

## **AN ANALYSIS ON RISK RETURN RELATIONSHIP OF AUTOMOBILE COMPANY'S STOCK IN INDIAN EQUITY MARKET**

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### **Introduction**

The growth and development of an economy in a nation are greatly influenced by the capital market. The capital market serves as a link between investors and business. Through the primary market, the industry gets funding directly from public and financial organizations. The securities that have been issued in the primary market have a ready market in the secondary market. Equity and debt are the two basic capital market instruments. Equity securities that are issued in the primary market are listed for trading and liquidation in the secondary market. Investors participate in the secondary market to make and modify their investment decisions.

The return and level of risk are used to appraise every investment. In general, investors seek to anticipate a larger return with the least amount of risk. In this article, the risk-return relationship of a few Automobile companies in the Indian stock market (Bombay Stock Exchange) is investigated. The performance of a few private sector automobile in the Indian capital market is also examined in this article.

### **Literature Review**

**Engle and Lee (1999)**, studied the twelve largest stock markets of the World and explored the association between markets volatility and equity returns from the time period of January 1980 to December 2001. The findings of the research were Consistent with the previous researches in which anticipated association between Stock return and volatility are sensitive.

**Batra (2003)** investigated the variation in time for Indian stock markets' volatilities. He incorporated asymmetric GARCH model with structural changes and found that the unexpected shifts in the equity volatility and also identified the reasons for these abrupt shifts in volatility.

**Shin (2005)** attempted to investigate the association between risk and return for several numbers of emerging markets and found a significant association between volatility and

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returns in emerging capital markets by following non-parametric conditional variance modeling.

**Ang et.al. (2006, 2009)** report confirms for an inverted relationship between idiosyncratic Volatility as differentiating to systematic and total risk for a fleeting one-month volatility measure in U.S. and additionally in other worldwide markets.

**Blitz & Vliet (2007)** study shows that the low volatility stocks have higher risk-adjusted returns in comparison to the FTSE World Development Index. The study additionally reports that high beta stocks have lesser returns while low beta stocks have more prominent returns than predicted by CAPM.

**Vikkreaman and Varadharajan (2009)** analysed the equity of selected companies in the automobile industry for the period of 2004 to 2007. They used Beta and Alpha techniques for analysing risk and return of the automobile companies. The calculation of the return indicator and systematic risk provide a clear understanding regarding the investment decisions on these companies.

**Fu (Fu, 2009)** in a study found a significant positive relationship between the evaluated conditional Idiosyncratic volatilities and expected returns utilizing the exponential GARCH models.

**Rambhia (2012)** examined the risk anomaly in Indian equity market using the low volatility portfolio strategy over an eleven year period (from 2001 to 2011) with rolling monthly iterations. The study provided empirical evidence to the existence of risk anomaly in the Indian equity market where the low volatility portfolios as compared to the high-volatility portfolios produces not only higher absolute returns, but also higher risk-adjusted returns.

**Sharma et.al, (2012)** scrutinizes the risk return trade off of the stocks listed in the stock exchanges of South Asia. This study aimed to find out, the expected return and risk connected over time by using the descriptive statistics. The study found that high returns and rational risk complicated in those South Asian countries.

**Reddy (2013)**, the study is done for the purpose of analyzing the factors influencing the volatility of the stock prices of the selected FMCG companies which are listed on the NSE in order to compare them with that of the market. Three FMCG company's data for a period of one year was being collected. They concluded that it was not easy to analyze the performance of the FMCG Companies due to lot of fluctuations, and that the performance of the market index was better when compared to the company.

**Shanmugasundram and Benedict (2013)** deliberate risk influenced in the Indian Sectoral indices and Nifty. They found risk association in varied with time period.

**Lakshmi, (2013)** analysed the volatility pattern in different Sectoral Indices in Indian stock market utilising Autoregressive Conditional Heteroskedasticity, an econometric model. This study was conducted for the period starting 2008 till 2012 of eleven Sectoral Indices from NSE. The study found that the reality sector has uppermost volatility than other sector, however the banking sector has bottommost volatility for the period.

**Gopalakrisnan & Ramanathan(2013)**, studied post and prerecession period Indian stock market price fluctuations. The volatility in the market required to estimate the risk on investment. Researcher analyses the selected indexed stock volatility of sectoral in Nifty as on 28-03-2013 daily opening and closing price of 31 selected companies. This analysis helps in identifying volatility relationship during pre and

**Joghee, (2021)** investigated risk- return analysis of selected companies in the banking sector. The mean, standard deviation, covariance, variance, correlation, and beta were calculated.

