



# Empirical Study on Effects of the Lok Sabha Election on Stock Market Performance (BSE SENSEX)

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Available online at: [www.isca.in](http://www.isca.in), [www.isca.me](http://www.isca.me)

Received 4<sup>th</sup> January 2015, revised 28<sup>th</sup> January 2015, accepted 5<sup>th</sup> February 2015

## Abstract

*This study is mainly focused on effects of 16<sup>th</sup> Lok Sabha election on stock market performance in India. Various factors have been analysed which affect the stock market performance during election period. The study has found that there is significant relationship between Lok Sabha election and Stock market performance. People's sentimental analysis about the companies and also Portfolio optimization for the companies which are listed in BSE SENSEX index have been done during election time. This study examines that Lok Sabha election affects the stock market performance and also company's endogenous and exogenous factors are affected. 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.*

**Keywords:** Elections, sentimental analysis, event study, abnormal returns.

## Introduction

History has demonstrated that stock market (financial system) plays important role in economy for economic growth. Stock market is also reflects the country's status. Now a days, stock market has been impacted by many factors which are political, weather condition etc., we are in technological world where news could be spread all over the world within a short span of time. Because of this, every news could be reached to the public so that investors could analyse news which is related to stock market. So stock market fluctuation is based on news. The news which is related to economy, political events weather conditions and relationship between countries could impact on stock market fluctuations. We have taken an event which has been an important reason of stock market fluctuations in India. The event is Lok Sabha Election in India 2014. Political events usually have great impact on the stock market. In many cases, the stock market fluctuates because of political announcements such as regulation promulgation, law amendments and national elections.

Moreover, this year Lok Sabha election (2014) is most important election in Indian political history. Congress was ruling government of India for last ten years. Nevertheless, Congress party did not run a government properly so that people need a new government which would be helpful for economic growth. By which time Mr Narendra Modi waves have spread throughout the country. Narendra Modi was Chief Minister of Gujarat. He has done many things which helped for economic growth of Gujarat. So he has got a good reputation across the country. This news spread all over the country then all over the world. Indian investors and also foreign investors have believed that there would be chance for economic growth in India, if

Modi becomes Prime Minister. Indian stock market has positive impact when Narendra Modi was selected for prime ministerial candidate.

This study discusses the impact of Lok Sabha elections on stock market. BSE SENSEX Index and Companies have been taken for the analysis. Event study has been conducted in this paper. The event is 16<sup>th</sup> Lok Sabha election result date (16<sup>th</sup> May 2014). Sentimental analysis (Rstudio) has been done for comparing market movements and investor's sentiments by using social network Twitter. Company's exogenous and endogenous factors have been analysed.

Measuring abnormal returns for firms on particular events like elections, acquisitions, stock market crash and so on has been an interesting area of study to researchers in the west and also in India<sup>1</sup>. The most common measure of abnormal returns across the globe is the event study methodology which measures the returns for specific windows. The abnormal returns for a particular event may be due to various reasons. One such reason is the information asymmetry and rumours that spreads across the market about a particular event. In recent years after the introduction of internet, the social media has become one of the most powerful medium of information dissemination. Researchers have tried to capture the use of social media and its information in predicting events such as tsunami, movies success, election polls results and so on. Thus prediction of events and results from the information in social media is becoming an upcoming and attractive topic to researchers across the world.

The recent improvement in this field is capturing the sentiments of investors through social media and predicting the stock

market behaviour using the investor sentiments. Twitter is one of the social media which is highly accepted in the financial community. Messages from twitter, known as tweets can be easily accessed through application programming interface (API). Many sub forums in twitter has been started recently like Stock twitsand Tweet Trader which acts as a platform for discussion among the investors. Researchers have tried to capture the stock market behaviour using the investor sentiments derived from twitter using Google Profile of Mood States, Opinion Finder and so on<sup>2,3,4</sup>.

