# COMPARATIVE ANALYSIS OF INDIAN STOCK MARKET WITH INTERNATIONAL STOCK MARKET

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## ABSTRACT

The concept of risk and return plays a vital role in the investment process, business organization, economic, political, and technological issues/problems. In the paper, three levels have been taken to measure the performance of the Stock Indices. In the first level, the Return (Log Mean), Risk (Standard Deviation), have been calculated. In the second level, it provides an overview of volatility of stock exchange and about Efficiency of the Market. The correlation among the Indices performance has been calculated in the third level. This research paper shows the trends, similarities and patterns in the activities and movements of the Indian Stock Market in comparison to its international counterparts.

**Key words: Return, Risk, Efficiency, Stock Volatility**

## INTRODUCTION

A Stock Exchange is a platform for exchanging or selling stocks/shares, securities, and bonds. Stock Exchanges around the world enable the stock brokers and traders to operate on highly organised and institutionalized manner. The stock exchanges are regulated by the law of the country and hence, assure the prohibition of fraudulent activities. A particular share is eligible to be traded in the stock market where the company is listed with. Company is allowed to list its stock after it meets some predefined criteria for that particular stock exchange.

In the earlier days, there were centralized physical forms of stock exchange. But with changing technologies the market has taken an electronic form where most of the transactions happen over the networked computers. Only the registered brokers of a trade exchange are allowed to perform any exchange operation. In stock markets, often the process of continuous auction of assets is performed.

The Indian Stock Exchanges hold a place of prominence not only in Asia but also at the global stage. The Bombay Stock Exchange (BSE) is one of the oldest exchanges across the world, while the National Stock Exchange (NSE) is among the best in terms of sophistication and advancement of technology. The Indian stock market scene really picked up after the opening up of the economy in the early nineties. The whole of nineties were used to experiment and fine tune an efficient and effective system. The 'badla' system was stopped to control unnecessary volatility while the derivatives segment started as late as 2000.

The study pertains to comparative analysis of the Indian Stock Market with respect to various international counterparts. Exchanges are now crossing national boundaries to extend their service areas and this has led to cross-border integration. Also, exchanges have begun to offer cross-border trading to facilitate overseas investment options for investors. This not only increased the appeal of the exchange for investors but also attracts more volume. Exchanges regularly solicit companies outside their home territory and encourage them to list on their exchange and global competition has put pressure on corporations to seek capital outside their home country.

## 1.2 Early History

The idea of debt dates back to the ancient world as evidenced for example, by ancient Mesopotamian clay tablets recording interest-bearing loans. There is little consensus among scholars as to when corporate stock was first traded. Some see the key event as the Dutch East India Company's founding in 1602, while others point to earlier developments. Economist Ulrike Malmendier of the University of California At Berkeley argued that a share market existed as far back as ancient Rome.

The First Stock Exchange - Belgium boasted a stock exchange as far back as 1531, in Antwerp. Brokers and moneylenders would meet there to deal in business, government and even individual debt issues. It is odd to think of a stock exchange that dealt exclusively in promissory notes and bonds, but in the 1500's there were no real stocks. There were many flavors of business-financier partnerships that produced income like stocks do, but there was no official share that changed hands.

Despite the ban on issuing shares, the London Stock Exchange was officially formed in 1801. Since companies were not allowed to issue shares until 1825, this was an extremely limited exchange. This

prevented the London Stock Exchange from preventing a true global superpower. That's why the creation of the New York Stock Exchange (NYSE) in 1817 was such an important moment in history.

The NYSE has traded stocks since its very first day. Contrary to what some may think, the NYSE wasn't the first stock exchange in the United States. The Philadelphia Stock Exchange holds that title. However, the NYSE soon became the most powerful stock exchange in the country due to the lack of any type of domestic competition and it's positioning at the center of U.S. trade and economics in New York. The London Stock Exchange was the main stock market for Europe, while the NYSE was the main exchange for America and the world.

## 1.3 Internationalization of Stock Exchange

Indian securities market is getting increasingly integrated with the rest of the world. Indian companies have been permitted to raise resources from abroad through issue of American Depository Receipts (ADRs), Global Depository Receipts (GDRs), Foreign Currency Convertible Bonds (FCCBs) and European Convertible Bonds (ECBs). Further, foreign companies are allowed to tap the domestic stock markets.

