

## **Modeling of the short-term returns pattern of BSE (Indian Stock Exchange) and NASDAQ (American Stock Exchange): An empirical study to correlate the two**

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**Abstract:** *Stock, in the general sense, refers to the ownership of a person in a company. As the concept of trading between countries increased, with globalization, the concept of stock exchange came into being. As businesses began to grow, the need for more capital, led to the owners trying to raise funds from the general public, in return of ownership in the company, according to the value of the shares they owned i.e. the money they invested. The prices of shares fluctuate and depend upon the stock market. Many companies list themselves in the global stock markets, thus making their presence in the other countries. Similarly, investors from one country invest in the shares/ stocks of another country, called foreign institutional investment (FII). Stock exchanges play a very important part of a country's economy. Every industry has been able to raise the required amount of capital through stock markets. On the whole, a stock market is considered as the "economic barometer" of a country and plays a major role in terms of the development of the economy. Each country is different in terms of development, yet they are closely knit in terms of trade, exchange of essential commodities, infrastructural ideas, scientific and technological advances, etc. This calls for an understanding of every country's stock market, and thus getting to learn better the changes that have contributed to the betterment of those countries, and the role played by its stock markets in its progress. This research intends to analyze the performance of BSE (Bombay Stock Exchange) of India and NASDAQ (National Association of Securities Dealers Automated Quotations), which is the New York Stock Exchange. It further helps in correlating the performance of the two stock exchanges using the returns of the two stock markets.*

**Keywords:** *Stock Market, Indices, NASDAQ, BSE, Correlation, Fluctuations*

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### **I. Introduction**

A listed company issues shares to the public for subscription. A partition of the ownership with respect to various assets and profits of the company after payment to creditors is called stock and the people whom own them are known as shareholders or owners of the company. A company needs to fulfill the norms of the particular stock exchanges where it wants to list itself. Stocks can be of two types: Common stocks- stocks owned by individuals, which allows them to get a particular stake in the ownership of the company. Preferred stocks- these stock holders are guaranteed of the dividends on the amount invested, unlike common stock holders.

A stockbroker is an individual, usually linked to a brokerage firm or broker-dealer, who does the buying and selling of stocks or shares and other securities for the individual investors and the companies who wish to invest in the stocks of other companies, through a stock exchange or over the counter, in return for a fee, commission or brokerage, which is generally expressed as a percentage. Stockbrokers are known by many designations, depending upon the license they hold, the type of securities they sell, or the services they provide to the clients.

Trading in a stock market refers to the buying and selling of stocks between two or more investors. This calls for a basic requirement that both of them arrive upon an agreed price to strike the deal. Participants in the stock market includes individuals who wish to invest their small savings in stocks to huge companies or wealthy investors, who can be based anywhere in the world that include banks, insurance companies, pension funds and hedge funds.

Bombay Stock Exchange (BSE) was set up as a voluntary not for profit organization in 1875 in the name of "The Native Share & Stock Brokers Association". It is the oldest stock exchange established in Asia. It is a platform for the investors to invest and trade in those securities of the companies that they wish to invest in. More than 5,000 companies are listed in the Bombay Stock Exchange, thus helping them raise funds for the business activities. BSE not only helps as a base for effective trading mechanism for securities, but also protects

the investors' interests and helps in the grievance redressal of both the investors and the trading share brokers. From time to time, BSE provides all the information regarding investment to the investors, so as to help in their investment decisions.

BSE is one of the fastest stock exchanges in Asia, with a speed of 200 microseconds. In 1995, BSE changed to a Screen Based Trading platform i.e. BSE online Trading/ BOLT/ Screen based trading of BSE. This was mainly done to avoid the public outcry at the Stock Exchange's Trading floor. In the year 2001, BSE allowed subsidiary companies that were listed in 13 regional stock exchanges outside Mumbai as its members to trade in; these members work as sub-brokers thus helping the investors of the regional stock exchanges to get a better platform for the investment. BSE's working hours is as follows: Pre-Open Trading session is 9.00 AM to 9.15 AM, Trading session is 9.30 AM to 3.30 PM and Position transfer & closing session is 3.40 PM to 4.00 PM.

BSE's initiatives as a part of its Corporate Social Responsibility (CSR) fetched the Golden Peacock Global CSR Award by the World Council of Corporate Governance in the year 2007. BSE has won the Virtual Corporation 2010 Award in the BSE STAR MF category. BSE has also been awarded the 'Best Exchange of the year' award at 4th India Bullion & Jewellery awards 2017. The Best Exchange of the year award for equity and currency derivatives in Tefla's Commodity Economic Outlook Award 2017 has also been won by BSE.

With a vision to "emerge as the premier Indian stock exchange with best-in-class global practice in technology, products innovation and customer service", BSE has been one of the best performers among the prominent stock exchanges in the world.

NASDAQ is the American Stock Exchange. NASDAQ stands for "National Association of Securities Dealers Automated Quotations" and was founded in 1971 by National Association of Securities Dealers (NASD). It is the first electronic stock market in the world. Over the years, the NASDAQ has added trade and volume reporting and automated trading systems. In 1992, NASDAQ joined with the London Stock Exchange to form the first intercontinental linkage of the securities markets. The National Association of Securities Dealers spun off the NASDAQ Stock Market in 2000 to form a publicly traded company. In 2006, the status of the NASDAQ Stock Market changed from a stock market to a licensed national securities exchange. In 2007, NASDAQ merged with OMX, a leading exchange operator in the Nordic countries, expanded its global footprint, and changed its name to the NASDAQ OMX Group.

