



RISK AND RETURN ANALYSIS OF BSE INDICES

B Suresh Kumar* Veena Murari* Dr.M.S.Vijaya Rao**

*Assistant Professor, MBA Department, Ellenki Institute of Engineering And Technology.

** Professor & Hod, MBA Department, Ellenki Institute of Engineering And Technology.

Abstract

Investment is the process of sacrificing something in present for the prospects of gaining something later. It implies that there are three dimensions to an investment, time today's sacrifice, and prospective gain. So, for making proper investment it is evident to analyze risk-return analysis. In this paper four indices of BSE namely BSE 100, BSE 200, BSE 500 and SENSEX are taken to calculate risk and return using monthly closing prices from Jan 2010 to April 2018. From the study return and risk (Standard Deviation) is almost same for all four indices. But Coefficient of variation of SENSEX is high so it is most risky and BSE 500 is least among four indices. Correlation analysis between all indices is High degree of positive correlation. Beta of BSE 100, BSE 200, and BSE 500 with SENSEX is almost equal to 1, so all three indices move with SENSEX.

Introduction

Investment is referred as a sacrifice of present money for future benefits. Time and risk are the most important attributes of Investment. The sacrifice which takes in present is certain but the amount of benefit expected in future is uncertain. Many studies which were conducted on investments have concluded that investment risk and expected return are significant for investors. The level of risk faced by investment is usually estimated by examining historical experience.

Return

Return is one of the most important motivating factors which encourage investment. Return is premium given to the investor for making investment. In order to evaluate the performance of investment, it is very essential to calculate the historical returns. These historical returns also help in predicting future returns. Total return of investment is sum of current return and capital return. Current return is periodic cash flows like dividend or interest which are produced from investment. Capital return is referred as appreciation or depreciation in price divided by initial price of asset. The value of current return can be zero or positive, where as the value of capital return can be negative, zero, or positive.

Risk

Risk means the uncertainty or probability that the actual outcome of an investment may be different from desired outcomes. In other words, risk refers to the variability in returns from security. If the range of potential outcome is wide then the risk will also be high. Total risk is the sum of systematic risk and unsystematic risk. Systematic risk is the risk where the changes in total returns from the securities are directly influenced by changes in general market or an economy as a whole. Unsystematic risk is the risk, in which changes in market circumstances does not influence the returns of securities.

Bombay Stock Exchange

The **Bombay Stock Exchange (BSE)** is an Indian stock exchange located at Dalal Street, Mumbai (formerly Bombay). Established in 1875, the BSE (formerly known as Bombay Stock Exchange Ltd.) is Asia's first stock exchange. It claims to be the world's fastest stock exchange, with a median trade speed of 6 microseconds. The BSE is the world's 10th largest stock exchange with an overall market capitalization of more than \$2.3 trillion on as of April 2018.

Review of Literature: Numerous studies are conducted to measure the performance of investments with help of Risk and Return analysis.

Bedanta Bora*, Anindita Adhikary(2015)

This paper has attempted to ascertain the relationship between returns of securities and market returns and to test the stability of beta for 30 companies of BSE Sensex. The descriptive statistics, multiple regression analysis and beta estimation were worked out. The study concluded that 99% of variation in Sensex is explained by the variation in Scripts. There is 95% confidence that there is a positive relationship between returns of securities and market returns.

Dr. S. Krishnaprabha , Mr.M.Vijayakumar (2015)

In this paper they calculated risk and return of sample scripts taken from Banking Sector, Information Technology sector, Automobile sector, Pharma Sector, FMCG sector during 2010 to 2014 which are listed in BSE. They found Long term investors were able to take advantage of the market as it less volatile. Also they found among five sectors, Information

technology, Fast Moving Consumer Goods, Pharma Sectors were giving more return than to Banking and Automobile sector.

Dr P Vikkraman & P Varadharajan (2009)

In their paper they tested risk return analysis on stocks of automobile industry. They analysed 5 automobile companies listed in NSE from 2004 to 2007 with the help of expected returns and Beta. They found M & M is best for investment among these 5 companies.

Objectives of Study

The main purpose of study is to analyse the risk-return analysis of selected BSE indices. The study undertaken with following objectives:

1. To ascertain Index movements of selected BSE indices with the help of closing prices.
2. To analyse the BSE indices with the help of Risk-Return analysis.
3. To test sensitivity of BSE 100, BSE 200, BSE 500 with SENSEX with the help of beta.