Indian companies are permitted to list their securities on foreign stock exchanges by sponsoring ADR/GDR issues against block shareholding. NRIs and OCBs (Overseas Corporate Bodies) are allowed to invest in Indian companies. FIIs have been permitted to invest in all types of securities, including government securities. The investments by FIIs enjoy full capital account convertibility. They can invest in a company under portfolio investment route up to 24% of the paid up capital of the company.

RBI permitted two-way fungibility for ADRs/GDRs, which meant that the investors (foreign institutional or domestic) who hold ADRs/ GDRs can cancel them with the depository and sell the underlying shares in the market. The company can then issue fresh ADRs to the extent of the shares cancelled.

Indices

| Sr. No. | Parameters | BSE | NSE | NYSE | TOKYO Stock Exchange | HONG KONG Stock Exchange |
|---|---|---|---|---|---|---|
| 1 | Country | India | India | USA | Japan | Hong Kong (China) |
| 2 | Name of Indices | SENSEX BSE-100 BSE-200 BSE-500 | NIFTY | Dow Jones Industrial Average | NIKKEI | HKSE |
| 3 | Number of Companies | SENSEX-30 | 50 | 30 | 225 | 33 |
| 4 | Method of Calculation of Indices | Free Float Market Capitalization Method | Weighted Average | Weighted Average | Price Weighted Average | Weighted Capitalization Method |

## 2. REVIEW OF LITERATURE

- **Dr. Ch. Chaitanya (2015)** The study aims to find out the stock exchange of BSE, NSE, Hang Sang & Tokyo which is performing financially better on various basis. The select global market Indices are integrated with each other and more specifically Sensex is more integrated with other Asian Exchanges.

- **Rakesh Gupta and Francesco Guidi (2014)** They investigated the integration of India with the developed countries such as US, Japan, and other Asia Pacific market for period in between (2010-2014). In this study, they found that Correlation roses dramatically during periods of crisis and return to their initial levels after the crisis.

- **Alan Harper, Zhenhu Jin, Gregory (2014)**
  The monthly returns of these markets tend to converge in the long run even though they may move in different directions in the short term. Sensex has given highest Risk adjusted return for the whole period followed, whereas, Nikkei has given negative Risk adjusted return for the same period.

- **Pratap Singh Daksha Chauhan, December (2013)** The study aims to find out the stock exchange of BSE and NSE which is performing financially better on various basis. It is limited for only financial performance covering averages of profits, listing income, brokerage income, operating expenses, total income, etc. The tool for appraisal of financial performance is mean, standard deviation, co-efficient of variance and trend analysis.

- **Patidar Sohan(2010)** studied investor's behavior towards share market. The findings of the study indicated that as per the age-wise classification, the investors in the age group of below 35

years are actively participating in the speculation trade and the age group above 55 hesitate to take risk and are not at all interested in the share market.

- **Mukherjee and Bose (2008)** They investigated the integration of India with the developed countries such as US, Japan, and five other Asia Pacific market for period in between 1999 to 2005. It founded that stock returns in India were led by major stock exchange return in US, Japan, Singapore, and South Korea. They also that founded Indian market exerted considerable influence in stock return in Japan and South Korea along with Malaysia and Taiwan.

## 3. DATA AND METHODOLOGY

Research refers to a research for knowledge through an objective. Research is an art of scientific investigation. It includes the various steps that are generally adopted by a researcher.

Research design is an absolute essentiality in research irrespective of the type of research (e.g., exploratory or descriptive), as it ensures that the data collected is appropriate, economical and accurate. This also ensures that the research project conducted is effectively and efficiently done.

A sufficiently formulated research design would ensure that the information gathered is consistent with the study objectives and that the data are collected by accurate procedures.

We have used Causal Research Design in our study because the data is collected for a specific and definite purpose and involves analysis, impact and cause-and-effect relationships. It is characterized by the formulation of specific objectives and we have used secondary data.

## 3. STOCK MARKET INDICES

### 3.1.1 BOMBAY STOCK EXCHANGE

The Bombay Stock Exchange (BSE) is an Indian stock exchange located at Dalal Street, Kala Ghoda, Mumbai (formerly Bombay), Maharashtra, India. Established in 1875, the BSE is Asia's first and oldest stock exchange. It claims to be the world's fastest stock exchange, with a median trade speed of 6 microseconds. The Bombay Stock Exchange Sensitive Index (Sensex) is a value-weighted index, calculated out of 30 stocks taking April 1979 as its base.

