

# Testing the Efficiency of Indian Stock Market Vis-À-Vis Merger and Acquisitions - A Study of Indian Banking Sector

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**Abstract-**The objective of the present study is to test the efficiency of the Indian Stock Market with respect to the announcement of Mergers and Acquisitions (M&As) in the Indian Banking Sector by employing the Standard Risk Adjusted Event Study Methodology. In order to analyze the effects of the announcements of Bank's Merger and Acquisitions on Stock Price's Risk Adjusted Rate of Return using 6 recent mergers as of 21<sup>st</sup> Jan 2003 to 19<sup>th</sup> May 2009. All the acquiring banks are either traded on the SENSEX, BSE 200 or BSE 100. The three forms of Efficient Market Hypothesis (EMH) i.e., weak, semi-strong and strong form of EMH are being tested under this study in order to test the investor's ability to earn positive abnormal return on the merger announcement. Specifically, Semi-strong form of EMH is being tested in this study to analyze how quickly the market reacts to the new information, exploring the idea of an investor's ability to earn an abnormal return against the market. Evidence here supports the efficiency of the market in its semi-strong form of EMH by accepting both the null hypotheses. It is observed that neither before nor after the merger announcement investors are able to earn abnormal/excess return.

**Key Words:** Market Efficiency, Efficient Market Hypothesis (EMH), Merger, Acquisition, Announcement Effect, Event Study.

## 1. Introduction

In the current scenario, all over the world the activity of Merger and Acquisitions (M&A's) is becoming the reality for almost all kinds of companies as the execution of cross-border M&A transactions helps in

boosting the value, efficiency, profitability and synergy of their businesses (International Business Report, 2008). Mergers and Acquisitions are means by which either the Corporations combine with each other or one Corporation is completely absorbed by another Corporation on the consent of the Board of Directors via process of voting. Federal and State Laws regulate M&A's and provide procedures for this in order to protect the interest of the shareholders and to eliminate the competition between the merging firms. Strategic Acquisitions or Mergers with another business are the common ways to expand one's business (Gale Encyclopedia of US History, 2012).

Large number of International and Domestic Banks are engaged in the activity of Merger and Acquisitions (M&A's). Both the Government and Private Banks are adopting the policies for M&A's. Sometimes Non-Banking financial institutions are also merged with other banks only if they are providing similar type of services. In Banking Sector, M&A's are controlled and regulated by the apex financial authority of a particular country like in India it is overseen by the Reserve Bank of India (RBI) (Economy Watch, 2010).

Whenever the announcements of successful mergers are made to the public, it is generally proved to be beneficial for the shareholders. By employing the combine efforts company could reduce its cost and can maximize its profitability. Moreover, by the combination of two competitors the company could achieve more market power and increased market shares (Gersdorff and Bacon, 2009).

If the prices of securities fully confiscate the return insinuation of particular information then it can be said that the capital market is efficient with respect to that information. In an efficient market, when a new information item is added to the market, its revaluation implications for security returns are

instantaneously and unbiasedly impounded in the current market price. Fama (1970) classified EMH in its three forms:

Weak Form of EMH states that current stock prices reflect all historical information it is not possible for anyone to utilize past data for predicting future prices and earning abnormal returns.

Semi-Strong Form of EMH states that the current stock price absorbs not only the historical information but also the information that is publicly available. Hence, new information cannot be used by anyone for earning abnormal returns.

Strong form of EMH states that current stock prices reflect all available information whether it is public or private and no one can earn abnormal return by using private or insider's information (Khan and Ikram, 2010).

## 2. Literature Review

Many studies have been made on testing the efficiency of Indian Stock Market in relation to event announcement like dividend, bonus, right issue, option listing, stock split, block trading, annual earning, Merger and Acquisitions (M&A's) etc. Critical reviews of significant studies by the Researchers are as follows-

Ormos (2002) empirically tested the efficiency of Hungarian Capital Market in its semi-strong and strong form. The study focused to examine whether the Hungarian Capital Market was efficient in the semi-strong form. The investigation was based on the capital market data over the period 1991 to 2000 which was analyzed by employing event study. The study concluded that strong form of efficiency of capital market does not completely hold true, thereby supporting that Hungarian Capital Market is semi-strong form efficient. Vandana (2003), tested the semi-strong efficiency of the Indian Stock market over the period 1995 to 2000 by employing event study. The study involved a sample of 145 bonus issues, in order to examine the announcement effects of bonus issues on equity share prices in India. The study concluded that the Indian Stock market was semi-strong form efficient. Mishra (2005) examined the reaction of the stock price to the information content of bonus issues over the period 1998 to 2004. For the purpose of the study samples of 46 stocks listed on the NSE and BSE of India were analyzed by employing event study using 180-day event window. It was found that stocks show abnormal return before eight or nine days of announcement, thereby supporting the evidence that Indian Stock market is efficient in its semi-strong form. Iqbal and

Mallikarjunappa (2007) tested market reaction to quarterly earnings announcement of 149 companies listed on the Bombay Stock Exchange for September 2001 by employing both parametric and non-parametric tests. It is observed that during event window, runs test are not significant at 5% level, which signifies that abnormal returns occur randomly. On the other hand, t-test rejects the existence of abnormal returns on daily basis, which provides an opportunity to beat the market and earn abnormal returns. The study concludes that Indian stock market is not efficient in semi-strong form. Yalama, Abdullah and Selik (2008) investigated semi-strong form efficiency in Istanbul Stock Exchange Market (ISE-100), Foreign Exchange Market (FEM) and Inter-bank Money Market (IMM) in respect to changes in Currency and Circulation (CIC). The data consist of the daily frequency over the period 1990-2008 which was analyzed by employing Toda Yamamoto Causality method. The study concludes that there is the causality relationship running from CIC to FEM and CIC to IMM. However, there is no causality relationship running from CIC to ISE-100. This result implies that in Turkey money market is semi-strong form efficient while capital market is not. Dhar, Satyajit and Chhaochharia (2008) analyzed the impact of the information relating to the announcement of stock split and bonus issue on stocks listed on National Stock Exchange (NSE) by employing event study. Both the events, that is stock split and bonus issue reflect significantly positive announcement effect. For bonus issues, the abnormal return was about 1.8% and for stock splits, it was about 0.8%. Thereby the study supports the view that Indian Stock Market is efficient in semi-strong form. Gersdorff and Bacon (2008) made an attempt to empirically examine the efficiency of the market with respect to the announcement of the mergers and acquisitions by US Company on stock prices risk adjusted rate of return using twenty recent mergers as of 31<sup>st</sup> Aug 2007. This study uses the Standard event study methodology test. The weak, semi-strong and strong form efficient market hypothesis which test an investor's ability to earn a positive abnormal return on the basis of merger announcements are examined. Specifically, this work focuses on the semi-strong form test in an effort to test the efficiency of merger announcement public information. Evidence here supports semi-strong market efficiency along with a positive signal exhibited by the sample of acquiring firms during the event period. Evidence of lingering excess returns after the merger announcement was

