

Impact of Indian Union Cabinet's Approval of Additional E-Bus Services on the Share Price Movement of Select EV Producing Companies

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Abstract

In the present study, we emphasize on the impact of Union Cabinet's approval for 10000 electric buses on the stock return of top 5 select electronic vehicles automobile manufacturing companies in India, based on market capitalization, as of August 16, 2023. In order to empirically validate the effect of this event, we have employed the event study methodology considering market model. For this purpose, we have collected the daily stock prices of TVS Motor Company Ltd., TATA Motors Ltd., Maruti Suzuki India Ltd., Eicher Motors Ltd. and Bajaj Auto Ltd. from the official website of Bombay Stock Exchange (BSE). We have considered August 17, 2023 as the event day, with an event window of 41 days (-20, +20) and an estimation window of 100 days. Furthermore, in the present study we have applied the parametric t-test to infer the significance of Cumulative Abnormal Return (CAR) for these companies individually. The findings reveal that the impact of this announcement on CARs of only Maruti Suzuki India Ltd for the range of windows (1, 10) and (1, 20) after the event announcement day are positive (5.9520 and 8.3722 respectively) and statistically significant at 1% level. The significant positive CARs implies that shareholders anticipate that this announcement may be beneficial for Maruti-Suzuki in the future, leading to a potential gain in market share.

Keywords: Indian Stock Market; S&P BSE 200; Electronic Vehicles (EV); Event study methodology; Cumulative Abnormal Return (CAR); Share Prices; Automobile Companies; Market Capitalization.

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Introduction

During the recent era the automobile industry has reached to a new beginning with the arrival of electric vehicles. Electric vehicles are emerged due to the limited reserve of crude oil and environmental pollutions which are caused by the traditional vehicles and the technological revolution is also a relevant part. Day by day these electric vehicles are experiencing huge popularity in the society. However, these vehicles have many backlashes which may include very high price, inconsistent charging setup and disappointing driving range etc. that need proper attention to make it a competitive market (Adéla Pavelková, 2018).

It's almost impossible to point out the origination of the first electric vehicle in the world. Instead that it can be identified as series of inventions, from the battery powered electric cars to electric motor cars during 1800s in different countries. According to the records the first crude electric vehicle was discovered by a British inventor named Robert Anderson in the year 1832, but electric vehicles became practical during 1870s or later. Around 1890s the first successful electric car was made its entrance in the US and was originated by William Morrison, this six-passenger car was capable of a highest speed of 14 miles per hour.

In India, the first electric car was introduced in the Auto Expo by Eddy Current Controls in the year 1993 named as "Lovebird" with a DC motor, powered by lead-acid battery. This car had a remarkable driving range of 60 km with a lone charge. Nowadays the electric vehicles' market is emerging remarkably. At present in the Indian electric vehicles' market, TATA motors ltd has acquired highest market share. The Indian government is also showing huge interest towards the promotion of electric vehicles by providing different kinds of subsidies.

Huge popularity of the electric vehicle's market evident from both side of automobile manufacturers, the traditional manufacturers who are at the pole position of the automobile industry from the beginning on the other hand from the emerging firms that have pioneered the electric vehicles since inception. Nevertheless, popularity of the electric vehicles is not at all emerged out of unfounded claims or empty promises. "The Glasgow Declaration on Zero Emission Cars and Vans" at COP26 declares that firms will obligate themselves "toward reaching 100 percent zero emission new cars and vans sales in leading markets by 2035 or earlier" (convenience.org).

On August 16th 2023 the Indian Union Cabinet approved a new scheme named “PM e-bus Sewa” where they commit to introduce 10000 electric buses to the city bus services of 169 cities across India and to cover up the infrastructure of the city bus services under green mobility. The PM e-bus Sewa scheme has made an estimated budget of ₹ 57,613 crore. In the present study, we emphasize the impact of Union Cabinet’s approval for 10000 electric buses on the stock return of top 5 select electric vehicles automobile manufacturing companies in India, based on market capitalization, as of August 16, 2023.