Twitter was established in 2006 and since then the number of people and firms joining twitter have been increasing drastically. Every day around 65 million tweets are posted per day with 750 tweets each second<sup>3</sup>. Though researchers in the west have started to exploit the information from twitter, in India it is still an unexplored area. Indian population is the second in the world in the usage of internet and thus the importance of market sentiments from social media cannot be undermined.

This study takes a different stand from literature as it studies the influence of twitter sentiments on the abnormal returns of firms on a particular event. Unlike the literature which predicts the stock behaviour of tomorrow using today's tweets, this study, studies the influence of twitter tweets around the event announcement on the abnormal returns and cumulative abnormal returns around the announcement. The event considered in this study is the announcement of the 16<sup>TH</sup>Loksabha election result date (16<sup>th</sup> may 2014). Thus the objectives of this paper are multiple:

**Objectives of the study:** i. To analyse the twitter sentiments from twitter tweets the behaviour of stock market around the event specified. ii. To identify the changes in the abnormal return of stocks due to specified event. iii. To identify the endogenous and exogenous factors that contributes significantly towards specified event.

**Review of literature:** Ling-Chun Hung (2011)<sup>5</sup> 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 favouring 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)<sup>6</sup>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)<sup>7</sup> focus on the relationship between political parties holding presidential office and SandP 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, Observation 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)<sup>8</sup> 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)<sup>9</sup> analysed the impact of Presidential elections on stock prices with reference to the USA. Using spectral analysis and the EGARCH Intervention model, the results suggests that since 1965, the US stock market has experienced several Presidential Election Cycles.

Nicholas Chen (2004)<sup>10</sup>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. 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. 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)<sup>11</sup> analysed 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<sup>12</sup> analysed the impact of Presidential elections on stock prices with reference to the USA. 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.

**Sentimental analysis review:** Bollen and Mao<sup>2</sup> 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). Sentimental analyses is performed for all public tweets broadcasted by twitter users between aug 1 and dec 20 2008. The results were compared to fluctuations recorded b stock market and crude oil price indices and major events in media. The results fund 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.

Bollen, Mao and Zheng<sup>13</sup> 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 Casualty analyses were used to correlate DJIA values to GPOMS and 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, Fuehresand Gloor<sup>3</sup> tried to predict stock market indicators such as DowJones, NASDAQ and SandP500 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 fl high, the Dow goes down the next day and when people have less hope, fear and worry Dow goes up.

**Hypothesis:** H1: There is a significance relationship between Loksabha election result (2014) and stock market.

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

H3: Endogenous and exogenous factors contribute significant towards a specified event.

## Methodology

**Sample selection:** Therefore 30 companies of the BSE SENSEX are selected for the study. The companies selected were expected to fulfil the following criteria: i. The companies should be listed in Bombay Stock Exchange (SENSEX). ii. The companies should have market data for (-14,+14) days around the specified announcement. iii. The companies should be active in twitter.