also observed. Cheng and Shavin (2008), in their paper, analyze the impact of Cross-Border Acquisition Announcement of US firms on the Indian acquiring firms stock prices. The sample of 114 acquisitions made by publicly listed Indian firms of US firms has been taken for the period from 1999 to 2005. Standard Event Analysis Methodology has been employed under this study to test for abnormal returns around announcement dates. Further, Multiple Empirical Analyses have been employed to test the effect of the presence of price pressure around the announcement dates. The study concluded that the acquisitions of U.S firms by the Indian firms have positive impact on the acquiring firm value in the initial days and become negative in next few days in the announcement period. This means that the announcement returns in the Indian Cross-Border Merger and Acquisitions are mainly effected by the price pressure rather than information. Pichardo and Bacon (2009) examined the effect of Lehman Brother's Bankruptcy on the overall market by taking stock price's risk adjusted rate of return for 15 selected brokerage firms. Statistical tests proved that the bankruptcy had a negative impact on stock price's risk adjusted rate of return for the 15 firms, which supports the semi-strong market efficiency theory. Even after the event, bankruptcy continued to affect the market. Raja, Sudhahar and Selvam (2009), in their paper, opine that very few studies have been conducted on testing the Semi-Strong efficiency of stock market with respect to stock split announcements amongst which some studies observed that security prices reacted prior to announcement of events while other observed that security prices reacted after the announcement of events. This study attempts to test the efficiency of the Indian Stock Market with respect to information content of stock split announcements of IT Companies in the semi-strong form of efficient market hypothesis over the period 2000 to 2007. The statistical tools used under this study in order to test the informational efficiency are Abnormal Returns, Cumulative Abnormal Return, Average Security Returns Variability and T-test. The study reveals that the Indian Stock Market in respect of IT Companies is efficient in its semi-strong form but not perfectly efficient to the announcement of stock split. This enables the investors to make abnormal profit during the announcement period. The study is confined to only one event and is restricted to only IT industry, it can also be extended to two or more events by taking different industries. The author himself highlights the limitations of the study. Raja and Sudhahar (2010), in

their paper, made an attempt to empirically examine the efficiency of the Indian Stock Market with respect to Information Content of Bonus issue announcement released by the IT Companies over the period 2000 to 2007. The statistical tools used under this study in order to test the informational efficiency of the Indian Stock Market are Average Security Returns Variability, Average Abnormal Returns, Cumulative Abnormal Returns and T-test. The study concludes that the Indian stock markets for the IT Companies are efficient but not perfectly efficient to the bonus issue announcement. This enables the investors to make abnormal profit during announcement period. The author himself highlights some of the limitations of the study. The study is confined to only one event and is restricted to only IT Companies. Moreover, it can also be extended to two or more events by taking different industries. Yilmaz, Altioek and Selcuk (2011), in their paper, analyzes the impact of Merger and Acquisitions (M&A's) on the performance of the Turkish Companies over the period from 2003 to 2007 by taking the sample of 62 Companies involved in M&A's. Event Study has been employed under this paper in order to measure whether the whether the security holders are earning abnormal returns around Merger and Acquisitions announcements. The study concluded that the returns for stocks of Turkish companies are showing positive signals around the Mergers and Acquisitions announcements. It suggests that the returns for stock of Turkish Companies involved in acquisitions exceed average industry returns. Earl and Bacon (2011), in their paper, test the Semi-Strong form of EMH by analyzing the impact of the failure announcement of Federal Deposit Insurance Corporation (FDIC) bank on the stock price returns of Bank Holding Companies. The period covered under this study is from 13<sup>th</sup> Feb 2009 to 16<sup>th</sup> Jul 2010. The study employed the Standard Risk Adjusted Event Study Methodology over the sample of 36 FDIC bank failure announcements which have been taken from publicly traded Companies which are traded on NYSE, NASDAQ or OTC. The study concluded that the market shows the negative signals on and around the bank failure announcements which suggest that the Bank Holding Companies cannot earn abnormal return and the management and stock holders have fear of FDIC bank failure announcement. Stuart *et al.* (2011), in their paper, investigates about the reaction of short term stock market to the announcement of outward Foreign Direct Investment (OFDI) related Mergers & Acquisitions by Indian Cos. by taking the sample of 30 Cos. engaged in Merger & Acquisitions

transactions over the period from 2000 to 2007. Sample of 74 firms have been taken for the event analysis and further a sample of 66 firms for Multivariate Analysis. Event study Methodology has been employed under this study in order to analyze short run share price performance of Indian Acquiring Companies engaged in OFDI related Mergers and Acquisitions. The study concluded that the OFDI related Mergers & Acquisitions announcement has a positive effect on the returns in the stock market. Ananthi and Dinesh (2012) examined the efficiency of Indian Stock Market with respect to the Information Content of Profit Booking Announcement. The Impact of Profit Booking Announcement by LIC housing finance Ltd. By employing Event study using rate of return, beta, excess return and average excess return, pivot point and t-statistics for testing market efficiency. The study concluded that the announcement of corporate events like Profit Booking made by the LIC housing finance Ltd. is having a slight impact on the stock market during the study period.

### 3. Research Gap

Some of the pertinent literature is scanned by the Researches through various research papers which show that many research studies have been conducted to test the efficiency of the Indian stock market with respect to the announcement effect. In the developed countries, many research studies have been conducted with respect to analyzing the impact of announcement effect of any event on the efficiency of the stock market. Whereas in India, very few studies have been conducted test the efficiency of the stock market with respect to the announcements (like dividend, bonus, stock split, merger, acquisition etc.). These studies have been conducted by taking different industries, banks and analyze the different types of announcement effects over the stock market with different time period. Present study is an attempt to test the efficiency of the Indian stock market with respect to the announcement effect of Merger and Acquisitions (M&A's) took place in the Indian Banking sector for a particular period ranging from 21<sup>st</sup> Jan 2003 to 19<sup>th</sup> May 2009.

### 4. Scope and Objectives

The present study tests the Efficiency of Indian Stock Market with Respect to Announcement of Merger and Acquisitions (M&A's). The study covers the period ranging from 21<sup>st</sup> Jan 2003 to 19<sup>th</sup> May 2009 in which the mergers and acquisitions took place in the Indian Banking sector. All the acquiring banks

are either traded on the Sensex, BSE 200 or BSE 100. The three forms of Efficient Market Hypothesis (EMH) i.e., Weak, Semi-strong and Strong form of EMH are being tested under this study in order to test the investor's ability to earn positive abnormal return on the merger announcement but emphasis is being given to the Semi-strong form of EMH to analyze how quickly the market reacts to the new information, exploring the idea of an investor's ability to earn an abnormal return against the market.

The objectives of the present study are as follows:

1. To test the speed with which the announcement of Merger and Acquisition are impounded in the share prices of Indian Banking Sector.
2. To test whether the investors are able to earn abnormal return on the bases of the announcement of Merger and Acquisition.
3. To test in which form of EMH (Efficient market Hypothesis) the market exists.

### 5. Hypotheses

**H<sub>10</sub>:** The Risk Adjusted Return of the stock price of the sample of banks announcing a Merger and Acquisitions is not significantly affected by this type of information on the day of announcement.

**H<sub>11</sub>:** The Risk Adjusted Return of the stock price of the sample of banks announcing a Merger and Acquisitions is significantly affected by this type of information on the day of announcement.

**H<sub>20</sub>:** : The Risk Adjusted Return of the stock price of the sample of banks announcing a Merger and Acquisitions is not significantly affected by this type of information around the announcement date, as defined by the event period.

**H<sub>21</sub>:** The Risk Adjusted Return of the stock price of the sample of banks announcing a Merger and Acquisitions is significantly affected by this type of information around the announcement date, as defined by the event period.

### 6. Data and Methodology

The data analyzed in this paper has been collected from the reliable source i.e.; from the website of Bombay Stock Exchange India (<http://www.bseindia.com/>). The sample consists of six recent mergers in the Indian banking sector; the mergers take place from 21 Jan 2003 to 19 May 2010. All the acquiring banks are either traded on the SENSEX, BSE 200 or BSE100. In order to find out the impact of M&As on Indian stock market researchers uses the Standard Risk Adjusted Event Methodology. The required historical financial data regarding adjusted stock

price of various banks and values of market Index like, SENSEX, BSE 200 & BSE100 was obtained from the website (<http://www.bseindia.com/>). Table 1 below shows the sample of M&A's in the Indian banking sector and date of announcement of mergers along with the traded Index of banks.