On 1st April 1979, the base value of the Sensex is 100 while its base year is 1978-79. The BSE authorities assess and revise composition of the Sensex at intervals, to ensure that it reveals the existing market conditions. The BSE is the world's 10th largest stock exchange with an overall market capitalization of US$1.7 trillion as of October 2016. More than 5,500 companies are publicly listed on the BSE.

### 3.1.2 NATIONAL STOCK EXCHANGE

The National Stock Exchange of India Limited (*NSE*) is the leading stock exchange of India, located in Mumbai.NSE was established in 1992 as the first demutualized electronic exchange in the country. NSE was the first exchange in the country to provide a modern, fully automated screen-based electronic trading system which offered easy trading facility to the investors spread across the length and breadth of the country.

National Stock Exchange has a total market capitalization of more than US$1.41 trillion, making it the world's 12th-largest stock exchange as of March 2016. NSE's flagship index, the NIFTY 50, the 51 stock index (50 companies with 51 securities inclusive of DVR), is used extensively by investors in India and around the world as a barometer of the Indian capital markets. However, only about 4% of the Indian economy / GDP is actually derived from the stock exchanges in India.

### 3.1.3 NEW YORK STOCK EXCHANGE

The New York Stock Exchange (abbreviated as NYSE and nicknamed "The Big Board"), is an American stock exchange located at 11 Wall Street, Lower Manhattan, New York City, New York. It is by far the world's largest stock exchange by market capitalization of its listed companies at US$19.3 trillion as of June 2016. The average daily trading value was approximately US$169 billion in 2013.

The NYSE is owned by Intercontinental Exchange, an American holding company that it also lists (**NYSE**: ICE). Previously, it was part of NYSE Euronext (NYX), which was formed by the NYSE's 2007 merger with Euronext. NYSE and Euronext now operate as divisions of Intercontinental Exchange.

### 3.1.4 NIKKEI STOCK EXCHANGE

The Nikkei-225 Stock Average is a price-weighted average of 225 top-rated Japanese companies listed in the First Section of the Tokyo Stock Exchange. The Nikkei Stock Average was first published on May 16, 1949, where the average price was ¥176.21 with a divisor of 225. It is Japan's widely watched index of stock market activity and has been calculated continuously since September 7, 1950.

The Current Calculation method, called the Dow Jones method, has been used since 1950. The 225 components of the NIKKEI Stock Average are among the most actively traded issues on the first section of the TSE. The index reflects the ex-rights-adjusted average stock price. It was these changes in the industrial and investment environments that necessitated revisions to the rules covering selection (addition and deletion) of index components.

### 3.1.5 HONG KONG STOCK EXCHANGE

The Stock Exchange of Hong Kong Limited (SEHK) is a stock exchange located in Hong Kong. It is East Asia's and Asia's third largest stock exchange in terms of market capitalization behind the Tokyo Stock Exchange and Shanghai Stock Exchange, and the sixth largest in the world before Euronext. As of 31 October 2016, SEHK had 1,955 listed companies, 989 of which are from mainland China, 856 from Hong Kong and 110 from abroad (e.g. Taiwan, Malaysia, United States, Singapore, etc.) Hong Kong Exchanges and Clearing owns SEHK and is listed on SEHK.

By 1972, Hong Kong had four stock exchanges in operation. There were subsequently calls for the formation of a unified stock exchange. The Stock Exchange of Hong Kong Limited (the Exchange) was incorporated in 1980 and trading on the Exchange finally commenced on 2 April 1986. Since 1986, a number of major developments have taken place. The 1987 market crash revealed flaws in the market and led to calls for a complete reform of the Hong Kong securities industry.

### 4. COMPARATIVE ANALYSIS

In this section, the various stock exchanges have been compared on the following parameters;

1. Market Capitalization
2. Number of Companies
3. Number of Listed Securities
4. Settlement

### 4.1.1 Market Capitalization
Market capitalization is the measure of corporate size of a country. It shows the current stock price multiplied by the number of outstanding shares. It is commonly referred to as Market cap. It is calculated by multiplying the number of common shares with the current price of those shares.

| Sr. No. | Country | Stock Exchange | Market Capitalization(US$ billions) |
|---------|---------|----------------|-------------------------------------|
| 1 | India | BSE | 1,736.08 |
| 2 | India | NSE | 1,416.07 |
| 3 | USA | NYSE | 20,215.46 |
| 4 | Japan | NIKKEI Stock Exchange | 4,325.19 |
| 5 | Hong Kong | HKSE | 3,021.58 |

