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AN EMPIRICAL STUDY OF GENERAL ELECTION IMPACT ON EQUITY MARKET

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ABSTRACT

In democracy country like India, elections place a vital role in financial market. The present study has been emphasize on three elections periods of 2004, 2009 and 2014. The bi-variate correlation indicates that there is an association between liquidity variable of liquidity in the bank and liquidity in the country with nifty returns, granger causality test has been applied and found that liquidity in the country and with the banks are influence the market indicator nifty. The Sharpe performance method role has been applied on three election and found that nifty is performance is well stronger than market returns performance.

KEYWORDS

FTA, NIFTY LIC, LIB, SENSEX, TSE.

INTRODUCTION

The political budget cycle theories indicate that macroeconomic variables like output, unemployment, inflation show a particular pattern during the election year. In India also, we can see political parties change their stances a lot to lure the voters for their benefits. In the Sensex data plot from 1979, we can see that a year before elections, Sensex surges almost all the election periods except for 1998 elections. This trend could be attributed to the fact that investors were afraid of the possibility of coalition government causing the policy paralysis. There is also an observable pattern in the Sensex performance for the post-election years. Except for 1999, Sensex has always surged up after the elections happened. That exception might be there because earlier Atal Bihari Vajpayee led coalition government which failed to get confidence vote because which allied parties removed the support in between. Investors were still not sure that government will last for 5 years.

For the Exchange rate for USD, there is no particular pattern found before or after the elections. Exchange rate has been changing continuously over the years as India's imports are increasing very fast as compared to exports which have been increasing slowly. Government policies rarely have affected the exchange rate changes.

In India, CPI data from 1958 does not give any particular pattern in terms of increase or decrease before and after the elections, but mostly inflation decreases pre-election year. There have been many theories which suggest that inflation increase before the elections. Government increases its spending pre-election year, which specially affects inflation in the manufacturing products. But government controls the inflation in primary articles which affects the common man directly to indicate that they are efficient. In India, Government generally spends money on the schemes that directly benefit to the people. Because of illiteracy, government doesn't spend money on capital investment. But since people are becoming more and more aware government has to think long term before the elections. There is a pattern in the pre-election and post-election year deficits in most of the years. Fiscal deficit goes up pre-election and a drop in the fiscal policy is observed post-election year.

But sometimes an opposite pattern is also observed. This might happen because just before the election, government doesn't spend more money, just divert the money to those schemes which will attract the people's attention. India surely has seen various schemes getting more funding just before the election period

2004: elections this was very important election as India was growing fast and first time and non congress government completed 5 years of their term. But after the election new government with different party was formed. During first year of congress government headed by Dr. Manmohan Singh, Sensex was booming because of good IT development, and high expectations from Dr. Manmohan Singh (Good reputation as an economist) as the prime minister. Gross fiscal deficit shows the exact opposite effect of what political budget cycle explains, but inflation data indicates the existence of political business cycle. Sensex improved because of previous government's policies. Exchange did not show much change after the elections.

2009: election this election happened during the global financial crisis. Many economic factors were affected by this recession. Also before the election, government increased the MSP for agricultural produce, waiving off the farmers' loans which increased the inflation, fiscal deficit as well as affected the exchange rate. We can see the existence of political budget/business cycle in this election. But most probably we can never say that it was due to politics because economy was declining, so government had taken measures to control it which resulted in very high fiscal deficit, high inflation as government was pouring money into markets. Also Sensex was under the pressure from worldwide situation.

2014 elections (2009-14), government announced many schemes to lure the voters as government was facing many corruption charges and government wanted to save face and make a comeback in the election with its subsidies and schemes. But data shows that these all schemes were launched during the full term, not in the pre-election year. New government has taken many strict measures to improve the economy. Also reduction in the crude oil prices helped the new government reduce the deficit, inflation as well exchange rate. By looking at the empirical data, inflation and deficit shows exactly opposite effect what is expected out of political budget/business cycle.

REVIEW OF LITERATURE

Keith, Bruce – 1988: The following article helps to understand the paper and examines the relationship between the Toronto Stock Exchange (TSE) and election polls during the 1988 Canadian General Election campaign. Two hypotheses were investigated: first, did polls influence the TSE, and secondly, if so, did the nature of the influence suggest that investors were reacting to expectations concerning the effect of the Canada -U.S. Free Trade Agreement (FTA)? I find that the TSE was positively related to conservative popularity as measured by polls, but that the differential movement of TSE sub-indices does not offer additional support to an FTA based interpretation of events.

