

IMPACT OF THE UNION BUDGET ANNOUNCEMENT ON THE STOCK RETURNS: A STUDY ON SELECT INDIAN ELECTRIC VEHICLE COMPANIES LISTED IN BSE

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Abstract

The Union Budget 2023 has portrayed a promising future for the EV logistics sector. An incentive programme called the Fame India Scheme promotes the use of hybrid and electric automobiles. “Faster Adoption and Manufacturing of Electric and Hybrid Vehicles in India” is the full name of the Fame India programme. This incentive takes the form of subsidies, which are given to producers of electric cars and infrastructure providers. The National Electric Mobility Mission Plan includes the Fame India programme, which was introduced by the Ministry of Heavy Industries and Public Enterprises. The crucial need to minimize carbon emissions is the present driving force, also electric vehicles will be more economical and useful than petrol vehicles, this may change in the near future. This study wants to know whether the act of EV stocks has undergone changes before and after the Union Budget 2023.

Keywords: Union Budget 2023, Electronic Vehicle, Market Capitalisation, Independent t test, Daily Stock Return

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IMPACT OF THE UNION BUDGET ANNOUNCEMENT ON THE STOCK RETURNS: A STUDY ON SELECT INDIAN ELECTRIC VEHICLE COMPANIES LISTED IN BSE

Introduction

A motor vehicle that runs on electrical energy rather than fuels like diesel, petrol or natural gas etc. is referred to as an electric car. Electric cars use electric motors and rechargeable batteries to run from one place to another instead of an internal burning engine. In today's world the electric vehicle (EV) market is an effective investment platform in the automotive sector and has the potential to enhance the Indian economy. The Union Budget 2023 has shown an encouraging future for the EV logistics sector. Now various incentive has been taken by the Union government of India to promote the electric vehicle sector. "Faster Adoption and Manufacturing of Electric and Hybrid Vehicles in India" is the full name of the Fame India programme. This incentive takes the form of subsidies, which are given to producers of electric cars and infrastructure providers. The National Electric Mobility Mission Plan includes the Fame India programme, which was introduced by the Ministry of Heavy Industries and Public Enterprises. The FAME-II and PLI Scheme has a budgetary outlay of INR 10000 crore and INR 25938 crore respectively as per the Union Budget 2023. The study focuses to evaluate whether the performance of EV stocks has undergone changes before and after the Union Budget 2023.

Literature review and research gap

Gakhar (2015) in their study analyzed the daily closing prices of NIFTY index, which have been collected by the authors from the NSE website for a period from 2011 to 2015 which includes a total of 5 Union Budgets and 1 Interim Budget. The time period of the study has been classified into pre-budget and post-budget period. The standard deviation and variances during the previous and next 3, 10, and 30 days of the budget is calculated and thereafter

statistical tools such as paired T-test and F-test have been applied. The paired T-test have been applied on the average returns and the F-test has been applied over the variability of returns of CNX NIFTY over different periods. The study concluded that invest more cautiously around the budget day as volatility in the market is high in the short term during the budget announcement days.

Ghosh (2020) in her paper presentation in International E Conference on Adapting to the New Business Normal – The way ahead; discussed if the BSE's selected 6 indices have increased or decreased since the Union Budget release on February 1st, 2020. A 95% confidence level T test was performed to analyse the data. The study came to the conclusion that the Union Budget's positive announcements were leading to anomalous gains in some indices while leading to negative returns in other indexes when the announcement was negative.

Yong et al. (2015) The article examines the most recent advancements in electric car technology, the effects of their adoption, and the prospects they open up. A possible strategy to address the problem of climate change is to electrify transportation. The market's acceptance of electric vehicles has had a substantial impact on a number of areas, including the power grid. A number of measures have been put in place to encourage the use of electric vehicles, and the upward trend in acceptance of these vehicles in recent years has been encouraging.

Thomas and Shah (2002) found in the study that there was no evidence of over-reaction or under-reaction prior to the Budget date, or immediately after it, and that the information process was not affected by either. The study examined the Indian stock market index from April 1979 to June 2001, spanning 26 Budget dates. On average, post-budget returns were either positive or negative depending on the year. Furthermore, it was concluded that the information processing by the stock market participants were rational and that the market was semi-strong efficient.

