

# MARKET REACTION AROUND THE STOCK SPLIT ANNOUNCEMENTS IN INDIAN BANKING SECTOR

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## ABSTRACT:

All publicly traded companies have a fix number of shares which are outstanding. Stock split is an important decision taken by company's board of directors (BOD) to increase the current number of shares which are outstanding by issuing further shares to existing shareholders. It is usually exercised by the companies to increase liquidity and matching the price level with similar companies in respective sector. The aim of present study is to investigate the impact of stock split announcements on the returns and efficiency of Indian banking sector. The stock split data set has been formed by taking the companies listed in the BSE and belonging to S&P BSE 500 index from April, 2010 to March, 2018 were selected pertaining to banking sectors. The companies considered in the data set were such that they continue to be and active in the stock market during the study period. Percentage Analysis, CAGR (Compounded Annual Growth Rate), Mean, Standard Deviation, Regression Analysis and t-test as statistical tools have been used to analyze and interpret the data. The findings depict that there is no significant average abnormal returns during the event window on announcement of stock split. Results of present empirical study found the semi-strong form of efficient market hypothesis to be true in the context of Indian banking sector.

## INDEX TERMS:

Stock split announcements, Abnormal returns, Event study, Market model, Indian banking sector

## 1. INTRODUCTION:

Stock markets, worldwide are regularly flooded with torrents of information that may significantly influence the prices of stock and related financial instruments. Consequently, measurement of market reactions to certain events remains an eye-catching and widely discussed topic one among academicians and economists. The basic assumption of event study is that releasing of new

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information should result in an immediate adjustment in the prices of stocks (Fama *et al.* 1969). Apart from the quickness of the reaction, changes in prices and their magnitude are of utmost use. Hence, versatility event study carries wider scope of application. In Indian context, event studies have a perennial history, comprising of original stock split, reverse stock split, bonus issue among others. As the substantiation was conflicting with the market efficient, hypothesis started to grow in the late 1970s and early 1980s, and then the interest in long-horizon studies continued.

The term stock split is elaborated in investopedia as “*A stock split is a corporate action in which company divides its existing shares into multiple shares to boost the liquidity of the shares. Although the numbers of shares outstanding increases by a specific multiple, whereas the total value of shares remains unchanged.*” Stock split is of two types; forward stock split and reverse stock split. In forward stock split, the company increases its numbers of outstanding shares by dividing its existing shares into small parts and decreases the share price. While in reverse stock split, the company decreases its number of outstanding shares and increases the price of shares. Stock splits are financial puzzles for many researchers and practitioners. The paradoxical nature of stock splits has two contrasting views:

- i. Stock split is viewed as a costly exercise that can't affect the value of the firm.
- ii. Value of the firm immediately and significantly increases on announcement of stock split.

Stock split event increases the number of shares that are outstanding in a company. The prices of stock are adjusted in such a way that the before and after market capitalization remains unchanged and dilution doesn't occur. Generally, stock split event is exercised to infuse liquidity and to make shares affordable for small investors who couldn't buy these shares earlier due to high prices. There is large number of buyers and sellers for 10 shares at ₹10 than one share at ₹100. The most common stock split ratios are 10:1, 5:1 and 2:1, which means that shareholders get 10, 5 or 2 shares respectively, for each shares held earlier. On the contrary, some companies follow different strategy: by refusing to stock split and keeping the price of shares high, try to reduce trading volume. Berkshire Hathaway is a notable example of this.

Fama (1991) defines 'Efficient Market' as a market which “*adjusts rapidly to new information and fully reflects all available information*”. In efficient markets, all the known information is immediately discounted by stakeholders and is reflected in security prices (Gupta & Joshi, 2014).

Market efficiency is classified in three levels: weak form efficiency, semi-strong form of efficiency and strong form of efficiency. Weak form efficient market is one in which current price of a stock reflects past prices, volumes, and other market related information. Semi-strong efficient market is one in which stock price adjusts rapidly to all publicly available information. That means investors are not able to earn abnormal returns by using publicly available information. So, one can earn abnormal return in semi-strong form efficient market by insider trading only. Strong form efficient market reflects all public as well as private information and no investor cannot earn abnormal returns using these information.

There are various theories attempting to elaborate why, despite creating no value on paper, stock split event tends to influence the share prices and trading volume.