**Savsani & Rathod, (2018)** discussed the risk-return analysis of the Bombay Stock Exchange in comparison to chosen Indian banking equities. Researchers have adopted paired t-test and regression techniques. It was revealed through the study that Sensex has provided high returns as compared to all other selected stocks.

### **Objectives of the study**

The author has framed the following objectives for the study:

1. To analyze the risk and return of select automobile companies.
2. To examine the relationship between the daily return of selected automobile companies and the S&P BSE auto Index.
3. To analyze the performance of select automobile companies in Indian capital market based on the return yielded.
4. To measure the systematic risk with the beta coefficient of the selected companies on the S&P BSE Auto Index.
5. To measure the correlation with the correlation coefficient of selected automobile stocks with S&P BSE Auto Index.

### **Methodology:**

#### **Sample Selection**

Secondary data have been used in this study. The daily share price of nine selected

stocks of automobile companies (Ashok Leyland, Bajaj Auto, Eicher Motors, Force Motors, Hero Motor Corp, Mahindra & Mahindra, Maruti Suzuki, TATA Motors and TVS Motors) listed in BSE are collected from 1 April, 2010 to 31 March 2022 for the analysis.

**Sources of Data**

Secondary source of data has been used for the study. The data for daily closing prices collected from nine selected stocks of automobile companies (Ashok Leyland, Bajaj Auto, Eicher Motors, Force Motors, Hero Motor Corp, Mahindra & Mahindra, Maruti Suzuki, TATA Motors and TVS Motors) listed in BSE official website and related literature published in the Books, Journals etc.

**Study period**

The study period for the study is from 1st April, 2010 to 31st March, 2022.

**Techniques for the analysis**

**Descriptive Statistics**

Analysis has been done using Descriptive statistics to specify the properties of daily return series of the selected Companies. Mean, standard deviation, Skewness, Kurtosis, of the daily returns were calculated and analysed.

**Tools used in this study:**

Tool	Purpose	Formula
<b>Mean:</b>	To calculate the average returns of stocks by using the formula.	$\text{Return} = (\text{Closing price} - \text{Opening price}) / \text{Opening price} * 100$ $\text{Mean} = \sum R/N$ Where, □ R is sum of the returns of the Stock N is number of days
<b>Standard deviation (SD):</b>	To measure the total risk associated with a security.	$SD(\sigma) = \sqrt{\text{Variance}}$ $\text{Variance}(\delta^2) = \sum (Ri - \bar{Ri})^2/n$
<b>Correlation Coefficient</b>	To figure out how two variables are related linearly	$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{\{n \sum x^2 - (\sum x)^2\}} \{n \sqrt{\{n \sum y^2 - (\sum y)^2\}}}$
<b>Skewness</b>	a measure of symmetry in distribution	$\text{Skewness} = \frac{n}{(n-1)(n-2)} \sum_{i=1}^n \left( \frac{x_i - \bar{x}}{s} \right)^3$
<b>Kurtosis</b>	reveals how far the tails of a distribution diverge from those of a normal distribution	$\text{Kurtosis} = \frac{n(n+1)}{n(n-1)(n-2)(n-3)} \sum_{i=1}^n \left( \frac{x_i - \bar{x}}{s} \right)^4$

<b>Beta</b>	measure the volatility of an individual stock compared to the systematic risk of the entire market	$\beta = \frac{Cov(r_i, r_m)}{Var(r_m)}$ <p> <math>\beta</math>= market beta of asset i                      Cov= Covariance                      Var= Variance  <math>r_m</math> = average expected rate of return on the market  <math>r_i</math> = expected return on an asset i                 </p>
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**Hypotheses:**

The following specific hypothesis is framed:

H0 : There is no significant relationship between the daily return of the S&P BSE Auto Index and the daily return of select automobile companies taken for the study.

H1 : There is a significant relationship between the daily return of the S&P BSE Auto Index and the daily return of select automobile companies taken for the study.