**Companies Name and Scrip Code:** The 30 companies and their scrip code in BSE is listed below.

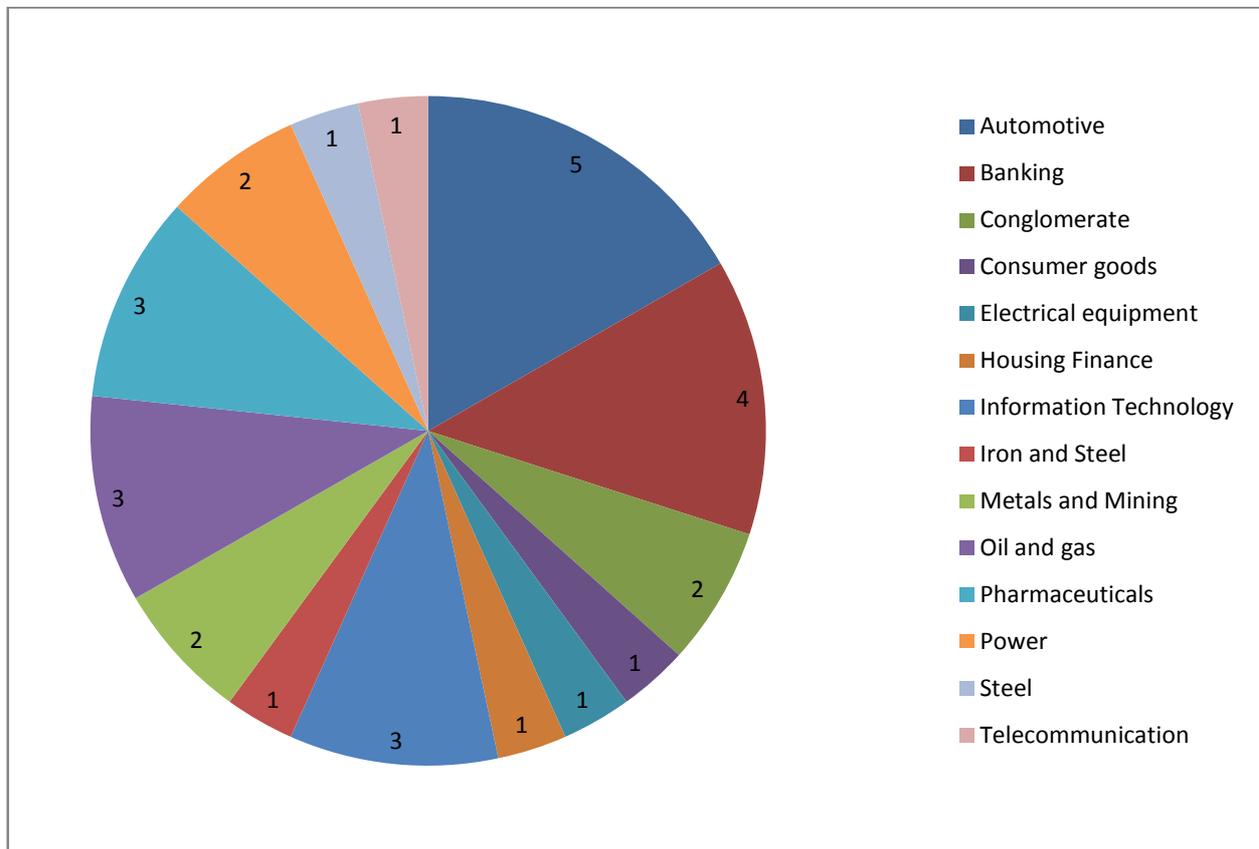
**Table-1**  
**Company and scrip name**

Company Name	Scrip Code
Axis Bank	532215
Bajaj Auto	532977
Bharat Heavy Electricals	500103
Bharti Airtel	532454
Cipla	500087
Coal India	533278
Dr. Reddy's	500124
GAIL	532155
HDFC Bank	500180
Hero Motocorp	500182
Hindalco Industries	500440
Hindustan Unilever	500696
Housing Development Finance Corporation	500010
ICICI Bank	532174
Infosys	500209
ITC	500875
Larsen and Toubro	500510
Mahindra and Mahindra	500520
Maruti Suzuki	532500
NTPC	532555
Oil and Natural Gas Corporation	500312
Reliance Industries	500325
SesaSterlite Ltd	500295
State Bank Of India	500112
Sun Pharmaceutical	524715
Tata Consultancy Services	532540
Tata Motors	500570
Tata Power	500400
Tata Steel	500470
Wipro	507685

**Classification of Companies:** The 30 Companies have been classified by industry.

**Table-2**  
**Number of companies in each sector**

Classification of Company	No of Companies
Automotive	5
Banking	4
Conglomerate	2
Consumer goods	1
Electrical equipment	1
Housing Finance	1
Information Technology	3
Iron and Steel	1
Metals and Mining	2
Oil and gas	3
Pharmaceuticals	3
Power	2
Steel	1
Telecommunication	1



**Figure-1**  
**No of companies in each sector**

**Twitter Sentimental Analysis:** The twitter tweets were collected for the 30 companies in the sample for 30 days around the election announcement. As a developing economy, tweets for Indian companies will be comparatively less when compared to the companies in the developed

economies. The number of tweets collected for each company is shown below.