### 4.1.2 Listed Securities

| Sr. No. | Stock Exchange | Listed Securities |
|---|---|---|
| 1 | BSE | 5962 |
| 2 | NSE | 1765 |
| 3 | NYSE | 3014 |
| 4 | NIKKEI Stock Exchange | 2392 |
| 5 | Hong Kong Stock Exchange | 1259 |

### 4.1.3 Number of Companies

| Sr. No. | Parameters | BSE | NSE | NYSE | TOKYO Stock Exchange | HONG KONG Stock Exchange |
|---|---|---|---|---|---|---|
| 1 | Country | India | India | USA | Japan | Hong Kong |
| 2 | Number of Companies | SENSEX-30 | 50 | 30 | 225 | 33 |

### 4.1.4 Trading and Settlement Cycle

This segment takes care of the efficiency issue of the said stock exchange. It basically looks into the speed at which any of the numerous transactions affected in the market gets settled. This is especially crucial given the volume. Below are the various settlement cycles for the stock exchanges:

| Sr. no | Stock Exchange | Country | Settlement Cycle |
|---|---|---|---|
| 1 | BSE | India | T+2 |
| 2 | NSE | India | T+2 |
| 3 | NYSE | USA | T+3 |
| 4 | TOKYO Stock Exchange | Japan | T+3 |
| 5 | HONG KONG Stock Exchange | Hong Kong | T+2 |

## 4.2 Statistical Analysis

Statistical analysis refers to a collection of methods used to process large amounts of data and report overall trends. Statistical analysis involves collecting and scrutinizing every data sample in a set of items from which samples can be drawn. A sample, in statistics, is a representative selection drawn from a total population.

### 4.2.1 Return Analysis of Stock Market

Stock Market Returns are not homogeneous and may change from investor-to-investor depending on the amount of risk one is prepared to take and the quality of his Stock Market Analysis.

| Month/ Stocks | BSE | NSE | NYSE | NIKKEI (Japan) | Hong Kong Stock Exchange |
|---|---|---|---|---|---|
| Feb 2017 | 3.9317 | 03.7179 | 04.773 | 0.4078 | 01.626 |
| Jan 2017 | 3.8665 | 04.5872 | 0.514 | -0.382 | 06.183 |
| Dec 2016 | -0.099 | -0.471 | 03.342 | 04.4017 | -03.46 |
| Nov 2016 | -04.612 | -04.787 | 05.408 | 05.0701 | -00.63 |
| Oct 2016 | 0.2711 | 0.3118 | -0.91 | 05.9282 | -01.56 |
| Sept 2016 | -02.06 | -01.992 | -0.5 | -02.591 | 01.394 |
| Aug 2016 | 01.427 | 01.7098 | -00.17 | 01.92 | 04.959 |
| Jul 2016 | 03.8969 | 04.2321 | 02.801 | 06.3775 | 05.275 |
| Jun 2016 | 01.244 | 01.5643 | 0.803 | -09.626 | -0.1 |
| May 2016 | 04.1448 | 03.953 | 0.076 | 03.4137 | -01.2 |

The above table shows the month wise average daily return for various indices selected for study. It can be also seen that, among all the individual observations the highest average daily return was earned by the Nikkei in the month of July 2016. All ordinaries earned positive returns in the month of July 2016 and February 2017. And the negative return was also very high in Nikkei i.e. -09.626% in June 2016 and it was very low i.e. -0.099% in the December 2016 in BSE.

### 4.2.2 Mean

The log mean or average considers all the sample observations to calculate the value of mean.

The mean value is equal to the sum of all observations divided by the total number of observation/sample.

| Stock Indices | $(\Sigma x_i)$ | Mean($\bar{X}$) {where n=10} |
|---|---|---|
| BSE | 12.011 | 1.2011 |
| NSE | 12.826 | 1.2826 |
| NYSE | 16.137 | 1.6137 |
| NIKKEI | 14.92 | 1.492 |
| Hong Kong Stock Exchange | 12.487 | 1.2487 |

### 4.2.3 Standard Deviation

The standard deviation is used to measure variability of observations. It indicates the degree to which most data scores cluster around the mean. If the standard deviation is small relative to the mean, then we can say that the data scores reasonably cluster around the mean.

