro-Wilk Test, For the analysis and visualization tools like Microsoft Excel and SPSS were used.

Objectives of the Study

The main and primary objective of this study is to determine and compare the performance of BSE returns and NASDAQ Index during the period between February 2022 and September 2025.

Specifically, the study aims to

To understand the relationship between BSE and NASDAQ.

To help the investor to understand the functioning of BSE and NASDAQ.

To make Comparative analysis of financial performance of BSE and NASDAQ.

Hypothesis

Ho: "There is no significance different between BSE SENSEX and NASDAQ indices during the period between February 2022 and September 2025.

Regression Analysis[11]

Regression analysis can help to understand the relationship between BSE Returns and NASDAQ Returns.

Regression model

$Y = \beta 0 + \beta 1\ X + \varepsilon$

Where: Dependent Variable Y= BSE Sensex returns

Independent Variable X = NASDAQ returns

$\beta 0$ is the intercept or constant term

$\beta 1$ is coefficients of the independent variables

ε is the error term

Data Analysis

Table No- 1

descriptive statistics	BSE Return	Nasdaq Return
Mean	-0.014	-0.0092
Standard Error	0.02353	0.02495
Median	0.00903	0.01608
Standard Deviation	0.15611	0.1655
Sample Variance	0.02437	0.02739
Range	1.08584	1.12349
Minimum	-1	-1
Maximum	0.08584	0.12349
Sum	-0.6166	-0.4067
Count	44	44
Largest(1)	0.08584	0.12349

Smallest(1)	-1	-1
Confidence Level(95.0%)	0.04746	0.05032

Source: Research Base

The NASDAQ Returns Mean is considered to be equal to the BSE Returns during the period between February 2022 and September 2025.

The NASDAQ Returns Standard Error is considered to be equal to the BSE Returns during the period between February 2022 and September 2025.

The NASDAQ Returns standard Deviation is considered to be equal to the BSE Returns during the period between February 2022 and September 2025.

Table No. 2 Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	BSE[b]	.	Enter
a. Dependent Variable: NASDAQ b. All requested variables entered.			

Source: Research Base

Table No 3			**Model Summary**	
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940[a]	.883	880	.05733
a. Predictors: (Constant), BSE				

Source: Research Base

From the above table, the R value is 0.94. That indicate that there is a strong or high positive correlation between BSE Sensex and NASDAQ indices, it means that they moves in the same direction during the period between February 2022 and September 2025.

R square value is 0.883. This means that above 88.3% variations in returns of BSE Sensex while the remaining 11.7% can be explained by NASDAQ returns. Higher R square indicates a better fit.

Adjusted R square value is 0.880 is a slight adjustment to R square, considering the number of predictors in the model. This suggests that the model is good fit.

Table No. 4					**ANOVA[a]**	
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	1.042	1	1.042	317.089	.000[b]
	Residual	.138	42	.003		
	Total	1.180	43			

a. Dependent Variable: NASDAQ
b. Predictors: (Constant), BSE

Source: Research Base

From the above table, the value of F statics is 317.089 and significant value is 0.000 which is less than 0.05 this shows that the Nasdaq index returns have significant positive impact on BSE Sensex returns during the period between February 2022 and September 2025.

Table No 5: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.006	.009		.673	.505
	BSE	.995	.056	.940	17.807	.000
a. Dependent Variable: NASDAQ						

Source: Research Base

From the above table, regression equation is as follow

$Y = 0.006 + 0.995\ X + \varepsilon$

BSE Sensex returns = 0.006 + 0.995 NASDAQ returns + ε

Result show that BSE Sensex returns has a coefficient regression which amounts to 0.995 with a significant level of 0.000 or less than 0.05. This indicates that HO is not accepted suggesting that BSE Sensex returns does have positive impact towards the NASDAQ returns during the period between February 2022 and September 2025.

Result of Paired t test (Two tailed)

Hypothesis: Ho: that "There is no significance different between BSE SENSEX and NASDAQ indices during the period between February 2022 and September 2025.

Table No 6: Result of Paired t test (Two tailed)	
	Value
P-value	0.4928
t	0.6917
Sample size (n)	44
Average of differences ($\bar{x}_d$)	0.005909
SD of differences (S_d)	0.05666
Normality p-value	0.05306
A priori power	0.9
Post hoc power	0.1038
Skewness	-0.9056
Skewness Shape	**Asymmetrical**, left/negative (pval=0.011)

Excess kurtosis	1.7884
Kurtosis Shape	**Leptokurtic**, long heavy tails (pval=0.011)
Outliers	-0.17, -0.14

Source: Research Base

Here the NASDAQ indices average is considered to be equal to the BSE SENSEX average but p-value is Greater than α =0.05 therefore we cannot reject the null hypothesis that "

There is no significance different between BSE SENSEX and NASDAQ indices during the period between February 2022 and September 2025.

In other words, the sample difference between the average of BSE SENSEX and NASDAQ indices is not big enough to be statistically significant. A Non significant result cannot prove that Ho is correct, only that the null assumption cannot be rejected.