**Table 1**  
Description of Study Sample Banks

Name of the Transferor Bank	Name of the Transferee Bank	Date of announcement of Merger / Amalgamation	Acquired Bank Traded Index
Nedungadi Bank Ltd.	Punjab National Bank	21 Jan 2003	BSE100
South Gujarat Local Area Bank Ltd.	Bank of Baroda	18 June 2004	BSE100
Global Trust Bank Ltd	Oriental Bank of Commerce	26 July 2004	BSE200
Bharat Overseas Bank Ltd.	Indian Overseas Bank	15 Feb 2006	BSE200
Centurion Bank of Punjab Ltd.	HDFC Bank Ltd.	23 Feb 2008	SENSEX
The Bank of Rajasthan	ICICI Bank Ltd	19 May 2010	SENSEX

**Source:** Compiled from Business Standard, Times of India, Indian Express, The Hindu, The Financial Express and Bombay Stock Exchange (<http://www.bseindia.com/>).

To test the efficiency of Indian stock market with respect of announcement effect of bank's Merger and Acquisitions on and around the date of announcement of the event period Standard Risk Adjusted Event Study methodology is being used here and the following steps are undertaken.

1. The historical stock price of the sample banks and SENSEX, BSE200 & BSE100 Index for the event study duration of -165 to +15 days (with days -15 to days +15 defined as the event period and the day of announcement of Merger and Acquisitions used in post period).
2. Then, holding period return of banks (R) and the corresponding return of SENSEX, BSE200 & BSE100 ( $R_m$ ) for each day in this study were calculated using the formula:

$$R = \frac{(\text{Current Day Close Price} - \text{Previous Day Close Price}) \times 100}{\text{Previous Day Close Price}}$$

$$R_m = \frac{(\text{Current Day Market Close Price} - \text{Previous Day Market Close Price}) \times 100}{\text{Previous Day Market Close Price}}$$

R= Current Daily Return

$R_m$ = Current Daily Market Return

A regression analysis is performed using the actual daily return of each bank (R) as dependent variable and the corresponding daily market return ( $R_m$ ) of SENSEX, BSE200 & BSE100 as independent variable over the pre-event period (days -165 to -15 or prior to the event period of days -15 to +15) to obtain the intercept alpha and standardized beta for each sample bank separately. Table 2 shows Alphas and Betas for each bank.

**Table 2**  
Alphas and Betas of Study Sample Banks

Acquiring Bank Name	Alpha( $\alpha$ )	Beta( $\beta$ )
Punjab National Bank	0.165	0.498
Bank of Baroda	-0.236	1.709
Oriental Bank of Commerce	0.004	1.409
Indian Overseas Bank	-0.335	0.849
HDFC Bank Ltd	0.177	0.941
ICICI Bank Ltd	0.135	1.287

**Source:** Compiled and Calculated from Appendix 1&2

1. For the study, in order to get the normal expected return, the Risk-Adjusted Method was used. The expected return of each stock for each day during the event period from (day -15 to +15) was calculated as:  $E(R) = \text{Alpha} + \text{Beta} (R_m)$ , where  $R_m$  is the return on the market. i.e. SENSEX, BSE200 or BSE100 index.

2. Then, the Excess Return (ER) was calculated as:

$$ER = \text{the Actual Return}(R) - \text{Expected Return } E(R)$$

3. Average excess return (AER) were calculated from days -15 to days +15 by simply averaging of all excess returns for all the banks for given day.

$$\text{AER} = \text{Sum of all Excess Return for given day}/n$$

Where n= number of sample banks i.e. 6 in this case for the study.

4. Cumulative average excess return (CAER) was calculated by adding AER for each day from -15 to +15.
5. Graphs of AER and CAER were plotted for the event period i.e. table 4 shows the values of AER and CAER during the period of

event period. Graph 1 below depicts average excess return (AER) plotted against time. Graph 2 below depicts Cumulative average excess return (CAER) plotted against time.

## 7. Quantitative Analysis Tests and Results

The Quantitative analysis has been done in order to analyze how quickly and accurately market reacts to the information like Merger and Acquisitions of banks. Standard Risk Adjusted Event Study was conducted to measure whether any abnormal return has been earned by share holders around the Merger and Acquisition's announcement period. The basic assumption of the standard risk adjusted event study is that the information was communicated publicly and this type of information surprising content that the abnormal return will occur at the time of event. Abnormal return of stock price indicates the impact of the particular event on the stock price. After obtained the value of alphas and betas, finds the expected average return and compared it with actual average return. The actual average return and expected average return within the event period should differ in order to know the possibility to outperform the Indian stock market with respect to Merger and Acquisitions announcement. A paired sample t-test was conducted and finds that the announcement of mergers of banks does not have any significant effect on the risk adjusted stock price. Table 3 shows mean, standard deviations, t-stat and p-value which concluded that announcement of mergers does not have any effect on the stock prices, and shareholders does not earn any abnormal return from the market except the case of Indian overseas bank which has p- value .020 which is less than 5% significance level and concluded statistically significant but it may be not the reason of merger announcement it may be some other reasons. The majority of bank's mergers fail to create the abnormal return to the shareholders. The share holders of sample banks were not able to earn above normal risk adjusted return by the information of Merger and Acquisitions around the announcement date, as defined by the event period. Likewise, the result support  $H_{10}$ : Therefore we concluded that the market is efficient in semi-strong form respect to merger and acquisitions announcement as no investor is able to earn abnormal return neither before nor after the announcement.

**Table 3**  
Result using paired sample t-test

Acquiring Bank Name	Mean	Std. Deviation	t-stat	p-value
Punjab National Bank	0.02366	4.54837	0.028	.977
Bank of Baroda	0.85142	2.74337	1.700	.100
Oriental Bank of Commerce	0.10350	2.11944	0.267	.791
Indian Overseas Bank	1.19137	2.64072	2.471	.020
HDFC Bank Ltd	0.36943	2.44046	0.829	.414
ICICI Bank Ltd	-0.00515	0.98406	-0.029	.977

**Source:** Compiled and Calculated from Appendix 3

Table 4 depicts the analysis of Average Excess Return (AER) along with Cumulative Average Excess Return (CAER) for M&As announcement of Indian banks during the period of event study and display the changes takes place in the daily market return from (day -15 to +15 days). It is clear that from the above table that there was no significant abnormal return almost all the days (from days -15 to days+15) surrounding the mergers announcement. The value of cumulative average excess return (CAER) was below on the very first day and has not been significant. It is unambiguous that the Merger and Acquisitions announcement did not generate cumulative average excess return. The lowest Cumulative Average Excess Return was on the first day after announcement with -5.0209 and the highest on the day 11 that was -13.2876. The value of Cumulative Average Excess Return during the pre and post announcement period was less than 1. It reveals that M&As announcement in the Indian banking sector did not meet the significant reaction on the security prices of banks in the Indian capital market.

The Graph 1 shows the relationship Average Excess Return (AER) to time and Graph 2 shows the relationship of Cumulative Average Excess Returns (CAER) to time during the event period (day -15 to +15 days). The Cumulative Average Excess Returns (CAER) graph shows the return on adjusted stock price during the event period (during day -15 to +15 days), which shows that the mergers announcement had negative impact on the stock prices of acquiring

banks and suggest that the merger announcement had not the positive significant impact on the stock price of banks immediately on the first day after the announcement of mergers and likewise the result support  $H_2_0$  and continuing decreasing to the whole event period .