On the contrary, a large standard deviation will indicate that the scores are distributed farther from the mean.

| Stocks | $\Sigma(X-\bar{X})^2$ | $\Sigma(X-\bar{X})^2 / n$ | $\sigma =(\sqrt{\Sigma(X-\bar{X})^2 / n})$ |
|---|---|---|---|
| BSE | 77.52818 | 7.752818 | 2.7437 |
| NSE | 84.52412 | 8.452412 | 2.9073 |
| NYSE | 47.02406 | 4.702406 | 2.1685 |
| NIKKEI | 213.6614 | 21.36614 | 4.6223 |
| HongKongStockExchange | 95.89349 | 9.589349 | 3.0966 |

### 4.2.4 Correlation

Correlation is statistical tool which measures the degree of relationship between two and more variable. Here, by term relationship, we mean the tendency of variable to move together. In this sense, it denotes interdependency amongst variables.

Stock Indices Correlation (with BSE)

| Stocks | $\Sigma\{(X-\bar{X})(Y-\bar{Y})\}$ | $(\sqrt{\Sigma(X-\bar{X})^2} \sqrt{\Sigma(Y-\bar{Y})^2})$ | Corr($X,Y$) | $r^2$ |
|---|---|---|---|---|
| BSE(X) and NYSE(Y) | -11.1315 | 60.37955 | -0.18436 | 0.033989 |
| BSE(X) and NIKKEI(Y) | -4.90186 | 128.7042 | -0.03809 | 0.001451 |
| BSE (X) and HKSE(Y) | 37.7894 | 86.22324 | 0.438274 | 0.192084 |

The above tables shows co movement of stock price indices among different countries. It helps to predict stock price indices by using information of other stock price indices. Table revealed that BSE has highest correlation with Hang Seng but have less correlation with NIKKEI and NYSE in overall period.

Stock Indices Correlation (with NSE)

| Stocks | $\Sigma\{(X-\bar{X})(Y-\bar{Y})\}$ | $(\sqrt{\Sigma(X-\bar{X})^2}\ \sqrt{\Sigma(Y-\bar{Y})^2})$ | Corr($X,Y$) | r² |
|---|---|---|---|---|
| NSE(X) and NYSE(Y) | -14.224 | 63.04497 | -0.22562 | 0.050904 |
| NSE(X) and NIKKEI(Y) | -9.99734 | 134.3858 | -0.07439 | 0.005534 |
| NSE (X) and HKSE(Y) | 45.67742 | 90.0295 | 0.50736 | 0.257414 |

The above Table demonstrates that NSE has highest correlation with Hang Seng but have less correlation with NIKKEI and NYSE in overall period. The overall correlation of the Stock indices revealed that only the Hong Kong Stock Exchange have the highest (positive) correlation with the Indian Stock Market (BSE & NSE), and the other International Stock indices (NYSE & NIKKEI) showed the negative(less) correlation with the Indian stock indices.

**CONCLUSION:**

The study brings forth some distinct conclusions many of which validate popular beliefs. It mainly looked at various aspects of efficiency in the stock market on a standalone basis and tried to draw conclusion regarding the state of our maturity. The correlation analysis of the Stock indices revealed that only the Hong Kong Stock Exchange have the highest (positive) correlation with the Indian Stock Market (BSE & NSE). And the other International Stock indices (NYSE & NIKKEI) showed the negative(less) correlation with the Indian stock indices.

However, Indian stock market is very much at the same pedestal and, in fact, better than most of its Asian counterparts especially the emerging economies. Indian system enjoys creditability even when compared with a stock exchange like NIKKEI (Japan). If we look at the efficiency of trading captured by the 'trading and settlement' mechanism, then we have found that the Indian mechanism is faster than the NYSE and at par with the best in the world. In fact, it is one of the fastest.

**RECOMMENDATIONS:**

- We are living in a global village. Any important event happening in any part of the world has an impact on our financial markets. Hence, we need to constantly monitor our portfolio and keep affecting the desired changes in it. This will result in increasing the returns of the market. Social media should positively highlight various schemes for children so that intervention of students towards financial stock should be enriched.

- There should be incorporation of financial courses in secondary education with practical oriented training, and part time courses to stock market knowledge especially by the banks which promote D-Mat accounts. Stock simulation games at school and college level should be encouraged. It will give more practical approach to students and will generate interest for investing in stock markets.

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