

Event Study on Stock Prices of Maruti Suzuki India Limited – A Case Study on Launch of Celerio

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Abstract

Event studies are based on theoretical framework of efficient capital market and focus on impact of particular types of firm-specific events on the prices of the affected firms' securities. They examine the direction, magnitude and speed of price reactions of securities to an event and are based on theoretical framework of efficient capital market. In present study event study methodology using Market Model Method (single factor model) has been used to estimate cumulative abnormal returns (CAR) in a 90 day window period of declaration of launch of Celerio on stock prices of Maruti Suzuki Limited. The study attempts to identify cumulative abnormal returns (CAR) of Maruti Suzuki Limited and to compare expected and actual stock market returns of Maruti Suzuki Limited before and after launch of Celerio and analyzes the after effects of launch of Celerio.

Keywords: Event Study Methodology, Cumulative Abnormal Returns, Celerio, Capital Market.

Introduction

Maruti Suzuki India Limited (MSIL), formerly known as Maruti Udyog Limited is a subsidiary of Suzuki Motor Corporation of Japan. It is India's largest passenger car company engaged in manufacturing and selling of a complete range of cars. The company Maruti Udyog Ltd was incorporated in 1981 at the time when only two car models were running on Indian roads i.e. Ambassador and Premier Padmini. The company had a stake from the Government of India and Suzuki Motor Corporation. This joint venture gave birth to the automobile revolution in India. It started with Maruti 800, which at that time was the only modern car available in India. The company became the market leader in passenger car industry in India. From the mid 1990s, foreign automobile companies started entering the Indian passenger car market and Maruti started losing market share as competitors began taking over their space with the launch of models that proved very popular with Indian buyers.

To counter the competition, Maruti started a major restructuring exercise. The company focused on improving its operational efficiency by upgrading manufacturing using new manufacturing techniques, increasing capacity, using information technology (IT) in manufacturing, focus on new product launches at regular intervals and buying and selling used Maruti cars. The new products launched by the company were well accepted by the market and its restructuring

exercise paid off as the company was able to hold its market leadership position. Since then Maruti has overtook every rival and has been the leader of the car manufacturing in India in terms of production, revenues and profits. Originally, 74% of the company was owned by the Indian government, and 26% by Suzuki of Japan. In May 2007, the Government of India sold its complete share and no longer had any stake in Maruti Udyog.

MSIL has biggest market share in passenger car segment in India. Its product line extends from practical to powerful and from hatchback to SUV. Its product portfolio ranges from entry-level Alto to hatchbacks like A-Star, Zen Estilo, etc. to sedans like SX 4 to sports utility vehicles like Grand Vitara. MSIL has always been known for delivering value for money by providing low cost of acquisition, high fuel economy, less maintenance, hassle free and wide service network. Aimed at strengthening its position in the compact car segment, country's largest car maker MSIL launched the manual as well as Automated Manual Transmission (AMT) versions of the Celerio hatchback in India on 6 February 2014. Celerio Auto Gear Shift variants had the flexibility of both manual mode and auto drive mode in the same car, with a simple shift of gear lever. The automated gear shift technology of Celerio not only offered the convenience of an automatic car, but also offered a good mileage similar to that of manual cars.

The launch of Celerio was much appreciated as it was hatchback Car with revolutionary auto gear shift technology which arrived for the first time in India at an affordable price. Market discounts all the information. All publicly available information is incorporated into the stock prices immediately on announcement (Brown and Warner, 1980 and 1985). Hence, the present study is an attempt to estimate cumulative abnormal returns (CAR) on stock prices of MSIL in a 90 day window period of declaration of launch of Celerio using Market Model Method (single factor model). This procedure has been applied on the Celerio car launch event so as to study the impact of this event on the stock prices. In the present study, event study methodology has been used to estimate cumulative average returns (CAR) in a 90-day window period.

Objectives of the Study

1. To study the impact of launch of Celerio car on stock prices of Maruti Suzuki India Limited.
2. To compare actual returns and expected returns of Maruti Suzuki India Limited during event window period.
3. To explore the implications of launch of Celerio car for the shareholders.

Literature Review

An event study is an empirical analysis that is normally used to measure the effect of an event on stock prices (returns). Although the majority of previous literature investigates stock prices, several studies examine stock trading volume, or return volatility. The event study is of importance because it can be used to evaluate the impact of company policies on firm value. An event study is a statistical technique that estimates the stock price impact of occurrences such as mergers, earnings announcements, and so forth. The basic notion is to disentangle the effects of two types of information on stock prices – information that is specific to the firm under question (e.g., dividend announcement) and information that is likely to affect stock prices market wide e.g., change in interest rates (Mitchell and Netter, 1994).