Chandra, Kanchan – 1992: The 1992 British general election took place in the context of a severe housing recession, which hit hardest in those regions from which the government usually drew much of its electoral support. The slump notwithstanding, however, the government went on to win its fourth successive election victory. The paper investigates the impact of the housing recession on the geography of the vote at the 1992 general election. Party fortunes were linked to local housing market conditions, and the failure of the housing market was a factor in reducing support for the government. Negative equity is identified as a particularly important problem in this regard.

The 4 equity market factors from **Fama and French (1993)** and **Carhart (1997)** are pervasive in academia and practice. However, not much is known about their joint distribution and dynamics. We find striking evidence of asymmetric tail dependence across the factors. While the linear factor correlations are small and even negative, the extreme correlations are large and positive, so that the linear correlations drastically overstate the benefits of diversification across the factors. We model the nonlinear factor dependence dynamics and explore their economic importance in a portfolio allocation experiment showing that significant economic value is earned when acknowledging nonlinear dependence.

Kumar Deva B (February 2015): This study is mainly focused on effects of 16th Lok Sabha election on stock market performance in India. Various factors have been analyzed 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.

Zuwena Zainabu (November 2014): The main aim of the study was to establish the effect of the general elections on the return of the stock market in Kenya. This is an empirical study that analyzed the stock market returns during electioneering periods in Kenya. The study covered the period between 1997 and 2013. The NSE index performance during this period was analyzed and the performance of the NSE index during election years compared to none election years. Descriptive research design was applied.

AlehMazol (2013): The thesis deals with election cycles in stock returns of 52 developing and developed countries and provides the analysis of influence of information transparency on stock returns and volatility of returns during election periods. The data covers the period from January 1994 to January 2012. The volatility of stock returns is estimated by EGARCH model in order to capture time-varying volatility and the asymmetry effects of "bad news" and "good news" as a result of political shocks caused by election cycles.

Savita A. Ramesh (May 2015): This paper analyses the share price performance around National elections in India during the 2014 general elections. Due to change in the market sentiment, the stock prices react to the changes in the government. We investigate shareholders' returns around national elections for 30 companies of BSE SENSEX.

Dr. Sharon Sophia & Maria Evelyn Jucunda.M (September-October, 2014): 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.

Sofia Lehander Frida Lönnqvist (Fall 2011): We perform an event study where we investigate 47 parliamentary elections' impact on short-term stock market returns from 1999 to 2011 in 16 developed countries in Europe. We focus on small-cap indices and the results suggest that parliamentary elections have significant negative impact on small-cap stock market returns. We suggest that this can be explained by the increase in market uncertainty due to the political uncertainty. Hence, investors tend to avoid small-cap stocks in uncertain times because of their lack of liquidity and since larger stocks are seen as a safer alternative. We also find significant negative abnormal returns when looking at small-cap indices and considering only the elections with a centre government outcome, while we neither see a significant reaction when investigating the elections with a right-wing government outcome nor when considering the ones with a left-wing government outcome. Moreover, when considering all the elections that had a non-majority government outcome we find significant negative abnormal returns when considering the small-cap stock market indices. On the contrary, elections with a majority outcome did not generate any significant abnormal returns. We suggest that confusion about what political agenda the new government will adopt can lead to market uncertainty and hence increased investor risk aversion and thereby lower returns, when a non-majority government wins the elections. For mid-cap and large-cap firms we see no significant reaction and the same holds when considering indices including stocks of all market capitalizations. We perform robustness checks and non-parametric tests to ensure the validity of our significant findings. Thus, our findings propose that this type of political event can create market uncertainty that impact investor risk aversion and thereby significantly impact small-cap stock market returns negatively in the short run.

Bc. Tom a's (2011/2012): The thesis deals with electoral and partisan cycles in stock returns of nine CEE countries and checks consistency of observed cycles with efficient market hypothesis. The evidence mostly supports possibility of political influence on stock markets, but the effects often have opposite sign than hypothesized. Electoral cycle has been found in Estonia and Hungary, while returns in four other countries are significantly lower before elections. Markets more often exhibit left-wing premium, it is significant in the Czech Republic, Lithuania Romania. The results are similar between nominal and real returns. Both cycles are also considered significant for the panel of countries. Moreover, cycles are hardly explainable by macroeconomic conditions, which indicates market inefficiency. This is confirmed by analysis of volatility, which reveals that risk does not correspond to changes in returns induced by the cycles.