Babu and Venkateswara (2013) analysed the impact of Union budgets on Indian stock prices. The period of the study was 1991-2009, and according to the results, it seems that budgets have an effect only within fifteen business days of the return budget date. So, an investor must be very careful and very quick to invest around the budget day. Writers also reported that the budget will have the biggest impact in terms of absolute income immediately and around a budget day, gradually decreasing as one moves away from the budget day.

Singhvi (2014) in the study analysed over a long period of 1996 to 2013, S&P CNX NIFTY, to check whether the Union budget announcement have any impact on them in the stated time period. The S&P CNX NIFTY stock represented almost 64.98% of the total free float market capitalisation of the stock market as on 31.03.2011. Thus, the study provided important insights on the impact of Union budget on NIFTY.

All the eminent research scholars and experts have conducted various studies regarding the development of the electronic vehicles and the electronic vehicle stocks, but a comprehensive and detailed study of the performance of the EV stocks have not been covered in the above papers. This paper intends to fill the research gap by analysing the performance of the selected EV stocks in India before and after the Union Budget 2023.

Objectives of the study

The EV sector has a bright future, as the Union Budget 2023monstrates. The primary objective of this study is to evaluate whether the performance of EV stocks based on their daily return has undergone changes due to the announcement of the Union Budget 2023. However, our objective is: -

- to know whether there is any difference in the stock return of post-UB with reference to pre-UB stock returns of five EV companies.

Research hypothesis

H₀₁ : There is no significant difference in daily stock return of five selected Electric Vehicles Companies during the 30-day period pre and post Union Budget announcement date 2023.

H₀₂ : There is no significant difference in daily stock return of five selected Electric Vehicles Companies during the 60-day period pre and post Union Budget announcement date 2023.

H₀₃ : There is no significant difference in daily stock return of five selected Electric Vehicles Companies during the 90-day period pre and post Union Budget announcement date 2023.

Research methodology

This study analyses the impact of Union Budget 2023 announcement on the stock return of select electronic vehicle companies. The researchers have selected five listed EV companies (Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Company Ltd) based on their market capitalisation. The daily closing stock prices of five electric vehicle companies have been taken from the Yahoo Finance (<https://finance.yahoo.com/>). The data have been analysed considering the period from 1st September 2022 to 30th June 2023. The entire sample has been divided into 5 months of pre-budget as well as post-budget daily closing prices based on the budget announcement date on 01.02.2023. The continuous daily returns have been calculated using log-difference of daily stock prices method as follows $R_{it} = [\log(P_{it} - P_{it-1}) / P_{it-1}] \times 100$.

Where, R_{it} = continuous daily return i^{th} company at day t ,

P_{it} = closing price of i^{th} company at day t ,

P_{it-1} = closing price of i^{th} company at day $t-1$,

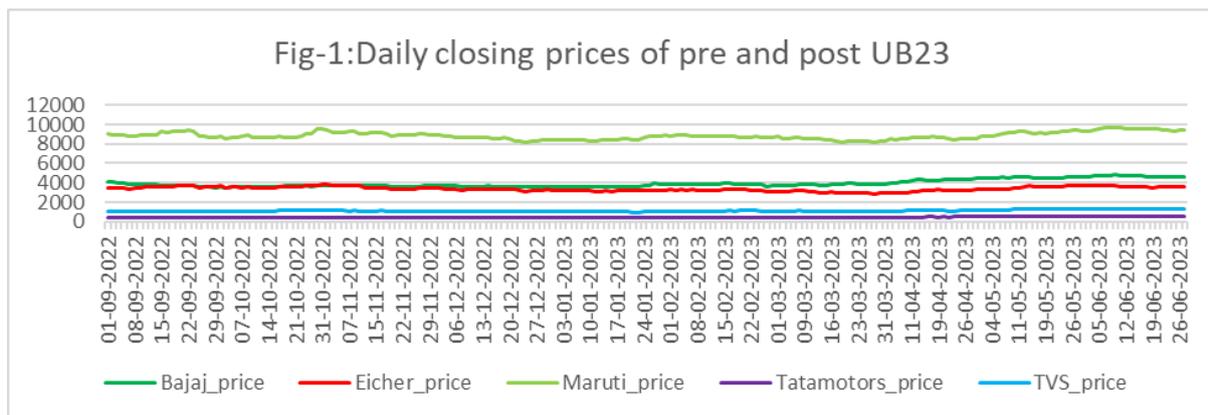
Furthermore, the researchers have used data for 30 days pre and post-Union Budget, 60 days pre and post-Union Budget and 90 days pre and post-Union Budget 2023. For the purpose of analysing the impact, the researcher used independent sample t-test. All the data has been analysed and processed

through MS EXCEL and SPSS 21. The researchers have compared the daily return of 5 EV companies' stocks for the pre and post-period announcement of Union Budget 2023 Using statistical packages for Social sciences and the research tool is an independent sample t-test.