**Data analysis and Interpretation:**

**Table 2. Descriptive Statistics of Return of selected Automobile companies**

Name of the Company	Mean	Minimum	Maximum	Standard Deviation	Kurtosis	Skewness
Ashok Leyland	0.064074	-49.514563	25.25399	2.7440065	42.83114	-1.73724
Bajaj Auto	0.0400601	-50.565792	12.05243	1.8680812	183.3122	-6.61873
Eicher Motors	0.1132715	-89.97707	16.76878	2.6769776	432.0156	-12.4092
Force Motors	0.0740586	-16.942692	20	2.8522975	9.751365	1.731818
Hero Motor Corp	0.0219534	-11.0674	17.99178	1.8170555	7.207883	0.528432
Mahindra & Mahindra	0.03907	-51.867947	16.73557	2.1307859	120.7874	-4.57456
Maruti Suzuki	0.0742045	-17.022513	13.40969	1.8629745	7.700551	0.137215
TATA Motors	0.0436728	-80.827658	20.42538	3.0364495	171.3753	-6.03011
TVS Motors	0.1023159	-48.542714	14.83636	2.5542643	46.17171	-1.84765

Source: Compiled by the author

Summary of Descriptive statistics related to selected nine automobile company's stocks from 1st April-2010 to 31st March-2022 are shown in Table 2. Table 2 reveals that all the companies have generated positive return during the study period. From the table it is found that Eicher Motor is having the highest mean return (0.1132715). Whereas Hero Motor Corp is having lowest mean return during the study period(0.0219534). The standard deviation is a measurement of how much the return on an asset deviates from the average return over a certain time period. Standard deviation is a commonly used measure of volatility in securities, funds, and markets. A high standard deviation suggests a security is considered as more volatile and less stable. A low standard deviation of a security is considered to be

more stable and less volatile. Hero Motor Corp is having the lowest standard deviation (1.8170555) so investment in the shares of Hero Motor Corp is less risky as compared to shares of other companies. TATA Motors has the highest standard deviation (3.0364495) among all the sample companies so investment in TATA Motors is highly risky during the study period.

The deviation in daily return during the study period is ranging from a minimum of -49.514563 to a maximum of 25.25399, a minimum of -50.565792 to a maximum of 12.05243 a minimum of -89.97707 to a maximum of 16.76878, a minimum of -16.942692 to a maximum of 20, a minimum of -11.0674 to a maximum of 17.99178, a minimum of -51.867947 to a maximum of 16.73557, a minimum of -17.022513 to a maximum of 13.40969, a minimum of -80.827658 to a maximum of 20.42538, a minimum of -48.542714 to a maximum of 14.83636 for Ashok Leyland, Bajaj Auto, Eicher Motors, Force Motors, Hero Motor Corp, Mahindra & Mahindra, Maruti Suzuki, TATA Motors and TVS Motors respectively.

The Skewness of the companies shows that the daily returns of the Ashok Leyland, Bajaj Auto, Eicher Motors, Mahindra & Mahindra, TATA Motors and TVS Motors are negatively skewed and Force Motors, Hero Motor Corp, and Maruti Suzuki are positively skewed. Positive skewness suggests that investors will experience minor losses regularly and a few large gains. Negative skewness means that investors could expect either frequent tiny wins or a few big losses. It is ascertained that during the study period investing in Force Motors, Hero Motor Corp, and Maruti Suzuki will lead to experiencing recurrent small losses and few large gains. While, investing in Ashok Leyland, Bajaj Auto, Eicher Motors, Mahindra & Mahindra, TATA Motors and TVS Motors will result in repeated minor gains and few large losses.

In the analysis it is proved that Leptokurtic for sample stock returns as it has been found that the Kurtosis measures of return for all sample companies were higher than 3.

#### **Paired t-Test Analysis of S&P BSE Auto Index and Selected Automobile Companies:**

The analyzes of daily returns between the S&P BSE Auto Index and the select automobile companies with the support of a t-test the study period April 1, 2010 to March 31, 2022 are shown below

**Table 3 : Paired t-Test Analysis of S&P BSE Auto Index and Ashok Leyland**

<b>t-Test: Paired Two Sample for Means</b>		
	Ashok Leyland -Return	BSE Auto-Return
Mean	0.064074034	0.047824
Variance	7.5295717	1.880221
Observations	2978	2978
Pearson Correlation	0.544360941	
Hypothesized Mean Difference	0	
df	2977	
t Stat	0.384706147	
P(T<=t) one-tail	0.35024131	
t Critical one-tail	1.645365635	
P(T<=t) two-tail	0.70048262	
t Critical two-tail	1.960761117	

Source: Compiled by the author

The t-test result shows that the Ashok Leyland 's daily average return is (0.064074034) better than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the Ashok Leyland 's daily return has performed better than the S&P BSE Auto Index. The smaller variance, however, Of the S&P BSE Auto Index (1.880221) compared to Ashok Leyland (7.5295717), there is no doubt that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and Ashok Leyland indicates that there exists a positive correlation of 0.544360941. The p-value of 0.35024131 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and Ashok Leyland at a level of significance of 5 percent. Therefore, the null hypothesis (H<sub>0</sub>) is accepted.

