

Comparative Risk and Return Analysis of Bombay Stock Exchanges and Steel Sector in India

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ABSTRACT

In the contemporary economic expansion interest rates are failing and fluctuation in the stock market has forced the investors to think before investment in financial securities. Hence it found difficulties to take investment decision for framing an efficient portfolio. This is mainly, as investments in stock market are risky in nature and investors have to expect various issues before investing. These issues include risk, return, volatility of financial securities and liquidity. Therefore the primary objective of this research is risk and returns analysis of Sensex and different steel sectors of Bombay Stock Exchange. The risk and return have analyzed by considering the daily closing value of Sensex and all the sample companies. The study is centered on secondary data. The data for the study has been composed from the BSE website over a period of 10 years from January 4, 2010 to December 31, 2019. For achieving the above objective in addition to test the hypothesis, various methods like correlation, descriptive statistics and t test have been employed.

Key words: Risk, Return, Sensex, Steel Sector, Correlation, t test

I. INTRODUCTION

Stock market is one of the important indicators which show the performance of economic condition in a country. The business environment is getting more competitive day by day. Different companies stocks are traded in the stock market. Two most important factors for investment are return and risk. The return which is to be earned in future is known as expected return. The actual return of past is known as realised return. The expected return may not be equal to actual return. When the stock prices fluctuate more the volatility is more. More the price fluctuate more uncertainty of return. Volatility of the stock market is very high. There is no fixed return and risk in the stock market. So trading in stock market is very risky for investors. It requires proper analysis of risk and return. Investors want both capital gain and dividend gain from their investment. If the investors want to fulfil their financial objective, they have to follow both fundamental and technical analysis. Investors always want more return for less amount of risk. So in the competitive world researchers are also

doing the analysis of volatile stock market. These researches will be helpful for investors to get more return from their investment. Bombay Stock Exchange (BSE) and National Stock exchange (NSE) are the two most important stock exchanges in Indian stock market.

All the investors try to find the probable risk and return from their future investment. There is no guarantee that expected return will be equal to actual return creating risk in the investment. There are number of factors which lead to risk. The risk can be systematic or unsystematic risk. Unsystematic risk can be controlled but Systematic risk cannot be controlled but can be calculated. By knowing and analysing different risk, investor can take right decision for his investment. When investor takes more risk he adds risk premium to his expected return. So investor's expected return is more with more risk.

II. LITERATURE REVIEW

Vikkraman and Varadharajan (2009), analysed that return can be maximised by properly analysing the risk. After deciding the company to invest, the investor has to find the relationship between risk and return. They found that, the correlation between risk and return is high in long period of time. They have taken beta and other statistical model for the analysis. While Ratna (2013) has analysed the risk return by considering IT stocks and banking Stocks for the analysis. Different statistical tools and descriptive analysis has been taken to test the hypothesis. The result suggested holding the stock for a longer period of time to get good amount of return. Similarly Setiawan et.al, (2013) have taken Syariah stocks and orthodoxy stocks for the analysis. They have taken risk and return into consideration. They did not find any significant relation between risk and weekly return. They have used statistical techniques, standard deviation and beta for the analysis.

On the other hand Ansar et.al (2014), have used "A-Y Model" for their study. They tried to find the performance of bullish and bearish market by analysing risk and return of different portfolios. They did not find any reliable performance between the expected return of portfolio and risk. While Sharma et.al, (2012) analysed the risk return trade-off between the stocks of South Asia Stock exchanges. They used descriptive statistics to find out the risk return relationship in a long period of time. They found that in South Asian countries high returns and rational risk are complicated. Similarly Shanmugasundram and Benedict (2013) analysed the risk and return of sectoral indices and Nifty. They have taken 5 different indices from NIFTY for the period of 8 years which is from 2004 to 2012. They used t-test and ANOVA for the study. Again Swarna Lakshmi, (2013) found the volatility pattern in different sectoral indices of Indian stock market. Autoregressive Conditional Heteroskedasticity (ARCH) an econometric model is used for the study. Eleven different sectoral indices have been taken for the period of 2008 to 2012. The result shows that the volatility was very high in reality sector and it was lowest in banking sector for the said period.