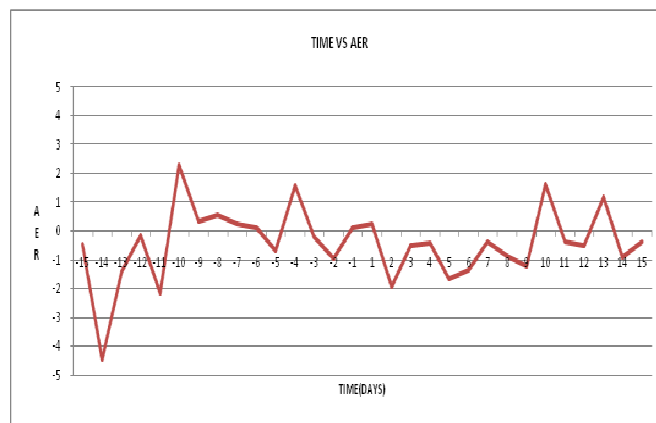
**Table 4**

Result of Average Excess Return and Cumulative Average Excess Return of Stock Price for Merger and Acquisitions Announcement of Indian Banks

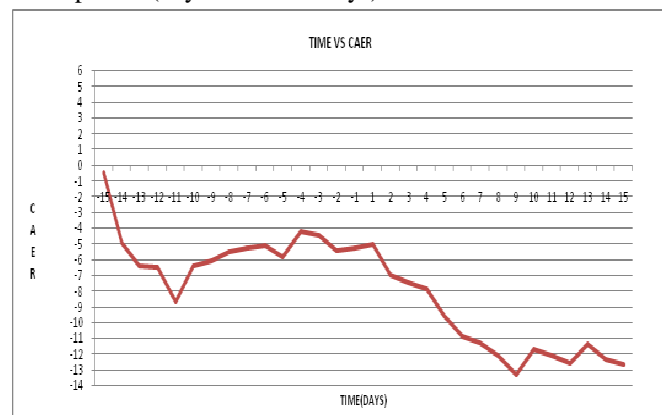
Days	AER	CAER
-15	-0.47975	-0.47975
-14	-4.46442	-4.94417
-13	-1.40973	-6.3539
-12	-0.14246	-6.49636
-11	-2.16962	-8.66598
-10	2.292895	-6.37309
-9	0.325515	-6.04757
-8	0.550479	-5.49709
-7	0.26562	-5.23147
-6	0.116059	-5.11541
-5	-0.66611	-5.78152
-4	1.565823	-4.2157
-3	-0.19737	-4.41307
-2	-0.95768	-5.37075
-1	0.117311	-5.25344
1	0.232532	-5.0209
2	-1.932	-6.9529
3	-0.50221	-7.45512
4	-0.42942	-7.88453
5	-1.64435	-9.52889
6	-1.34411	-10.873
7	-0.37118	-11.2442
8	-0.83911	-12.0833
9	-1.20435	-13.2876
10	1.617352	-11.6703
11	-0.38038	-12.0507
12	-0.48924	-12.5399
13	1.168847	-11.3711
14	-0.924	-12.2951
15	-0.37611	-12.6712

**Source:** Researcher's Compilation and Calculated from Appendix 3

**Graph 1** shows the relationship of Average Excess Return (AER) to time during the event period (day -15 to +15 days).



**Graph 2** shows the relationship of Cumulative Average Excess Returns (CAER) to time during the event period (day -15 to +15 days)



## 8. Conclusion

Generally investors will view the announcement as something positive. This study has empirically examined the informational efficiency of the Indian Stock Market with regards to the announcement of Merger and Acquisitions in the Indian Banking Sector. After testing, the study shows that the expectations of share holders of sample banks to avail the excess return cannot be realized with public information and they are unable to earn abnormal return neither before nor after the announcement of M&A's. The study proved that Indian stock market shows that the market is efficient in its semi-strong form as both the historical and publically available information are disseminated in the stock prices and no investor is able to earn abnormal/excess return. This study had empirically testing the market efficiency of Indian stock market with respect to merger and acquisitions announcement after released

the information in the market and examined the effects of mergers announcement on stock price of banks. Six recent mergers were used as the sample for the study with stock price obtained from (<http://www.bseindia.com/>) for the whole study. They were traded on SENSEX, BSE200, or BSE100, the standard adjusted event study methodology was used to test the efficiency of Indian stock market.

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## APPENDICES

Appendix 1. Daily market Return and stock price Return of each bank during the Period of ((Days -165 to Days -15)

Rm-ICICI	R-ICICI	Rm-HDFC	R-HCFC	Rm-IOB	R-IOB	Rm-OBC	R-OBC	Rm-BOB	R-BOB	Rm-PNB	R-PNB
0.380211	-0.49115	0.587704	-0.38528	-0.62666	-0.49689	0.972166	0.193966	2.079725	2.393162	2.824274	-4.41176
-0.48759	-0.04	0.081382	-0.2908	-0.47351	-1.64453	1.515315	0.108225	0.554216	0	-0.46517	0.383632
-0.41761	-2.37567	-0.47306	-2.19481	0.089843	-2.60152	-0.36263	0.362473	-2.35212	-4.53552	-2.3681	-2.44216
1.052357	0.930127	0.813087	2.61121	0.753894	0.986842	0.585663	-0.67625	-0.51307	-3.58166	0.320551	1.542416
0.174881	1.90128	0.179909	0.266094	0.54968	-1.54839	0.4896	-1.20253	0.316636	1.764706	-0.71299	-3.375
-0.04728	-0.14838	-0.59768	-2.72458	-0.06762	-0.64935	-1.82914	-5.28541	0.555292	3.965517	-0.39301	-2.50313
-0.64993	-1.03324	-0.25107	0.209059	0.693017	-2.17949	0.479569	-2.99003	2.875887	5.115512	0.312372	-4.36409
0.690515	2.596443	0.858821	4.1757	0.079247	-1.49545	1.597214	2.320865	1.646349	-6.97372	0.857541	2.067183
1.746483	1.348214	0.367291	1.996851	-1.44805	-1.32275	0.845906	0.770077	0.472477	1.824212	1.165983	7
-0.12429	1.557018	0.105851	-1.78968	0.799543	-2.64375	0.218802	1.861472	-0.15757	-2.9205	-2.368	-5.07901
-0.26522	-0.41224	-0.44135	-1.3081	0.312975	-1.00267	-0.19434	2.047277	-0.03638	3.162816	-1.1092	2.380952
0.461594	-1.74508	0.033407	-1.1548	0.523015	5.666667	0.459933	-2.22898	-1.68565	-3.24037	1.418929	-9.3
-1.11457	-1.57104	1.255097	1.588433	1.067024	-0.37618	0.201207	-2.97582	0.823143	-2.21918	0.645215	8.189655
-0.23313	-1.123	-0.3845	-1.79624	-0.80649	-1.00629	0.058794	-2.61218	0.777609	3.186813	-0.16625	0.9375
0.23803	-0.36564	1.10298	3.440678	0.952053	5.987261	1.681861	0.662676	-0.53297	2.751323	-1.10995	-2.45399
-0.75868	0.463372	-0.04601	5.138655	-1.91859	-5.06555	1.008478	1.005025	-2.54317	-6.51674	0.2594	0.629591
2.296492	1.14211	-0.07981	0.534413	0.67724	4.625	0.865245	6.752814	-1.8859	-3.20652	-0.76614	-1.85185
-0.97959	-2.05503	0.050925	-1.68159	0.725787	-2.72835	-0.83681	-2.51923	1.023612	-2.10811	-1.59604	-3.79487
-1.91754	-1.09306	-1.63477	-1.96622	0.136221	1.333333	0.884652	0.983865	0.7444	-3.92211	-1.25313	-2.37603
0.041368	-0.37495	-0.11206	3.042957	-0.41324	-1.2426	1.186972	1.947551	-1.22995	-1.66667	0.920257	-0.31088
-1.5539	0.161254	1.25206	2.888412	-0.70212	-0.05988	1.107827	0.320634	-1.3524	-4.2322	-0.56834	2.275078
-0.26034	0.06295	-2.66065	-2.26298	0.990375	0.059524	-0.36581	-4.11985	-1.62376	-0.94118	-0.16518	-0.91371
1.549971	1.074066	-0.24742	-0.64655	0.337218	-2.22222	0.535272	-0.62016	1.187285	-0.77381	-0.34263	-0.4158
-0.82757	-0.27753	0.513043	-0.83477	0.100721	-1.41176	1.425286	2.317497	-0.1896	0.386905	-0.6171	0.422833
0.511839	1.070796	0.070035	2.024474	0.068912	-1.07143	2.633087	-1.12486	1.169216	1.736315	0.441898	0.209205
-0.51192	-0.41806	-0.69996	-1.07359	-0.68754	-2.02381	-0.07172	-4.71028	1.220678	3.764368	0.230787	2.745512
-1.06431	-2.14507	1.457509	2.532808	1.206308	-0.30211	-2.66275	2.550201	0.996204	-1.94574	1.032828	-1.34021
-0.87217	-2.25908	-2.27983	-2.49789	0.851354	6.519139	-0.76795	-0.80709	1.442462	-0.35931	0.143495	-1.45078
0.230257	5.989964	1.317418	1.044643	-0.0133	-0.38954	2.729681	4.448819	-0.5237	1.538462	0.370897	0.21097
0.410112	3.772392	0.344522	-1.90896	0.400576	-1.27283	-1.92257	4.776119	0.481646	-0.74271	-0.35668	1.359833
-0.30132	0.05692	-0.43672	0.609649	0.485851	0.227402	-1.84135	-0.58428	0.47475	-0.82932	0.240485	0.306748
-0.03478	-0.59438	-1.55441	-1.44144	0.718085	-1.06982	-0.17119	0.636267	-1.96732	-1.79432	0.336168	-1.5015
1.397385	1.716358	-1.17301	-1.72335	1.434858	0.170068	0.330544	1.388889	0.357929	2.065217	0.071628	-0.81633
-0.19339	0.134069	-0.58385	2.179837	-0.36397	-3.63128	-2.08134	-7.56601	1.522953	-1.0543	-1.01568	0
-0.90101	-0.98186	-3.60442	-2.22764	0.143499	2.440476	-2.45467	0.222222	0.967241	-1.57333	-1.01736	-4.48065
0.386391	1.556	1.374988	1.565336	-0.11325	-2.52809	1.348113	1.648148	0.288055	-1.61117	0.053024	-2.24949
-0.19998	-0.15501	-2.03585	-3.61087	-1.67446	0.654762	-2.98997	-7.64493	-0.33135	-1.21687	-0.79832	2.105263
-1.63093	-1.32155	1.31774	-0.81081	-0.3391	-2.7381	-5.01331	-7.35178	0.509014	-0.02716	-1.43665	-2.16495
-1.81615	-2.08851	1.790163	-0.32444	1.504709	2.179177	-3.37097	-1.74077	0.205812	-0.3276	-0.39598	-1.89076
0.704446	2.278428	0.414197	3.170339	0.514931	-1.29412	4.164413	6.779661	-0.02616	-4.40577	0.827702	-0.10638
-2.48673	-2.16843	2.331162	4.617611	-0.67728	-2.20238	2.669081	3.352941	1.638307	-1.07345	-0.1243	0.757576