Literature Review

Shafiq and Quresh (2022) in their research study titled “Impact of budget announcement on stock returns: An Event Study in Pharmaceutical and Automobile sector” analysed the effect of budget announcement on the stock prices of the automobile and pharmaceutical industry of Pakistan. Here the researchers had used ‘event study methodology’ to examine the effect of the announcement with an event window of 15 days (+7, -7) and estimation window of 230 days. The results of the study shows that the stock market of Pakistan is efficient in the semi strong form. It also reveals that the impact of the event on the stock returns of the automobile industry was insignificant, on the other hand, significant impact was found on the stock returns of the pharmaceutical industry.

Yousef El Emary (2022) in his research article had tried to explore the relationship between press release of firms’ achievement in developing electric vehicles and their stock prices. To examine the relationship here the researcher had used event study methodology. The findings showed that news about electric vehicles appeared to have some explanatory impact over changes in stock prices. Furthermore, the key terms selected from the type of enterprise (legacy vs. electric vehicles) and the news source from which they were obtained illustrate the differing degrees of explanatory power held by different types of EV-related news, notwithstanding the relatively weak correlation established in all the connections investigated.

Inamdar and Rachchh (2021) in their research study examined whether there was any impact of corporate tax reforms on the stock prices of the Indian

auto industry by using event study methodology. On 20th September 2019 the Indian Finance Minister made a remarkable announcement on corporate tax cut due to which the Indian corporate rate became lesser than global average tax rate. Here the researcher had 20th September 2019 as the event day with an event window of 11 days (+5, -5) and an estimation window of 120 trading days. The results reveal that corporate tax rate cut has significant influence over the stock prices of the respective firms. It also shows exceedingly significant influence on the event day and on the next trading days which results abnormal returns on the stock prices.

Hussain et. al. (2020) in their research article titled “Domestic oil price reductions and automobile & spare parts industry stocks; an application event study” had examined the impact of oil price reduction on the share prices of spare parts and automobile sector of Pakistan by applying event study methodology. Here the authors had considered oil price reductions by ORGA as events and used time series as well as cross section data. To analyze the impact of the event both parametric and non-parametric techniques were applied. The results reveals that reductions in oil price had significant impact on the stock prices of selected 19 firms.

Felekidis and Buczek (2022) in their research study tried to investigate the factors that affect the electric vehicles industry’ market returns. Here the researchers had applied CAPM, FAMA- FAMA-FRENCH THREE-FACTOR MODEL, FAMA-FRENCH FIVE-FACTOR MODEL and Multiple linear regression to identify the factors that have significant impact on electric vehicles producing companies. The findings of the study reveals that the factors like Market risk premium, SMB, HML, RMW have significant positive impact on the stock returns of the electric vehicles producing companies.

Pavelková (2018) in his research article examined the influence of the electric vehicles on the automobile industry. Here the researcher also tried to identify the future position of electric vehicles in the automobile market. The findings of the study reveals that the correlation between sale of electric vehicles and internal combustion engine vehicles are very strong and positive. Furthermore, the regression analysis shows that electric vehicles and internal

combustion engine vehicles are close substitutes of each other, which indicates that the price of electric vehicles have significant impact on the sales of internal combustion engine vehicles.

From the above literature we found that no one conducted research on the impact of Indian Union Cabinet's Approval of Additional E-Bus Services on the Share Price Movement of EV Producing Companies. This is the first attempt we have taken to get a clear picture regarding this event.

We made the following research hypothesis to investigate the impact of Union Cabinet's approval for 10000 electric buses on the stock return:

H₀₁: There is no significant impact of Union Cabinet's approval for 10000 electric buses on the stock return of the select EV-Producing companies under study.

H₁₁: There is a significant impact of Union Cabinet's approval for 10000 electric buses on the stock return of the select EV-Producing companies under study.