**Table 4 : Paired t-Test Analysis of S&P BSE Auto Index and Bajaj Auto**

<b>t-Test: Paired Two Sample for Means</b>		
	Bajaj Auto- Return	BSE Auto -Return
Mean	0.04006	0.047824
Variance	3.489727	1.880221
Observations	2978	2978
Pearson Correlation	0.553035	
Hypothesized Mean Difference	0	
df	2977	
t Stat	-0.26602	
P(T<=t) one-tail	0.395121	
t Critical one-tail	1.645366	
P(T<=t) two-tail	0.790242	
t Critical two-tail	1.960761	

Source: Compiled by the author

The t-test result shows that the Bajaj Auto's daily average return is (0.04006) Lower than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the S&P BSE Auto Index 's daily return has performed better than the share of Ashok Leyland's. The smaller variance of the S&P BSE Auto Index (1.880221) compared to Bajaj Auto's (7.5295717), reveals that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and Bajaj Auto indicates that there exists a positive correlation of 0.553035. The p-value of 0.395121 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and Bajaj Auto at a level of significance of 5%. Therefore, the null hypothesis (H0 ) is accepted.

**Table 5 : Paired t-Test Analysis of S&P BSE Auto Index and Eicher Motors**

<b>t-Test: Paired Two Sample for Means</b>		
	Eicher Motors- Return	BSE-Auto Return
Mean	0.113271454	0.047824
Variance	7.166208936	1.880221
Observations	2978	2978
Pearson Correlation	0.401719164	
Hypothesized Mean Difference	0	
df	2977	
t Stat	1.446396707	
P(T<=t) one-tail	0.074085619	
t Critical one-tail	1.645365635	
P(T<=t) two-tail	0.148171239	
t Critical two-tail	1.960761117	

Source: Compiled by the author

The t-test result shows that the Eicher Motors 's daily average return is (0.113271454) is better than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the Eicher Motors 's daily return has performed better than the S&P BSE Auto Index. The smaller variance of the S&P BSE Auto Index (1.880221) compared to Eicher Motors's (7.166208936), reveals that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and Eicher Motors indicates that there exists a positive correlation of 0.401719164. The p-value of 0.074085619 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and Eicher Motors at a level of significance of 5%. Therefore, the null hypothesis (H0 ) is accepted.



**Table 6 : Paired t-Test Analysis of S&P BSE Auto Index and Force Motors**

<b>t-Test: Paired Two Sample for Means</b>		
	Force Motors- Return	BSE-Auto Return
Mean	0.074059	0.047824
Variance	8.135601	1.880221
Observations	2978	2978
Pearson Correlation	0.381116	
Hypothesized Mean Difference	0	
df	2977	
t Stat	0.539777	
P(T<=t) one-tail	0.294696	
t Critical one-tail	1.645366	
P(T<=t) two-tail	0.589391	
t Critical two-tail	1.960761	

Source: Compiled by the author

The t-test result shows that Force Motors 's daily average return is (0.074059) is better than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the Force Motors 's daily return has performed better than the S&P BSE Auto Index. The smaller variance of the S&P BSE Auto Index (1.880221) compared to Force Motors 's (8.135601), reveals that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and Force Motors indicates that there exists a positive correlation of 0.381116. The p-value of 0.294696 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and Force Motors at a level of significance of 5%. Therefore, the null hypothesis ( $H_0$ ) is accepted.

**Table 7 : Paired t-Test Analysis of S&P BSE Auto Index and Hero Motors**

<b>t-Test: Paired Two Sample for Means</b>		
	Hero Motors -Return	BSE-Auto Return
Mean	0.021953	0.047824
Variance	3.301691	1.880221
Observations	2978	2978
Pearson Correlation	0.616959	
Hypothesized Mean Difference	0	
df	2977	
t Stat	-0.97249	
P(T<=t) one-tail	0.165443	
t Critical one-tail	1.645366	
P(T<=t) two-tail	0.330886	
t Critical two-tail	1.960761	

Source: Compiled by the author

The t-test result shows that Hero Motors 's daily average return is (0.021953) is lower than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the S&P BSE Auto Index daily return has performed better than the Hero Motors 's. The smaller variance

of the S&P BSE Auto Index (1.880221) compared to Hero Motors 's (3.301691), reveals that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and Hero Motors 's indicates that there exists a positive correlation of 0.616959. The p-value of 0.165443 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and Force Motors at a level of significance of 5%. Therefore, the null hypothesis (H0 ) is accepted.

