



The Influence of Sentimental Analysis and Portfolio Optimization on a Political Event Study

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ABSTRACT

This study discusses on effects of Indian general election of 2014 on stock market performance of banking sector. Different factors have been analyzed which affect a stock market performance during this event date. This analysis has found that there is significant relationship between Indian Lok sabha election and Stock market performance. Sentimental analyses of people about the Banks is identified and also Portfolio optimization for the Banks which are listed in NSE BANK NIFTY index have been done during this event date. This study examines how Banks financial parameters are affected by this 16th Lok sabha election. In addition to, Election result is also one of the factors of an investment decision which has proved in this study by the way of conducting an Event study. Portfolio Optimization software has been used to identify the optimal investment that can be made to maximize return with minimal risk.

Keywords: Sentimental analysis, event study, portfolio optimization, abnormal returns, banks.

1. INTRODUCTION

1.1 Portfolio Optimization

Portfolio optimization has come a long way from Markowitz (1952) seminal work which introduces return/variance risk management framework. Developments in portfolio optimization are stimulated by two basic requirement 1) adequate modeling of utility functions, risks, and constraints; 2) efficiency, i.e. ability to handle large numbers of instruments and scenarios. The optimal portfolio concept falls under the modern portfolio theory. The theory assumes (among other things) that investors fanatically try to minimize risk while striving for the highest return possible. The theory states that investors will act rationally, always making decisions aimed at maximizing their return for their acceptable level of risk. Portfolio is which the risk-reward combination is such that it yields the maximum returns (provides the highest utility) possible under the current and anticipated circumstances.

The distribution of a capital over different investment options is called a portfolio. Determining the optimal investment strategy employed by the investor, meaning the decision on how many shares of which security they should hold in order to maximize their profit from the final capital X (T) in the planning horizon T, is in financial mathematics called portfolio-optimization. Here we have to pay attention that this optimization problem exhibits, aside from its ordinary quantitative and selective criteria (How many shares of which security?), a temporal dimension as well (when?). With this in mind one has to continuously make decisions. This is why we are dealing in general with a so-called dynamic optimization problem.

1.2 Bank Nifty

Bank Nifty represents the 12 most liquid and large capitalized stocks from the banking sector which trade on the National Stock Exchange (NSE). It provides investors and market intermediaries a benchmark that captures the capital market performance of Indian banking sector.

Eligibility criteria for selection of constant stock

For Banks to be eligible for the Nifty, they need to satisfy the following criteria as per the S&P rules

- **Liquidity:** Liquidity is measured by impact cost of the banks on the index. Each bank must have traded at an average impact cost of 75% or less for the preceding six months for 90% of the trades. Impact cost measures the difference between the ideal selling price of a security and the actual price. This is the percentage markup suffered while buying/selling the desired quantity of a security compared to its ideal price -- (best buy best sell)/2. The more liquid a security, the greater the chance that its shares trade at prices close to the ideal price. Highly liquid securities have very low impact cost.
- **Market Capitalization:** Each Banks must have a market capitalization equal to or exceeding Rs. 5 billion for the preceding six months.
- **Public Float:** Each Banks must have at least 12% of its outstanding shares available for public trading.
- **Domicile:** The Banks must be domiciled in India and trade on the NSE.
- **Securities:** Convertible stock, bonds, warrants, rights, and preferred stock that provide a guaranteed fixed return are not eligible.
- **Stock Market Performance On An Event Date:**
- Today's world, stock market plays an important role in the development of countries industry and commerce that affect the economy of the country to a greater extent. The stock market performances are affected by different factors. The key factors affecting the stock market are Fundamental factor like a banks earning base (e.g. Earnings

per share), a valuation multiple (e.g. P.E ratio), then Technical factors like inflation, substitutes, economic market strength and peer market, demographic, the last key factor that affects market is the Market sentiments.

- In the recent trends the investor's emotions and sentiments towards the market and the banks has influence towards stock market changes. The investors fear of losing his profit share or his greed of getting more profit during an economic event like election, inflation or any changes in the external environment would affect market as these sentiments would either make a market all at time bullish or bearish.
- This project discusses how stock market performances in and around the 16th Lok Sabha election (2014) which is said to be important event in the history of Indian politics. NSE BANK NIFTY is the index from which the data of 12 banks that are listed is taken and analyzed. Here I have used the Rstudio software to analyses the investor's sentiments by extracting the news and media information provided in a social media called twitter based on their polarity and comparing it with the market movements. Twitter is one of the social media which is highly accepted in the financial community. Tweets is the term used for the messages put in the twitter by banks, companies, public and anyone who has a twitter account and this can be easily accessed through Application Programming Interface (API) which are used to understand the market sentiments. Twitter has started many sub forums like Stock-twits and Tweet-traders which act as a platform for investors to discuss among themselves about the stock market performances and stock market relating discussion. The Researchers like Bollen & Mao, 2009; Zhang & Gloor, 2011; Roa & Srinivasta, 2013 have taken interest to capture the investor's sentiments and stock markets behavior using Google profile of moods states, Opinion finder etc.,
- Event Study has been conducted in this paper, the event that is studied is 16th Lok Sabha Election (16th may 2014). Lok sabha election is considered to be an important reason for the fluctuation in Indian stock market. The market abnormal return for the Banks that are listed in the NSE index around the event date is been analyzed. The researchers in the west has taken interest to study the abnormal return measured due to particular events like presidential election, acquisition and stock market crash and also the financial parameters of the banks constituting to the significant specified event have been analyzed, where the companies ratios are been compared with their abnormal return to understand the co-relation between their financial parameters and cumulative abnormal return. This study has also used another software called Portfolio Optimization Software is a excel based software drawn upon the concept of Markowitz mean variance optimization which tells us based on stock changes which banks would be optimal to invest.
- This study stands different from the literature as it studies on a specific event i.e. it tries to understand the abnormal return of banks due to the market sentiments during the specific event. The literature states the future prediction using the present twitter tweets, unlike that this study is analysing the twitter tweets around the event announcement on the abnormal return.

1.3 Objectives of the Study:

- To analyse the twitter sentiments of behaviour of banks in the stock market around the event specified.
- To identify the changes in the abnormal return of bank stocks due to specified event.
- To identify the financial parameters contributes significantly towards specified event.

2. REVIEW OF LITERATURE

Ling-Chun Hung (2011) The study has described that History has demonstrated the fact that politics and economy are intertwined. Presidential election is considered the most powerful political event. This study examines three Taiwanese presidential elections after the year 2000 in order to investigate the existence of short-term (bull-run election) and long-term (election cycle) effects as well as the myth regarding the market favoring a particular party (The Kuomintang). The findings indicate that there is an election cycle in the Taiwanese presidential election, but there is no proof for a bull-run election and no evidence for the market's preference.

Ling-Fang Liu (2007) This study examines that stock market is fluctuating by election results. In addition, there is positive reaction over the stock exchange after 15 days and before 15 days which has been proven by conducting event study. Moreover, other financial and political factors have been found to play an important role in influencing the return pattern around presidential elections.

Ray M. Valadez, Marshall D. Nickles (2009) The study focus on the relationship between political parties holding presidential office and S&P 500 performance, Volatility and risk. The research encompassed a several steps. First, the specific years within presidential cycle were evaluated for price change over time. Next, ONSErvation were to determine if there were any relationship between political party in office and historical stock market performance from the post-world war-II period to the present. Moreover, there is four year presidential election cycle in the country but the result shows that there is no significance between political parties and historical stock market performance.