- i. Signaling Theory
- ii. Optimal Trading Range Theory
- iii. Dispersion of Control Theory
- iv. Increased Liquidity Theory

Further, the paper is organized as Review of Literature, Research Methodology, Data Analysis and Results, Conclusion and followed by References utilized.

## 2. LITERATURE REVIEW:

Various studies have been conducted across the world to examine the impact of stock split announcements, stock dividend, right issue, financial results etc., and also in the context of different macro-economic and market related news like announcement of monetary policy, FIIs in capital market and so on. Some of the related studies are arranged in chronological order below:

**Pradhan & Kasilingam (2018)** analyzed the sample data taken from S&P BSE 500 index to find out the impact of stock split on shareholders' wealth. The event window consists of 30 days before and 30 days after the announcement date. They concluded that the event affected the share prices.

**Chakrabarti *et al.* (2017)** examined the effects of stock split announcements of 23 companies of NSE and the study found statistically significant ARRs of 1.61% at 10% level of significance on stock split announcement day that leads to acceptance of signaling hypothesis but within few days it reversed. The results of actual stock split event don't found statistically significant on specific

day or after event date. It was concluded that an abnormal return can be earned by shareholders/market traders of sample companies.

**Liu Hua & Skanthavrthar Ramesh (2013)** scrutinized the stock prices response to stock split announcements, for which, standard event study methodology was employed. Average abnormal return (1.46%) was found statistically significant at 5% significance level on the announcement date and large negative cumulative average abnormal return (-6%) was found during the period (to  $t_{10}$ ) that means stock splits had a significant signal and information content in CSE.

**Ramachandran (2013)** examined the efficiency of Indian stock market by analyzing the corporate events i.e. dividend, stock split, merger and bonus issue announcements. Five year period (1<sup>st</sup> April 2004 to 31<sup>st</sup> March 2009) was taken as time frame of the study and an event study methodology was adopted to test the efficiency by considering 60 days event window. Statistical tools such as t-test, z-test and nonparametric u-test were used to test the impacts of various events. It was found that the information release of dividend, stock split, bonus issue and merger announcements don't significantly influenced the security returns. This revealed that investors were not able to earn abnormal returns on the release of these four corporate events.

**Joshiपुरa (2013)** investigated the impacts of stock splits in large and liquid stocks by adopting standard event study methodology. A total of 41 stock splits were taken as sample during the study period (January 2001 to August 2012). A positive mean abnormal return of 0.75% was found insignificant on announcement date and out of 41 sample stocks, 23 had in-significant positive abnormal returns and concluded that there was no evidence of positive impact of stock split.

**Chakraborty (2011)** examined whether Indian stock market was pricing efficient with stock split announcements. Event study methodology was adopted for this purpose, 17 events were found during study period (2000 to 2010). It was found that, statistically insignificant AARs generated by the sample companies during the event window, this confirmed the semi-strong form of pricing efficiency of the market. But statistically significant and positive CAARs were found in pre-event period and statistically significant and negative CAARs found mostly in post-event period; hence the study failed to prove pricing efficiency of the Indian stock market.

**Ray (2011)** investigated Indian equity market reaction to stock split and bonus issue announcements. An event study approach was followed during the period 1996 to 2008. 60 days

(-30 to +30 days) event window was taken for testing the abnormal return and changes in liquidity. Indian stock market was found to react to stock split announcements but not to bonus issue. The change in liquidity was found significant for stock split at 1% level of significance, whereas at 5% significance level both events showed significant change in liquidity from pre to post event period.

**Dhar & Chhaochharia (2008)** empirically analyzed the association of information relating to the announcements of stock splits and bonus issues on stocks listed on NSE by employing event study. Both events, stock splits and bonus issues, reflected significant and positive influence of such announcements. The results depicted that abnormal return was about 1.8% for bonus issues, and 0.8% for stock splits.

### **3. RESEARCH METHODOLOGY:**

In this paper, research methodology is discussed in 5 sub-sections viz. objectives of the study, hypothesis formulation, population & sampling, instrumentation and estimation procedure.

#### **3.1 Objectives of the Study:**

1. To assess the stock returns in terms of change in market value around stock split announcement days in Indian banking sector.
2. To test the efficiency of Indian banking sector in context of stock split announcements.