-0.33599	-2.70665	-0.30952	1.116339	0.058604	3.658537	-2.23276	-0.38256	1.053691	3.347518	-1.7335	-1.20879
-1.98826	-1.31014	1.23743	0.102555	0.971269	4.254079	-1.27994	-4.27481	0.761723	4.386921	1.683006	2.359551
1.236441	2.160734	0.130243	-0.74262	-1.00732	-3.57143	-3.22346	-8.1746	-0.91819	3.324742	-1.54324	0.99889
-0.75388	-0.97175	-0.08483	-1.18507	-0.38703	0.632184	-3.36936	-3.80342	0.999602	-0.69479	-1.56109	-3.40426
-1.39562	-2.84111	-0.57417	-0.34805	-0.79519	-2.72882	2.448572	7.240018	1.109207	2.452924	-2.21446	-1.98238
-1.23766	-1.47707	1.515486	2.154615	-1.97554	-2.79557	-0.41747	0.204082	1.117741	1.322115	-0.81373	-2.58427
-1.31678	-0.19077	-0.41487	0.470588	-0.44316	0.664653	1.756393	3.673469	-0.15773	1.445498	-1.76414	-2.66667
0.908772	2.038019	1.188887	3.455135	0.319447	1.059447	1.961181	4.640281	0.668203	12.99517	0.542016	-1.26437
0.764044	-0.72483	-0.8018	-1.43154	0.243537	2.271404	-0.11098	2.185995	1.404074	-2.61758	-0.49605	1.149425
1.638557	1.562228	-0.66079	-0.78925	-0.68164	-0.63182	0.460769	-0.80819	2.712299	3.484848	0.293886	4.685714
-0.22936	0.860169	0.429518	2.156698	0.884058	-0.97701	-0.42447	-3.07554	0.052928	-2.0625	0.500485	1.521739
-0.20472	-0.42544	-0.69914	0.302041	0.776521	1.485714	1.377305	2.568876	-2.70209	0.641593	1.074034	0.437637
-0.28416	-2.75947	-1.02338	-0.55556	0.615354	-0.11111	-0.39979	-0.9971	-0.66466	-1.62996	-0.66012	-3.76344
-0.24151	-3.03057	0.785035	1.109741	0.158513	-2.38889	0.002595	2.610294	2.701162	2.351375	-1.96453	1.128668
-0.89472	0.004521	2.396117	5.261905	0.239239	2.352941	0.23925	-1.61663	-2.06142	-0.04241	0.331795	-0.56117
-2.55133	-4.07404	0.039164	-0.14684	0.244411	-1.76136	-3.12186	-0.1076	-1.88211	2.627119	0.922759	-0.22422
1.598801	5.728477	1.295902	-0.54511	0.965959	-1.31129	0.117042	-0.76364	-0.21112	1.466993	0.697505	-1.11359
0.46683	-0.57333	0.88598	1.221805	0.055671	4.127907	-3.19824	-5.99711	0.297707	4.18	-0.22931	1.927438
0.265563	-0.28075	0.05204	2.395604	0.873329	3.184358	0.547968	2.722393	-2.25223	-4.32565	0.621122	1.674107
-0.72482	-2.19551	-0.28321	-0.05816	0.701371	3.429796	-2.54208	1.596244	-2.46253	-4.05138	0.246248	0.434783
0.844071	2.155412	0.533131	2.378571	-0.32563	-2.42268	-1.04258	0.147656	1.474237	2.957447	0.558976	0.752688
0.601213	-0.05455	0.809162	0.401172	0.949993	-0.10455	1.315202	5	-3.14347	-5.50308	0.017332	-0.53763
0.675307	3.129529	-0.16345	-3.04202	0.789648	-1.90918	2.948352	2.358079	-4.89643	-6.66667	-0.75455	-0.32715
-0.51206	-1.33455	2.173362	0.618987	0.610724	-0.46875	-0.26435	1.327586	-3.43928	-2.92505	0.823692	2.759382
-0.27921	-0.57608	-0.12635	0.3	0.590318	-1.77083	-0.48242	-1.08475	4.128292	7.948244	0.450367	-0.10753
0.814606	0.004468	-0.32706	-1.02827	-0.78705	-2.68421	1.520327	1.729156	2.687421	1.835443	-1.25576	-2.44161
-0.16782	0.541145	-2.29333	-0.98592	-3.63149	-3.24176	1.612458	4.414716	-2.31899	-1.46634	0.037367	-0.76754
-0.15481	-0.96043	5.045327	0.748758	0.041009	-1.41643	-1.09864	1.585761	-1.30971	-2.99578	-0.30079	-0.4415
0.972789	0.921288	1.000464	-1.99448	2.445794	3.386912	-0.9029	-4.4448	-3.26379	-6.16246	2.16277	-1.30577
0.566979	0.628319	0.628188	2.207018	0.351648	-1.8617	-1.4619	-5.85676	-3.17395	-5.40849	-0.82945	-2.15054
0.471911	1.005956	-1.99839	-0.49722	0.625975	-0.4878	0.56157	0.805009	2.428479	3.038278	-1.15097	-1.53846
-0.29367	-0.81526	2.877422	1.387708	0.26293	-0.48913	-3.68425	-6.2931	-0.44657	1.636322	1.080327	8.495146
-0.57553	-3.52993	-0.26734	-0.68647	-0.21901	2.459016	0.821263	-0.12965	1.920154	5.398171	-0.28515	-1.55039
-1.01829	-2.70934	3.758309	4.406295	0.680995	-1.5442	0.058009	4.644708	1.92058	5.295359	-1.11301	4.250295
-1.03337	-2.04186	-4.40351	-6.17687	1.053703	-0.10753	-1.82167	-3.3345	-0.1582	-1.87625	-0.03318	-0.45558
-2.34102	0	-2.61644	-0.93066	-0.91364	-1.5442	0.427645	1.696751	0.459338	4.306122	0.293924	-2.09945
-2.48701	-3.03059	2.052996	4.923547	-1.59803	0.163043	-2.10142	-4.28571	-0.47254	-6.43902	0.239189	-1.44766
-0.43273	0.466395	3.252542	4.783227	-0.4818	-1.53005	0.207671	-1.38837	1.321797	2.511937	-0.59051	2.386364
0.933999	3.605699	-1.14797	-0.87171	-0.54918	1.388889	0.213031	-2.06439	-0.49889	-0.64607	-1.54295	0.555556
-1.5877	-3.98131	1.358912	1.719472	-0.07254	4.393191	0.478653	4.020777	0.011257	2.42915	0.586696	10.11097
-1.75851	-1.64006	2.228631	0.917102	-1.54054	-3.08416	1.763427	2.321429	0.203076	-2.98215	-0.81343	-0.44944
-0.1543	-1.89216	1.815774	-0.07927	-2.12557	-2.03209	1.421199	-0.72476	-3.22308	-2.65594	-0.71263	1.260023
0.573402	-0.04943	-1.59142	-2.80781	-0.58879	0.777778	-0.48943	0.275862	0.21079	-1.18405	0.703969	2.298851
-0.91363	0.738189	0.053411	2.996885	-1.03043	-3.29787	1.22961	2.923577	-3.29614	-6.53361	-0.4433	-0.11236
0.815724	3.435377	-2.01627	-0.56083	-1.57807	-2.60388	2.471953	3.930921	0.629728	5.303371	0.191708	-0.11364
0.002368	2.004977	3.158442	9.836066	-1.95272	-3.58744	1.185045	4.28125	-2.68917	-4.13136	1.372413	2.325581