Angela Kithanji and Wilson Ngugi (2007) This study has examined that analyses the performance of Nairobi Stock Exchange before and after the last four general elections in Kenya. The study focused on the NSE performance before and after the 1992, 1997, 2002 and 2007 general elections. The study results indicate that the NSE performance was influenced by the political activities and expectations around the election period in the short-term. In addition, the study also reveals that the first two years after the general elections the NSE performed better than the last two years before the next general elections. The poor performance before the election could be attributed to investor anxiety and panic associated with pre-election period.

Wing-Keung Wong and Michael McAleer (2007) The study analysed the impact of Presidential elections on stock prices with reference to the USA, which has not only a well-developed political electoral system but also a mature and sophisticated stock market. The empirical results using spectral analysis and the EGARCH Intervention model found that, since 1965, the US stock market has experienced several robust and quantitatively important Presidential Election Cycles.

Nicholas Chen (2004) This study foresees that in the almost four decades from January 1965 through to December 2003, US stock prices closely followed the four-year Presidential Election Cycle: in general, stock prices fell during the first half of a Presidency, reached a trough in the second year, rose during the second half of a Presidency, and reached a peak in the third or fourth year. This cyclical trend is found to hold for the greater part of the last ten administrations, starting from President Lyndon Johnson to the present administration under President George W. Bush, particularly when the incumbent is a Republican. The empirical results suggest that the Republican Party may have greater cause to engage in active policy manipulation to win re-election than their Democratic counterparts. There is irony in that bullish runs in the stock market have tended to coincide with sub-periods under Democratic administrations. The existence of the Presidential Election Cycle shown in the paper may constitute an anomaly in the US stock market, which could be useful for investors.

Yi-Hsien Wang, Mei-Yu Lee and Che-Yang Lin (2008) The U.S presidential elections are a major event that takes place every 4 years and affects economies all over the world. Election results may influence corporate performance by changes in government policies such as spending and tax changes. Further, specific sectors might gain or suffer from sector-specific governmental policies. It can be seen that elections do affect stock markets in a certain direction, depending on both the individual president's themselves as well as the general policies the winning parties will undertake and the possible effect of those policies on market reactions and sentiments. In addition to this, we must look at the other economic factors in the environment at the particular time and place in order to make a good assessment of the market direction. Effects of post elections must also be taken into account, such as the so called fiscal cliff for the 2012 elections. David Leblang and Bumba Mukherjee (2003) the study analysed the impact of Presidential elections on stock prices with reference to the USA, which has not only a well-developed political electoral system but also a mature and sophisticated stock market. The empirical results using spectral analysis and the EGARCH Intervention model found that, since 1965, the US stock market has experienced several robust and quantitatively important Presidential Election Cycles.

Twitter Analysis Based Literature Review

Bollen & Mao (2009) study analyzed the public's emotional state over a month period by using a term based emotional rating system known as Profile Of Mood States (POMS). A sentimental analysis is performed for all public tweets broadcasted by twitter users between August 1st and Dec 20th 2008. The results were compared to fluctuations recorded by stock market and crude oil price indices and major events in media. The results found that the events in the social, cultural and economic sphere do have a significant, immediate and highly specific effect on the various dimensions of public mood.

Mao & Bollen (2009) developed a simple and direct indicator of online investment which was extracted from twitter updates and Google search queries. The study examined the predictive power of this new investor bullishness indicator on international stock markets. The study compared twitter and Google bullishness to stock market values across four different countries using granger causality test. The results indicated that changes in twitter bullishness predict changes in Google bullishness which indicated that twitter information precedes Google queries. The study also found that high twitter bullishness predicts the increase of stock returns.

Bollen, Mao & Zheng (2010) investigated whether the measurement of collective mood states derived from large scale twitter feeds were correlated to the value of DJIA overtime. The study used opinion finder and GPOMS to measure variations in the public mood from tweets submitted to the twitter service from Feb to Dec 2008. Granger Causality analyses were used to correlate DJIA values to GPOMS & OF values for the past n days. Next the study used self-organizing fuzzy neural network model to test the hypothesis that the prediction accuracy of DJIA prediction models using measurements of public mood. A correlation of mood time series was drawn between GPOMS and OF and was found that certain mood dimensions of GPOMS partially overlap with OF.

Zhnag, Fuehres & Gloor (2011) tried to predict stock market indicators such as Dow Jones, NASDAQ & S&P500 by analyzing twitter posts. They analyzed the positive and negative moods of the masses of twitter for a period of 6 months and compared it with stock market indices. The study investigated the emotions of the tweets under three different baselines: number of tweets per day, number of followers per day and number of re-tweets per day. The study correlated the ratio of emotions with the indices returns for the day t+1. The results were surprising as it found that people start using emotional words such as 'hope', 'fear' and 'worry' in times of economic uncertainty, independent of whether they have a positive or a negative context. Thus when the emotions on twitter fly high, the Dow goes down the next day and when people have less hope, fear and worry Dow goes up.

Peter Byrne, University of Reading, UK and Stephen Lee, University of Reading, UK (1994) did a research on "Real Estate Portfolio Analysis Using a Spreadsheet Optimizer". In it they address spreadsheet tool called an "optimizer" and describes the tool and its functions. This tool is useful for examining certain real estate investment problems and this is done in Microsoft excel, Add-in available in Excel named solver. This Documentation do not explain much about the optimization process used in the documentation and cannot be understood by beginners.

Truc Le, School of Finance and Economics and Department of Mathematical Sciences, University of Technology Sydney, Sydney, Australia and Eckhard Platen, School of Finance and Economics and Department of Mathematical Sciences, University of Technology Sydney, Sydney, Australia (2006) conducted a study for "Approximating the growth optimal portfolio with a diversified world stock index". Based on diversification theorem any diversified portfolio as a proxy for the growth optimal portfolio. Using that diversified world stock index has applications to derivative pricing and investment management is been identified.

BERNARD LEE, Director of financial engineering consulting at SunGard Trading and Risk Systems and researcher at the Centre for Quantitative Finance, Imperial College, London, (2000) created "A Practitioner's Guide to Active Portfolio Management Using Implied View". That present a computational example to illustrate how proposed heuristic an analytical tool will be useful to active portfolio managers using secondary data.

HELMUT MAUSSER, Mathematician at Algorithmic Inc. in Toronto, Canada, and DAN ROSEN, Director of research at Algorithmic Inc. in Toronto, Canada, (2000) did on review on "Efficient Risk/Return Frontiers for Credit

Risk". In which he provides a general introduction to using catastrophe models to optimally manage the risk of a portfolio of Property & Casualty (P&C) liabilities. The optionality (the skewness, kurtosis, and correlation with asset risk) of liability risks contribute substantially to earnings volatility. The severity of low-probability events, i.e. natural catastrophes (e.g. hurricanes, earthquakes), combined with increases in geographic concentrations of wealth can adversely affect the diversification of the liability risk at the portfolio level. Lixin Zeng describes a well-established optimization algorithm and produces a reasonable approximation for an optimal solution.

Rajendra Sahu, ABV – Indian Institute of Information Technology and Management, Gwalior, India, Mohit Jain, ABV – Indian Institute of Information Technology and Management, Gwalior, India, and Geshu Garg, ABV – Indian Institute of Information Technology and Management, Gwalior, India, (2006) did research on “Optimal portfolio allocation using portfolio theory and heuristics driven evolutionary technique”. The used model for the research was Heuristics driven evolutionary model (HEDM) and Critical line model (CLM). The data used was secondary data. The research provides the detail of the problem of portfolio optimization involves selecting appropriate stocks for investment by maximizing the returns from the portfolio at a pre-specified level of risk. The current approaches center on Markowitz’s mean variance optimization method that suffers from several pitfalls like instability of beta, and are either computation extensive or lead to sub-optimal solutions. The heuristics technique is employed for asset selection while the evolutionary technique is used for allocation of funds among the already selected assets. The approach is capable of handling a large number of instruments and scenarios, and is relatively stable to minor variations of the inputs, as is practiced in real life situations. The performance from this approach compares well with the Markowitz’s model, and performs better than the stock market indices of US and India.