#### **3.2 Hypothesis Formulation:**

For achieving the first objective, no hypothesis testing was required as it involved calculations of stock returns around stock split announcements days. Thus,  $H_1$ ,  $H_2$  and  $H_3$  relates to the second research objective, analyzing the impact of stock split announcement on stocks return and thus tests the efficiency of Indian banking sector.

**$H_{01}$ :** There is no significant average abnormal returns during the event window on announcement of stock split.

**$H_{02}$ :** There is no significant cumulative average abnormal returns during the event window on announcement of stock split.

**$H_{03}$ :** There is no significance difference between abnormal returns before and after the announcement date.

### ***3.3 Population and Sampling:***

Present study is based on the daily stock prices of Indian banking sector listed in BSE 500 index, dates of stock split announcement and the value of index for a period of eight years from April, 2010 to March, 2018. The entire population is used as sample (except 2 banks viz. SBI and BOB as on the stock split announcement date, BSE was closed). Daily closing prices of the stocks and concerned index are considered. For the purpose of study, secondary data has been collected from annual reports of banks, published research reports and websites including [www.bseindia.com](http://www.bseindia.com), [www.moneycontrol.com](http://www.moneycontrol.com), and [www.sebi.gov.in](http://www.sebi.gov.in) etc.

### ***3.4 Instrumentations:***

According to market model, standard event study methodology has been used for the research, the steps are provided in the estimation procedure below. Important terms like, event date, event window and estimation window are explained as:

- Event date is the announcement date of stock splits. The basic assumption of this approach is that the information was unknown to the market before event date.
- Event window has been taken as  $t_{-10}$  to  $t_{+10}$  relative to the announcement day i.e.  $t_0$ . It will assist in analyzing the stock price behavior pre and post announcement date.
- Estimation window has been taken from  $t_{-130}$  to  $t_{-11}$  relative to announcement day i.e.  $t_0$ . It will assist in estimating the parameters ( $\alpha$  and  $\beta$ ) of market model used for calculating the expected returns of the select stocks.

Statistical tools includes Percentage Analysis, CAGR (Compounded Annual Growth Rate), Mean, Standard Deviation, Regression Analysis and t-test as statistical tools have been used to analyze and interpret the data.

### ***3.5 Estimation Procedure:***

According to the market model, standard event study methodology has been applied, the steps of which are given below:

- i. Returns on security p and returns of given index for period t is calculated as -

$$\text{Current Daily Returns} = \text{Log (Today's closing price)} / \text{Log (Yesterday's closing price)}$$

Note: Here, log normal (LN) prices are considered to generate a continuous time measure of the returns for both, estimation period as well as event window. Alternatively it can also be concluded as follows:

$$\text{Daily Return (\%)} = \frac{\text{Today's } (t_0) \text{ closing price} - \text{Yesterday's } (t_{-1}) \text{ closing price}}{\text{Yesterday's } (t_{-1}) \text{ closing price}} \times 100$$

- ii. Alpha ( $\alpha$ ) and Beta ( $\beta$ ) are calculated using ordinary least square (OLS) regression model.
- iii. Expected return for each bank was calculated as follows:

$$\text{Expected Return} = [\alpha + \beta * \text{S\&P Actual Return}]$$

- iv. Excess or Abnormal Return is the difference between actual returns and expected returns, calculated as: Actual Returns - Expected Returns
- v. Average Abnormal Returns (AARs) are computed by averaging the abnormal returns of sample units for each day of the event period.

$$AAR_t = \frac{1}{N} \times \sum_{i=1}^N AR_{i,t}$$

- vi. Cumulative Average Abnormal Returns (CAARs) are the sum of daily AARs during the event window. CAARs are calculated to know the persistence movements in stock prices, also called as drifts.

$$CAAR_t = \sum_{t=-k}^k AAR_t$$

- vii. AARs in all the trading days during event window and CAARs during the event window are analyzed by using the 't' test to identify whether these significantly differ from zero. t-statistics for  $AAR_t$  as given as:

$$t = \frac{AAR_t}{S.E.}$$

where,

$$\text{Standard Error (S.E.)} = x = \sqrt{\frac{\sum (AR - AAR)}{N-1}}$$

### 3.6 Significance Level and p-value:

Level of significance states the probability of rejecting the null hypothesis and is denoted by Greek letter alpha ( $\alpha$ ), whereas p value, also known as calculated probability value is used to determine the statistical significance in hypothesis testing and is compared to defined significance level of the study. Let say, level of significance is 10%, it means that whenever calculated probability value is less than 10%,  $H_0$  (null hypothesis) will be rejected. But it doesn't ensure that  $H_0$  is accepted, reason being there might be chances of occurring type II error. Also, level of significance is the maximum probability of occurrence of type I error. In this study, the researchers fixed the level of significance at 5%, hence, p value should be less than 0.05 to be called it significant.