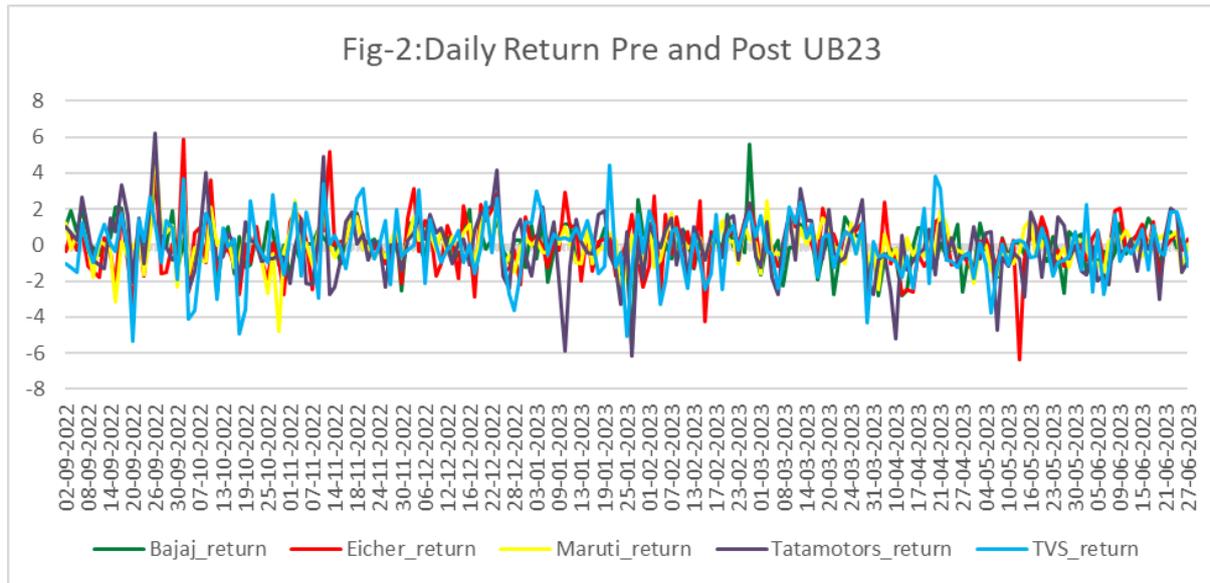
In this study the following abbreviations have been used:

Pre-UB = Pre-Union Budget; Post-UB = Post-Union Budget; EV = Electronic Vehicles; Bajaj_return = Stock return of Bajaj Auto Ltd; Eicher_return = Stock return of Eicher Motors Ltd; Maruti_return = Stock return of Maruti Suzuki India Ltd; Tatamotors_return = Stock return of Tata Motors Ltd; TVS_return = Stock return of TVS Motor Company.

Data analysis and findings



Source: Authors' own computation



Source: Authors’ own computation

Fig-1 and Fig-2 show daily prices and daily returns of Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Company for pre and post-announcement of UB 2023 respectively. From Fig-1 we can say that there are no significant breaks in the prices of 5 companies’ stocks over the period. Fig-2 depicts daily return fluctuations of those companies under study around event day.

Table 1: Group Statistics of Mean of 30 days Pre-UB daily return and Post-UB daily return of five EV Companies

Company	Classification	Number of observations	Mean Value	Standard Deviation	Standard Error of Mean
Bajaj_return	Pre_UB	30	-0.171	1.493	0.273
	Post_UB	30	0.081	1.342	0.245
Eicher_return	Pre_UB	30	0.122	1.453	0.265
	Post_UB	30	0.274	1.583	0.289
Maruti_return	Pre_UB	30	-0.108	1.099	0.201
	Post_UB	30	0.161	0.962	0.176
Tatamotors_return	Pre_UB	30	-0.263	2.280	0.416
	Post_UB	30	0.316	1.363	0.249