Andreas Oehler: Election results may influence corporate performance by general changes in government spending and tax changes. In addition, specific companies or sectors might benefit or suffer from sector-specific governmental decisions. Stock market participants will incorporate expectations about political change into stock prices prior to an election and adjust their opinion according to the actual decision making following the election. To date, we do not know whether both the Republican and Democratic parties are associated with particular stock price effects for certain companies or sectors and whether these effects persist over several elections. We analyze abnormal stock price returns around the U.S. presidential elections from 1976 to 2008 with focus on party-specific favoritism. The results demonstrate statistically significant (positive or negative) cumulative abnormal price returns for most industries. Most effects appear to be related to the individual presidents and changes in political decision making per se irrespective of the underlying political ideology.

James Ndungu Kabiru, Duncan Elly Ochieng, Hellen Wairimu Kinyua: The performance of the financial markets is significantly impacted by the political environment during general elections. This paper focused on the effect of general elections on the stock returns at the Nairobi Securities exchange. Empirical results have given inconsistent results on whether general election events negatively or positively impact the stock return. The study adopted event study methodology and analyzed secondary data collected from the NSE around the 1997, 2002, 2007 and 2013 general election dates in Kenya. The study found that market reaction to elections is highly negative or positive depending on the volatility of the election

Environment. Analysis of the cumulative abnormal returns (CAR) found that the 2002 and 2013 general elections were insignificant, while the CAR around the 1997 and 2007 general election events were found to be significant at 5% level of significance. The study, thus recommends that stock market, investors and other stakeholders not to overlook electioneering events, and to implement policies that will cushion the security market against political risks during general elections to enhance investor confidence.

Dolores Furió, Ángel Pardo. (September 2012): This paper examines the influence of Spanish major political events on stock market performance by testing the empirical implications of the existing theories focused on the connection between politics and stock exchanges. On the one hand, our findings give support to the partisan politics theory, since stock returns behave differently depending on the political orientation of the government, not only on the day of the national election but also during their tenure of office. On the other hand, the analytical results demonstrate that there are no abnormal positive returns during the second half of the government's term, which contradicts the opportunistic political business cycle theory. Finally, according to Brown et al.'s (1988) Uncertain Information Hypothesis, volatility of stock returns is shown to increase following the arrival of unexpected information.

Geoff Willcocks: UK equity market returns are described by a component GARCH model and two thirty six year periods of daily short term and long term volatility values are generated. These are aggregated by inter general election quarters. The findings show a reducing level of volatility over the quarters between elections and significant differences in both the temporary and permanent components in relation to the party in power. Volatility is higher under a Labour government, spikes on the day following a general election and is symmetric under Conservative governments but asymmetric under Labour. No similar patterns are found for Germany.

Bialkowski, Jędrzej Gottschalk, Katrin Wisniewski, Tomasz Piotr: This paper investigates a sample of 27 OECD countries to test whether national elections induce higher stock market volatility. It is found that the countryspecific component of index return variance can easily double during the week around an Election Day, which shows that investors are surprised by the election outcome. Several factors, such as a narrow margin of victory, lack of compulsory voting laws, change in the political orientation of the government, or the failure to form a coalition with a majority of seats in parliament significantly contribute to the magnitude of the election shock. Our findings have important implications for the optimal strategies of risk-averse stock market investors and participants of the option markets.

Art Durnev: We show that political uncertainty surrounding elections can affect how corporate investment responds to stock prices. In a large panel of elections around the world, investment is 40% less sensitive to stock prices during election years compared to non-election years. The decrease in investment-to-price sensitivity appears to be due to stock prices becoming less informative during election years making them noisier signals for managers to follow. Further, the drop in investment-to-price sensitivity is larger when election results are less certain, in countries with higher corruption, large state ownership, and weak standards of disclosure by politicians. Finally, we show that election uncertainty leads to inefficient capital allocation, reducing company performance. JEL classification: G15 (international financial markets), G38 (government policy and regulation), P16 (political economy)

Why and how general elections in India have impact on stock market?

The economic, industrial policy of a country is determined by the government of the day. All these policies have an impact on the stock prices. On 17th May 2009 when the UPA government came to power the bse sensx had gone up by 17% on a single day.

The current Bihar election is important for India, as it will determine if the NDA can get a majority in Rajya Sabha. Members of Rajya Sabha are elected by the MLAs elected in a state assembly election. Currently lot of reforms are in doldrums due to the lack of majority of the government in Rajya Sabha.

Asad Dossani (2014): The 2014 Indian election is officially underway. In just over a month from now, we will know our next Prime Minister, and the composition of the Lok Sabha. An important question for investors is how the results of the election will impact the markets. The election matters both for short and long term market movements.

During the last general election in 2009, Congress won a greater than expected number of seats, and the Indian stock markets rose 17% over the two days following the election result. In the previous general election in 2004, when the BJP unexpectedly lost, the markets fell 17% over the two days after the election results. This information tells us that whatever the result of Indian election, we can expect stock markets to be extremely volatile in the days immediately after the result.