Patjoshi (2011) studied the instability in the Indian Stock Market by considering different indices in BSE and NSE. On the other hand, Patjoshi and Tanty (2016) studied the volatility of BSE and NSE. Patjoshi (2016) examined the correlation between risk and return of the Sensex and banking stocks of BSE thirty (Sensex). During this study Sensex and banking

stock indices are analysed to examine the risk-return trade-off of Sensex therewith of HDFC Bank, ICICI Bank, Axis Bank, and SBI. It had been found that Sensex returns, and also all the stock returns, shows positive average daily returns except ICICI Bank return for the chosen period. Patjoshi (2016) studies the constancy of the day of the week effect in return as well as in volatility sign from BSE. On the opposite hand Patjoshi and Tanty (2017) scrutinized the volatility pattern of Bombay securities market and BSE thirty companies. This study includes the impact of various BSE thirty companies on BSE Sensex. The study relies on the daily returns of various indices and corporations. The daily returns for the analysis have been taken from the BSE .Nandini, Patra, Mishra (2012) studied that the usual market anomalies are the January effect, the size effect, also the day of the week effect. Rendering to the month of the year effect, the normal monthly returns of the market are not alike for all the months of the year. The objective of this paper is to observe the month of the year effects in Bombay Stock exchange (BSE). This paper examines the month of the year effect of the Bombay Stock exchange from January 1993 to December by using simple statistical techniques as well as GARCH (1, 1) model. Nandini (2013) investigated the pattern of volatility in the Indian Stock Market. The research shows daily returns of the market is not equal for all days of the week and it shows the existence of day of the week effect in the Indian Stock market for the chosen period. Patjoshi (2016) studied the issue and challenges faced by the Indian Stock Market. Patjoshi (2016), examined to find a suitable day for investment, in the Bombay Stock Exchange (BSR), India in 15 years. So as to justify the objectives of the paper the daily return data of four main indices of BSE have categorized by concentrating on the day of the week from Monday to Friday. While sample indices display Wednesday return was the highest and Monday provides the lowest return with higher volatility. Similarly, Patjoshi and Nandini (2020) studied to find out the appropriate day of the week effect of developing the stock market of an emergent nation like India from 1st January 2000 to 31st December 2018. In this study, descriptive statistics and the GARCH model has also used with the purpose of measuring the day of the week effect analysis. Conferring to the results, the coefficients express that the return among different days of the week are statistically significant,

III. OBJECTIVES OF THE STUDY

The elementary framework of this study is comparative analysis of Sensex and steel sector in India. Therefore the study is commenced through the following objectives-

- a. To study the risks and returns comprise of Sensex and sample Steel companies in India.
- b. To analyse the comparative risks & returns of Sensex and sample Steel companies in India.

IV. HYPOTHESIS OF THE STUDY

Keeping the objectives in view, the hypothesis framed for the study is

Ho: There is no significant difference between returns of Sensex and sample Steel companies in India.

V. METHODOLOGY AND TESTS USED IN THE STUDY

In this study Sensex and different sample Steel companies in India have been used to examine the risk return trade off. The sample steel companies have been considered for the study is Tata steel, JSW steel, Visa steel and SAIL. The risks and returns have examined by using the daily closing value of Sensex and all the sample companies. The study is based on secondary data. The data for the analysis has taken from the BSE website over a period of 10 years from January 4, 2010 to December 31, 2019. The main objective of the study is to analyse the comparative risk-return associated with Sensex and sample companies. For satisfying the above objectives and for testing hypothesis, different methods like correlation, descriptive statistics and t test have been adopted in the study.

VI. RISK AND RETURN ANALYSIS OF SENSEX AND DIFFERENT STEEL COMPANIES

Table-1 indicates the results by means of the assistance of descriptive statistics of daily market returns of Sensex in addition to the sample steel companies from January 4, 2010 to December 31, 2019.