TVS_return	Pre_UB	30	0.059	1.945	0.355
	Post_UB	30	-0.002	1.622	0.296

Source: Authors' own computation

Table 1 represents Group Statistics of Mean value of 30 days Pre-UB and Post-UB daily returns of Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Companies individually. The table reveals notable findings regarding the daily returns of five companies during the 30 days before and after the Union Budget announcement. Bajaj Auto Ltd.'s Pre-UB mean of daily returns being (-0.171) which is negative and lower than the mean value of Post-UB daily returns which is 0.081. The Pre-UB standard deviation being 1.493 which is marginally higher than the Post-UB standard deviation 1.342. Similarly, Eicher Motors Ltd has a lower Pre-UB mean value of daily returns which is 0.122 compared to the post-UB mean value of daily returns 0.274. Also, the Pre-UB standard deviation is 1.453 slightly lower than the post-UB standard deviation which is 1.583. Maruti Suzuki India Ltd also exhibits a negative Pre-UB mean value of daily returns which is (-0.108), lower than the mean value of Post-UB daily returns which is 0.161. Also the Pre-UB standard deviation is 1.099 which is slightly more than the Post-UB standard deviation which is 0.962. Tata Motors Ltd has a negative Pre-UB mean value of daily returns which is (-0.263), lower than the Post-UB mean value of daily returns which is 0.316. Also the Pre-UB standard deviation is 2.280 marginally higher than the Post-UB standard deviation which is 1.363. In contrast, TVS Motor Company has a higher Pre-UB mean value of daily returns which is 0.059 compared to the Post-UB mean value of daily returns which is (-0.002). The Pre-UB standard deviation (1.945) is a little higher than the Post-UB standard deviation (1.622).

Table 2: Group Statistics of Mean of 60 days Pre-UB daily return and Post-UB daily return of five EV Companies

Company	Classification	Number of Observations	Mean Value	Standard Deviation	Standard Error of Mean
Bajaj_return	Pre_UB	60	-0.021	1.291	0.167

	Post_UB	60	-0.253	1.365	0.176
Eicher_return	Pre_UB	60	0.192	1.554	0.201
	Post_UB	60	-0.041	1.514	0.195
Maruti_return	Pre_UB	60	0.062	0.987	0.127
	Post_UB	60	0.018	0.980	0.127
Tatamotors_return	Pre_UB	60	-0.102	1.926	0.249
	Post_UB	60	-0.113	1.484	0.192
TVS_return	Pre_UB	60	0.119	1.752	0.226
	Post_UB	60	-0.190	1.607	0.207

Source: Authors' own computation

Table 2 represents Group Statistics of Mean of 60 days Pre-UB and Post-UB daily returns of Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Companies individually. The table reveals notable findings regarding the daily returns of five companies during the 60 days before and after the Union Budget announcement. Bajaj Auto Ltd.'s Pre-UB mean of daily returns being (-0.021) which is negative and lower than the mean value of Post-UB daily returns which is (-0.253). The Pre-UB standard deviation being 1.291 which is marginally lower than the Post-UB standard deviation 1.365. Similarly, Eicher Motors Ltd has a higher Pre-UB mean value of daily returns which is 0.192 compared to the Post-UB mean value of daily returns (-0.041) which is negative. Also, the Pre-UB standard deviation is 1.554 slightly higher than the Post-UB standard deviation which is 1.514. Maruti Suzuki India Ltd exhibits a Pre-UB mean value of daily returns which is 0.062, slightly higher than the mean value of Post-UB returns 0.018. Also the Pre-UB standard deviation is 0.987 which is very slightly more than the Post-UB standard deviation which is 0.980. Tata Motors Ltd has a negative Pre-UB mean value of daily returns which is (-0.102), slightly higher than the Post-UB mean value of daily returns which is (-0.113). Also, the Pre-UB standard deviation is 1.926 marginally higher than the Post-UB standard deviation which is 1.484. In contrast, TVS Motor Company has a higher Pre-UB mean value of daily returns which is 0.119 compared to the Post-UB mean

value of daily returns which is (-0.190). The Pre-UB standard deviation 1.752 is a little higher than the Post-UB standard deviation 1.607.