Research Design

Need of Study

Major gap find that most of the studies are in and around either SENSEX of BSE or NIFTY of NSE or Sectoral indices . So it is need to study performance of other important indices, BSE 100, BSE 200, BSE 500.

Sample Size: BSE has so many Indices, for this study 4 major indices selected namely BSE 100, BSE 200, BSE 500 and SENSEX.

Data Collection: The study is based on Secondary Data. Data is extracted from BSE exchange website.

Period of Study:The duration of study is 100 month from JAN 2010 to APRIL 2018.

Tools and Techniques

1. The monthly closing price for each month is taken and monthly rate of return on each of the index is computed by using the formula:

$$r_{jt} = (P_{j,t} - P_{j,t-1}) / P_{j,t-1} * 100$$

Where

r_{jt} = Monthly rate of return of index j in the time period t,

$P_{j,t}$ = Monthly closing price of index j in the time period t, and

$P_{j,t-1}$ = Monthly closing price of index j in the time period t -1

2. Descriptive statistics like mean, standard deviation

3. Coefficient of variation and Correlation analysis

4. $Beta^{(i)} = COV_{im} / \sigma_m^2$

Where COV_{im} = covariance between i^{th} index(BSE 100,BSE 200, BSE 500), m is SENSEX

$$\sigma_m^2 = \text{Variance of SENSEX}$$

5. Table and Graphs are used to interpret the results.

Data Analysis

S&P BSE 100

The index is designed to measure the performance of the 100 largest and most liquid Indian companies within the S&P BSE LargeMidCap. The index calculated in Indian Rupees. A broad-based index, the BSE-100 was formerly known as the BSE National index. This Index has 1983-84 as the base year and was launched in 1989. In line with the shift of the BSE Indices to the globally accepted Free-Float methodology, BSE-100 was shifted to Free-Float methodology effective from April 5, 2004. The method of computation of Free-Float index and determination of free-float factors is similar to the methodology for SENSEX. The below graph shows movement of monthly closing prices of BSE 100 index during JAN 2010 to APRIL 2018. From the chart, BSE 100 index increased more than 200% during 100 month period.

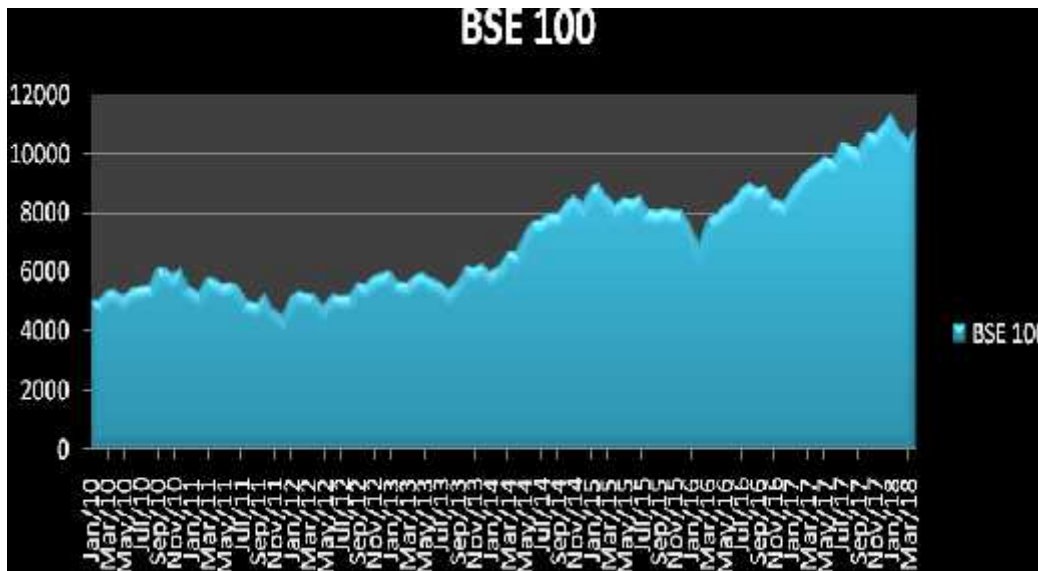


Chart 1: BSE 100 index movement from JAN 2010 to APRIL 2018

S & P BSE 200

S&P BSE 200 Index is a free float weighted index of 200 companies selected from Specified and Non-Specified lists of BSE India Exchange, selected based on their market capitalization. It started as a cap-weighted index with a base value of 100, and base year 1989-90. With effective from 16/08/2005 it was changed to a free float index. The below graph shows movement of monthly closing prices of BSE 200 index during JAN 2010 to APRIL 2018. From the chart, BSE 100 index increased more than 200% during 100 month period.