## 4. DATA ANALYSIS AND RESULTS:

This section encloses the abnormal returns of sample stocks and their descriptive statistics, analysis of AAR & CAAR during the event window and testing the significance of the same using t-value and p-value. Table I presents the alpha, beta, abnormal returns and descriptive statistics of abnormal returns of the of sample companies. It shows that out of ten sample banks, five banks have positive mean returns and other five shows negative returns.

*Table I: Descriptive Statistics of Abnormal Returns of Sample Stocks*

Stocks	$\alpha$	$\beta$	Mean Abnormal return (%)	Standard deviation	Mini. (%)	Maxi. (%)	Skewness
Kotak Bank	-0.975	1.975	-0.077	0.0027	-0.627	0.445	-0.094
South Indian Bank	-0.686	1.686	-0.143	0.0040	-1.384	0.445	-1.328
HDFC Bank	-0.387	1.387	-0.011	0.0011	-0.191	0.183	0.075
Federal Bank	-0.372	1.372	0.006	0.0019	-0.426	0.370	-0.434
Axis Bank	-1.464	2.464	-0.005	0.0020	-0.340	0.484	0.849
J&K Bank	-0.666	1.666	0.167	0.0063	-0.294	2.807	3.909
Corporation Bank	-0.814	1.813	0.117	0.0025	-0.437	0.736	0.115
ICICI Bank	-1.200	2.200	0.013	0.0014	-0.372	0.208	-1.035
PNB	-1.407	2.407	0.016	0.0027	-0.425	0.705	1.105
Yes Bank	-0.145	1.145	-0.089	0.0028	-0.741	0.322	-0.878

Source: Author's own calculation.



Mean returns range between -0.143 to 0.167, J&K Bank have highest mean return of 0.167% and South Indian Bank have lowest of -0.143%. Standard deviation tells about total risk whereas  $\beta$  indicates systematic risk component of total risk. J&K Bank have highest standard deviation and Axis Bank shows highest  $\beta$  value, where HDFC Bank shows minimum standard deviation and Yes Bank have minimum  $\beta$  value. The value of skewness ranged from -1.035 of ICICI Bank to 3.909 of J&K Bank. Minimum value lies within the range of -1.38 to -0.19 and maximum values lie in range of 0.18 to 2.80.

*Table II: Impact of Stock Split Announcement on Returns of Sample Stocks*

Sr. No.	Stocks	AAR	Sign	t-statistics	p-value
1	Kotak Bank	-0.077	-	-1.376	0.184
2	South Indian Bank	-0.143	-	-1.628	0.119
3	HDFC Bank	-0.011	-	-0.437	0.667
4	Federal Bank	0.006	+	0.140	0.890
5	Axis Bank	-0.005	-	-0.108	0.915
6	J&K Bank	0.167	+	1.214	0.239
7	Corporation Bank	0.117	+	2.174	0.042*
8	ICICI Bank	0.013	+	0.432	0.670
9	Punjab National Bank	0.016	+	0.268	0.792
10	Yes Bank	-0.089	-	-1.475	0.156

Note: \* presents the 5% level of significance.

Table II depicts the AAR value of selected stocks, their sign, t-value, p-value and their significance over the event window. It shows that out of 10 sample banks, 5 have negative AARs and 5 have positive AARs. The AARs value ranges from lowest -0.143 of south Indian Bank to the highest value 0.167 of J&K Bank. Out of 10 sample banks, only one banks' AAR i.e. Corporation Bank found significant, that indicates that shareholders of that bank have earned abnormal return due to stock split announcement over the event window and other nine banks' AAR found insignificant. Hence, it evidences semi-strong form efficiency of banking sector at primary level.

In order to access the share price reaction on the announcement of stock split, average abnormal return during the event window is calculated and significance is checked, the same is depicted in Table III.