Three market tiers exist in the NASDAQ Stock Market:

- Capital Market (small cap) is the stock (equity) market for those companies that have smaller levels of market capitalization. The requirements for a small cap company to get listed are less than for other NASDAQ markets that list larger companies with significantly higher market capitalization.
- Global Market (mid cap) consists of those stocks that represent the Nasdaq Global Market. These include 1,450 stocks that fulfill NASDAQ's financial and liquidity requirements and corporate governance standards.
- Global Select Market (NASDAQ-GS large cap) is a market capitalization-weighted index which includes US-based and international stocks. It represents the Global market. The Global Select Market is inclusive of around 1,200 stocks that follow NASDAQ's strict financial and liquidity requirements and corporate governance standards.

The world today is very closely knit and in this era of globalization, it is very important to understand the various stock markets, since any investor can invest in any stock exchange in the world. Foreign institutional investors need a thorough understanding by comparing more than one stock exchange to find out as to which is the best one for them to invest to gain maximum returns.

## **II. Research Methodology**

### **A. Objectives:**

- To analyze the relation between BSE SENSEX with NASDAQ
- To analyze the performance of BSE SENSEX
- To analyze the performance of NASDAQ
- To know the risk and return of the BSE and NASDAQ
- To correlate the performance of BSE SENSEX with NASDAQ with the help of returns.
- To identify the factors influencing the indices.

### **B. Tools for analysis:**

Statistical tools have been used for the research to analyze the data. These include Arithmetic Mean, Median, Range, Variance, Standard Deviation and Correlation of returns. Further financial tool that has been used prior to the usage of statistical tools is Return. For calculation purpose, the values have been estimated to two decimal points.

**C. Data Collection Method:**

The data for 4 months has been collected through secondary sources regarding the closing values of both NASDAQ and BSE SENSEX.

**D. Plan of analysis:**

The idea of the research is to understand the correlation between the two stock exchanges so as to get a clearer picture about the return and thus help investors in better understanding towards investment.

**E. Reference period:**

Data of every working day has been collected for a period of 4 months between May 2017 and August 2017.

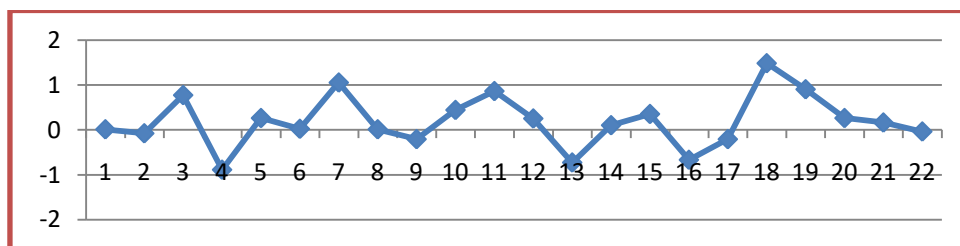
**III. Analysis Of Closing Values Of Bse And Nasdaq For May 2017**

**Table No. I - Closing Values and return of BSE for May 2017**

Sl. No.	Date	Closing values	Return(X)= {(Current Value-Previous value)/Previous Value} * 100	X-Mean	Deviation=(X-Mean) <sup>2</sup>
		29918.40			
1.	2 May 2017	29921.18	0.009	-0.171	0.03
2.	3 May 2017	29894.8	-0.08	-0.26	0.07
3.	4 May 2017	30126.21	0.77	0.59	0.35
4.	5 May 2017	29858.8	-0.89	-1.07	1.14
5.	8 May 2017	29926.15	0.26	0.08	0.006
6.	9 May 2017	29933.25	0.02	-0.16	0.03
7.	10 May 2017	30248.17	1.05	0.87	0.76
8.	11 May 2017	30250.98	0.009	-0.171	0.03
9.	12 May 2017	30188.15	-0.21	-0.39	0.15
10.	15 May 2017	30322.12	0.44	0.26	0.07
11.	16 May 2017	30582.6	0.86	0.68	0.46
12.	17 May 2017	30658.77	0.25	0.07	0.005
13.	18 May 2017	30434.79	-0.73	-0.91	0.83
14.	19 May 2017	30464.92	0.10	-0.08	0.006
15.	22 May 2017	30570.97	0.35	0.17	0.03
16.	23 May 2017	30365.25	-0.67	-0.85	0.72
17.	24 May 2017	30301.64	-0.21	-0.39	0.15
18.	25 May 2017	30750.03	1.48	1.3	1.69
19.	26 May 2017	31028.21	0.90	0.72	0.52
20.	29 May 2017	31109.28	0.26	0.08	0.006
21.	30 May 2017	31159.4	0.16	-0.02	0.0004
22.	31 May 2017	31145.8	-0.04	-0.22	0.05

**Table no. II - Calculations and returns chart:**

Mean = {Sum of (Returns)}/ 22	4.088/22=0.185818
Median= Mid-value of returns in ascending order	0.06136
Variance=Total Deviation/22	7.1034/22=0.322882
Standard Deviation = √Variance	√0.32=0.5682269
Range= Highest value of return-Least value of return	1.479754891-(-0.8876323)=0.592122
Maximum Return	1.479754891
Minimum Return	-0.8876323



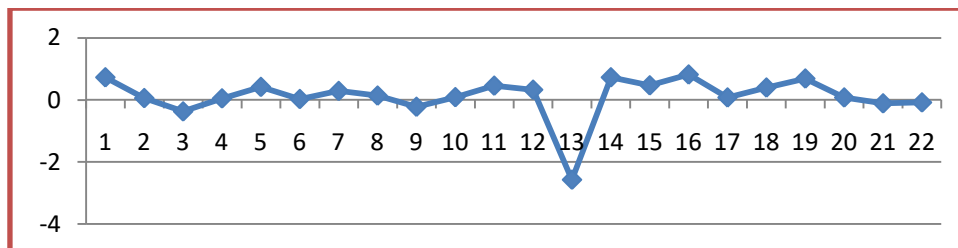
*Analysis:* The mean value which represents the average of the returns is 0.185818. The median value is 0.06136. The graph shows that there are a lot of fluctuations in the returns of BSE in May 2017. There is a price variation of 0.322882 and the returns fluctuate between -0.88 and 1.48.