**Table 8 : Paired t-Test Analysis of S&P BSE Auto Index and Mahindra & Mahindra**

<b>t-Test: Paired Two Sample for Means</b>		
	Mahindra & Mahindra-Return	BSE-Auto Return
Mean	0.03907	0.047824
Variance	4.540248	1.880221
Observations	2978	2978
Pearson Correlation	0.654552	
Hypothesized Mean Difference	0	
df	2977	
t Stat	-0.29652	
P(T<=t) one-tail	0.383426	
t Critical one-tail	1.645366	
P(T<=t) two-tail	0.766853	
t Critical two-tail	1.960761	

Source: Compiled by the author

The t-test result shows that Mahindra & Mahindra 's daily average return is (0.03907) is lower than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the S&P BSE Auto Index daily return has performed better than the Mahindra & Mahindra 's. The smaller variance of the S&P BSE Auto Index (1.880221) compared to Mahindra & Mahindra 's (4.540248), reveals that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and Mahindra & Mahindra 's indicates that there exists a positive correlation of 0.654552. The p-value of 0.383426 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and Mahindra & Mahindra 's at a level of significance of 5%. Therefore, the null hypothesis (H0 ) is accepted.

**Table 9 : Paired t-Test Analysis of S&P BSE Auto Index and Maruti Suzuki**

<b>t-Test: Paired Two Sample for Means</b>		
	Maruti Suzuki-Return	BSE-Auto Return
Mean	0.074205	0.047824
Variance	3.470674	1.880221
Observations	2978	2978
Pearson Correlation	0.727355	
Hypothesized Mean Difference	0	
df	2977	
t Stat	1.125933	
P(T<=t) one-tail	0.130142	
t Critical one-tail	1.645366	
P(T<=t) two-tail	0.260284	
t Critical two-tail	1.960761	

Source: Compiled by the author

The t-test result shows that Maruti Suzuki 's daily average return (0.074205) is better than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the Maruti Suzuki 's daily return has performed better than the S&P BSE Auto Index. The smaller variance of the S&P BSE Auto Index (1.880221) compared to Maruti Suzuki 's (3.470674), reveals that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and Maruti Suzuki indicates that there exists a positive correlation of 0.727355. The p-value of 0.130142 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and Maruti Suzuki at a level of significance of 5%. Therefore, the null hypothesis ( $H_0$ ) is accepted.

**Table 10 : Paired t-Test Analysis of S&P BSE Auto Index and TATA Motors**

<b>t-Test: Paired Two Sample for Means</b>		
	TATA Motors- Return	BSE-Auto Return
Mean	0.043673	0.047824
Variance	9.220025	1.880221
Observations	2978	2978
Pearson Correlation	0.676798	
Hypothesized Mean Difference	0	
df	2977	
t Stat	-0.09691	
P(T<=t) one-tail	0.461401	
t Critical one-tail	1.645366	
P(T<=t) two-tail	0.922803	
t Critical two-tail	1.960761	

Source: Compiled by the author

The t-test result shows that TATA Motors 's daily average return is (0.043673) is lower than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the S&P BSE Auto Index daily return has performed better than the TATA Motors 's. The smaller variance of the S&P BSE Auto Index (1.880221) compared to TATA Motors 's (9.220025), reveals that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and TATA Motors 's indicates that there exists a positive correlation of 0.676798. The p-value of 0.383426 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and TATA Motors 's at a level of significance of 5%. Therefore, the null hypothesis (H0 ) is accepted.