Table3: Group Statistics of mean of 90 days Pre-UB daily return and Post-UB daily return of five EV Companies

Company	Classification	Number of Observations	Mean Value	Standard Deviation	Standard Error of Mean
Bajaj_return	Pre_UB	90	-0.026	1.301	0.137
	Post_UB	90	-0.217	1.232	0.129
Eicher_return	Pre_UB	90	0.135	1.737	0.183
	Post_UB	90	-0.089	1.497	0.157
Maruti_return	Pre_UB	90	0.044	1.344	0.141
	Post_UB	90	-0.085	0.928	0.098
Tatamotors_return	Pre_UB	90	-0.062	1.879	0.198
	Post_UB	90	-0.256	1.475	0.156
TVS_return	Pre_UB	90	0.032	1.906	0.201
	Post_UB	90	-0.300	1.508	0.159

Source: Authors' own computation

Table 3 represents Group Statistics of Mean of 90 days Pre-UB and Post-UB daily returns of Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Companies individually. The table reveals notable findings regarding the daily returns of five companies during the 90 days before and after the Union Budget announcement. Bajaj Auto Ltd.'s Pre-UB mean of daily returns being (-0.026) which is negative and higher than the mean value of Post-UB daily returns which is (-0.217). The Pre-UB standard deviation being 1.301 which is marginally higher than the Post-UB standard deviation 1.232. Similarly, Eicher Motors Ltd has a higher Pre-UB mean value of daily returns which is 0.135 compared to the Post-UB mean value of daily returns (-0.089) which is negative. Also, the Pre-UB standard deviation is 1.737 slightly higher than the Post-UB standard deviation which is 1.497. Maruti Suzuki India Ltd exhibits a Pre-UB mean value of daily returns which

is 0.044, higher than the mean value of Post-UB returns (-0.085). Also, the Pre-UB standard deviation is 1.344 which is more than the Post-UB standard deviation which is 0.928. Tata Motors Ltd has a negative Pre-UB mean value of daily returns which is (-0.062), higher than the Post-UB mean value of daily returns which is (-0.256). Also, the Pre-UB standard deviation is 1.879 marginally higher than the Post-UB standard deviation which is 1.475. In contrast, TVS Motor Company has a higher Pre-UB mean value of daily returns which is 0.032 compared to the Post-UB mean value of daily returns which is (-0.300). The Pre-UB standard deviation of 1.906 is higher than the Post-UB standard deviation of 1.508.

Research Hypothesis 1:

H₀₁: There is no significant difference in the daily stock return of five Electric Vehicles Companies during the 30-day period pre and post-Union Budget announcement date 2023 for each company.

H₁₁: There is a significant difference in the daily stock return of five Electric Vehicles Companies during the 30-day period pre and post-Union Budget announcement date 2023 for each company.

Table 4: Independent Sample t-test for equality of mean of 30 days pre and post-UB data

Company		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Level of Significance	T	Degrees of Freedom	Level of Significance (2-tailed)	Mean Difference	Standard Error of Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Bajaj_return	Equal variances assumed	0.902	0.346	-0.686	58	0.495	-0.2515	0.3665	-0.9852	0.4821
Eicher_return	Equal variances assumed	0.018	0.894	-0.386	58	0.701	-0.1515	0.3923	-0.9368	0.6338
Maruti_return	Equal variances assumed	0.187	0.667	-1.008	58	0.318	-0.2688	0.2667	-0.8026	0.2650

Tatamotors_return	Equal variances not assumed	4.192	0.045	-1.193	47.387	0.239	-0.579	0.485	-1.554	0.397
TVS_return	Equal variances assumed	0.043	0.836	0.133	58	0.895	0.0615	0.4624	-0.8642	0.9872

Source: Authors' own computation

Table 4 displays the result of the Independent Sample t-test of five EV companies i.e. Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor daily returns for 30 days pre and post-UB 2023. The results of Levene's Test for four companies' data (Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd and TVS Motor Company) are leading to do not reject the null of equality of variances as the P-values are insignificant at 5% level of significance for all the companies excluding Tata Motors Ltd. For Tata Motors Ltd., the result of Levene's test is significant at a 5% level of significance leading to reject the null of equality of variance.

Under the assumption of the equality of variances, the result of the t-test for all the selected companies (Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Company) are insignificant because the P-values are insignificant at 5% level of significance for each case. Hence it can be expressed that there is no significant difference in the daily stock return of five selected Electric Vehicles Companies during the 30-day period pre and post-Union Budget announcement date 2023 tested individually.

Research Hypothesis 2:

H₀₂: There is no significant difference in the daily stock return of five selected Electric Vehicles Companies during the 60-day period pre and post-Union Budget announcement date 2023.

H₁₂: There is a significant difference in the daily stock return of five selected Electric Vehicles Companies during the 60-day period pre and post-Union Budget announcement date 2023.