Naima Lassoued, Associate Professor of Finance, FSEG Mahdia, University of Mounastir, Mahdia, Tunisia and Ali Elmira, Professor of Finance at the Institut Supérieur de Gestion, University of Tunis, Tunis, Tunisia, (2012) conducted research on “Portfolio selection: does corporate governance matter?”. This research was done with a sample of 460 American firms between 1995 and 2004, the authors first determine the optimal mean-variance portfolio. The authors then test whether governance characteristics explain the optimal portfolio weights. The result showed that the optimal portfolio weights are sensitive to internal control mechanisms, ownership concentration, managerial entrenchment and incentive compensation which are the characteristic of corporate governance.

Bryan D. MacGregor, (1990) tried to forecast "Risk and Return: Constructing a property portfolio". He considered the principles of portfolio construction, consisting of development of economic scenarios; forecasts of return on asset classes; asset allocation and portfolio construction; and stock selection. But found out that there was a seriously flawed by inadequate data as both the structure and stock of the fund not considered.

3. RESEARCH METHODOLOGY

3.1. Hypothesis:

H1: There is a significance relationship between specific event and bank stock in the market behaviors.

H2: There is a significance changes in the abnormal return of banks.

H3: financial parameters contribute significantly towards specified event.

3.2. Sample Selection:

Therefore 12 banks in NSE NIFTY are selected for the study. The banks selected were expected to fulfill the following criteria:

- The banks should be listed in National Stock Exchange (NIFTY).
- The banks should have market data for (-10,+10) days around the specified announcement date.
- The banks should be active in twitter.
- **Banks Name And Script Code:**

The 12 banks and their script code in NSE is listed below.

Banks Name	Symbol
Axis Bank	AXISBANK
Bank of Baroda	BANKBARODA
Bank of India	BANKINDIA
Canara Bank	CANBK
Federal Bank	FEDERALBNK
HDFC Bank	HDCFBANK
ICICI Bank	ICICIBANK
IndusInd Bank	INDUSINDBK
Kotak Mahindra Bank	KOTAKBANK
Punjab National Bank	PNB
State bank of India	SBIN
Yes Bank	YESBANK

Table No-1 Bank Names and Symbols.

3.2.1. Classification of Banks:

The 12 banks have been classified based on Sectors.

Classification Of banks	No Of banks
Private sector banks	2
Public sector banks (state-owned)	9
Scheduled bank	1

Table No-2 Sector Classification of Banks

Classification Of Banks:

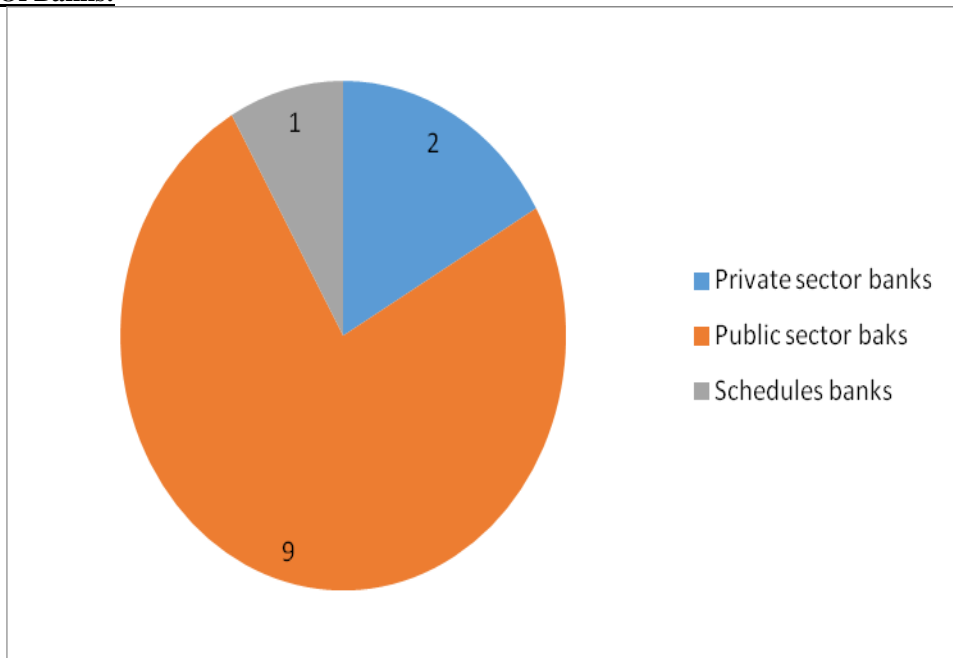


Chart No-1 Sector Classification of Banks in pie chart representation.

3.3. Twitter Sentimental Analysis:

The twitter tweets were collected for the 12 Banks in the sample for 30 days around the election announcement. As a developing economy, tweets for Indian banks will be comparatively less when compared to the banks in the developed economies. The number of tweets collected for each Banks is shown below:

No. Of Tweets and Banks Name:

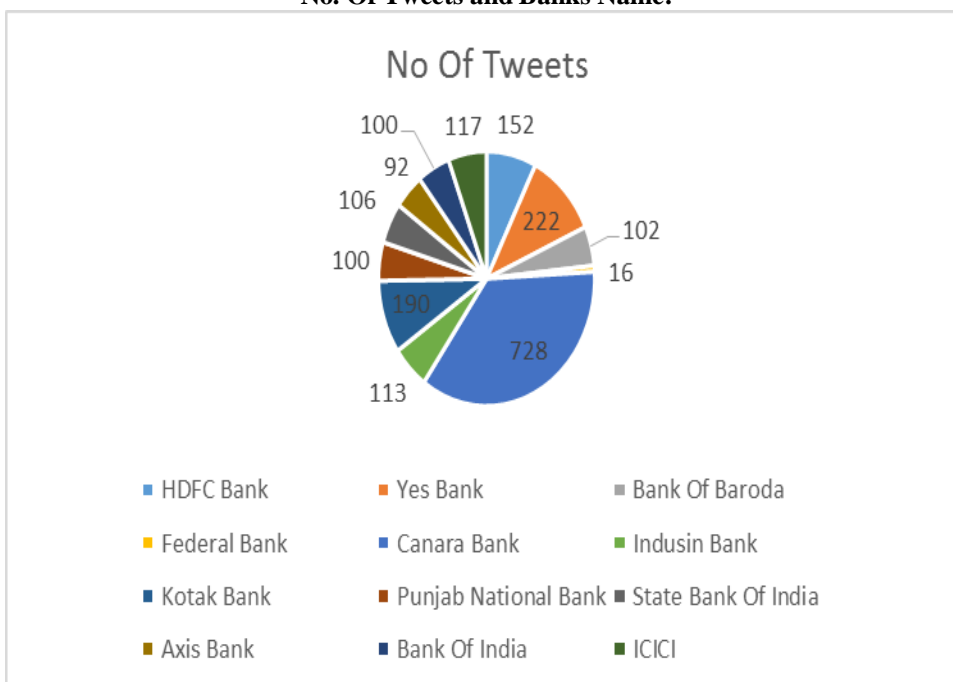


Chart No-2 Total number of tweets collected and Bank Names

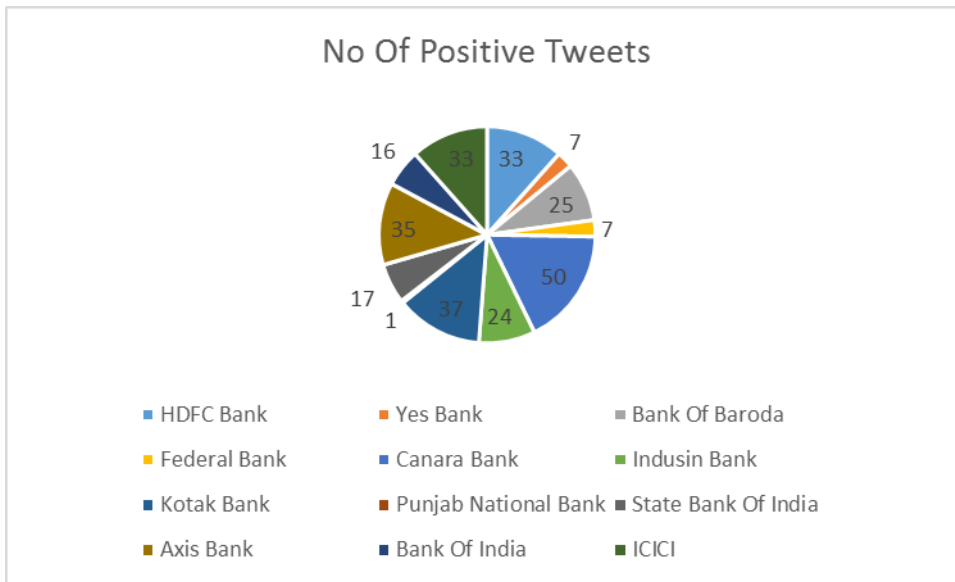


Chart No-3 Number of positive tweets Of Banks

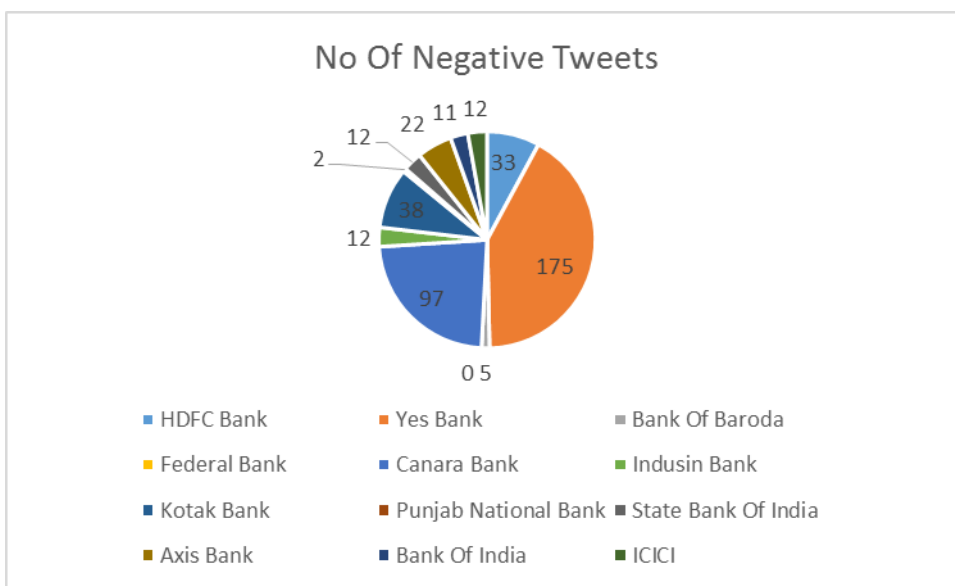


Chart No-4 Number of Negative tweets Of Banks

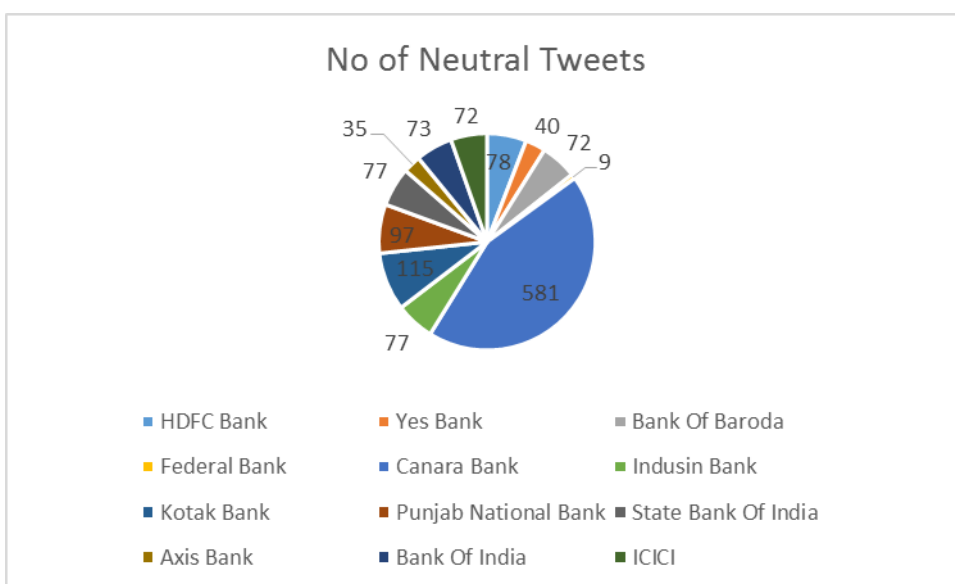


Chart No-5 Number of Neutral tweets Of Banks

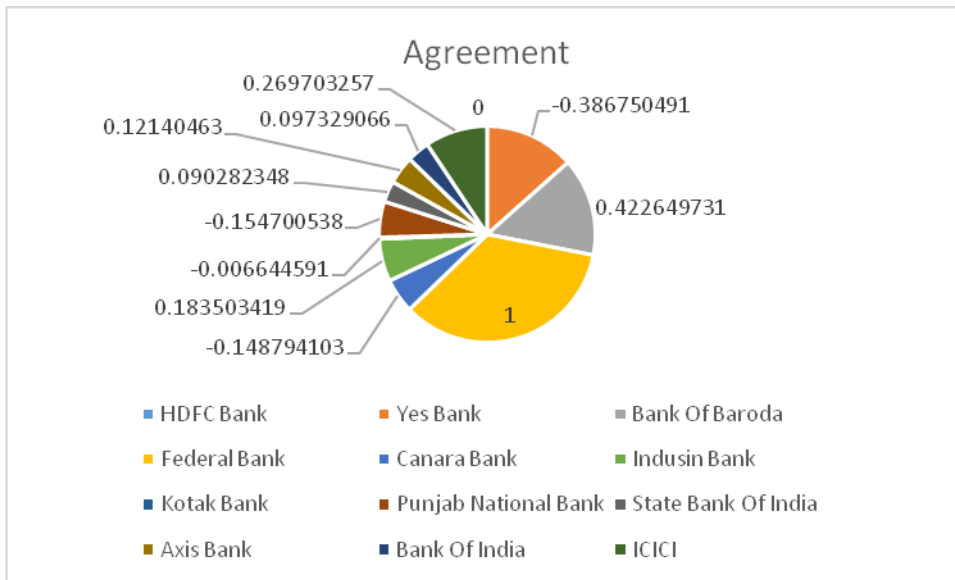


Chart No-6 percentage of agreeing emotions of different banks.