If the BJP win the election comfortably, meaning that they gain enough seats to build a stable coalition expected to push through significant economic reforms, then markets will rally. Markets have been rising in recent weeks in anticipation of this, and a resounding victory for the BJP will confirm these movements.

On the other hand, if other small parties do better than expected, this would hinder the likelihood of economic reforms getting put in place, and will affect the markets negatively as a result. For example, if the Aam Aadmi Party performs well, this would weaken the power of the ruling party. If the BJP does worse than expected, or the Congress does better than expected, markets will likely take a large hit following the elections.

While most analysts do expect the BJP to win comfortably, past history tells us that Indian elections are far from predictable. This is due to the large and diverse electorate that make up the Indian voters. In both the 2009 and 2004 elections, the results ended up surprising everyone, and this caused significant market movements following those results.

In the upcoming election, the greater risk for markets is to the downside. Markets have rallied anticipating that the BJP will win comfortably, and so this event is largely priced into the markets already. However, markets could fall significantly if there was another unexpected result.

In this week's Equitymaster club forum, we are asking the questions: "How will the Election Impact the Markets?" We invite you to please login and post your views.

HOW ELECTION YEARS AFFECT THE STOCK MARKET

The ongoing stock market rally has been primarily supported by foreign investors. The rupee also rose to a near three-month high against the dollar on Friday.

It is rather unusual for the Indian market to jump in pre-election months, particularly after 1996 when coalitions became the new political strategy to make up for shortfalls in parliamentary majority. In most election years, the market had actually fallen just before the elections – in 2004, by more than 10 percent.

There are reasons why the Sensex is behaving differently now.

The market has its own fears and hopes. First, the market detests uncertainty, which is at its peak in coalition times with regional parties vying for power.

Second, the market would like the communist parties to be drowned in political backwaters. Though a few regional parties want to assert their right to influence the government at the centre, the Bharatiya Janata Party (BJP) can still command a good number of seats from the states that it already rules as well as others. This has generated some confidence in investors who are looking to make some quick gains.

That confidence may have come partly from opinion surveys announced recently. Most of them forecast that the BJP may capture more seats than the Congress did in 2009 and be in a good position to form the government with support from old and new friends. If that happens, how will the market respond to the political change?

Well, the BJP-led National Democratic Alliance had come to power in 1999. At the time, the market responded well in the three months before the elections (the Sensex jumped nearly 17 percent) as also in the three months following the elections (the Sensex jumped another 6.4 percent). But the euphoria did not last long. In the one year after the elections, the Sensex dropped 13 percent.

The market trend was different in 2004 when a Congress-led coalition formed the government. That is because it had to rely on the communist parties to remain in power. In the first three months, the Sensex was down 6 percent, though over the year it was up 16 percent.

This year, investors seem excited with expectations that the BJP will form the next government with Narendra Modi as the prime minister. They hope he will give priority to development by reforming policies and governance.

The present rally may not continue for long and the market is more likely to move sideways. Political uncertainty is high. But if the BJP comes to power, the Sensex is bound to jump with enough support coming from foreign institutional investors. That will also harden the rupee further. However, over a longer period, it is possible that the Sensex can slide, depending on how much a new government remains true to its word.

CAN ELECTIONS HELP MARKETS TURN AROUND?

With markets tumbling like nine-pins since the past few months on global and domestic issues and the economy gasping for breath, there has been a growing chorus that the fortunes are likely to change post the general elections (scheduled for May 2014) and formation of a new government.

In two out of the past three occasions, the BSE S&P Sensex has recorded a gain of over 50 per cent during the 12-month period before the Lok Sabha elections. Except the last general elections held in 2009, the benchmark index had surged 61 per cent in 1999 and a whopping 93 per cent in 2004 during the one year prior to elections, data compiled by BS Research Bureau shows. Five stocks from the BSE-30 Sensex companies, Tata Motors, Mahindra and Mahindra, Hero MotoCorp, Hindalco Industries, Larsen and Toubro and Sun Pharmaceutical Industries appreciated more than 100 per cent in both these years.

However, in the year the market did not rally before the elections, it rallied after the elections. In 2009, while the Sensex declined 33 per cent before elections, it rallied 61 per cent in the next one-year after the new government took charge.

WILL A CONGRESS WIN DISAPPOINT STOCK MARKETS?

A Congress-led government may disappoint markets, at least initially, says UBS in its latest report. The global investment bank says the statement is based on the existing government not meeting heightened expectations of the markets, which it displayed by the gap-up move in 2009 when Congress-led UPA government secured a thumping victory.