0.291113	1.110075	-2.09187	0.502646	1.604055	-1.72414	0.206877	-5.6359	-1.16206	-3.08099	0.050463	0.113895
-1.34168	-4.80425	-1.46838	0.226191	-1.75018	-1.08696	-0.83948	-0.03143	1.352878	1.306306	0.361964	1.136364
-2.10754	-2.9813	-1.34356	-5.38304	0.255866	-0.78784	-0.17798	-1.12308	3.160883	2.631579	-1.21183	1.368301
-1.67115	-0.00492	-0.26933	-1.11604	-0.30538	1.875	0.657207	0	-0.2846	0.300043	-0.36443	-0.22573
0.557165	1.553166	-1.94527	-1.3595	-2.21349	1.5	-0.6922	-3.06248	-0.50689	-2.10773	-0.56423	0.454545
-2.18701	-2.70323	0.519031	-3.9388	-1.54898	-1.1413	1.575916	1.707692	1.618744	1.099612	-0.05497	-2.44989
-0.69326	-0.12871	1.896998	7.74744	2.188803	0	-0.55508	3.387574	1.634967	3.954082	0.649257	-0.79365
1.852628	2.086017	3.062012	7.379213	-0.1981	-0.54885	0.030609	4.724638	-1.20308	-1.18852	0.901372	-0.91013
-2.39522	-2.49511	-0.81628	-2.90286	1.189851	-0.05552	-0.09283	-0.74792	-0.89015	-4.95663	-1.0365	-1.71821
-0.53945	-0.87968	0.485995	2.251515	1.517657	-0.11099	-1.8228	-5.61625	-1.50658	-3.32604	0.198031	-1.95853
-2.01643	-3.73482	-1.31753	-4.70927	1.22733	0.607735	-0.25944	-3.09158	0.612831	1.533883	0.322988	-4.79532
-0.74035	0.593487	-1.17954	0.406154	-0.25642	1.208791	1.615137	2.018072	-3.73697	-3.33482	-0.3446	-3.65135
-0.79673	0.15625	3.09909	-2.88344	0.156968	0.486486	0.839856	2.533883	1.032671	-1.65138	-1.02458	-1.07143
1.195721	3.792746	-1.05634	1.531847	1.613469	0.053763	0.028947	-1.06868	-0.04058	1.433526	0.386575	0.966184
1.460634	1.724648	0.617221	-3.53704	-0.03904	-1.43617	-3.25311	-6.63793	-1.83213	-3.92954	-0.66082	0.486618
0.075137	1.645753	0.39794	-0.31838	0.84082	7.849462	-0.19026	1.723607	0.343283	1.475755	-0.55669	0
0.152355	0.014245	-0.00591	0.150307	0.447483	-3.49409	-0.23389	-0.52711	-2.00231	-0.94645	-1.01691	-0.24213
0.881433	1.11828	-1.95628	-5.13569	0.182615	-1.86869	-0.76814	-4.23193	0.28687	-1.79195	-0.47295	-1.79641
-1.89915	-3.16748	-1.48989	2.968443	-0.93725	-3.16327	-1.55511	-6.70127	0.248768	-1.2	-1.03935	-1.21951
1.095318	1.263415	1.186604	1.177163	-0.73066	-2.78069	1.003537	-1.11778	0.4031	7.156398	-0.98629	-0.49383
-0.51417	0.410317	0.288125	-2.73299	0.850249	-4.34343	0.44004	1.710262	1.728705	2.511013	-1.37716	0.12285
-0.30405	-1.16176	-0.90366	-1.01453	0.885523	-0.89568	0.437449	0.929487	1.439833	-2.20619	1.617089	1.3382
-2.77202	-5.22366	0.556426	1.623529	1.108786	-0.26316	-1.31555	-1.77187	-0.57529	0.334728	0.092142	0.481928
-0.41727	1.788752	-1.11049	-4.47309	0.649386	-0.1051	-1.19063	0.378289	1.225085	1.167153	0.424753	-0.60241
0.06917	-2.60782	-0.48596	-0.9977	0.959563	-2.33888	-2.96679	-2.18053	2.462025	3.039014	-0.00889	1.690821
2.581541	4.369278	-0.71851	-2.68966	-0.58479	0	1.294608	-4.37282	1.202825	-1.13659	1.17215	0.352941
0.935894	0.752475	1.204727	4.087977	-1.6593	-1.80085	2.64409	0.935115	0.447723	-4.7419	-0.23093	0.234192
-0.73163	-1.60228	0.883429	0.79096	1.454311	0.273224	-8.64342	-14.4906	-0.93468	2.635983	-0.60597	0.233372
-0.7569	-0.06942	-1.92076	-1.53501	-0.4077	-2.23958	-11.0952	-16.3399	-0.14921	-0.22106	-0.05943	-3.29545
0.88804	0.774926	-0.38422	-0.71223	-1.26414	-1.63158	7.121555	4.447368	0.265109	1.98556	-0.43804	-1.41011
-0.28532	0.63778	-3.85031	-1.8538	-0.23155	-0.37634	3.223463	17.11443	-1.03592	-1.34766	0.843499	-1.31265
-0.55809	-1.04878	-1.34184	2.277778	0.644483	0.053763	-1.6954	-0.55319	1.44279	2.851485	-0.05576	0.242424
-0.40563	-0.23765	-0.84875	-1.94982	0.194673	-1.00105	0.843843	0.543478	-0.85549	-1.23077	0.656214	1.579587
1.499304	1.076389	-0.24805	-0.4955	1.381496	-0.89474	2.078204	5.549581	0.0258	0.232019	0.99151	-1.07143
0.297287	0.52459	2.8274	2.315821	0.359584	-1.84017	-0.16323	-0.79365	-0.19253	0.768049	0.28291	-0.47904
0.520213	2.45509	1.261524	-0.39773	1.011322	0.31746	-0.256	-1.46245	-1.40786	-5.03774	0.832012	-1.90476
-0.42404	-0.24631	-0.4154	1.746356	-0.03931	-0.26042	-0.60081	-4.39936	-0.12602	-1.66008	-0.06348	-0.84848
-2.04025	-1.10345	0.242235	1.814706	-1.10548	-0.80645	-4.47863	-7.41051	1.423429	1.772764	0.259099	0.60241
-0.80997	0.00994	-0.17856	-0.41499	0.916514	2.403058	-0.96511	4.623209	0.673792	-0.43358	0.927204	1.150748
0.330245	-0.9037	-0.12083	0.173611	1.229886	0.10582	0.975192	-0.8913	-0.04116	-1.08097	0.211018	-1.812
1.30269	4.313627	0.354041	-1.31397	-0.4976	1.201672	1.627784	1.629956	-3.08916	-8.96414	-0.18552	1.387283
0.351736	0.823558	-0.28774	-0.15588	-0.18211	-0.91837	-3.2701	-1.75739	-0.00785	2.697368	0.686988	1.133787
1.812432	2.446469	1.565941	-0.15	-0.18411	-0.71832	1.861044	2	-0.58214	-2.53165	0.399322	0.334076
0.762937	1.519069	0.850115	-0.48048	-1.53509	-3.3033	0.595613	3.218975	-0.55522	-2.39637	1.390397	3.26087
0.903609	-0.20427	-0.46132	0.075802	-2.04174	-4.12371	-0.05447	0.82996	-1.25846	-5.78261	-1.60652	0.105263
0.580903	-0.05416	-0.15892	2.955752	2.288688	-0.10695	-0.0637	-2.00803	0.738919	-2.82609	-1.64631	-0.10526
0.545353	0.017977	-1.66362	-2.06139	-0.25198	-2.23881	0.268218	-3.77593	0.346414	-0.17786	1.208577	1.263158