The most common types of event studies in use currently (market models) can be traced to the seminal paper of Fama, Fisher, Jensen and Roll (1969). They studied stock spit announcements using a regression model and measured abnormal returns as residuals. Regression analysis appeared to be more accurate and became a dominant model in event studies. Later improvements include using a regression term to measure abnormal returns and measuring changes in risk using dummy variables (e.g., Gujarati, 1970). This approach, called as modified market model, is the most popular in recent event studies. In order to implement a market model event study a researcher must make several decisions. These include the frequency over which returns are measured, the length of the estimation period, and the window used to measure abnormal returns. Early event studies use monthly stock returns, but with the growth of technical opportunities and the knowledge base, since the mid-1980s the use of daily returns has become standard. At the present time, short-term event studies use daily returns almost exclusively.

Brown and Warner (1980) found that event study tests based on a market model using a value weight index were poorly specified. Campbell and Wasley (1993) found that the choice between an equal weight or value weight market index was important in event studies using Nasdaq data and strongly recommended using the Nasdaq equal weight market index. Similarly, Corrado and Truong (2008) found that tests based on an equal weight index provide noticeably improved performance over tests based on a value weight index with both United States and Asia-Pacific data. Corrado and Truong (2008) also found that tests based on logarithmic returns generally produce better test specification than tests based on arithmetic returns. Ahern (2009) provided interesting evidence demonstrating how severe biases can be introduced into an event study when sample selection includes securities grouped by certain common characteristics such as market capitalisation, prior returns, book-to market ratio, and earnings-price ratio.

Samples concentrated within any of these characteristics can easily lead to imprecise and potentially erroneous inferences.

Anderson (2009) examined the effectiveness of friction modeling in dealing with biases induced by thin trading. Fields, et al. (1998) examined intra-industry effects on publicly traded US insurance companies stemming from reports of Lloyd's financial distress appearing in the New York Times on 27 April 1993 and the Wall Street Journal three days later. Mezner, et al. (1998) investigated the effects of corporate announcements to withdraw from South Africa during the apartheid era. Drakos (2004) investigated the effects of the September 11 terror attacks on a set of airline stocks listed on various international stock exchanges and Calvo-Gonzalez (2007) examined how the Spanish-American agreements in the Pact of Madrid signed on 26 September 1953 affected asset prices in Franco-era Spain.

Research Methodology

The present study is the case in corporate finance research, whereby the research is done to investigate a very sophisticated effect of an event using the data which is publicly available. The study attempts to use the event study methodology to examine the direction, magnitude and speed of the price reactions to an event. In present study actual returns and expected returns of Maruti Suzuki India Limited during event window period were compared using two sample KS test. In second stage, event study methodology using Market Model Method (single factor model) has been used to estimate cumulative abnormal returns (CAR) in a 90 day window period of declaration of launch of Maruti Celerio on stock prices of Maruti Suzuki India Ltd. To get a representative study, reasonably large sample was chosen as an appropriate event period. It was assumed that factors such as investor's sentiments, management considerations etc. are reflected in the stock price and return immediately due to the efficient market hypothesis. Therefore, only effect of return was calculated.

An event study is an empirical analysis that is normally used to measure the effect of an event on stock prices (returns). The event study is of importance because it can be used to evaluate the impact of company policies on firm value. The definition of such an event study will be the study of the changes in stock price beyond expectation (Abnormal Returns) over a period of time (event window), We attribute the abnormal returns to the effects of the event (Tripathi and Singh, 2012). The event study methodology attempts to identify whether there is an abnormal stock price effect associated with an event and reflects significance of the event. The event study analysis assumes that all public information is incorporated into stock prices immediately on announcement (Brown and Warner 1980 and 1985).

The key assumption of the event study methodology is that the market must be efficient. Given an efficient market, the effects of the event will be reflected immediately in the stock prices of the company. This allows the researcher to observe the economic effect of the event over a relatively short period. One must be careful while analyzing the impact of an event because at any given point of time we may observe a mixture of market wide factors and bunch of other firm events. To correctly measure the impact of a particular event we need to control these unrelated factors. The selection of the benchmark to use or the model to measure normal returns is therefore central to conduct an event study. The Market Model Method (single factor model) was used for the analysis of present study. The study endeavoured to find the Cumulative Abnormal Returns (CAR) of Maruti Suzuki India Limited. The Market model assumes that all interrelationships among the returns on individual assets arise from a common market factor that affects the returns of all assets i.e. the expected returns on individual assets (Fama, et al. 1969).