Table-1 Descriptive Statistics of the Daily Returns of Sensex and steel companies

Particulars	Sensex	Tata Steel	JSW Steel	Visa Steel	SAIL
Mean	0.0339	-0.1653	-0.0576	-0.0853	-0.0775
Standard Deviation	0.9557	4.4251	5.2223	3.3839	2.4027
Kurtosis	1.9819	750.5834	1569.7629	6.6773	1.4164
Skewness	-0.0968	-20.1939	-35.4516	1.2901	0.1450
Minimum	-6.1197	-162.9761	-231.1897	-13.1028	-9.5581
Maximum	5.1859	18.2322	11.2560	18.2322	13.4651

It has depicted in the table -1 that during the study period i.e. from January 4, 2010 to December 31, 2019, average daily returns of Sensex displayed positive returns whereas all sample steel companies indices displayed negative returns. The average daily returns recorded highest of 0.0339 designed for Sensex, however it recorded lowest of -0.1653 designed for Tata steel. Thus from the above certainly recommend that average daily return of Sensex has performed and provided better return than that of all sample steel companies indices returns over the study period. In the circumstance of the standard deviation of Sensex is lowermost as compare to all sample companies returns. Consequently it designates that investment in Sensex involves lesser risk than that of all other companies returns, while Tata steel return incorporates higher risk among all the companies as the standard deviation of Tata steel recorded highest of 4.4251 during study period. The daily returns have fluctuated between -6.1197 to 5.1859, -162.9761 to 18.2322, -231.1897 to 11.2560, -13.1028 to 18.2322, -9.5581 to 13.4651 for Sensex, Tata Steel, JSW Steel, Visa Steel and SAIL respectively for the study period. The daily returns distribution of Sensex, Tata Steel and JSW Steel are found to be negatively skewed whereas daily returns of Visa Steel and SAIL distribution are positively skewed.

Correlation between Sensex and Different Steel Companies Returns

The Table-2 explains the correlation matrix for daily returns of Sensex along with sample steel companies from January 4, 2010 to December 31, 2019,

Table-2 Correlation of Sensex and Different Steel Companies Returns

Particulars	Sensex	Tata Steel	JSW Steel	Visa Steel	SAIL
Sensex	1.0000				
Tata Steel	0.1831	1.0000			
JSW Steel	0.2589	0.0814	1.0000		
Visa Steel	0.0575	0.0464	0.0321	1.0000	
SAIL	0.5583	0.1977	0.2718	0.0556	1.0000

From the Table-2, it can find that average daily return of Sensex is positively correlated with all steel companies' average daily returns. The Sensex average daily return is highly correlated with that of SAIL, on the other hand Sensex average daily return has logged lowermost correlation with that of Visa Steel.

Analysis t-Test: Paired of Sensex and Tata Steel

Table 3 t-Test: Paired of Sensex and Tata Steel

Particulars	Sensex	Tata Steel
Mean	0.0339	-0.1653
Variance	0.9134	19.5812
Pearson Correlation	0.1831	
t Stat	2.2638	
P(T<=t) one-tail	0.0118	
t Critical one-tail	1.6455	
P(T<=t) two-tail	0.0237	
t Critical two-tail	1.9609	

Table 3 reviews the consequences of daily returns of Sensex and Tata steel from January 4, 2010 to December 31, 2019 with the assistance of t-test. The t test results of average daily returns delivers that Sensex has provided higher return as compared to that of the Tata steel; leading to the conclusion that mean daily returns of Sensex has performed better and provided higher returns. Conversely, lesser variance for Sensex daily returns as compared to Tata steel daily returns undoubtedly specifies that former is more consistent than the latter. Again, the correlation value is 0.1831 signifies positive correlation between both the indices. The p-value of 0.0118, which is less than 0.05, indicates that there is a significant difference in the daily returns of Sensex and Tata steel at 5 percent level of significance. Consequently here the null hypothesis (there is no significant difference between average daily returns of Sensex and sample steel companies) is rejected.