On May 18, 2009, both Sensex and Nifty hit their respective upper circuits, and trading was halted. After two hours, when trading resumed, the indices hit the upper circuit again. Bombay Stock Exchange's Sensex was locked at 14,272.62, up 2,099.21 points, or 17.24 per cent. National Stock Exchange's Nifty was locked at 4,308.05, up 636.40 points, or 17.33 per cent.

"The weak investment cycle, loose fiscal policy, policy flip-flops, etc, are known negatives as far as the present government is concerned," the report says.

NEED FOR THE STUDY

This study analyses the stock markets condition during the general elections period. This study is made to know how the liquidity is during before and after the elections period. i.e., whether it increased or decreased and this study is also done to know the investors interest in different types of investments. i.e., shares, bank deposits and post office deposits and also to find the performance of NIFTY before and after the general elections period in India.

SCOPE OF THE STUDY

This study has been emphasized on 3 general elections periods. The analysis has been bifurcated into 3 phase's. before and after period analyses has been considered for 1 year.

TABLE 1

elections	2004	2009	2014
NIFTY	NSE india	NSE india	NSE india
liquidity	RBI website	RBI website	RBI website
bank deposits	RBI website	RBI website	RBI website
post office deposits	RBI website	RBI website	RBI website

OBJECTIVES OF THE STUDY

1. To know the relationship between liquidity in country, banks and market returns.
2. To know the impact of liquidity of bank and liquidity in the country on nifty returns.
3. To know the performance of the nifty during the election period.

RESEARCH METHODOLOGY

The study “general elections impact on NIFTY and market returns” uses secondary data.

SOURCE OF SECONDARY DATA

1. Three past elections (i.e., 2014, 2009 and 2014 elections) details has been taken from the elections commission website.
2. The NIFTY values of this period have been taken from the NSE India website
3. The liquidity, bank deposits and post office deposits of this period have been taken from the RBI website.

METHODOLOGY

The formulae that are used in this study are

STANDARD DEVIATION

The standard deviation (SD, also represented by the Greek letter sigma σ or s) is a measure that is used to quantify the amount of variation or dispersion of a set of data values. A standard deviation close to 0 indicates that the data points tend to be very close to the mean (also called the expected value) of the set, while a high standard deviation indicates that the data points are spread out over a wider range of values.

Let X be a random variable with mean value μ :

$$E[X] = \mu.$$

Here the operator E denotes the average or expected value of X . Then the standard deviation of X is the quantity

$$\begin{aligned} \sigma &= \sqrt{E[(X - \mu)^2]} \\ &= \sqrt{E[X^2] + E[(-2\mu X)] + E[\mu^2]} = \sqrt{E[X^2] - 2\mu E[X] + \mu^2} \\ &= \sqrt{E[X^2] - 2\mu^2 + \mu^2} = \sqrt{E[X^2] - \mu^2} \\ &= \sqrt{E[X^2] - (E[X])^2} \end{aligned}$$

(Derived using the properties of expected value).

In other words, the standard deviation σ (sigma) is the square root of the variance of X ; i.e., it is the square root of the average value of $(X - \mu)^2$.

The standard deviation of a (univariate) probability distribution is the same as that of a random variable having that distribution. Not all random variables have a standard deviation, since these expected values need not exist. For example, the standard deviation of a random variable that follows a Cauchy distribution is undefined because its expected value μ is undefined.

VOLATILITY

In finance, volatility is the degree of variation of a trading price series over time as measured by the standard deviation of returns.

Historic volatility is derived from time series of past market prices. An implied volatility is derived from the market price of a market traded derivative (in particular an option). The symbol σ is used for volatility, and corresponds to standard deviation, which should not be confused with the similarly named variance, which is instead the square, σ^2 .

The generalized volatility σ_T for time horizon T in years is expressed as:

$$\sigma_T = \sigma\sqrt{T}.$$

Therefore, if the daily logarithmic returns of a stock have a standard deviation of σ_{SD} and the time period of returns is P , the annualized volatility is

$$\sigma = \frac{\sigma_{SD}}{\sqrt{P}}.$$

RESIDUAL TEST

Mathematically, a residual is the difference between an observed data point and the expected -- or estimated -- value for what that data point should have been. The formula for a residual is $R = O - E$, where “O” means the observed value and “E” means the expected value. This means that positive values of R show values higher than expected, whereas negative values show values lower than expected. For example, you might have a statistical model that says when a man’s weight is 140 pounds, his height should be 6 feet, or 72 inches. When you go out and collect data, you might find someone who weighs 140 pounds but is 5 feet 9 inches, or 69 inches. The residual is then 69 inches minus 72 inches, giving you a value of negative 3 inches. In other words, the observed data point is 3 inches below the expected value.