**Table no. III - Closing Values and return of NASDAQ for May 2017**

Sl. No.	Date	Closing values	Return(X)= {( Current Value-Previous value)/ Previous Value} * 100	X-Mean	Deviation=(X-Mean) <sup>2</sup>
		6047.61			
1.	1 May 2017	6091.60	0.73	0.62	0.38
2.	2 May 2017	6095.37	0.06	-0.05	0.0003
3.	3 May 2017	6072.55	-0.37	-0.48	0.23
4.	4 May 2017	6075.34	0.05	-0.06	0.004
5.	5 May 2017	6100.76	0.42	0.31	0.10
6.	8 May 2017	6102.66	0.03	-0.08	0.0006
7.	9 May 2017	6120.59	0.29	0.18	0.03
8.	10 May 2017	6129.14	0.14	0.03	0.009
9.	11 May 2017	6115.96	-0.22	-0.33	0.11
10.	12 May 2017	6121.23	0.09	-0.02	0.0004
11.	15 May 2017	6149.67	0.46	0.35	0.12
12.	16 May 2017	6169.87	0.33	0.22	0.05
13.	17 May 2017	6011.24	-2.57	-2.68	7.18
14.	18 May 2017	6055.13	0.73	0.62	0.38
15.	19 May 2017	6083.70	0.47	0.36	0.13
16.	22 May 2017	6133.62	0.82	0.71	0.50
17.	23 May 2017	6138.71	0.08	-0.03	0.0009
18.	24 May 2017	6163.02	0.40	0.29	0.08
19.	25 May 2017	6205.26	0.69	0.58	0.34
20.	26 May 2017	6210.19	0.08	-0.03	0.0009
21.	30 May 2017	6203.19	-0.11	-0.22	0.05
22.	31 May 2017	6198.52	-0.08	-0.19	0.04

**Table no. IV - Calculations and returns chart:**

Mean = {Sum of (Returns)}/ 22	2.52/22=0.114545
Median= Mid-value of returns in ascending order	0.084577
Variance=Total Deviation/22	9.7442/22=0.442918
Standard Deviation = √Variance	√0.442918=0.665521
Range= Highest value of return-Least value of return	0.8205532-(-2.571043)=3.3915962
Maximum Return	0.8205532
Minimum Return	-2.571043



*Analysis:* The mean value which represents the average of the returns is 0.084577. The median value is 0.442918. The graph shows that there are a lot of fluctuations in the returns of NASDAQ in May 2017, with a steep fall in return on 17<sup>th</sup> May 2017. There is a price variation of 0.665521 and the returns fluctuate between - 2.57 and 0.82.

**IV. Analysis Of Closing Values Of Bse And Nasdaq For June 2017**

**Table no. V - Closing Values and return of BSE for June 2017**

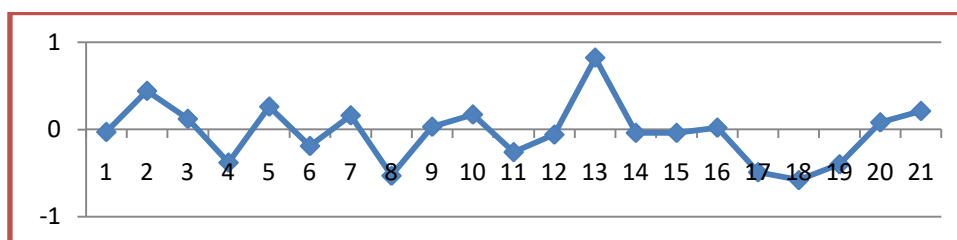
Sl. No.	Date	Closing values	Return(X)= {( Current Value-Previous value)/ Previous Value} * 100	X-Mean	Deviation=(X-Mean) <sup>2</sup>
		31145.8			
1.	1 June 2017	31137.59	-0.03	0	0
2.	2 June 2017	31273.29	0.44	0.47	0.22
3.	5 June 2017	31309.49	0.12	0.15	0.02
4.	6 June 2017	31190.56	-0.38	-0.35	0.12
5.	7 June 2017	31271.28	0.26	0.29	0.08
6.	8 June 2017	31213.36	-0.19	-0.16	0.03
7.	9 June 2017	31262.06	0.16	0.19	0.04
8.	12 June 2017	31095.7	-0.53	-0.50	0.25
9.	13 June 2017	31103.49	0.03	0.06	0.004
10.	14 June 2017	31155.91	0.17	0.20	0.04

*Modeling of the short-term returns pattern of BSE (Indian Stock Exchange) and NASDAQ (American*

11.	15 June 2017	31075.73	-0.26	-0.23	0.05
12.	16 June 2017	31056.4	-0.06	-0.03	0.001
13.	19 June 2017	31311.57	0.82	0.85	0.72
14.	20 June 2017	31297.53	-0.04	-0.01	0.0001
15.	21 June 2017	31283.64	-0.04	-0.01	0.0001
16.	22 June 2017	31290.74	0.02	0.05	0.0025
17.	23 June 2017	31138.21	-0.49	-0.46	0.21
18.	27 June 2017	30958.25	-0.58	-0.55	0.30
19.	28 June 2017	30834.32	-0.40	-0.37	0.14
20.	29 June 2017	30857.52	0.08	0.11	0.01
21.	30 June 2017	30921.61	0.21	0.24	0.06