**Table 11 : Paired t-Test Analysis of S&P BSE Auto Index and TATA Motors**

<b>t-Test: Paired Two Sample for Means</b>		
	TVS Motors-Return	BSE-Auto Return
Mean	0.102316	0.047824
Variance	6.524266	1.880221
Observations	2978	2978
Pearson Correlation	0.489801	
Hypothesized Mean Difference	0	
df	2977	
t Stat	1.333407	
P(T<=t) one-tail	0.09125	
t Critical one-tail	1.645366	
P(T<=t) two-tail	0.1825	
t Critical two-tail	1.960761	

Source: Compiled by the author

The t-test result shows that TVS Motors 's daily average return is (0.102316) is better than the S&P BSE Auto Index's daily returns of (0.047824), indicating that the TVS Motors 's daily return has performed better than the S&P BSE Auto Index. The smaller variance of the S&P BSE Auto Index (1.880221) compared to TVS Motors 's (6.524266), reveals that the former is more reliable than the latter. The correlation between the S&P BSE Auto Index and TVS Motors 's indicates that there exists a positive correlation of 0.489801. The p-value of 0.09125 is more than 0.05, which points out that there is no significant difference between the monthly returns of S&P BSE Auto and TVS Motors 's at a level of significance of 5%. Therefore, the null hypothesis (H0 ) is accepted.

**Ranking of selected Automobile Companies Based on the Return Yielded:**

As shown in Table 12 below the stocks of the selected companies are ranked based on the average daily returns generated during the study period.

**Table 12: Ranking of Companies Based on Monthly Returns**

Name of the Company	Mean	Ranking
Eicher Motors	0.113271454	1
TVS Motors	0.102315897	2
Maruti Suzuki	0.074204514	3
Force Motors	0.074058643	4
Ashok Leyland	0.064074034	5
TATA Motors	0.043672805	6
Bajaj Auto	0.04006006	7
Mahindra & Mahindra	0.039070028	8
Hero Motor Corp	0.021953414	9

Table 12 reveals the ranking of the companies on the basis of average returns yielded. From the table it is found that Eicher Motors is ranked 1 as it has generated highest average return amongst the selected companies during the study period. Where Hero Motors Corp ranked 9th due to lowest average return.

#### **Estimated Beta Values of the Sample Companies:**

**Table 13 Estimated Beta Values of the Sample Companies:**

Name of the Company	$\beta$
Ashok Leyland	1.088985
Bajaj Auto	0.753178
Eicher Motors	0.784002
Force Motors	0.792504
Hero Motor Corp	0.817287
Mahindra & Mahindra	1.016796
Maruti Suzuki	0.987878
TATA Motors	1.498216
TVS Motors	0.912085

The systematic risks of various securities differ due to their market linkages. The change in a stock's or a portfolio's returns relative to market returns is described by the beta factor. Since the index is an excellent mirror of the market, market returns are essentially quantified by index returns .

Table 13 shows that the beta value of Ashok Leyland, Mahindra & Mahindra, TATA Motors is greater than one, with TATA Motors having the highest beta value of 1.498216. This shows that these stocks have higher volatility when compared to other securities. When adding these stocks to the portfolio, the risk of the portfolio is increased due to the

market. Whereas beta value of Bajaj Auto, Eicher Motors, Force Motors, Hero Motor Corp, Maruti Suzuki and TVS Motors is less than one, indicating that this stock is less susceptible to the market and so adding this stock to the portfolio will make the portfolio less risky.

**Table 14 Correlation Coefficient of S&P BSE Finance Index and Sample Companies:**

Name of the Company	Correlation
Ashok Leyland	0.54436094
Bajaj Auto	0.55303463
Eicher Motors	0.40171916
Force Motors	0.3811159
Hero Motor Corp	0.61695934
Mahindra & Mahindra	0.65455239
Maruti Suzuki	0.72735535
TATA Motors	0.67679751
TVS Motors	0.48980109

Table 14 makes it evident that there is a good correlation between the S&P BSE Finance Index's average daily return and the daily returns of all the selected companies. Maruti Suzuki's daily return and the S&P BSE Auto Index's daily return have a strong correlation (0.72735535). Whereas, the S&P BSE Auto Index's daily return has exhibited a low correlation with Force Motors (0.3811159).

### Conclusions:

In order to attain the goal of maximising return, which vary from company to company, an investor should be able to evaluate both risk factor and return potential of different companies. An investor who is willing to take on significant risk and anticipates high returns will go stocks with great returns at significant risk. Therefore, if an investor wants to be more aggressive and wants to invest in highly risky stock, they must be stock-specific, which can benefit them in terms of earning more revenue. The study does not draw any conclusion for best or worst company for investment since stock ratings must be dependent on the type of investment and the type of investor. An investor with a lower risk tolerance will prefer equities with little risk and high return. Force Motors is superior for investors whose goal is to maximise returns because it offers the highest actual and abnormal returns among the stocks being studied.

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