Data and Methodology

In order to empirically validate the impact of Union Cabinet's approval for 10000 electric buses, we consider top five automobile companies listed in BSE producing electronic vehicle based on their market capitalization. Taking into account the objective of computing the significant abnormal stock returns by using event study methodology we have employed the market model as introduced by Sharpe (1963). For this purpose, we collected the daily stock prices of TVS Motor Company Ltd., TATA Motors Ltd., Maruti Suzuki India Ltd., Eicher Motors Ltd. and Bajaj Auto Ltd. from the official website of Bombay Stock Exchange (BSE) and we have considered S&P BSE Auto index for calculating market return. All the returns have been calculated as log difference of the price series, symbolically-

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right) \times 100$$

Where, r_t and P_t are the continuous daily return series and daily price series respectively. P_{t-1} denotes the previous value of price series.

Subsequently, we generated abnormal stock returns by differentiating the estimated stock returns from actual stock returns, symbolically-

$$AR_{it} = R_{it} - ER_{it}$$

$$\text{and, } ER_{it} = \alpha_i + \beta_i R_{mt}$$

Where, AR_{it} is the abnormal return of i^{th} security on t^{th} day,

R_{it} is the actual return of i^{th} security on t^{th} day,

R_{mt} is the market return on t^{th} day,

ER_{it} is the estimated return of i^{th} security on t^{th} day,

α_i is the intercept of the market model for i^{th} security,

β_i is the slope coefficient of the market model for i^{th} security.

To implement the methodology of event study, we have divided the entire data set in two parts such as “Estimation Window” and “Event Window”. Where, we consider August 17, 2023 as the event day, with an event window of 41 days (-20, +20) and an estimation window of 100 days presented in the Fig. 1.

Ranges of Cumulative Abnormal Returns (CARs) are computed by summing all the abnormal returns within its range, where

$$CAR_{i,t1-t2} = \sum_{t=t1}^{t2} AR_{it}$$

Furthermore, in this study we have considered the parametric t-test to infer the significance of Cumulative Abnormal Return (CAR) for these companies individually. The t-statistic is calculated using the following formula