**Table no. VI - Calculations and returns chart:**

Mean = {Sum of (Returns)}/ 21	-0.69/21= -0.0328571
Median= Mid-value of returns in ascending order	-0.0443804
Variance=Total Deviation/21	2.305/21=0.1097619
Standard Deviation = $\sqrt{\text{Variance}}$	0.33130334
Range= Highest value of return-Least value of return	0.847994
Maximum Return	0.8216342
Minimum Return	-0.0263599



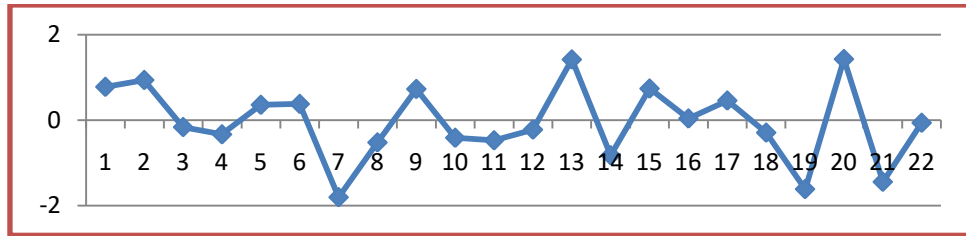
*Analysis:* The mean value which represents the average of the returns is -0.0328571. The median value is -0.0443804. The graph shows that there are a lot of fluctuations in the returns of BSE in June 2017, with a rise in returns on 19<sup>th</sup> June 2017 and a fall in return for three days continuously between 23<sup>rd</sup> June 2017 and 28<sup>th</sup> June 2017. There is a price variation of 0.1097619 and the returns fluctuate between -0.03 and 0.82.

**Table no. VII - Closing Values of NASDAQ for June 2017**

Sl. No.	Date	Closing values	Return(X)= {( Current Value-Previous value)/ Previous Value} * 100	X-Mean	Deviation= (X-Mean) <sup>2</sup>
		6198.52			
1.	1 June 2017	6246.83	0.78	0.82	0.67
2.	2 June 2017	6305.80	0.94	0.98	0.96
3.	5 June 2017	6295.68	-0.16	-0.12	0.01
4.	6 June 2017	6275.06	-0.33	-0.29	0.08
5.	7 June 2017	6297.38	0.36	0.40	0.16
6.	8 June 2017	6321.76	0.38	0.42	0.18
7.	9 June 2017	6207.92	-1.80	-1.76	3.09
8.	12 June 2017	6175.46	-0.52	-0.48	0.23
9.	13 June 2017	6220.37	0.73	0.77	0.59
10.	14 June 2017	6194.89	-0.41	-0.37	0.14
11.	15 June 2017	6165.50	-0.47	-0.43	0.18
12.	16 June 2017	6151.76	-0.22	-0.18	0.03
13.	19 June 2017	6239.01	1.42	1.46	2.13
14.	20 June 2017	6188.03	-0.82	-0.78	0.61
15.	21 June 2017	6233.95	0.74	0.78	0.61
16.	22 June 2017	6236.69	0.04	0.08	0.006
17.	23 June 2017	6265.25	0.46	0.50	0.25
18.	26 June 2017	6247.15	-0.29	-0.25	0.06
19.	27 June 2017	6146.62	-1.61	-1.57	2.46
20.	28 June 2017	6234.41	1.43	1.47	2.16
21.	29 June 2017	6144.35	-1.44	-1.40	1.96
22.	30 June 2017	6140.42	-0.06	-0.02	0.0004

**Table no. VIII - Calculations and returns chart:**

Mean = {Sum of (Returns)}/ 22	-0.85/22= -0.038636
Median= Mid-value of returns in ascending order	-0.3833401
Variance=Total Deviation/22	16.5963/22=0.7543773
Standard Deviation = $\sqrt{\text{Variance}}$	0.8685489
Range= Highest value of return-Least value of return	3.229029
Maximum Return	1.4282646
Minimum Return	-1.8007643



*Analysis:* The mean value which represents the average of the returns is -0.038636. The median value is -0.3833401. The graph shows that there are a lot of fluctuations in the returns of NASDAQ in June 2017, with a steep fall in returns on 9<sup>th</sup> June 2017 and a rise in steep rise in return, on days 19<sup>th</sup> June 2017 and 28<sup>th</sup> June 2017. There is a price variation of 0.7543773 and the returns fluctuate between -1.80 and 1.43.

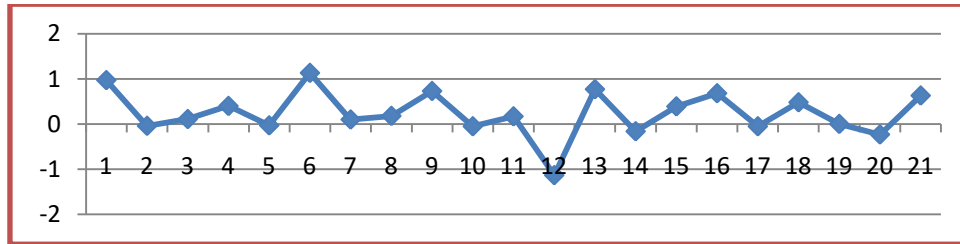
**V. Analysis Of Closing Values Of Bse And Nasdaq For July 2017**