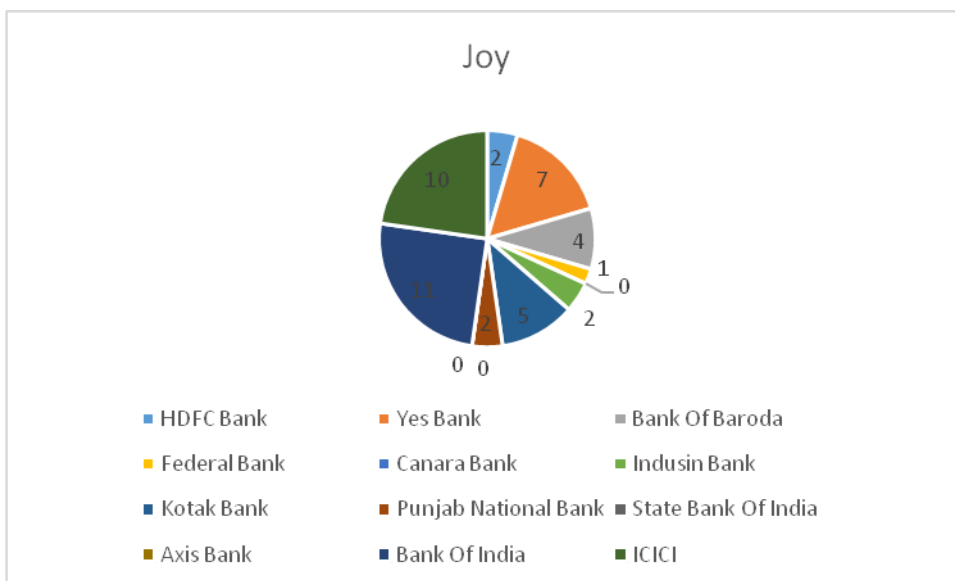


Chart No-7 Percentage of joyous emotions of different bank.

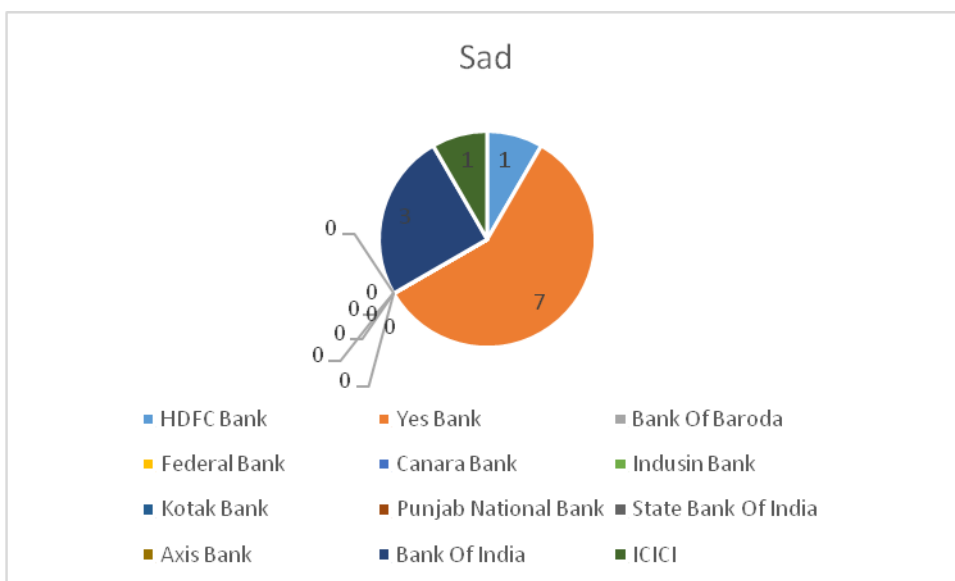


Chart No-8 Percentage of sad of different bank.

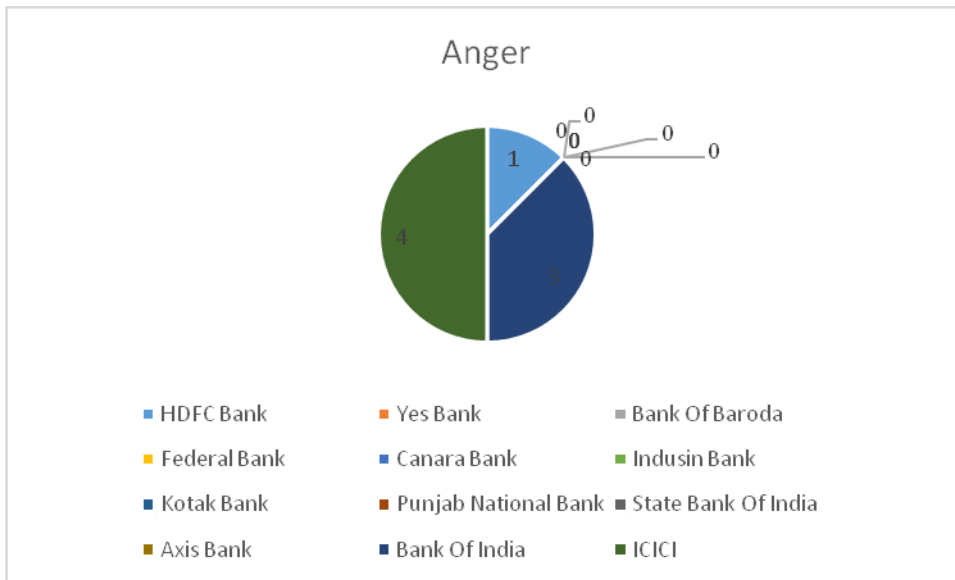


Chart No-9 Percentage of anger of different bank.

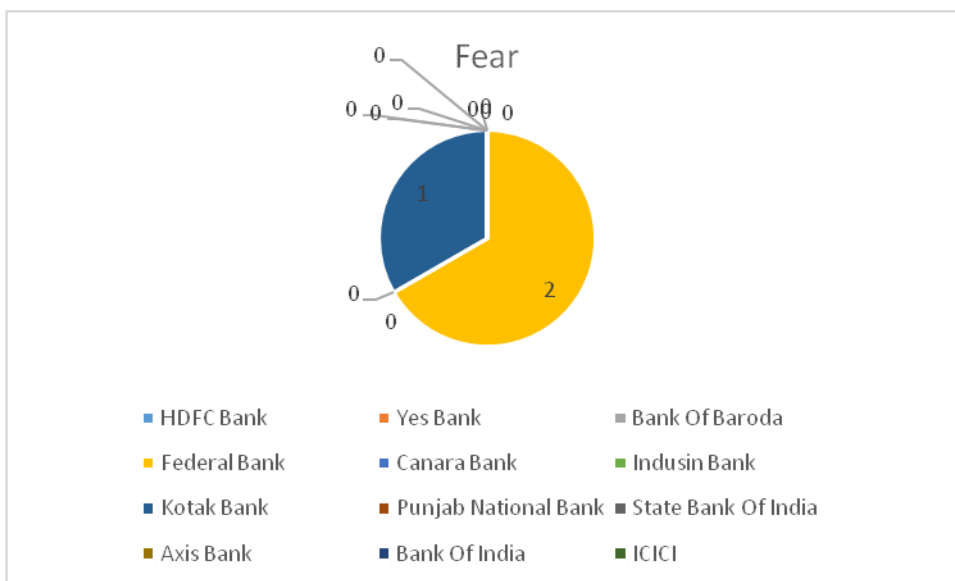


Chart No-10 Percentage of fear of different bank.