$$t - \text{stat} = \frac{CAR_{i,t1-t2}}{\text{Std. Error of } CAR_{i,t1-t2}}$$

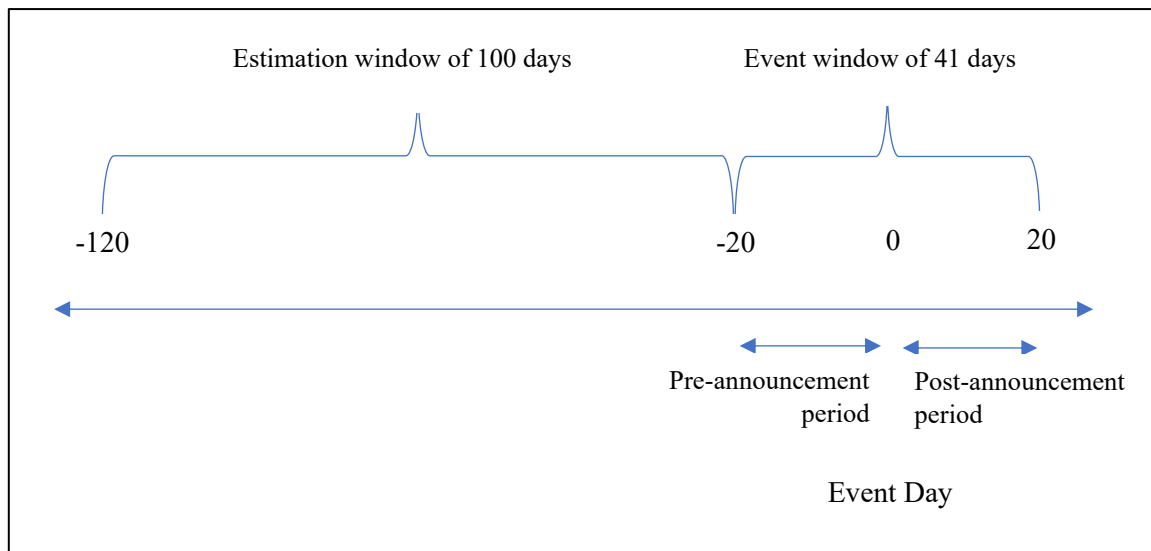


Fig-1: Framework for Estimation window and Event window

Results and discussions

Table-1 represents Cumulative Abnormal Return (CAR) of TVS Motor Co Ltd along with its standard error of CAR, t-statistic and the p value of t-statistic, across different window ranges. The Cumulative Abnormal Return (CAR) over the various window range shows constant fluctuations. Though, all the CARs are insignificant. Moving to Table-2, it displays Cumulative Abnormal Return (CAR) along with its corresponding standard error of CAR, t-statistic and the p value of t-statistic of Tata Motors Ltd over its various window ranges. The Cumulative Abnormal Return (CAR) over the various window range shows constant fluctuations. Similar to the result of TVS Motor Co Ltd, all the CARs for Tata Motors Ltd are statistically insignificant.

In Table-3, Cumulative Abnormal Return (CAR) along with its corresponding standard error of CAR, t-statistic and the p value of t-statistic of Maruti Suzuki India Ltd is exhibited across various window ranges. The Cumulative Abnormal Return (CAR) demonstrates constant fluctuations over the various window range. From this table, we can also state that there is significant impact of this announcement on CARs of Maruti Suzuki India Ltd for the windows ranges (1, 10) and (1, 20) after the event announcement day. The CARs for these window ranges are positive (5.9520 and 8.3722 respectively) and statistically significant at 1% level of significance.

Table 1: TVS Motor Co Ltd

Window	CAR	Std. E of CAR	t-statistic	p value
(-20,-1)	-3.7854	5.7104	-0.6629	0.5090
(1,20)	2.9537	5.7104	0.5172	0.6062
(-10,-1)	-0.7098	4.0379	-0.1758	0.8608
(1,10)	3.9718	4.0379	0.9836	0.3277
(-5,-1)	-0.1036	2.8552	-0.0363	0.9711
(1,5)	1.6395	2.8552	0.5742	0.5671
(-5,5)	1.3027	4.2350	0.3076	0.7590
(-2,2)	-0.9291	2.8552	-0.3254	0.7456
(-10,10)	3.0288	5.8514	0.5176	0.6059
(-20,20)	-1.0649	8.1761	-0.1302	0.8966

Table-2: Tata Motors Ltd

Window	CAR	Std. E of CAR	t-statistic	p value
(-20,-1)	0.0398	4.4390	0.0090	0.9929
(1,20)	-5.7606	4.4390	-1.2977	0.1974
(-10,-1)	-0.4575	3.1388	-0.1458	0.8844
(1,10)	-4.3091	3.1388	-1.3728	0.1729
(-5,-1)	1.1478	2.2195	0.5171	0.6062
(1,5)	-0.5714	2.2195	-0.2575	0.7974
(-5,5)	-0.1635	3.2920	-0.0497	0.9605
(-2,2)	0.6922	2.2195	0.3119	0.7558
(-10,10)	-5.5065	4.5486	-1.2106	0.2290
(-20,20)	-6.4608	6.3557	-1.0165	0.3119

Table-3: Maruti Suzuki India Ltd

Window	CAR	Std. E of CAR	t-statistic	p value
(-20,-1)	-2.9267	2.9749	-0.9838	0.3276
(1,20)	8.3722	2.9749	2.8143	0.0059***
(-10,-1)	-1.1647	2.1036	-0.5537	0.5811
(1,10)	5.9520	2.1036	2.8295	0.0057***
(-5,-1)	-1.4069	1.4874	-0.9458	0.3466
(1,5)	2.3525	1.4874	1.5816	0.1170
(-5,5)	0.5778	2.2062	0.2619	0.7940
(-2,2)	0.7621	1.4874	0.5124	0.6096
(-10,10)	4.4194	3.0484	1.4498	0.1503
(-20,20)	5.0776	4.2594	1.1921	0.2361