**Table no. IX - Closing Values of BSE for July 2017**

Sl. No.	Date	Closing values	Return(X)= {(Current Value-Previous value)/Previous Value} * 100	X-Mean	Deviation= (X-Mean) <sup>2</sup>
		30921.61			
1.	3 July 2017	31221.62	0.97	0.73	0.53
2.	4 July 2017	31209.79	-0.04	-0.28	0.08
3.	5 July 2017	31245.56	0.11	-0.13	0.02
4.	6 July 2017	31369.34	0.40	0.16	0.03
5.	7 July 2017	31360.63	-0.03	-0.27	0.07
6.	10 July 2017	31715.64	1.13	0.89	0.79
7.	11 July 2017	31747.09	0.10	-0.14	0.02
8.	12 July 2017	31804.82	0.18	-0.06	0.004
9.	13 July 2017	32037.38	0.73	0.49	0.24
10.	14 July 2017	32020.75	-0.05	-0.29	0.08
11.	17 July 2017	32074.78	0.17	-0.07	0.005
12.	18 July 2017	31710.99	-1.13	-1.37	1.88
13.	19 July 2017	31955.35	0.77	0.53	0.28
14.	20 July 2017	31904.4	-0.16	-0.40	0.16
15.	21 July 2017	32028.89	0.39	0.15	0.02
16.	24 July 2017	32245.87	0.68	0.44	0.19
17.	25 July 2017	32228.27	-0.05	-0.29	0.08
18.	26 July 2017	32382.46	0.48	0.24	0.06
19.	27 July 2017	32383.3	0.003	-0.237	0.06
20.	28 July 2017	32309.88	-0.23	-0.47	0.22
21.	31 July 2017	32514.94	0.63	0.39	0.15

**Table no. X- Calculations and returns chart:**

Mean = {Sum of (Returns)}/ 21	5.053/21=0.240619
Median= Mid-value of returns in ascending order	0.1687343
Variance=Total Deviation/21	4.975869/21=0.236946
Standard Deviation = $\sqrt{\text{Variance}}$	0.486771
Range= Highest value of return-Least value of return	2.266217
Maximum Return	1.1320234
Minimum Return	-1.134193



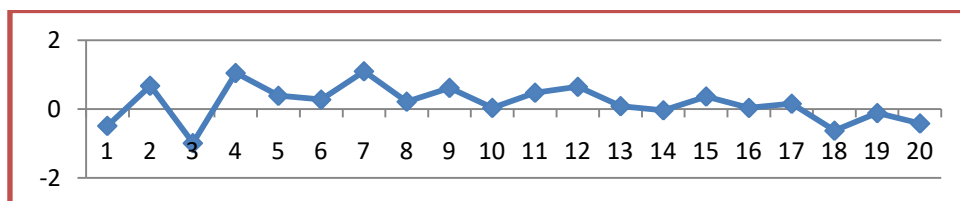
*Analysis:* The mean value which represents the average of the returns is 0.240619. The median value is 0.1687343. The graph shows that there are a lot of fluctuations in the returns of BSE in July 2017, but do not show any major fluctuations. There is a price variation of 0.486771 and the returns fluctuate between -1.13 and 1.13.

**Table no. XI - Closing Values of NASDAQ for July 2017**

Sl. No.	Date	Closing values	Return(X)= {( Current Value-Previous value)/ Previous Value} * 100	X-Mean	Deviation=(X-Mean) <sup>2</sup>
		6140.42			
1.	3 July 2017	6110.06	-0.49	-0.66	0.44
2.	5 July 2017	6150.86	0.67	0.50	0.25
3.	6 July 2017	6089.46	-0.99	-1.16	1.35
4.	7 July 2017	6153.08	1.04	0.87	0.76
5.	10 July 2017	6176.39	0.38	0.21	0.04
6.	11 July 2017	6193.30	0.27	0.10	0.01
7.	12 July 2017	6261.17	1.09	0.92	0.85
8.	13 July 2017	6274.44	0.21	0.04	0.002
9.	14 July 2017	6312.47	0.61	0.44	0.19
10.	17 July 2017	6314.43	0.03	-0.14	0.02
11.	18 July 2017	6344.31	0.47	0.30	0.09
12.	19 July 2017	6385.04	0.64	0.47	0.22
13.	20 July 2017	6390.00	0.08	-0.09	0.008
14.	21 July 2017	6387.75	-0.04	-0.21	0.04
15.	24 July 2017	6410.81	0.36	0.19	0.04
16.	25 July 2017	6412.75	0.03	-0.14	0.02
17.	26 July 2017	6422.75	0.15	-0.02	0.0004
18.	27 July 2017	6382.19	-0.63	-0.80	0.64
19.	28 July 2017	6374.68	-0.12	-0.05	0.003
20.	31 July 2017	6348.12	-0.42	-0.59	0.35

**Table no. XII - Calculations and returns chart:**

Mean = {Sum of (Returns)}/ 20	3.34/20=0.167
Median= Mid-value of returns in ascending order	0.18394
Variance=Total Deviation/20	5.3132/20=0.26566
Standard Deviation = $\sqrt{\text{Variance}}$	0.515422
Range= Highest value of return-Least value of return	2.094096
Maximum Return	1.095862
Minimum Return	-0.998234



*Analysis:* The mean value which represents the average of the returns is 0.167. The median value is 0.18394. The graph shows no major fluctuations in the returns of NASDAQ in July 2017, but has shown a declining returns trend from 20<sup>th</sup> July 2017 till the end of the month (31<sup>st</sup> July 2017). There is a price variation of 0.515422 and the returns fluctuate between -0.99 and 1.09.