**No. of Tweets and Company Name:** The tweets were collected manually for each company. The collected tweets were subjected to sentimental analysis through R-Studio.

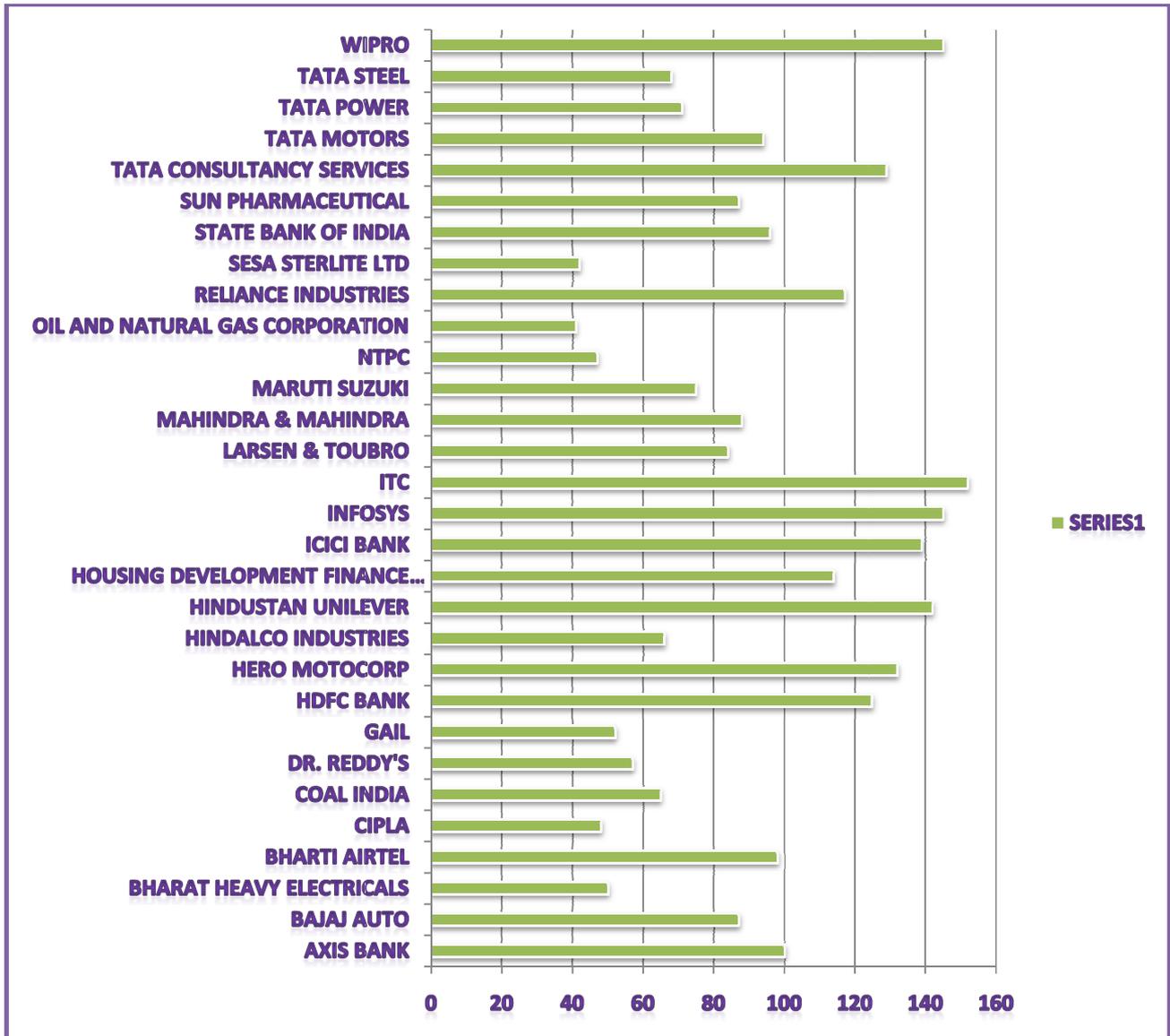


Figure-2  
 List of companies

Importing the tweets into R-Studio and computing the emotion and polarity of tweets for each company. 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 company 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 company. Each company's polarity and emotion were thus classified separately using R-studio. The emotions were then computed as ratios or percentage. From Zhang, Fuehres and Gloor<sup>3</sup> the percentage of emotion and polarity is computed as follows:

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

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

Positive% = (total positive tweets) / (total number of tweets)

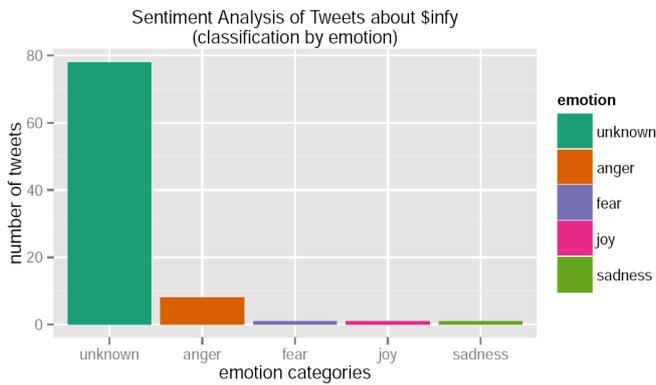
Negative% = (total negative tweets) / (total number of tweets)

Joy% = (total joy tweets) / (total number of tweets)

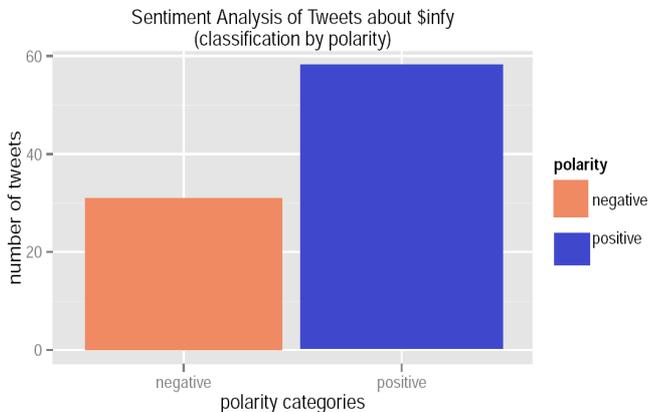
Sad% = (total sad tweets) / (total number of tweets)

Fear% = (total fear tweets) / (total number of tweets)

Anger % = (total anger tweets) / (total number of tweets)



**Figure-3**  
**Emotion of the market**



**Figure-4**  
**Polarity of the market**

**Event Study Methodology:** The Cumulative Abnormal Returns are calculated using:

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

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

Examining the CAR of a set of sample securities will be used to look at whether or not the values of the average residuals, starting from the day of cumulation and up to a specific point, are systematically different from zero.

**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:  
 $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_N X_N + \epsilon$

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.

E = randomized disturbance or error.

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

**Variable selection:** The variables used in the stud are the twitter parameters of emotion and polarity and CAR for each company. The table-2 below shows the list of variables used in the study.

**Table-2**  
**Variables used in the study**

Variables	Explanation
	<b>Dependent Variable</b>
CAR (-14,+14)	Cumulative Abnormal Returns for 28 days around the acquisition announcement
	<b>BINARY VARIABLES</b>
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	A <b>bonus</b> share is a free share of stock given to current shareholders
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
Adjusted Cash Margin	It includes the cost of carrying inventory, whereas the gross <b>margin</b>
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 <b>adjusted net worth</b> represents a measure of value of an insurance
Return on Assets Excluding Revaluations	A ratio that measures a company's earnings before interest and taxes (EBIT) against its total net assets. The ratio is considered an indicator of how effectively a company is using its assets to generate earnings before contractual obligations must be paid.
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.
Total Assets Turnover Ratios	The <b>total asset turnover ratio</b> is an asset management ratio that measures how efficiently a company can use its <b>assets</b> to generate sales
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 Payout Ratio Cash Profit	This ratio identifies the percentage of earnings (net income) per common share allocated to paying <b>cash dividends</b> 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.
Earnings Per Share	The portion of a company's profit allocated to each outstanding share of common stock. <b>Earnings per share</b> serves as an indicator of a company's profitability.
Book Value	Book value of the company – Value represented in the books of accounts.