VECTOR AUTO REGRESSION

The vector auto regression (VAR) is an econometric model used to capture the linear interdependencies among multiple time series. VAR models generalize the uni variate autoregressive model (AR model) by allowing for more than one evolving variable. All variables in a VAR are treated symmetrically in a structural sense (although the estimated quantitative response coefficients will not in general be the same); each variable has an equation explaining its evolution based on its own lags and the lags of the other model variables. VAR modeling does not require as much knowledge about the forces influencing a variable as do structural models with simultaneous equations: The only prior knowledge required is a list of variables which can be hypothesized to affect each other intertemporally.

A VAR model describes the evolution of a set of k variables (called *endogenous variables*) over the same sample period ($t = 1, \dots, T$) as a linear function of only their past values. The variables are collected in a $k \times 1$ vector y_t , which has as the i th element, $y_{i,t}$, the observation at time “t” of the i th variable. For example, if the i th variable is GDP, then $y_{i,t}$ is the value of GDP at time t .

A p -th order VAR, denoted VAR(p), is

$$y_t = c + A_1y_{t-1} + A_2y_{t-2} + \dots + A_p y_{t-p} + e_t,$$

where the l -periods back observation y_{t-l} is called the l -th lag of y , c is a $k \times 1$ vector of constants (intercepts), A_i is a time-invariant $k \times k$ matrix and e_t is a $k \times 1$ vector of error terms satisfying

1. $E(e_t) = 0$ – every error term has mean zero;
2. $E(e_t e_t') = \Omega$ – the contemporaneous covariance matrix of error terms is Ω (a $k \times k$ positive-semidefinite matrix);
3. $E(e_t e_{t-k}') = 0$ for any non-zero k – there is no correlation across time; in particular, no serial correlation in individual error terms

A p th-order VAR is also called a VAR with p lags. The process of choosing the maximum lag p in the VAR model requires special attention because inference is dependent on correctness of the selected lag order.

AUGMENTED DICKEY-FULLER TEST

In statistics and econometrics, an augmented Dickey–Fuller test (ADF) is a test for a unit root in a time series sample. It is an augmented version of the Dickey–Fuller test for a larger and more complicated set of time series models. The augmented Dickey–Fuller (ADF) statistic, used in the test, is a negative number. The more negative it is, the stronger the rejection of the hypothesis that there is a unit root at some level of confidence

The testing procedure for the ADF test is the same as for the Dickey–Fuller test but it is applied to the model

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t,$$

where α is a constant, β the coefficient on a time trend and p the lag order of the autoregressive process. Imposing the constraints $\alpha = 0$ and $\beta = 0$

corresponds to modelling a random walk and using the constraint $\beta = 0$ corresponds to modeling a random walk with a drift. Consequently, there are three main versions of the test, analogous to the ones discussed on Dickey–Fuller test (see that page for a discussion on dealing with uncertainty about including the intercept and deterministic time trend terms in the test equation.)

By including lags of the order p the ADF formulation allows for higher-order autoregressive processes. This means that the lag length p has to be determined when applying the test. One possible approach is to test down from high orders and examine the t -values on coefficients. An alternative approach is to examine information criteria such as the Akaike information criterion, Bayesian information criterion or the Hannan–Quinn information criterion.

The unit root test is then carried out under the null hypothesis $\gamma = 0$ against the alternative hypothesis of $\gamma < 0$. Once a value for the test statistic

$$DF_\tau = \frac{\hat{\gamma}}{SE(\hat{\gamma})}$$

is computed it can be compared to the relevant critical value for the Dickey–Fuller Test. If the test statistic is less (this test is non symmetrical so we do not consider an absolute value) than the (larger negative) critical value, then the null hypothesis of $\gamma = 0$ is rejected and no unit root is present.

AUTOREGRESSIVE CONDITIONAL HETEROSKEDASTICITY

In econometrics, autoregressive conditional heteroskedasticity (ARCH) models are used to characterize and model time series. They are used at any point in a series, the error terms are thought to have a characteristic size or variance. In particular ARCH models assume the variance of the current error term or innovation to be a function of the actual sizes of the previous time periods' error terms: often the variance is related to the squares of the previous innovations.

Such models are often called ARCH models (Engle, 1982),^[1] although a variety of other acronyms are applied to particular structures that have a similar basis. ARCH models are commonly employed in modeling financial time series that exhibit time-varying volatility clustering, i.e. periods of swings interspersed with periods of relative calm. ARCH-type models are sometimes considered to be in the family of stochastic volatility models, although this is strictly incorrect since at time t the volatility is completely pre-determined (deterministic) given previous values.