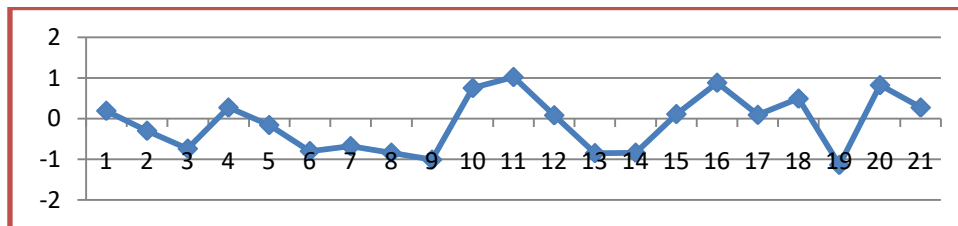
**VI. Analysis Of Closing Values Of Bse And Nasdaq For August 2017**

**Table no. XIII - Closing Values of BSE for August 2017**

Sl. No.	Date	Closing values	Return(X)= {( Current Value- Previous value)/ Previous Value} * 100	X-Mean	Deviation= (X-Mean) <sup>2</sup>
		32514.94			
1.	1 August 2017	32575.17	0.19	0.31	0.10
2.	2 August 2017	32476.74	-0.30	-0.18	0.03
3.	3 August 2017	32237.88	-0.74	-0.62	0.38
4.	4 August 2017	32325.41	0.27	0.39	0.15
5.	7 August 2017	32273.67	-0.16	-0.04	0.002
6.	8 August 2017	32014.19	-0.80	-0.68	0.46
7.	9 August 2017	31797.84	-0.68	-0.56	0.31
8.	10 August 2017	31531.33	-0.84	-0.72	0.52
9.	11 August 2017	31213.59	-1.01	-0.89	0.79
10.	14 August 2017	31449.03	0.75	0.87	0.76
11.	16 August 2017	31770.89	1.02	1.14	1.30
12.	17 August 2017	31795.46	0.08	0.20	0.04
13.	18 August 2017	31524.68	-0.85	-0.73	0.53
14.	21 August 2017	31258.85	-0.84	-0.72	0.52
15.	22 August 2017	31291.85	0.11	0.23	0.05
16.	23 August 2017	31568.01	0.88	1.00	1.00
17.	24 August 2017	31596.06	0.09	0.21	0.04
18.	28 August 2017	31750.82	0.49	0.61	0.37
19.	29 August 2017	31388.39	-1.14	-1.02	1.04
20.	30 August 2017	31646.46	0.82	0.94	0.88
21.	31 August 2017	31730.49	0.27	0.39	0.15

**Table no. XIV - Calculations and returns chart:**

Mean = {Sum of (Returns)}/ 21	-2.39/21= -0.1138095
Median= Mid-value of returns in ascending order	-0.1600598
Variance=Total Deviation/21	9.4461/21=0.449814
Standard Deviation = √Variance	0.6706819
Range= Highest value of return-Least value of return	2.164916
Maximum Return	1.023434
Minimum Return	-1.141482



*Analysis:* The mean value which represents the average of the returns is -0.1138095. The median value is -0.1600598. The graph shows a lot of fluctuations in the returns of BSE in August 2017 with a continuous fall in return between 8<sup>th</sup> August 2017 and 11<sup>th</sup> August 2017. This is followed by an immediate rise in returns between 14<sup>th</sup> August 2017 and 17<sup>th</sup> August 2017, with a downward positive trend. After this, there have been steep rises and falls in the returns of BSE. There is a price variation of 0.449814 and the returns fluctuate between -1.14 and 1.02.

**Table no. XV - Closing Values of NASDAQ for August 2017**

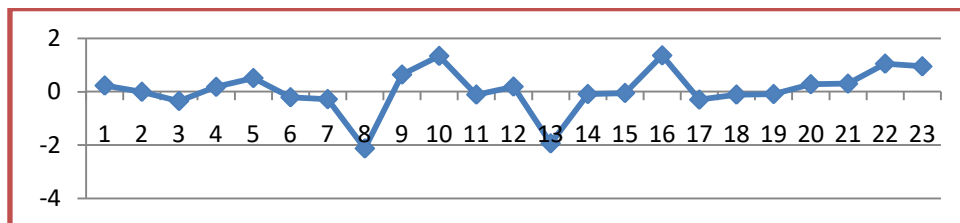
Sl. No.	Date	Closing values	Return(X)= {( Current Value- Previous value)/ Previous Value} * 100	X-Mean	Deviation= (X-Mean) <sup>2</sup>
		6348.12			
1.	1 August 2017	6362.94	0.23	0.17	0.03
2.	2 August 2017	6362.65	-0.005	-0.065	0.004
3.	3 August 2017	6340.34	-0.35	-0.41	0.17
4.	4 August 2017	6351.56	0.18	0.12	0.01
5.	7 August 2017	6383.77	0.51	0.45	0.20



6.	8 August 2017	6370.46	-0.21	-0.27	0.07
7.	9 August 2017	6352.33	-0.28	-0.34	0.16
8.	10 August 2017	6216.87	-2.13	-2.19	4.80
9.	11 August 2017	6256.56	0.64	0.58	0.34
10.	14 August 2017	6340.23	1.34	1.28	1.64
11.	15 August 2017	6333.01	-0.11	-0.17	0.03
12.	16 August 2017	6345.11	0.19	0.13	0.02
13.	17 August 2017	6221.91	-1.94	-2.00	4
14.	18 August 2017	6216.53	-0.09	-0.15	0.02
15.	21 August 2017	6213.13	-0.05	-0.11	0.01
16.	22 August 2017	6297.48	1.36	1.30	1.69
17.	23 August 2017	6278.41	-0.30	-0.36	0.13
18.	24 August 2017	6271.33	-0.11	-0.17	0.03
19.	25 August 2017	6265.64	-0.09	-0.15	0.02
20.	28 August 2017	6283.02	0.28	0.22	0.05
21.	29 August 2017	6301.89	0.30	0.24	0.06
22.	30 August 2017	6368.31	1.05	0.99	0.98
23.	31 August 2017	6428.66	0.95	0.89	0.79