Analysis t-Test: Paired of Sensex and JSW Steel**Table 4 t-Test: Paired of Sensex and JSW Steel**

Particulars	Sensex	JSW Steel
Mean	0.0339	-0.0576
Variance	0.9134	27.2722
Pearson Correlation	0.2589	
t Stat	0.8953	
P(T<=t) one-tail	0.1854	
t Critical one-tail	1.6455	
P(T<=t) two-tail	0.3707	
t Critical two-tail	1.9609	

Table 4 reveals the outcomes of daily returns of Sensex and JSW Steel from January 4, 2010 to December 31, 2019 with the help of t-test. The t test result shows that Sensex average daily return is higher as compared to that of the JSW steel; which means that average daily returns of Sensex has achieved superior result and provided better returns. On the contrary, lesser variance for Sensex (0.9134) daily returns as compared to JSW steel (27.2722) daily returns certainly agrees that Sensex is more reliable than the JSW. In the case of relationship between Sensex and JSW with a correlation value (0.9134) shows positive correlation between Sensex and JSW. The p-value of 0.1854, which is more than 0.05, indicates that there is no significant difference in the daily returns of Sensex and JSW steel at 5 percent level of significance. Accordingly in this case the null hypothesis (there is no significant difference between average daily returns of Sensex and sample steel companies) is accepted.

Analysis t-Test: Paired of Sensex and Visa Steel**Table 5 t-Test: Paired of Sensex and Visa Steel**

Particulars	Sensex	Visa Steel
Mean	0.0339	-0.0853
Variance	0.9134	11.4507
Pearson Correlation	0.0575	
t Stat	1.7037	
P(T<=t) one-tail	0.0443	
t Critical one-tail	1.6455	
P(T<=t) two-tail	0.0886	
t Critical two-tail	1.9609	

Table 5 analyses the values of daily returns of Sensex and Visa Steel from January 4, 2010 to December 31, 2019 with the support of t-test. The t test result for the average daily returns delivers that Sensex return is healthier as compared to that of the Visa Steel; which indicates that average daily return of Sensex has done better and provided higher return. On the contrary, smaller value of variance for Sensex average daily return as compared to Visa steel daily return unquestionably agrees that former is more stable than the latter. Again, the correlation value of 0.0575 specifies that positive correlation among the Sensex and Visa Steel. The p-value of 0.0443 (<0.05) point out that there is a significant difference in the daily returns of Sensex and Visa Steel at 5% level of significance. Subsequently at this point the

null hypothesis (there is no significant difference between average daily returns of Sensex and sample steel companies) is rejected.

Analysis t-Test: Paired of Sensex and SAIL

Table 6 t-Test: Paired of Sensex and SAIL

Particulars	Sensex	SAIL
Mean	0.0339	-0.0775
Variance	0.9134	5.7730
Pearson Correlation	0.5583	
t Stat	2.7138	
P(T<=t) one-tail	0.0033	
t Critical one-tail	1.6455	
P(T<=t) two-tail	0.0067	
t Critical two-tail	1.9609	

Table 6 appraisals the significances of daily returns of Sensex and SAIL from January 4, 2010 to December 31, 2019 with the help of t-test. The result directs that the average daily return of Sensex performs higher as compared to that of SAIL; leading to the conclusion that average daily return of Sensex has accomplished better outcome and provided higher returns. Contrariwise, lesser variance for Sensex average daily return as compared to SAIL average daily return definitely states that Sensex is more regular than the SAIL. Again, the correlation value is 0.5583 between Sensex and SAIL shows that there is a positive correlation among Sensex and SAIL. The p-value of 0.0033, which is less than 0.05, points that there is a significant difference in the daily returns of Sensex and SAIL at 5 percent level of significance. As a result at this juncture the null hypothesis (there is no significant difference between average daily returns of Sensex and sample steel companies) is rejected.

VII. CONCLUSION

Average daily returns of Sensex displayed positive returns whereas all sample steel companies displayed negative returns. Thus certainly recommend that average daily return of Sensex has performed and provided better return than that of all sample steel companies return over the study period. In the circumstance of the standard deviation of Sensex is lowermost as compared to all sample companies returns. Consequently it designates that investment in Sensex involves lesser risk than that of all other indices returns, while Tata steel return incorporates higher risk in all the companies. The average daily return of Sensex is positively correlated with all steel companies' average daily returns. The Sensex average daily return is highly correlated with that of SAIL and has logged lowermost correlation with that of Visa Steel. It has found from the t test that there is a significant difference between returns of Sensex and sample steel companies except JSW steel, therefore the null hypothesis (there is no significant difference between returns of Sensex and sample steel companies) is rejected for Tata Steel, Visa Steel and SAIL. Whereas, the null hypothesis is accepted for JSW Steel.

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