-0.21949	-0.65766	0.601412	0.711469	0.463474	0.218579	-2.24583	-7.32074	0.367598	4.666667	2.005784	3.979592
1.169769	1.038094	-0.90916	1.585227	0.733702	-2.05913	-1.6434	-3.92202	-1.26967	-3.32739	-2.3381	3.444976
-0.22583	-0.99893	-2.8094	-1.18461	-0.12786	-1.38298	1.632074	4.095238	-1.34366	-2.54237	1.207451	-1.01946
-0.43866	-0.85586	-1.05469	-4.23714	1.416745	0.798297	-1.1121	-2.60181	-2.94239	-3.07692	-0.12319	7.276119
-0.15137	-0.04534	-1.36151	-3.05474	1.12228	2.146597	0.699301	5.529954	1.141955	1.311111	0.274609	2.835052
-0.77213	-0.54348	-2.8903	-3.26274	0.129762	6.663276	-1.18196	-0.67391	2.839589	5	0.640199	6.575576
-0.62101	0.798165	-6.94635	-3.64762	0.209592	7.52381	-0.69819	1.880531	-7.0206	-19.819	-1.15528	-1.41732
2.657267	3.585859	-0.91299	-0.71379	-0.30276	7.699115	-0.55361	0.991189	-10.4617	-22.3611	-0.7807	19.45455
-1.44001	-1.50695	1.026743	5.771881	-1.29316	-4.5935	-2.33531	-1.45374	7.132728	18.97887	0.254405	7.121212
-1.53983	-1.97464	-3.9018	-3.69329	0.306105	-1.6323	1.033682	2.857143	1.814425	13.62857	-0.06043	-6.95035
0.157398	0.660173	4.899794	2	-0.40275	1.643714	1.194871	1.299559	1.175259	-1.35468	0.068289	-1.05263
1.020898	0.406578	0.782206	1.92926	-0.88244	-2.33766	1.512918	7.308378	0.600604	-1.56566	-0.55701	-2.118
0.100753	0.058212	-1.38746	-6.31498	-0.40961	2.272727	0.242304	0.854167	2.522297	-2.72959	0.801115	2.88097
0.234358	-0.25986	-1.99545	-0.21172	-0.55307	-1.12554	-1.03401	-1.09053	-0.42892	-2.69231	0.565286	1.811594
-0.2601	0.183199	-0.90634	2.149837	1.650481	1.061008	1.558786	2.465078	-0.34287	-0.81152	0.112805	-1.61972
-0.82618	-1.6694	2.367532	-1.98562	0.432656	0.519481	0.563945	-1.14734	-0.11247	-3.00261	-0.14008	0.660793

**Appendix 2:** Market Return and Daily Return of each bank During the Period of ((Days -15 to +15))

Rm-ICICI	R-ICICI	Rm-HDFC	R-HCFC	Rm-IOB	R-IOB	Rm-OBC	R-OBC	Rm-BOB	R-BOB	Rm-PNB	R-PNB
-1.23295	-0.16527	0.888245	-2.62579	-0.14659	-2.36254	-0.77611	-3.13008	-4.07219	-10.4324	0.144983	6.891496
-0.81176	-0.08519	0.379614	-3.1885	0.313192	-6.2605	1.688799	2.648172	-0.32444	-7.82353	0.266179	-10.631
-1.17577	-1.63465	-0.58936	2.828602	0.626874	-1.25448	0.4308	-0.06174	0.948618	-6.41975	-0.68345	-1.65414
-2.34266	-2.40804	-3.6912	-0.75516	1.140284	2.23314	-3.49718	-6.65298	1.52367	3.665786	-0.72348	-5.23169
-0.47941	-0.98723	-0.82441	-4.24172	-0.75444	-4.93407	3.580758	2.442922	-2.95959	-2.74485	-0.68823	-5.03145
-1.48301	-2.86686	-4.57	0.017728	0.294167	-1.0177	0.236455	4.720358	1.772994	2.886466	-0.44877	7.107843
1.252229	4.377413	-1.21706	-1.83158	-1.14179	-5	-1.14159	1.584582	0.24546	-2.51534	0.43123	3.770739
-0.53504	-0.7791	0.786112	1.814838	-0.27016	-9.47826	-1.08747	0.951374	0.034556	1.274083	0.438939	7.997118
-0.28107	-0.55967	2.904341	2.949833	-0.68069	-0.63725	1.193393	0.062526	-0.06555	2	-2.23338	0
0.066496	-0.4213	3.272758	3.92691	1.891519	0.679612	1.369798	3.169969	-0.02507	-1.53846	-0.39752	1.25
-1.02309	-1.55827	-0.98836	-1.1303	0.788402	-0.80189	0.615937	1.35655	-2.00665	-3.34539	0.196149	-2.64858
0.919431	1.855885	-0.76639	0.538462	-0.37086	-1.21495	-0.35684	1.98	-1.51671	-1.77215	0.616658	5.277221
-0.79842	-0.45187	-2.07706	-1.63462	0.601084	2.300469	0.65753	1.206226	2.181001	-0.38685	0.379188	0.063291
-1.29038	-1.93396	-0.50793	-2.02565	0.688082	-0.86364	0.210676	0.264951	-1.06063	-2.15394	-0.00603	-2.19711
-0.50128	-1.11111	-0.95087	-1.80093	-0.86676	-4.19108	-0.13426	-1.53587	0.810009	2.182285	-0.46062	5.760518
-0.13894	-1.00865	0.723359	-5.14701	-0.42962	-1.85357	1.471859	3.968872	-1.20483	0.990712	0.122796	4.567901
0.693024	0.796332	0.037248	1.748252	-0.12957	-0.70192	-1.4368	-8.53704	-0.68681	-3.50109	-0.02469	-3.88007
-1.50927	-3.01118	-0.87542	-1.17427	-1.85835	-3.71765	-0.6677	0.874636	-0.04014	-4.12338	-1.00687	2.193784
-0.02476	0.925743	0.078381	1.451724	0.16715	-0.29126	1.313238	-0.96311	-2.20213	-0.20311	-1.63697	-6.13095
-0.71828	-1.15972	-1.1295	-0.44863	0.568137	-2.16763	0.524825	-0.99297	0.961087	1.016949	-1.47675	-6.0625
0.711778	0.850541	-3.1907	-3.39378	0.307362	-0.78663	0.297047	-1.17769	1.093397	-1.68874	0.9136	-1.04167
0.88641	3.776332	-2.40297	-3.05	-0.35823	-1.3834	-0.56028	-1.70337	1.336584	1.227605	-0.78165	-1.50327
-0.47861	0.5103	1.305476	-3.7869	-0.13653	4.108911	-0.04436	-0.42373	0.228775	-1.69935	-0.69996	-3.35747
1.295643	0.929368	-1.45843	-3.28571	1.326331	-2.66355	1.460361	2.784272	-1.14557	-0.59603	0.615938	-2.65668
0.440921	0.207795	1.526883	4.868	0.260909	1.7991	-1.19863	-1.06996	1.235337	2.310231	1.12216	4.705882
0.370838	-1.07264	2.185791	1.675573	1.847991	-0.58824	0.550781	0.645833	0.529254	-0.51613	-0.25205	3.141361
-0.95891	-0.58768	-2.49777	-0.16058	0.389455	-0.53659	0.265198	-0.3516	-0.61706	-4.7112	-0.17425	-0.6993
0.413426	1.142447	-3.2503	-4.34317	-0.16017	2.260442	-2.06897	-1.82195	1.598257	1.581959	1.278114	5.893658
0.764466	0.432818	1.895148	0.458015	1.118037	-2.78302	-0.80878	0.106383	0.733368	1.036096	-0.8112	-1.45808
-0.2933	-0.43173	-3.37602	-1.3226	0.025992	0.666667	-0.24038	-0.7265	-2.62187	-5.70957	-0.66879	-3.50769