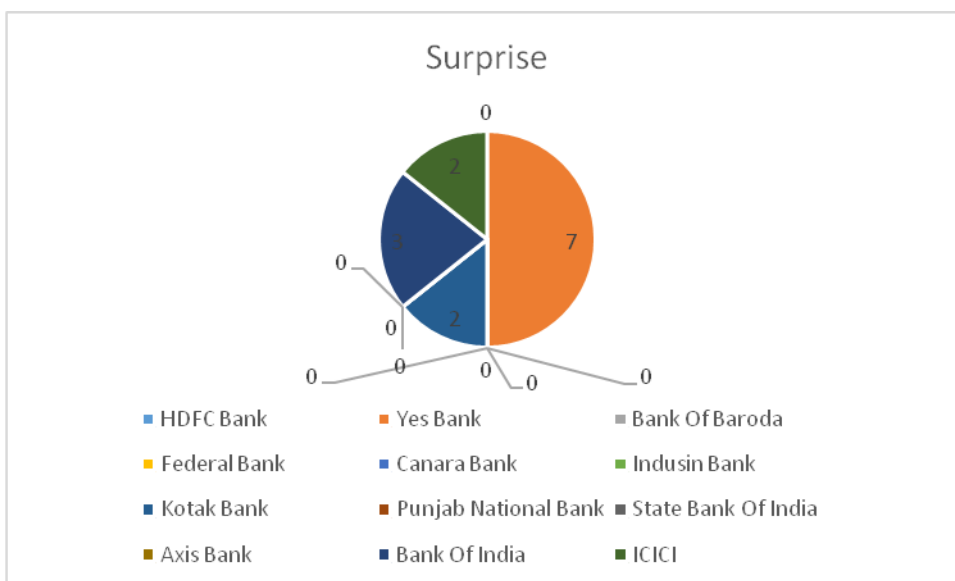


Chart No-11 Percentage of surprise of different bank.

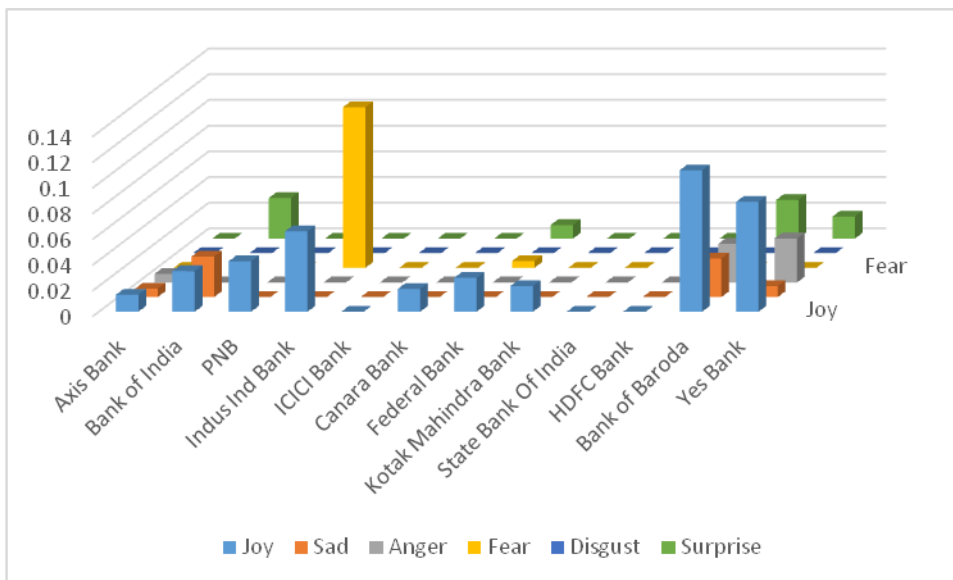


Chart No-12 Percentage of emotions of different bank.

The tweets were collected manually for each Banks. The collected tweets were subjected to sentimental analysis through **R-Studio**.

Importing the tweets into R-Studio and computing the emotion and polarity of tweets for each Banks. R-Studio is DATA MINING software which analyses the tweets and computes their emotion and polarity using various codes. It is coded software. The tweets collected for each Banks were imported into R-studio which upon the execution of codes gave the polarity (positive and negative) and emotion (sad, fear, anger, disgust, surprise and anger) for the tweets of each banks. Each Banks's polarity and emotion were thus classified separately using R-studio. The emotions were then computed as ratios or percentage. From Zhang, Fuehres & Gloor (2011) and Bollen & Mao (2010) the percentage of emotion and polarity is computed as follows:

$$(1) \text{ Bullishness : } B_t = \ln \left(\frac{1 + M_t^{\text{positive}}}{1 + M_t^{\text{negative}}} \right)$$

$$(2) \text{ Agreement : } A_t = 1 - \sqrt{1 - \frac{M_t^{\text{positive}} - M_t^{\text{negative}}}{M_t^{\text{positive}} + M_t^{\text{negative}}}}$$

- (3) Positive% = (total positive tweets) / (total number of tweets)
- (4) Negative% = (total negative tweets) / (total number of tweets)
- (5) Joy% = (total joy tweets) / (total number of tweets)
- (6) Sad% = (total sad tweets) / (total number of tweets)
- (7) Fear% = (total fear tweets) / (total number of tweets)
- (8) Anger % = (total anger tweets) / (total number of tweets).

3.4. Event Study Methodology:

To collect and calculate the abnormal returns of the banks, event study methodology is used. Abnormal returns and cumulative abnormal returns were collected for 14 days around the acquisition announcement.

This study uses a short-term event window of the estimation period -7 to +7 days around the announcement period. The CAR (Cumulative Abnormal Returns) is observed for (-7, +7) days around the announcement. Brown and Warner (1985) presented various measures in an event study methodology to test for excess returns. They were: Mean Adjusted returns, Market adjusted returns and Ordinary Least Square market model. This study adopts the Market model for calculating the abnormal returns from Chatterji & Kuenzi (2001) for its popularity in the literature.

The market model of Chatterji & Kuenzi ,2001:

The abnormal return AR_{jt} for the company j will then be calculated as:

$$AR_{jt} = R_{jt} - (\alpha_j + \beta_j R_{mt})$$

AR_{jt} = Abnormal return for company j on day t.
 R_{jt} = Return for company j on day t
 α_j = Estimate of OLS parameter of intercept
 β_j = Estimate of OLS parameter of slope
 R_{mt} = Rate of return of market index m on day t.

The Cumulative Abnormal Returns are calculated using:

$$CAR_{(t, T)} = \sum_t^T AR_t$$

AR_t = average abnormal return on day t;
 t, T = Accumulation period

3.5. Multiple Regression Analysis:

To finally examine the influence of twitter sentimental analysis on CAR, the multiple regression analysis is used. The regression function of the form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots + \beta_N X_N + \varepsilon$$

Where $\beta_0, \beta_1, \beta_2, \dots, \beta_N$ = are constants called the model regression co-efficient or parameters, which means the regression scores identified statistically for the variables that have a significant level as .000.

$X_1 + X_2 + X_3 + \dots + X_N$ = are the predictor variables in this study.

Y = will be the response variable or dependent variable that substitutes for acquirer decision. It is a quantitative data.

E = randomized disturbance or error.

Regression computes the regression co-efficients β_j while the independent or predictor variables are the actual values that are in the variables. Where $j = 1, 2, \dots, n$.

3.6. Variable selection

The variables used in the study are the twitter parameters of emotion and polarity and CAR for each banks. The variables for the twitter parameters were calculated from Zhang, Fuehres & Gloor (2011) and Bollen & Mao (2010) and CAR were computed following Chatterji & Kuenzi (2010) and Warner & Brown (1985). The table 3 shows the list of variables used in the study.