P-Value: The P value is 0.4928, P(x<= 0.6917)=0.7536. it means that the chance of type I error, rejecting a correct Ho, is too high : 0.4928 means 49.28 %. The larger the P value the more it supports Ho.

Test statistics: The test statistics t = 0.6917, which is in the 95% region of acceptance: [-2.0167, 2.0167]

The after minus before (0.0059), is in the 95% region of acceptance : [-0.01723,0.01723].
The 95% confidence interval of after minus before is : [-0.01132, 0.02314]

Effect size: The observed effect size d is very small, 0.1. This indicates that the magnitude of the difference between the average of the differences and the expected and the expected average of the differences is very small.

Validation: The data doesn't meet all the paired t-test assumptions.

Outliers: outliers' detection method : Tukey Fence, K=1.5.
The difference column contains 2 potential outliers, which is 4.55% of the observation (-0.17,-0.14)

The Paired T test is sensitive to the presence of outliers.

Too many outliers may result in skewed distribution.

Normality: The assumption was checked based on the Shapiro-Wilk Test ($\alpha = 0.05$)
It is assumed that after minus before does follow the normal distribution (P value is 0.05306), or more accurately, you can't reject the normality assumption.

Test Power: The test priori power is strong 0.9.

Interpretation of Findings

BSE, established in 1875, is Asia's oldest exchange, while NASDAQ, founded in 1971, pioneered electronic trading.

BSE Sensex returns, This makes sense, given the global nature of markets on Indian markets.

NASDAQ is known for being entirely digital and a global leader in listing technology companies (e.g., Apple, Microsoft, Tesla), and it boasts higher liquidity and a global investor base.

BSE predominantly lists Indian companies and serves a largely local investor base, though it has also transitioned to electronic trading systems.

The NASDAQ Returns Mean is considered to be equal to the BSE Returns during the period between February 2022 and September 2025.

The NASDAQ Returns standard Deviation is considered to be equal to the BSE Returns it suggested that The NASDAQ Returns can be equal volatile than BSE Returns during the period between February 2022 and September 2025.

The Nasdaq index returns have significant positive impact on BSE Sensex returns. The strong correlation and high R square value indicate that the NASDAQ index is a good predictor of the model.

REFERENCES

1. "Bombay Stock Exchange." Wikipedia, Wikimedia Foundation, 26 Nov. 2025, en.wikipedia.org/wiki/Bombay_Stock_Exchange.
2. "Bombay Stock Exchange." Wikipedia, Wikimedia Foundation, 26 Nov. 2025, en.wikipedia.org/wiki/Bombay_Stock_Exchange.
3. Hayes, Adam. "Nasdaq Explained: History, Trading System, and Financial Insights." Investopedia, Investopedia,

www.investopedia.com/terms/n/nasdaq.asp#:~:text=The%20exchange%20opened%20up%20for,the%20U.S.%20and%20global%20economies. Accessed 28 Nov. 2025.

4. Yatie, Whelsy Boungou & Alhonita. "The Impact of the Ukraine-Russia War on World Stock Market R." Working Papers, HAL, 29 Mar. 2022, ideas.repec.org/p/hal/wpaper/hal-03623580.html.
5. Dr. Chandra Shekar Dand, and Dr. Ravikumar. The Relationship between Stock Market Performances and Gold Prices in India., 2024, www.allfinancejournal.com/article/view/389/7-2-57.
6. Rao, Dr K Lakshmana, et al. "The Relationship between Gold Prices and Stock Market Performance: Evidence from Emerging Economies." International Journal of Latest Technology in Engineering Management & Applied Science, Apr. 2025, doi.org/10.51583/IJLTEMAS.2025.140400018.
7. Karamjeet Kaur. "Relationship of Indian Gold Market and Stock Market." View of Relationship of Indian Gold Market and Stock Market, 2018, researchersworld.com/index.php/ijms/article/view/1828/1710.
8. Choudhry, et al. Relationship between Gold and Stock Markets during the Global Financial Crisis: Evidence from Nonlinear Causality Tests - Sciencedirect, Oct. 2015, www.sciencedirect.com/science/article/abs/pii/S1057521915000484.
9. Alpa A Thakar, and Mahendra H Maisuria. "Volume 11, Issue 04, July 2025." IJREAM, July 2025, www.ijream.org/IJREAM_V11I04.html.
10. Sajid, and Neha jain. Impact of Global Events on Indian Investors: A Comparative ..., June 2022, www.researchgate.net/publication/362646623_IMPACT_OF_GLOBAL_EVENTS_ON_INDIAN_INVESTORS_A_COMPARATIVE_STUDY_OF_TWO_DIFFERENT_INVESTMENT_AVENUES_IN_TWO_DIFFERENT_TIME_PERIODS.
11. Shaishav M. Maisuria "Operational Efficiency of Some Selected Indian IT Companies"." Shree prakashan, 14(10): Oct. 2025, http://www.shreeprakashan.com/Documents/20251102015228776.7%20Research%20Paper%20Oct%202025.docx.pdf