Source: Authors' own computation

Table 5: Independent Sample t test for equality of mean of 60days pre and post-UB data										
Company		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Level of Significance	t	Degrees of freedom	Level of Significance (2-tailed)	Mean Difference	Standard Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Bajaj_return	Equal variances assumed	0.339	0.561	1.013	178	0.312	0.1915	0.1889	-0.1814	0.5643
Eicher_return	Equal variances assumed	1.481	0.225	0.928	178	0.355	0.2243	0.2417	-0.2526	0.7013
Maruti_return	Equal variances assumed	3.039	0.083	0.751	178	0.454	0.1293	0.1722	-0.2105	0.4691
Tatamotors_return	Equal variances assumed	1.194	0.276	0.773	178	0.440	0.1947	0.2518	-0.3022	0.6917
TVS_return	Equal variances assumed	2.274	0.133	1.296	178	0.197	0.3322	0.2562	-0.1735	0.8378

Table 5 denotes the result of the Independent Sample t-test of five EV companies i.e. Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor daily returns for 60 days pre and post-UB 2023. The results of Levene's Test for all companies' data (Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Company) are leading to do not reject the null of equality of variances as the P-values are insignificant at 5% level of significance for each case.

Under the assumption of the equality of variances, the result of the t-test for all the selected companies (Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Company) are insignificant because the P-values are insignificant at 5% level of significance for each case. Hence it can be expressed that there is no significant difference in the daily stock return of five selected Electric Vehicles Companies during the 30-day period pre and post-Union Budget announcement date 2023 tested individually.

Research Hypothesis 3:

H₀₃: There is no significant difference in the daily stock return of five selected Electric Vehicles Companies during the 90-day period pre and post-Union Budget announcement date 2023.

H₁₃: There is a significant difference in the daily stock return of five selected Electric Vehicles Companies during the 90-day period pre and post-Union Budget announcement date 2023.

Table 6: Independent Sample t test for equality of mean of 90 days pre and post-UB data

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Level of Significance	t	Degrees of freedom	Significance (2-tailed)	Mean Difference	Standard Error Difference	95% Confidence Interval of the Difference	
Company									Lower	Upper
Bajaj_return	Equal variances assumed	0.339	0.561	1.013	178	0.312	0.1915	0.1889	-0.1814	0.5643

Eicher_return	Equal variances assumed	1.481	0.225	0.928	178	0.355	0.2243	0.2417	- 0.2526	0.7013
Maruti_return	Equal variances assumed	3.039	0.083	0.751	178	0.454	0.1293	0.1722	- 0.2105	0.4691
Tatamotors_return	Equal variances assumed	1.194	0.276	0.773	178	0.440	0.1947	0.2518	- 0.3022	0.6917
TVS_return	Equal variances assumed	2.274	0.133	1.296	178	0.197	0.3322	0.2562	- 0.1735	0.8378

Source: Authors' own computation

Table 6 depicts the result of the Independent Sample t-test of five EV companies i.e. Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor daily returns for 90 days pre and post-UB 2023. The results of Levene's Test for all companies' data (Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Company) are leading to do not reject the null of equality of variances as the P-values are insignificant at 5% level of significance for each case.

Under the assumption of the equality of variances, the result of the t-test for all the selected companies (Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor Company) are insignificant because the P-values are insignificant at 5% level of significance for each case. Hence it can be expressed that there is no significant difference in the daily stock return of five selected Electric Vehicles Companies during the 30-day period pre and post-Union Budget announcement date 2023 tested individually.

Conclusion

From the above study, it may be concluded that researchers have tried to know the impact of the announcement of Union Budget 2023 in India on the daily return of the five best electronic vehicle companies. But there is no significant impact on the daily stock returns of the five most prominent EV

companies, viz., Bajaj Auto Ltd, Eicher Motors Ltd, Maruti Suzuki India Ltd, Tata Motors Ltd and TVS Motor for multiple observation windows study period. The non-existence of a significant impact on the daily stock returns indicates that the Union Budget 2023 did not generate any remarkable market response in investor feelings regarding these electric vehicle companies.

Limitation and further research scope

The present study deals with only the daily overall return of the selected EV stocks, however further study can be conducted by considering the abnormal returns of the stocks as well. Furthermore, only five companies have been considered here, future research is possible by considering the impacts on more such EV companies. Only one factor that is the impact of Union Budget 2023 announcement has been analyzed in the study, other factors which may prove significant can be included in the scope for further research.

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