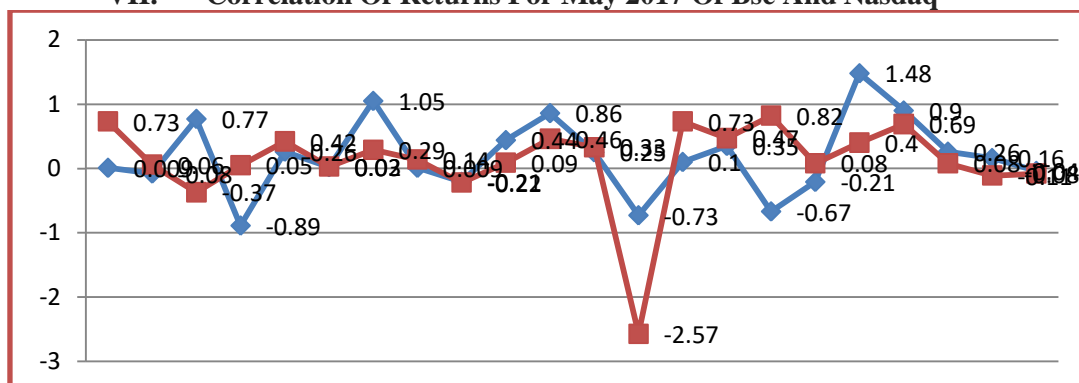
Table no. XVI - Calculations and returns chart:

Mean = {Sum of (Returns)}/ 23	1.365/23= 0.05934782
Median= Mid-value of returns in ascending order	-0.0045576
Variance=Total Deviation/23	15.254/23=0.663217
Standard Deviation = √Variance	0.8143816
Range= Highest value of return-Least value of return	3.4900547
Maximum Return	1.357609
Minimum Return	-2.132446



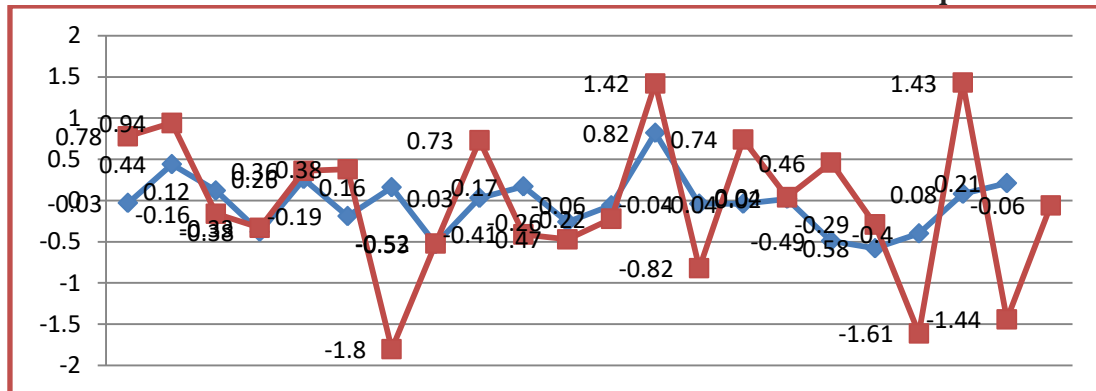
Analysis: The mean value which represents the average of the returns is 0.05934782. The median value is -0.0045576. The graph shows a lot of fluctuations in the returns of NASDAQ in August 2017 with a deep fall in return on 10<sup>th</sup> August 2017, followed by a sudden rise in returns on 11<sup>th</sup> and 14<sup>th</sup> of August 2017. This is followed by an alternate downward and upward trend in the returns. There is a price variation of 0.8143816 and the returns fluctuate between -2.13 and 1.36.

VII. Correlation Of Returns For May 2017 Of Bse And Nasdaq



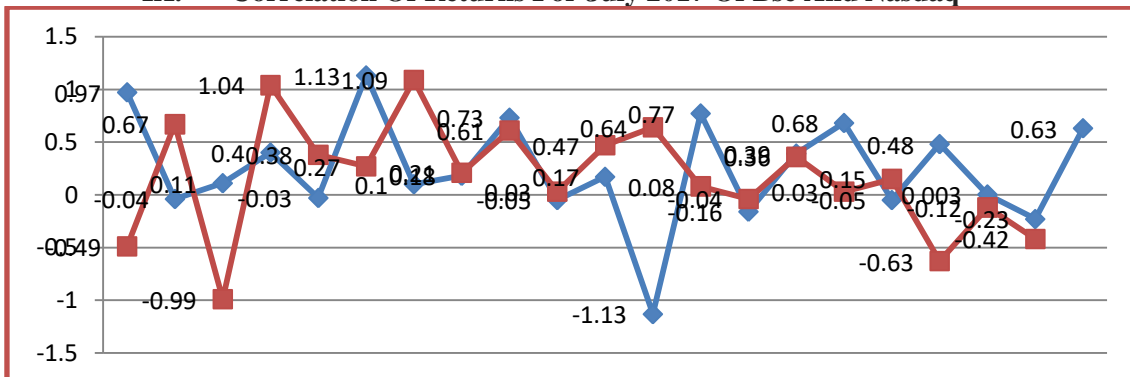
Analysis: It can be observed through the above graph that though there are returns of both BSE and NASDAQ in below the positive line, they seem to be positively correlated when the correlation of returns above the positive line is observed. This results in a slightly positive correlation between BSE (blue line) and NASDAQ (red line) stock returns of 0.3548227. This value indicates a weak uphill positive linear relationship between the two stocks.