*Table III: AAR's during the event window*

Days	Average Abnormal Returns (%)	t-value	p-value
-10	0.311	1.082	0.308
-9	0.019	0.249	0.809
-8	-0.099	-1.582	0.148
-7	-0.056	-1.063	0.315
-6	-0.050	-0.838	0.424
-5	-0.179	-1.196	0.262
-4	-0.033	-0.542	0.601
-3	0.030	0.506	0.625
-2	-0.077	-1.236	0.248
-1	-0.022	-0.181	0.860
0	-0.153	-2.042	0.072
1	-0.037	-0.617	0.553
2	0.104	1.054	0.319
3	0.026	0.232	0.822
4	0.015	0.251	0.807
5	0.135	2.295	0.047*
6	-0.035	-0.544	0.600
7	0.010	0.179	0.862
8	0.003	0.077	0.940
9	-0.009	-0.118	0.909
10	0.089	1.346	0.211

Note: \* presents the 5% level of significance.

Table III shows, on announcement date ( $t_0$ ) AAR is negative of 0.153% which is not significant. During the pre-announcement period ( $t_{-1}$  to  $t_{-10}$ ), AARs were positive for 3 days and negative for 7 days. It ranged from lowest value -0.179% on day -5 to the highest value 0.311% on day -10 and AARs are found statistically insignificant during the pre-announcement period. On the other hand, during the post-announcement period ( $t_1$  to  $t_{10}$ ), AARs were positive for 7 days and negative for 3 days. It ranged from lowest -0.037 on day 1 to the highest value 0.135 on day 5.

During the event window ( $t_{-10}$  to  $t_{+10}$ ) of 21 days AARs are found statistically significant on day 5, hence the null hypothesis ( $H_1$ : There is no significant average abnormal return during the event window on announcement of stock split) on this day is not accepted. On other days, the AARs were found not significant and the null hypothesis was failed to reject on those days, which means that on those days no abnormal returns earned on announcement of stock split.

During the period, AARs were statistically significant on day 5 only, on which it was found positive (0.135) at 5% level of significance. For remaining days, there has been no significant abnormal return for the shareholders of the sample banks.

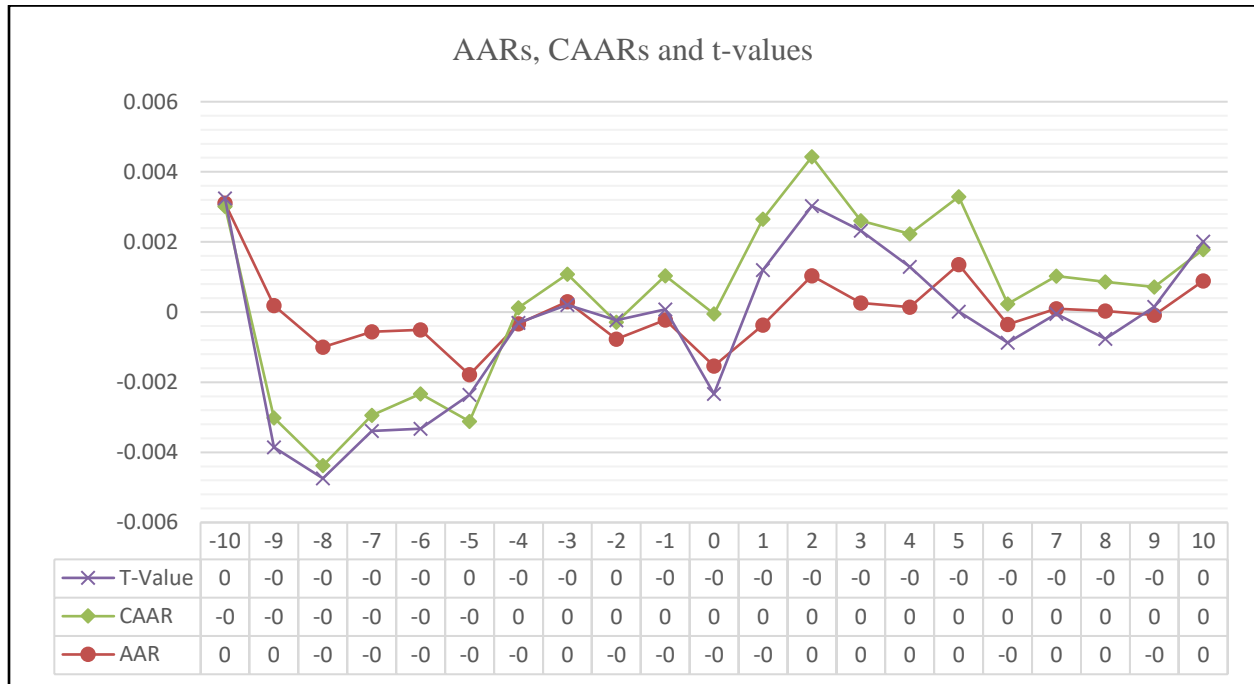
*Table IV: CAAR's during the event window*