The procedure of an event study comprises of

- 1) Identify the event in question
- 2) Identify estimation, event and post- event windows
- 3) Estimate parameters using data in estimation window
 - R_i and σ_e form the constant mean model
 - α_i , β_i and σ_e form the market model.
- 4) Measure abnormal returns in the event window
 - From the constant mean model: $AR_{it} = R_{it} - R_i$
 - The market model: $AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt}$
 - Aggregate abnormal returns: $CAR_i(T_1, T_2) = \sum_{T_1}^{T_2} AR_{it}$

Hypothesis

The Market model assumes that all interrelationships among the returns on individual assets arise from a common market factor that affects the returns of all assets i.e. the expected returns on individual assets (Fama, et al. 1969). Hence, this study hypothesizes

H0: There is no significant difference between actual returns and expected returns of stock of Maruti Suzuki India Limited during event window period.

Analysis of the Study

The stepwise detail is presented below:

Step 1: Event and Event Window

The researcher first decided upon the event they wished to investigate, and then collected the data of the company that

had gone through such a event. The event in question in the present study is launching of Maruti Celerio. For this study, the data that researchers include the announcement date i.e. February 06, 2014 and the stock prices of Maruti Suzuki India Ltd. before and after the event (i.e. -90 to +90 days) i.e. from November 06, 2013 to May 06, 2014.

Step-2: The next step in the procedure is to identify the window period i.e. an estimation window, event window and post event window. The researchers needed to decide on a period over which the security prices of the firms involved in this event were to be examined. This event window for the present study is: t (-90) to t (90).

Window Period and Clean Data Period: The event window had been taken from 90 days to the date of the announcement to 90 days. The estimation window had been taken as 200 days before 90 days window period. The share price data and market index data, namely Maruti Suzuki India Ltd. and Auto Index were taken from the official website of the Bombay Stock Exchange Limited (<http://www.bseindia.com>). Corporate announcements during t (-90) to t (90) have been presented in Table-1. The dates mentioned below were excluded while conducting the event study, because the data on these dates were influenced by announcements other than launch of Maruti Celerio.

Dates: 27/11/13, 02/12/13, 01/01/14, 15/01/14, 28/01/14, 05/03/14, 18/03/14, 01/04/14, 11/04/14, 02/05/14

Step3: Next, researchers made an estimation of the important parameters that will give them the expected returns during the event period. The researchers used the market model to find the expected returns. For this purpose they needed alpha (y-intercept) and beta (slope of the prices over a reasonably long estimation window (i.e. -90 to +90 days). Using the simple regression model in SPSS, the values of alpha and beta were calculated. The estimated Beta Value is 0.821 and the alpha value is 0.00002318 (Table-3).

Step4: Using the estimates, the expected returns (R_{jt}) for the Maruti Suzuki India Ltd. were calculated w.r.t Auto Index. The market model has been used for this purpose i.e.

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \epsilon_{jt}$$

Where R_{mt} is the return on the market index (Auto Index) for the day t, β measures the sensitivity of firm j to the market, this is a measure of risk, α_j measures the mean return over the period not explained by the market and ϵ_{jt} is a statistical error term with $E(\epsilon_{jt})=0$. The regression produces estimates of α_j and β_j ; call these $\hat{\alpha}_j$, $\hat{\beta}_j$. The predicted return for a firm for a day in the event period is the return given by the market model on that day using these estimates, which is:

$$\hat{R}_{jt} = \hat{\alpha}_j + \hat{\beta}_j R_{mt}$$

While using the market model for Maruti Suzuki India Ltd.

$$\text{Alpha } (\hat{\alpha}_j) = 0.00002318$$

$$\text{Beta } (\hat{\beta}_j) = 0.821$$

$$\hat{R}_{jt} = 0.00002318 + 0.821 (\text{Return on the market auto Index}) + 0$$

Where,

ϵ_{jt} is a statistical error term with $E(\epsilon_{jt})=0$

Step- 5: After calculating expected returns of Maruti Suzuki India Limited, it was compared with actual returns. Table 5 depicts that p value is .023; therefore null Hypothesis H_0 is rejected at 5% level of significance. It implies that there is significant difference between actual returns and expected returns of stock of Tata motors Limited during event window period.