Table-4: Eicher Motors Ltd

Window	CAR	Std. E of CAR	t-statistic	p value
(-20,-1)	-2.9267	2.9749	-0.9838	0.3276
(1,20)	8.3722	2.9749	2.8143	0.0059
(-10,-1)	-1.1647	2.1036	-0.5537	0.5811
(1,10)	5.9520	2.1036	2.8295	0.0057
(-5,-1)	-1.4069	1.4874	-0.9458	0.3466
(1,5)	2.3525	1.4874	1.5816	0.1170
(-5,5)	0.5778	2.2062	0.2619	0.7940
(-2,2)	0.7621	1.4874	0.5124	0.6096
(-10,10)	4.4194	3.0484	1.4498	0.1503
(-20,20)	5.0776	4.2594	1.1921	0.2361

Table-5: Bajaj Auto Ltd

Window	CAR	Std. E of CAR	t-statistic	p value
(-20,-1)	-2.9008	4.8728	-0.5953	0.5530
(1,20)	-0.7273	4.8728	-0.1493	0.8817
(-10,-1)	-4.6198	3.4456	-1.3408	0.1831
(1,10)	-2.4861	3.4456	-0.7215	0.4723
(-5,-1)	-1.6965	2.4364	-0.6963	0.4879
(1,5)	-0.9556	2.4364	-0.3922	0.6957
(-5,5)	-1.3103	3.6138	-0.3626	0.7177
(-2,2)	-0.2853	2.4364	-0.1171	0.9070
(-10,10)	-5.7641	4.9931	-1.1544	0.2511
(-20,20)	-2.2862	6.9768	-0.3277	0.7438

Source: Computed by the authors

***, **, * indicate significant level at 1%, 5% and 10%, respectively.

Similarly, Table-4 presents Cumulative Abnormal Return (CAR) of Eicher Motors Ltd including its corresponding standard error of CAR, t-statistic and the p value of t-statistic over its various window ranges. The Cumulative Abnormal Return (CAR) over the various window range shows stable fluctuations. Besides, from the Table-4 it is observed that all the CARs are not statistically significant. Finally, Table-5 demonstrates Cumulative Abnormal Return (CAR) along with its corresponding standard error of CAR, t-statistic and the p value of t-statistic of Bajaj Auto Ltd over its various window ranges. The Cumulative Abnormal Return (CAR) across window range shows constant fluctuations. From the Table-5, we also find that none of the CARs are statistically significant.

Conclusions and policy prescriptions

This paper analyses the effect of Union Cabinet approval for 10000 E-Buses on August 16th 2023 on the stock returns of the select companies (TVS Motor Company Ltd., TATA Motors Ltd., Maruti Suzuki India Ltd., Eicher Motors Ltd. and Bajaj Auto Ltd.). In our analysis, the significant positive CAR is observed for Maruti Suzuki India Ltd. This event has had a significant impact on the perceptions of the shareholders of Maruti Suzuki India Ltd. From this perspective, it can be concluded that shareholders anticipate that this announcement may be beneficial and leading to a potential gain in market share for Maruti-Suzuki in the future.

However, for other four companies, namely, TVS Motor Company Ltd., TATA Motors Ltd., Eicher Motors Ltd. and Bajaj Auto Ltd., no significant impact observed for this news. This announcement didn't really influence what the investors of these four companies think about their stocks. It is observed that shareholders of different companies can respond in a different way to the same information.

The present study considered five EV producing automobile companies, with a 100-day estimation window and 41-day event window. In further research, modification and alteration to the estimation window and the event window can be made to obtain more detailed and insightful information. Here, we have examined the impact of the macroeconomic event on the companies individually. Further study can be conducted considering the Average Abnormal Returns to get an overall picture.

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