Table 3: Variables for the study

VARIABLES	EXPLANATION
	DEPENDENT VARIABLE
CAR (-7,+7)	Cumulative Abnormal Returns for 20 days around the acquisition announcement
	BINARY VARIABLES
Bullishness	This represents the bullishness of the market at the time of the acquisition announcement.
Agreement	The agreement is the proportion of positive and negative feelings in the market at the time of acquisition announcement
Positive	This represents the percentage of positive feeling in the market due to acquisition announcement.
Negative	This represents the percentage of negative feeling in the market due to acquisition announcement.
Emotions (Joy, Sad, Surprise, Fear, Anger, Disgust)	These variables represent the various emotions of tweets around the acquisition announcement.
Face Value	Face value of the company
Dividend Per Share	Dividend per share of the company
Operating Profit Per Share	Operating earnings are an important measure of profitability, and since this metric ... behind the excitement over the most important figure in the stock market.
Net Operating Profit Per Share	A company's operating income after operating expenses are deducted, but before income taxes and interest are deducted. If this is a positive value, it is referred to as net operating income, while a negative value is called a net operating loss (NOL).
Bonus in Equity Capital	Bonus shares are additional shares given to the current shareholders without any additional cost, based upon the number of shares that a shareholder owns.
Interest Spread	Interest rate spread is the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits
Net Profit Margin	It is the percentage of revenue remaining after all operating expenses, interest, taxes and preferred stock dividends
Return on Long Term Fund	A unit investment trust's estimated return over the life of the portfolio, calculated according to formulas proposed by the Securities and Exchange Commission (SEC). The return is calculated as the annual percentage return based on the yields of all the underlying securities in the portfolio, but is weighted to account for each security's market value and maturity. The return is presented net of estimated fees and the maximum offering price, but does not account for delays in income distributions from the fund.
Return on Net Worth	The amount of net income returned as a percentage of shareholders equity. Return on equity.

Adjusted Return on Net Worth	As the adjusted net worth represents a measure of value of an insurance
Net Interest Income / Total Funds	The difference between the revenue that is generated from a bank's assets and the expenses associated with paying out its liabilities.
Non Interest Income / Total Funds	Bank and creditor income derived primarily from fees. Examples of non-interest income include deposit and transaction fees, insufficient funds (NSF) fees, annual fees, monthly account service charges, inactivity fees, check and deposit slip fees, etc.
Profit Before Provisions / Total Funds	The amount of income a bank or similar type of financial institution earns in a given time period, before taking into account funds set aside to provide for future bad debts.
Capital Adequacy Ratio	A measure of a bank's capital. It is expressed as a percentage of a bank's risk weighted credit exposures.
Total Debt to Owners Fund	A measurement of a company's financial leverage, calculated as the company's debt divided by its total capital. Debt includes all short-term and long-term obligations.
Financial Charges Coverage Ratio Post Tax	A ratio that is used to assess a company's financial durability by examining whether it is at least profitably enough to pay off its interest expenses. A ratio greater than 1 indicates that the company has more than enough interest coverage to pay off its interest
Dividend Pay-out Ratio Cash Profit	This ratio identifies the percentage of earnings (net income) per common share allocated to paying cash dividends to shareholders.
Earning Retention Ratio	The proportion of earnings kept back in the business as retained earnings. The retention ratio refers to the percentage of net income that is retained to grow the business, rather than being paid out as dividends.
Adjusted Cash Flow Times	The ratio of cash flow in relation to the total benefits paid out to insured policyholders over a given time period. The cash flow amount used in this calculation is adjusted to account for total earnings before interest, depreciation, taxes, and other incidental expenses are deducted.
Book Value	Book value of the company – Value represented in the books of accounts.

4. ANALYSIS

4.1 Regression Results:

From univariate analysis, the study now focuses on a multivariate analysis. Regression includes variables that are specified above in table 4. Regression results are summarized in the table below.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	296.512	113.038		2.623	.025
	Profit and loss	-7.158	2.682	-.645	-2.669	.024

Table 4 - Dependent Variable: CAR (-1.+1)

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	12.590	3.950		3.187	.010
	Management Efficiency Ratios	-4.517	1.540	-.680	-2.932	.015

Table 5 - Dependent Variable: CAR (-7+7)

From the variable selected for the study only two variables shows that the banks are sensitive during event time period at 5% significance. Banks financial parameters like Profit and loss are affected by the change in the economic decision. The banks Management efficiency ratio also effect are statistically significant where the p value is < .05.

4.2. T-test Results One-Sample Test

	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Net Profit Margin	10.246	11	.000	12.14417	9.5355	14.7528
Capital Adequacy ratio	21.249	11	.000	14.38333	12.8935	15.8732
Operating profit per share	3.975	11	.002	76.25750	34.0353	118.4797
Return on long term fund	12.863	11	.000	89.52250	74.2046	104.8404
Return net worth	11.501	11	.000	13.99167	11.3140	16.6693
Interest spread	8.472	11	.000	6.33250	4.6874	7.9776
Earning retention ratio	48.705	11	.000	83.71917	79.9359	87.5024
Dividend pay-out ratio NP	9.472	11	.000	16.28083	12.4976	20.0641
Dividend pay-out ratio CP	9.396	11	.000	15.11083	11.5713	18.6503

Table 6 – Onesample T Test

a. Listwise N=12

Table no. T-test.

H_0 (Null Hypothesis) – financial parameters not contribute significantly towards specified event.

H_1 (Alternate hypothesis) - financial parameters contribute significantly towards specified event.

As the sample size is less than 30 (N=12), it was appropriate to conduct T-test. Thereby the results show that the Significance value for the above tested financial parameters is less than 0.05 (p value is < .05), Therefore Null Hypothesis (H_0) is accepted.

Banks Name	β_0	β_1	Management Ratios	Efficiency	R
Axis Bank	12.59	-4.517	2.686666667		21.68946
Bank of India	12.59	-4.517	2.005555556		16.19085
PNB	12.59	-4.517	2.330000		18.81009
Indus Ind Bank	12.59	-4.517	3.163333333		25.53759
ICICI Bank	12.59	-4.517	2.504444444		20.21838
Canara Bank	12.59	-4.517	2.356666667		19.02537
Federal Bank	12.59	-4.517	2.636666667		21.28581
Kotak Mahindra Bank	12.59	-4.517	3.026666667		24.43428
State Bank Of India	12.59	-4.517	2.243333333		18.11043
HDFC Bank	12.59	-4.517	2.866666667		23.1426
Bank of Baroda	12.59	-4.517	1.796666667		14.50449
Yes Bank	12.59	-4.517	2.795555556		22.56852