ARCH(q) MODEL SPECIFICATION

Suppose one wishes to model a time series using an ARCH process. Let ϵ_t denote the error terms (return residuals, with respect to a mean process), i.e. the series terms. These ϵ_t are split into a stochastic piece z_t and a time-dependent standard deviation σ_t characterizing the typical size of the terms so that $\epsilon_t = \sigma_t z_t$

The random variable z_t is a strong white noise process. The series σ_t^2 is modeled by

$$\sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \dots + \alpha_q \epsilon_{t-q}^2 = \alpha_0 + \sum_{i=1}^q \alpha_i \epsilon_{t-i}^2$$

where $\alpha_0 > 0$ and $\alpha_i \geq 0, i > 0$.

An ARCH(q) model can be estimated using ordinary least squares. A methodology to test for the lag length of ARCH errors using the Lagrange multiplier test was proposed by Engle (1982). This procedure is as follows:

1. Estimate the best fitting autoregressive model AR(q)

$$y_t = a_0 + a_1 y_{t-1} + \dots + a_q y_{t-q} + \epsilon_t = a_0 + \sum_{i=1}^q a_i y_{t-i} + \epsilon_t$$

2. Obtain the squares of the error $\hat{\epsilon}_t^2$ and regress them on a constant and q lagged values:

$$\hat{\epsilon}_t^2 = \hat{\alpha}_0 + \sum_{i=1}^q \hat{\alpha}_i \hat{\epsilon}_{t-i}^2$$

where q is the length of ARCH lags.

3. The null hypothesis is that, in the absence of ARCH components, we have $\alpha_i = 0$ for all $i = 1, \dots, q$. The alternative hypothesis is that, in the presence of ARCH components, at least one of the estimated α_i coefficients must be significant. In a sample of T residuals under the null hypothesis of no

ARCH errors, the test statistic $T'R^2$ follows χ^2 distribution with q degrees of freedom, where T' is the number of equations in the model which fits the residuals vs the lags (i.e. $T' = T - q$). If $T'R^2$ is greater than the Chi-square table value, we reject the null hypothesis and conclude there is an ARCH effect in the ARMA model. If $T'R^2$ is smaller than the Chi-square table value, we do not reject the null hypothesis.

GARCH (p, q) model specification

The lag length p of a GARCH(p, q) process is established in three steps:

1. Estimate the best fitting AR(q) model

$$y_t = a_0 + a_1 y_{t-1} + \dots + a_q y_{t-q} + \epsilon_t = a_0 + \sum_{i=1}^q a_i y_{t-i} + \epsilon_t$$

2. Compute and plot the autocorrelations of ϵ^2 by

$$\rho = \frac{\sum_{t=i+1}^T (\hat{\epsilon}_t^2 - \hat{\sigma}_t^2)(\hat{\epsilon}_{t-1}^2 - \hat{\sigma}_{t-1}^2)}{\sum_{t=1}^T (\hat{\epsilon}_t^2 - \hat{\sigma}_t^2)^2}$$

3. The asymptotic, that is for large samples, standard deviation of $\rho(i)$ is $1/\sqrt{T}$. Individual values that are larger than this indicate GARCH errors. To estimate the total number of lags, use the Ljung-Box test until the value of these are less than, say, 10% significant. The Ljung-Box Q-statistic follows χ^2 distribution with n degrees of freedom if the squared residuals ϵ_t^2 are uncorrelated. It is recommended to consider up to T/4 values of n . The null hypothesis states that there are no ARCH or GARCH errors. Rejecting the null thus means that such errors exist in the conditional variance.

TGARCH

The Threshold GARCH (TGARCH) model by Zakoian (1994) is similar to GJR GARCH. The specification is one on conditional standard deviation instead of conditional variance

$$\sigma_t = K + \delta \sigma_{t-1} + \alpha_1^+ \epsilon_{t-1}^+ + \alpha_1^- \epsilon_{t-1}^-$$

where $\epsilon_{t-1}^+ = \epsilon_{t-1}$ if $\epsilon_{t-1} > 0$, and $\epsilon_{t-1}^+ = 0$ if $\epsilon_{t-1} \leq 0$. Likewise, $\epsilon_{t-1}^- = \epsilon_{t-1}$ if $\epsilon_{t-1} \leq 0$, and $\epsilon_{t-1}^- = 0$ if $\epsilon_{t-1} > 0$.