Chart 2: BSE 200 index movement from JAN 2010 to APRIL 2018

S & P BSE 500

The S&P BSE 500 is designed to be a broad representation of the Indian market. Consisting of the top 500 constituents in the S&P BSE AllCap, the index covers all major industries in the Indian economy. The index is launched on Aug 09, 1999. The below graph shows movement of monthly closing prices of BSE 100 index during JAN 2010 to APRIL 2018. From the chart, BSE 500 index increased more than 250% during 100 month period.

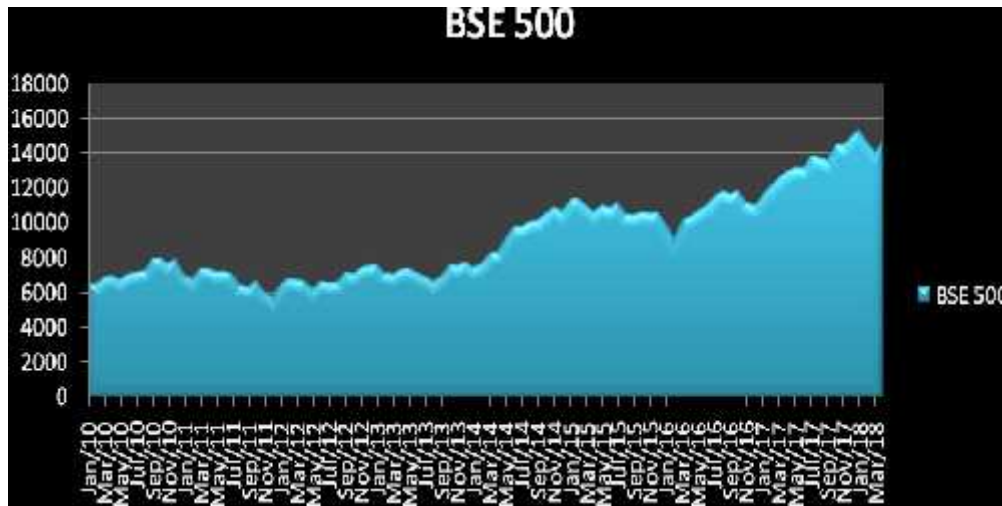


Chart 3: BSE 500 index movement from JAN 2010 to APRIL 2018

S & P Sensex

The **S&P BSE SENSEX** (S&P Bombay Stock Exchange Sensitive Index), also called the **BSE 30** or simply the **SENSEX**, is a free-float market-weighted stock market index of 30 well-established and financially sound companies listed on Bombay Stock Exchange. The 30 component companies which are some of the largest and most actively traded stocks, are representative of various industrial sectors of the Indian economy. Published since 1 January 1986, the S&P BSE SENSEX is regarded as the pulse of the domestic stock markets in India. The base value of the S&P BSE SENSEX is taken as 100 on 1 April 1979 and its base year as 1978–79. As of 25th September 2017, the full market capitalisation of S&P BSE SENSEX was about 54,637.0878 billion (US\$837 billion) (37% of GDP) while its free-float market capitalisation was 30,094.2286 billion (US\$461 billion). During 2008-12, Sensex 30 Index share of BSE market capitalisation fell from 49% to 25%^[1] due to the rise of sectoral indices like BSE PSU, Bankex, BSE-Teck, etc. The below graph shows movement of monthly closing prices of BSE 100 index during JAN 2010 to APRIL 2018.