## Results and Discussion

**Regression Results:** From univariate analysis, the study now focuses on a multivariate analysis. Regression includes variables that are specified above in table. Regression results are summarized in the table 3 below.

From the variable selected for the study only five variables shows that the companies are sensitive during event time period at 5% significance. Companies from the twitter data extracted indicate that there is negative emotions that effect the market behaviour and its significant. Profit and loss of the company is also affected

by the change in the economic decision. The companies in the private or public front also effect. The growth of the company in the form of sales and the debt - coverage ratio are statistically significant where the p value is < .05.

The result indicates that all the company are reaction is sensitive during the market changes and event also triggers the markets into various changes.

It is a portfolio optimization chart where the investors can decide on the companies they want to invest

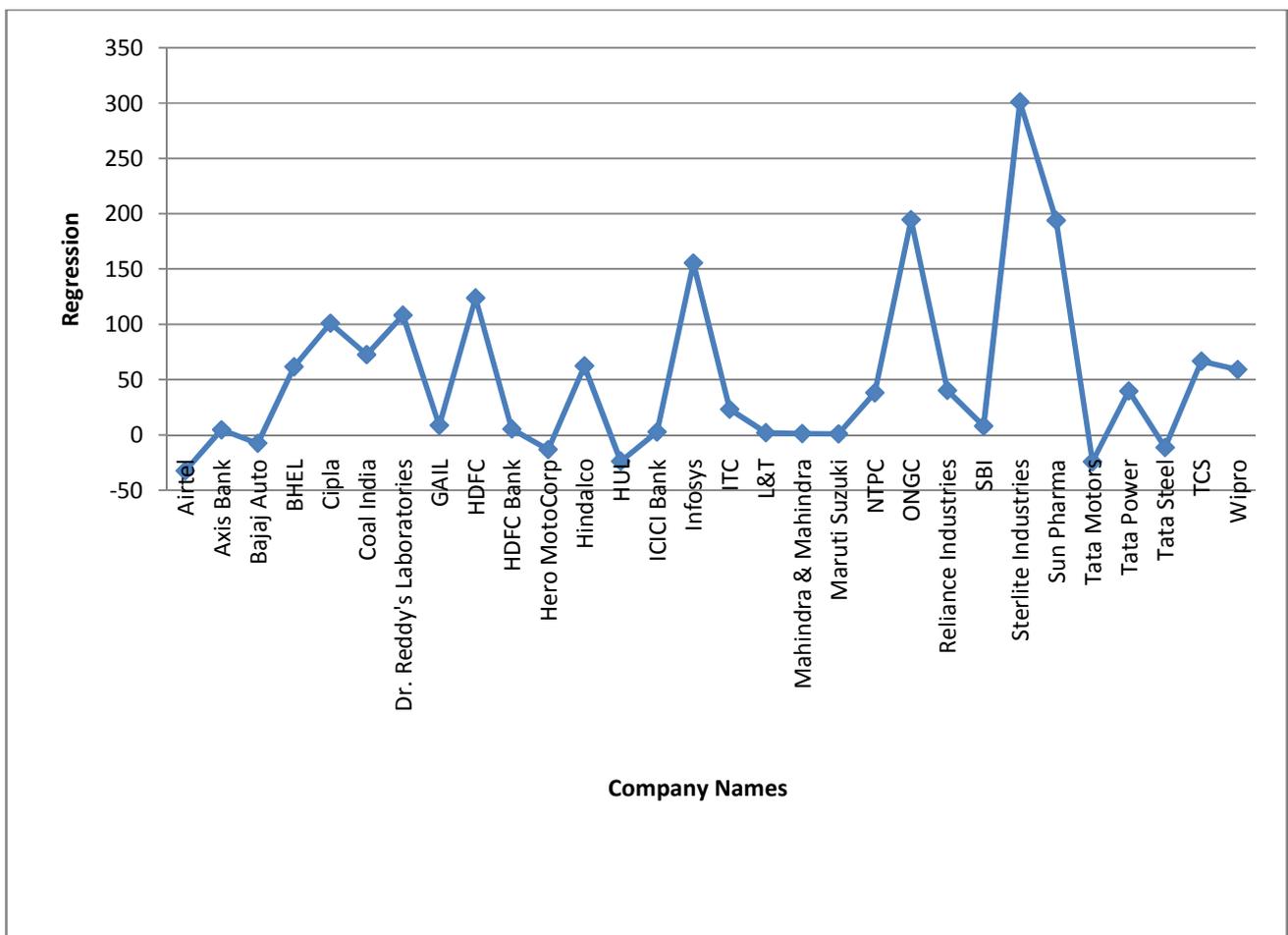
**Table-3**  
**Regression results**

Variables	t-test	significant
Negative(sentimental analysis)	3.193	.004
Profit and loss a/c	-3.569	.002
Private/public	-3.494	.002
Growth	5.275	.000
Debt-coverage ratio	3.688	.000

Dependent Variable: CAR (-1,+1)

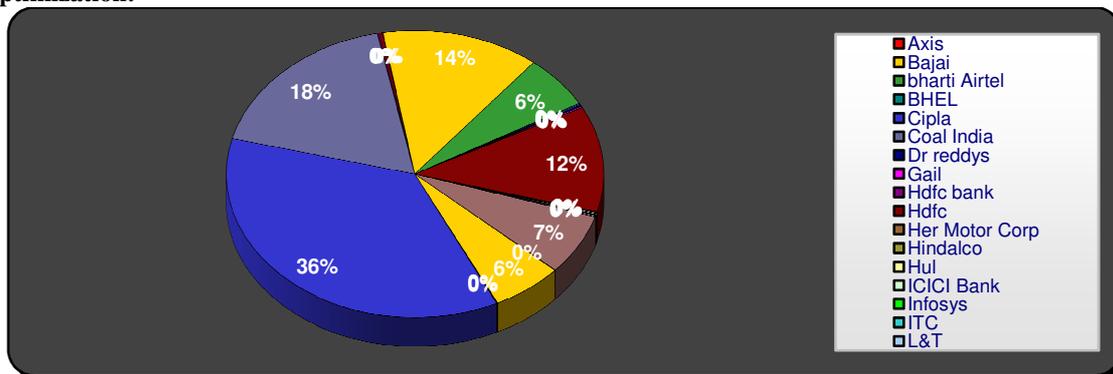
**Table-4**  
**Correlation results**

Correlations <sup>a</sup>						
	(-1,+1)	Negative	Total Debt to Owners Fund	profit or loss	pvt/pub	growth
(-1,+1)	1					
Negative	-.567	1				
Total Debt to Owners Fund	.177	-.372	1			
profit or loss	-.302	.244	.041	1		
pvt/pub	-.385	.122	-.356	-.093	1	
growth	.628	-.447	.181	.162	-.235	1



**Figure-4**  
**Beta co-efficient in regression analysis**

**Portfolio Optimization:**



**Figure-5**  
**Portfolio optimization**

**Conclusion**

This research is and analyse to attempt the effects of Loksabha election (2014) on stock market. It has analysed the sentiments of public during the election time by the way of getting information from twitter then it has been analysed by Rstudio software. Endogenous and exogenous factors have been analysed during election time. This study has proved that there is a significant relationship between Loksabha election (2014) and stock market. There is a positive reaction in the stock market during the election time. There is a significant change in the abnormal return of companies. Companies endogenous and exogenous factors have been contributed a significant towards specified event. So election is one of the reasons for stock market fluctuations. Myth has been demonstrated that political events and economy are intertwined. Once again it has proved that political event has been a part for fluctuations on the stock market.

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