Table 7 - Regression table for banks on Management Efficiency Ratio

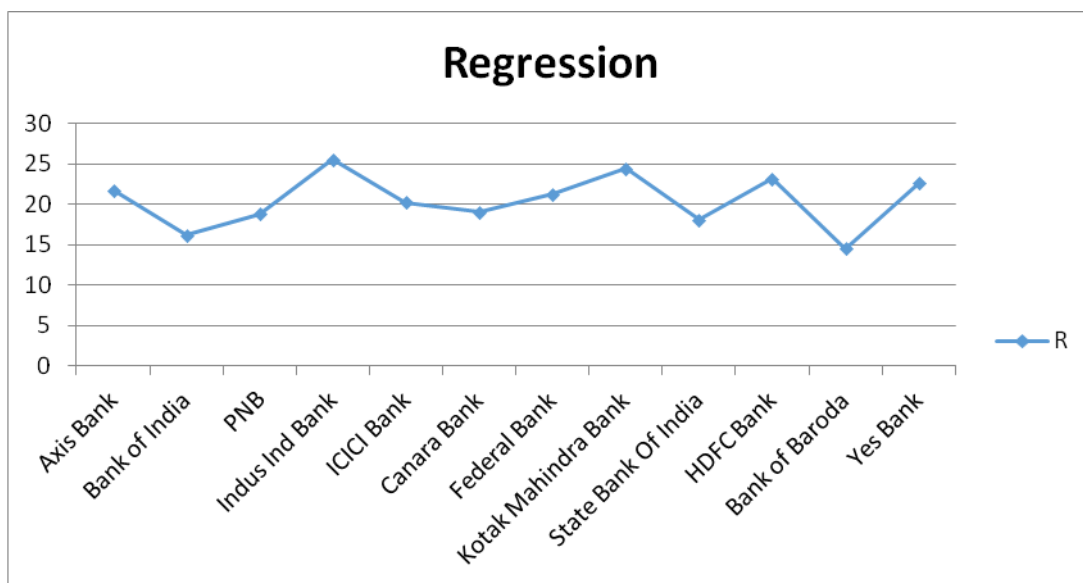


Chart - 13. - Regression Changes in the banks of Management Efficiency Ratio

Banks Names	β_0	β_1	Profit and loss ratio	R
Axis Bank	296.512	-7.158	221.765	64168.59
Bank of India	296.512	-7.158	133.73125	38695.67
PNB	296.512	-7.158	263.93125	76369.56
Indus Ind Bank	296.512	-7.158	61.80625	17883.89
ICICI Bank	296.512	-7.158	174.43125	50472.38
Canara Bank	296.512	-7.158	145.68	42153.09
Federal Bank	296.512	-7.158	37.9875	10991.84
Kotak Mahindra Bank	296.512	-7.158	55.43625	16040.7
State Bank Of India	296.512	-7.158	411.88	119179.1
HDFC Bank	296.512	-7.158	65.85875	19056.49
Bank of Baroda	296.512	-7.158	227.31875	65775.59
Yes Bank	296.512	-7.158	75.40375	21818.38

Table 8-Regression table for banks on Profit and loss Ratio

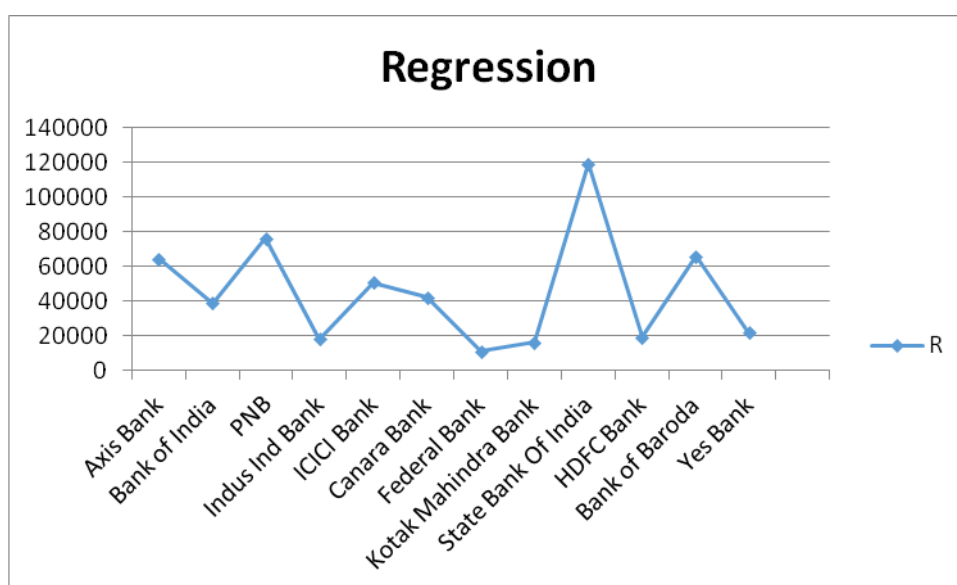


Chart 14 - Regression Changes in the banks of Profit and loss Ratio

The result indicates that all the Banks response is sensitive during the market changes and event also triggers the markets into various changes.

4.3. Portfolio Optimization Analysis: Current Portfolio:

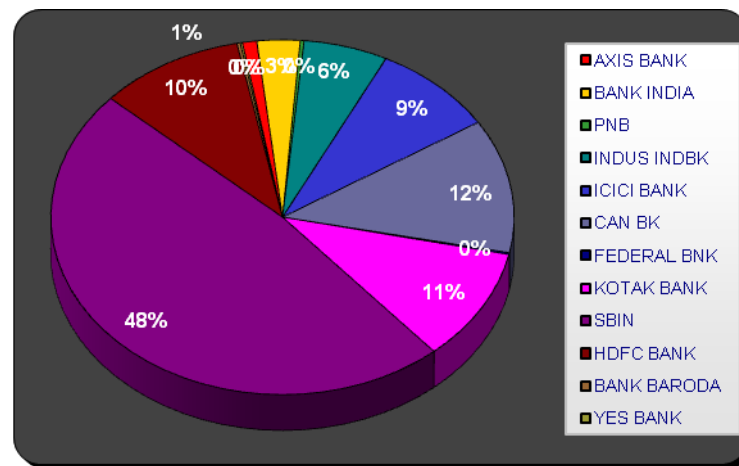


Chart 15 - Current portfolio of Banks

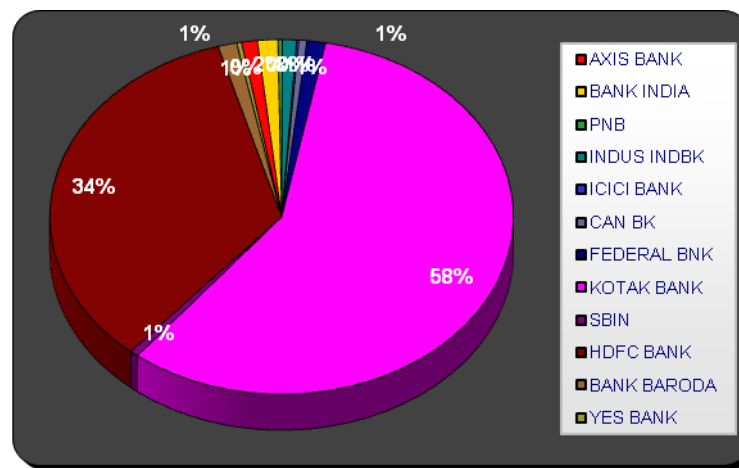


Chart 16 – Optimal portfolio of Banks

It is a portfolio optimization chart where an investor can decide on the banks they want to invest and this is a software using excel whose base is Markowitz's Mean Variance model. This chart is derived by having 8% risk-free rate and chart 15 tell about the current portfolio of banks and Chart 16 tell about what would be optimal to invest where we could reduce risk and maximize our returns.

5. CONCLUSION

This research is an analysis to attempt to understand the changes in Stock market performances of banks in NSE due to Indian general Lok sabha election (2014). Public sentiment during the election period is analyzed by getting the tweets from the twitter and then it has been analyzed by Rstudio software. The financial Parameters of banks have been analyzed during the event date and found there is a significant relationship between the Lok sabha election and stock market with the computed abnormal returns. The portfolio optimization software tells us that the current portfolio how the banks are been invested and what would be the optimal portfolio for a investor to invest in these banks in order to maximize profit and minimize the risk. Therefore, from this study we could say that investing in HDFC bank and Kodak banks would be an optimal investment where they remain constant irrespective of the election result. Expectation of the Modi wave and a return on BJP party led government influence stock market. During such external event as an investor it is better to look into all key factor like financial, technical and market sentiment to know which investment would be optimal to invest.

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