**VIII. Correlation Of Returns For June 2017 Of Bse And Nasdaq**



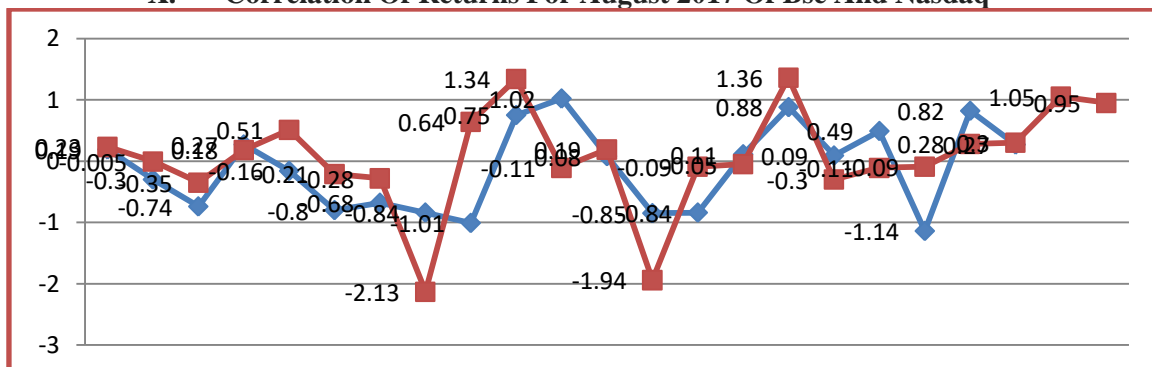
*Analysis:* It can be observed through the above graph that there are steep ups and downs in the returns of both BSE and NASDAQ. The returns have mostly remained slightly above the positive line. This results in a slightly positive correlation between BSE (blue line) and NASDAQ (red line) stock returns of 0.2837777, though is lesser than the correlation in the previous month's returns of the two stock markets. This slightly positive correlation between BSE and NASDAQ indicates that there is a simultaneous increase and decrease in the value of returns between the two stock exchanges.

**IX. Correlation Of Returns For July 2017 Of Bse And Nasdaq**



*Analysis:* It can be observed through the above graph that there are a lot of fluctuations in the correlated returns of the two stock markets. The returns seem to fall below the positive line, thus showing negative correlation between the two. This results in a slightly negative correlation between BSE (blue line) and NASDAQ (red line) stock returns of -0.2017447. This indicates that there is weak downhill negative linear relationship that has been established in July 2017 when the returns of BSE and NASDAQ are compared and correlated. This could be a result of the political, economic or business and law related changes of the particular nations that have influenced each of the stock market conditions, thus resulting in negative correlation.

**X. Correlation Of Returns For August 2017 Of Bse And Nasdaq**

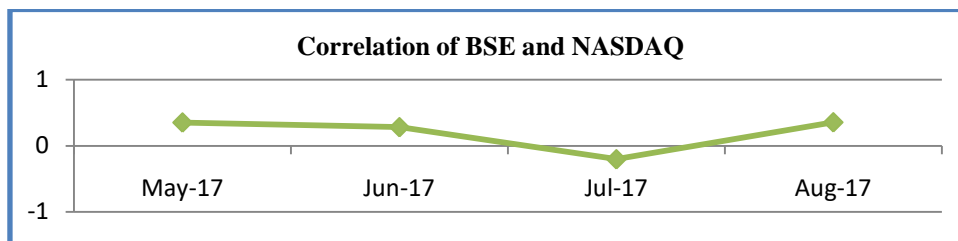


*Analysis:* It can be observed through the above graph that though there have been a lot of fluctuations in the returns movement of BSE and NASDAQ, it is clear that they are correlated positively. This results in a positive correlation between BSE (blue line) and NASDAQ (red line) stock returns of 0.3578722. This also indicates that the two exchanges have been influential to one another in determining the returns of stock. Though there is slight positive linear relationship between the two stock markets, yet it is a positive sign for businesses and investors.

**XI. Consolidated Correlation Values Of Bse And Nasdaq For The 4 Months May, June, July And August 2017**

**Table no. XVII**

Month	Correlation value
May 2017	0.3548227
June 2017	0.2837777
July 2017	-0.2017447
August 2017	0.3578722



*Analysis:* Karl Pearson’s correlation co-efficient has been calculated for each month’s returns considering BSE as variable 1 and NASDAQ as variable 2. The results arrived at are shown in the above table and graph. There is slight positive correlation between the returns of BSE and NASDAQ in months May, June and August 2017, though a negative correlation is observed in July 2017.

**XII. Conclusion**

Stock markets are an important part of today’s world. Businesses run their show and investors gain much more than they expect on their investments through the stock exchanges. With each country dependent on the other and with businesses being set up in every corner of the world, it becomes extremely important to understand the concept and functioning of stock exchanges and how it could be a driving factor to the success or downfall of an economy. The relationship between different stock markets and a thorough knowledge of them is very critical. The research has tried to bring about the relationship between BSE (Bombay Stock Exchange) of India and NASDAQ (National Association of Securities Dealers Automated Quotations) of America. The correlation between the two stock exchanges clearly indicates that there are certain factors that influence the returns of both stock markets simultaneously. The effects of changes that influence BSE and NASDAQ have their impact on businesses running in both countries. This could be similar impacts or may differ depending on the correlation between the two stock markets. Thus it can be said that the world being knit together, it is very important to have a clear and thorough understanding of the various economies, laws, businesses and more importantly the stock markets of those nations.

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