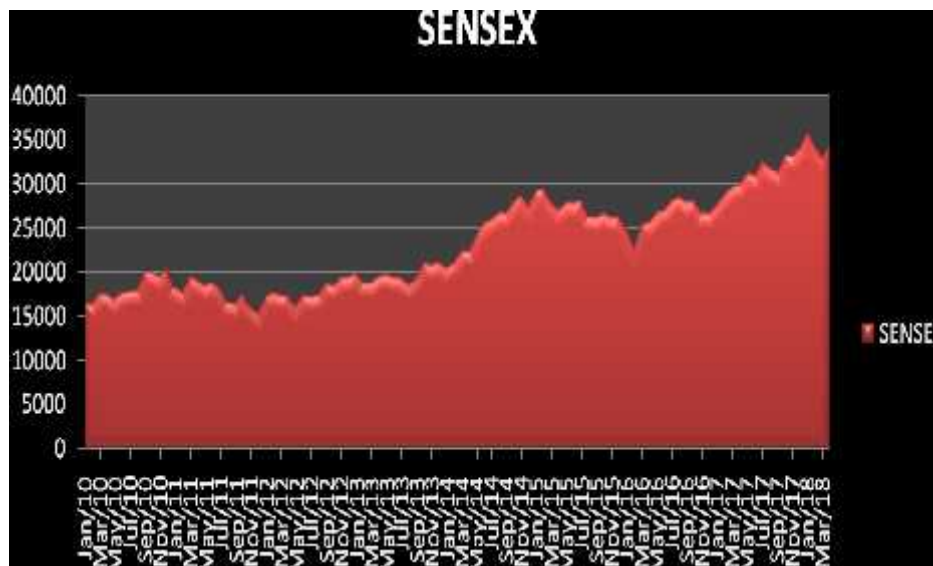


Chart 4: SENSEX index movement from JAN 2010 to APRIL 2018

Return Analysis

Table1: Percentage Monthly Average Return During Jan 2010 To April 2018

| Indices | Return (%) |
|---------|------------|
| BSE 100 | 0.891 |
| BSE 200 | 0.926 |
| BSE 500 | 0.940 |
| SENSEX | 0.851 |

Table 1 Shows the Monthly average return of selected indices during the study period from Jan 2010 to April 2018. The results shows, all the indices return contribution is almost similar. Among selected indices BSE 500 contributed highest return and SENSEX contributed least.

Risk Analysis

Table 2: Risk During Jan 2010 To April 2018

| Indices | Standard Deviation | Coeff Of Variation |
|---------|--------------------|--------------------|
| BSE 100 | 4.578 | 5.1401 |
| BSE 200 | 4.575 | 4.9395 |
| BSE 500 | 4.613 | 4.9091 |
| SENSEX | 4.442 | 5.2172 |

From Table 2, the risk calculated by standard deviation is almost similar of selected indices, among these BSE 500 is highest and SENSEX is least. Risk calculated by Coeff of variation SENSEX is more risky and BSE 500 is least risky.

Correlation Analysis

Table 3: Correlation Table

| | BSE 100 | BSE 200 | BSE 500 | SENSEX |
|---------|----------|----------|----------|----------|
| BSE 100 | - | 0.997856 | 0.993753 | 0.987504 |
| BSE 200 | 0.997856 | - | 0.998578 | 0.979133 |
| BSE 500 | 0.993753 | 0.998578 | - | 0.970133 |
| SENSEX | 0.987504 | 0.979133 | 0.970133 | - |

From Table 3, correlation between the indices is high degree of positive correlation with almost nearer 1, further between BSE 200 and BSE 500 exist highest degree of positive correlation and between BSE 500 and SENSEX is least.

Systematic Risk

| | Table 4: BETA |
|-----------------|----------------------|
| SYSTEMATIC RISK | |
| BSE 100 &SENSEX | 1.0093 |
| BSE 200 &SENSEX | 0.9991 |
| BSE 500 &SENSEX | 0.9956 |

From table 4, BETA values of BSE 100, BSE 200, BSE 500 with SENSEX are almost 1, so we conclude that all three indices are moves with SENSEX.

Conclusion

Investment is the process of sacrificing something in present for the prospects of gaining something later. It implies that there are three dimensions to an investment, time today's sacrifice, and prospective gain. So, for making proper investment it is evident to analyze risk-return analysis. In this paper four indices of BSE is taken to calculate risk and return using monthly closing prices form Jan 2010 to April 2018. The mean (return) of all indices are almost same. Risk (Standard Deviation) is almost same for all four indices. Coeff of variation of SENSEX is more than other three indices so it is most risky index and BSE 500 is least risky among four indices. Correlation analysis between all indices is High degree of positive correlation. Beta of BSE 100, BSE 200, and BSE 500 with SENSEX is almost equal to 1, so all three indices move with SENSEX.

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