Step- 6: As there was significant difference between actual return and expected return. Hence, researchers deducted the expected return from the actual return ($R_{jt} - \hat{R}_{jt}$) to get the abnormal return on each day in the event window.

As explained above, to estimate the abnormal returns, (or prediction error or PE),

$$PE_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt})$$

Step 7: After calculating abnormal return, the researchers calculated the standard deviation of the abnormal return:

$$\text{Standard Deviation} = \sqrt{\text{VAR}(PE_{jt})}$$

Value calculated for the standard deviation of the abnormal returns for Maruti Suzuki India Ltd. = 0.015788 (Table -3).

PE_{jt} is the prediction error from the estimated market model, and $\text{VAR}(PE_{jt})$ is the variance of the prediction error.

Step 8: In next step the T Statistic was calculated as below

$$T = PE_{jt} \div \sqrt{\text{Var}(PE_{jt})}$$

After calculating T statistic the cumulative abnormal return for the event window was calculated as shown below

$$CAR(-T \text{ to } +T) = \sum_{-T}^{+T} AR_t$$

The researchers then added up the abnormal return over the entire period of time to get the Cumulative Abnormal Return (CAR). Cumulative abnormal return for Maruti Suzuki India Ltd. is 6.46258 i.e. stockholders gained about 6.46% abnormal returns because of the launch event, as shown in Table-3.

Conclusion

Using the single window model, this study finds that the average Cumulative Abnormal Return (CAR) of Maruti Suzuki India Ltd. is Positive. Results reveal that the launching announcement of Maruti Celerio generated a

positive abnormal return, i.e. CAR of 6.46 percent. Thus, the shareholders of Maruti Suzuki India Ltd. got significant positive abnormal returns. The event study methodology is widely used in corporate finance because the researchers are interested to know how corporate policies can impact the value of the firm, e.g. the effect of launching of Maruti Celerio on the shares prices of the company. The usefulness of such a study in corporate finance comes from the fact that, given rationality in the marketplace, the effects of an event will be reflected in the security prices.

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**Annexure
Table-1**

Corporate Announcement for the Event Window (-90 to +90 days)	
Date	Events
27/11/13	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated November 27, 2013, titled "Maruti Suzuki to recall 1492 vehicles (Ertiga, Swift, Dzire and A-Star)".
02/12/13	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated December 02, 2013 titled "Maruti Suzuki Sales in November 2013".
01/01/14	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated January 01, 2014 titled "Maruti Suzuki Sales in December 2013".
15/01/14	Exchange had sought clarification from Maruti Suzuki India Ltd with respect to a news report in a Financial daily about "Maruti surges on buzz parent may hike its stake". Maruti Suzuki India Ltd has replied as under: "we are in no position to comment on the contents of the 'Article' in question as the matter has never been placed before the board of directors of the Company".
28/01/14	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated January 28, 2014 titled "Maruti Suzuki Board Decision on Gujarat Project".
05/03/14	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated March 05, 2014 titled "Indian Railways and Maruti Suzuki flag-off India's First Flexi Deck Auto-Wagon rake".
18/03/14	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated March 15, 2014 titled "Information on Gujarat Project".
01/04/14	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated April 01, 2014, titled "Maruti Suzuki sales in March 2014"
11/04/14	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated April 11, 2014 titled "Maruti Suzuki to recall 103,311 vehicles (Ertiga, Swift and DZire) starting 11th April".
02/05/14	Maruti Suzuki India Ltd has informed BSE regarding a Press Release dated April 01, 2014, titled "Maruti Suzuki sales in April 2014".

Table-2 : Model Summary Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.821 ^a	.674	.671	.57345

a. Predictors: (Constant), VAR00001

Table-3: Coefficients Regression Analysis

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.00002318	.052		.000	1.000
	VAR00001	.821	.052	.821	15.747	.000

a. Dependent Variable: VAR00002

Table 4: (Two sample Kolmogorov-Smirnov test)

Test Statistics

		VAR00001
Most Extreme Differences	Absolute	.204
	Positive	.120
	Negative	-.204
Kolmogorov-Smirnov Z		1.497
Asymp. Sig. (2-tailed)		.023

a. Grouping Variable: VAR00002