Days	Cumulative AAR's (%)	t-value	p-value
-10	-0.009	-0.015	0.988
-9	-0.320	-0.680	0.513
-8	-0.338	-0.761	0.466
-7	-0.239	-0.574	0.580
-6	-0.183	-0.445	0.667
-5	-0.133	-0.302	0.770
-4	0.046	0.125	0.904
-3	0.079	0.230	0.823
-2	0.049	0.143	0.889
-1	0.126	0.418	0.685
0	0.149	0.690	0.508
1	0.302	1.760	0.112
2	0.339	2.162	0.059
3	0.235	2.265	0.050
4	0.208	1.874	0.094
5	0.194	1.538	0.159
6	0.058	0.507	0.624
7	0.093	0.754	0.470
8	0.083	0.598	0.568
9	0.080	0.673	0.518
10	0.089	1.345	0.211

Note: \* presents the 5% level of significance.

Share price reaction is assessed by calculating the average abnormal return and to know the persistence of effect of information on stock price, cumulative average abnormal returns are calculated. Table IV shows the analysis of CAARs of stock split announcements. It shows during the pre-announcement period, CAARs were negative from  $t_{-10}$  to  $t_{-5}$  and for remaining days it was positive. But no significant CAARs were found during the pre-announcement period.

Figure I: AARs, CAARs and t-values during the Event Window



CAARs were positive during the post announcement period and were found statistically insignificant. It can be said that absence of statistically significant positive CAARs throughout the event window denotes no possibility of earning abnormal returns in a continuous way on the basis of informational release. This reveals that the banking sector is efficient in its semi strong form.

Table V: AARs Before and After Stock split announcement

Average Abnormal Returns (%)		t-value	p-value
Before Announcement	After Announcement		
-0.022	-0.037	-1.027	0.331
-0.077	0.104		
0.030	0.026		
-0.033	0.015		
-0.179	0.135		
-0.050	-0.035		
-0.056	0.010		
-0.099	0.003		
0.019	-0.009		
0.331	0.089		

Source: Author’s own calculations.

Table V shows insignificant p-value (0.331) regarding t-value (-1.027) that leads to the failure of rejection of null hypothesis that there is no significance difference between abnormal returns before and after the announcement date.

## 5. CONCLUSION:

The present study calculates the abnormal returns of the selected banks on the announcement of stock split and tests the semi strong form efficiency of Indian banking sector. The study reveals that out of ten sample banks, five banks found with positive AAR and other five with negative AAR. Only one bank i.e. Corporation bank showed significant AAR with value 0.117 and remaining nine banks showed insignificant AARs. It is also found that during the event window of 21 days, AARs were found negative on 11 days and positive on remaining 12 days. On day  $t_5$ , it was found statistically significant but on announcement day and other days it showed statistically insignificant AARs.

On this basis, it can be said primarily that we are failed to reject null hypothesis  $H_{01}$ : There is no significant average abnormal returns during the event window on announcement of stock split. Regarding CAARs, it shows increasing trend during the event window, which indicates the possibility of beating the market or investors might have earned abnormal returns. But insignificant CAARs for all 21 days of event window lead to the failure of rejection of null hypothesis  $H_{02}$ : There is no significant cumulative average abnormal return during the event window on announcement of stock split. This reflects the semi strong form efficiency of Indian banking sector. Further, results of paired t-test also show the insignificant t-value of -1.027 with p-value of 0.331. Thus, we are unable to reject the null hypothesis  $H_{03}$ : There is no significance difference between abnormal returns before and after the announcement date, hence in overall, we can conclude that Indian banking sector is semi-strong form efficient.

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