**Appendix 3:** Expected Return and Actual Return of each bank during the Period of ((Days -15 to +15)

ICICI(ER)	AR-ICICI	HDFC(ER)	AR-HCFC	IOB(ER)	AR-IOB	OBC(ER)	AR-OBC	BOB(ER)	AR-BOB	PNB(ER)	AR-PNB
-1.4518	-0.16527	1.012838	-2.62579	-0.45946	-2.36254	-1.08954	-3.13008	-7.19537	-10.4324	0.237202	6.891496
-0.90974	-0.08519	0.534217	-3.1885	-0.0691	-6.2605	2.383518	2.648172	-0.79047	-7.82353	0.297557	-10.631
-1.37821	-1.63465	-0.37758	2.828602	0.197216	-1.25448	0.610997	-0.06174	1.385188	-6.41975	-0.17536	-1.65414
-2.88	-2.40804	-3.29642	-0.75516	0.633101	2.23314	-4.92353	-6.65298	2.367951	3.665786	-0.19529	-5.23169
-0.482	-0.98723	-0.59877	-4.24172	-0.97552	-4.93407	5.049288	2.442922	-5.29394	-2.74485	-0.17774	-5.03145
-1.77363	-2.86686	-4.12337	0.017728	-0.08525	-1.0177	0.337165	4.720358	2.794047	2.886466	-0.05849	7.107843
1.746619	4.377413	-0.96825	-1.83158	-1.30438	-5	-1.6045	1.584582	0.183491	-2.51534	0.379752	3.770739
-0.55359	-0.7791	0.916731	1.814838	-0.56436	-9.47826	-1.52824	0.951374	-0.17694	1.274083	0.383592	7.997118
-0.22673	-0.55967	2.909985	2.949833	-0.85178	-0.63725	1.685491	0.062526	-0.34802	2	-0.94723	0
0.22058	-0.4213	3.256665	3.92691	1.2709	0.679612	1.934046	3.169969	-0.27885	-1.53846	-0.03296	1.25
-1.18171	-1.55827	-0.75305	-1.1303	0.334353	-0.80189	0.871855	1.35655	-3.66536	-3.34539	0.262682	-2.64858
1.318307	1.855885	-0.54417	0.538462	-0.64986	-1.21495	-0.49878	1.98	-2.82806	-1.77215	0.472096	5.277221
-0.89257	-0.45187	-1.77751	-1.63462	0.17532	2.300469	0.93046	1.206226	3.491331	-0.38685	0.353836	0.063291
-1.52572	-1.93396	-0.30096	-2.02565	0.249182	-0.86364	0.300843	0.264951	-2.04863	-2.15394	0.161998	-2.19711
-0.51015	-1.11111	-0.71776	-1.80093	-1.07088	-4.19108	-0.18517	-1.53587	1.148305	2.182285	-0.06439	5.760518
-0.04381	-1.00865	0.857681	-5.14701	-0.69975	-1.85357	2.077849	3.968872	-2.29505	0.990712	0.226152	4.567901
1.026921	0.796332	0.21205	1.748252	-0.44501	-0.70192	-2.02046	-8.53704	-1.40976	-3.50109	0.152707	-3.88007
-1.80743	-3.01118	-0.64677	-1.17427	-1.91274	-3.71765	-0.93679	0.874636	-0.30461	-4.12338	-0.33642	2.193784
0.10314	0.925743	0.250756	1.451724	-0.19309	-0.29126	1.854353	-0.96311	-3.99943	-0.20311	-0.65021	-6.13095
-0.78942	-1.15972	-0.88586	-0.44863	0.147348	-2.16763	0.743478	-0.99297	1.406497	1.016949	-0.57042	-6.0625
1.051058	0.850541	-2.82545	-3.39378	-0.07405	-0.78663	0.42254	-1.17769	1.632616	-1.68874	0.619973	-1.04167
1.27581	3.776332	-2.08419	-3.05	-0.63914	-1.3834	-0.78543	-1.70337	2.048221	1.227605	-0.22426	-1.50327
-0.48097	0.5103	1.405453	-3.7869	-0.45092	4.108911	-0.05851	-0.42373	0.154977	-1.69935	-0.18358	-3.35747
1.802492	0.929368	-1.19538	-3.28571	0.791055	-2.66355	2.061648	2.784272	-2.19379	-0.59603	0.471737	-2.65668
0.702466	0.207795	1.613797	4.868	-0.11349	1.7991	-1.68486	-1.06996	1.87519	2.310231	0.723835	4.705882
0.612268	-1.07264	2.233829	1.675573	1.233944	-0.58824	0.780051	0.645833	0.668495	-0.51613	0.039481	3.141361
-1.09912	-0.58768	-2.1734	-0.16058	-0.00435	-0.53659	0.377663	-0.3516	-1.29055	-4.7112	0.078221	-0.6993
0.667079	1.142447	-2.88154	-4.34317	-0.47099	2.260442	-2.91117	-1.82195	2.495421	1.581959	0.801501	5.893658
1.118868	0.432818	1.960335	0.458015	0.614213	-2.78302	-1.13557	0.106383	1.017325	1.036096	-0.23898	-1.45808
-0.24248	-0.43173	-2.99983	-1.3226	-0.31293	0.666667	-0.3347	-0.7265	-4.71678	-5.70957	-0.16806	-3.50769