EGARCH

The exponential generalized autoregressive conditional heteroskedastic (EGARCH) model by Nelson (1991) is another form of the GARCH model. Formally, an EGARCH(p,q):

$$\log \sigma_t^2 = \omega + \sum_{k=1}^q \beta_k g(Z_{t-k}) + \sum_{k=1}^p \alpha_k \log \sigma_{t-k}^2$$

where $g(Z_t) = \theta Z_t + \lambda(|Z_t| - E(|Z_t|))$, σ_t^2 is the conditional variance, $\omega, \beta, \alpha, \theta$ and λ are coefficients. Z_t may be a standard normal variable or come from a generalized error distribution. The formulation for $g(Z_t)$ allows the sign and the magnitude of Z_t to have separate effects on the volatility. This is particularly useful in an asset pricing context.

Since $\log \sigma_t^2$ may be negative there are no (fewer) restrictions on the parameters.

DATA ANALYSIS

1. To know the relationship between liquidity in country, banks and market returns.

TABLE 2

election years	liquidity in the country	liquidity with banks	Market returns	SD of nifty
2004	2.370134364	-45.84615385	14.63318569	503.58406
2009	3.232819978	-99.16881628	7.542664055	125.54896
2014	5.579447445	5.540092067	4.767704562	110.91224

Interpretation: The above table depicts picture of liquidity can market return during the election period. Liquidity in the country is observe to growing 2004, 2009, 2014 elections some during election period liquidity in the banks. It is observe to be negative 2004, 2009 but 2014 liquidity in the banks staid in positive. Market returns in all three elections period staid in positive with higher standard deviation.

TABLE 3

	LIB	LIC	NIFTY
LIB	1		
LIC	-0.969842	1	
NIFTY	0.0978999	-0.25429	1

Interpretation: The above analyses of bivariate correlation has been apply between liquidity of banks on the country. Along with the nifty returns the analyses, output reveals that liquidity in the country is having negative correlation with liquidity in the banks in nifty returns.

2009

TABLE 4

	LIB	LIC	NIFTY
LIB	1		
LIC	-0.91923	1	
NIFTY	-0.774942	0.93359	1

Interpretation: Liquidity in the banks is observed to negative correlation with liquidity in the country and nifty returns. According to bivariate correlation liquidity in the country is having correlation with nifty returns.

2014

TABLE 5

	LIB	LIC	NIFTY
LIB	1		
LIC	-0.084939	1	
NIFTY	0.30199	0.56184	1

Interpretation The above table bivariate correlation results indicate that nifty having positive correlation with liquidity in the bank and liquidity in the country.

2. To know the impact of liquidity of bank and liquidity in the country on nifty returns

TABLE 6

Pairwise Granger Causality Tests			
Sample: 1 18			
Null Hypothesis:	Obs	F-Statistic	Prob.
NIFTY does not Granger Cause LIC	16	0.22415	0.8028
LIC does not Granger Cause NIFTY		0.90421	0.4329
NIFTY does not Granger Cause LIB	16	2.89389	0.0978
LIB does not Granger Cause NIFTY		0.49199	0.6242

Interpretation: The above table of granger has been applied to measures to the influence the liquidity on equity market.

- The null hypothesis indicates the probability value $0.4329 > 0.05$. Hence null hypothesis is rejected, accepted the alternative hypothesis H1.
- Liquidity in the bank null hypothesis with nifty has been rejected the cost probability value is $0.6242 > 0.05$. Hence, H1 alternative hypothesis has been accepted.

INFERENCE:- Liquidity in the bank and liquidity in the country. Both variables are having influence on equity market returns.

3. To know the performance of the nifty during the election period.

TABLE 7

Years		Mkt returns	Risk		Market Sharpe	nifty returns
2004	sharpe	0.047008453	0.036840079	0.550789215	-0.30576917	0.000764202
2009	sharpe	0.002654931	-0.031609341	-0.062039924	-0.46551074	0.000899391
2014	sharpe	0.031433224	-0.140692741	-0.036916788	-0.332287959	0.000512181

Interpretation: The above table of performance measure to as been applied on nifty returns during the election period. According to sharpe methodology nifty performance is observed to be positive in all three election period and compare with the market performance.

FINDINGS OF THE STUDY

1. The study found that liquidity in the country is growing during the election period when its compare with non-election period.
2. Liquidity in the banks in the 2004 and 2009 staying negative but in the year 2014. The study observe that it has staying positive.
3. The present study bivariate a correlation result reveals that in the 2009 liquidity in the bank is negative correlation with nifty and liquidity in the country.
4. In the year 2014 election period nifty with positive correlation with liquidity in the country and with the bank.
5. This study observes that equity market branch mark nifty returns got influence liquidity in the country and liquidity with the bank.
6. The performance the market in three elections found that nifty return performance sufferer than the market performance.

CONCLUSION

In democracy country like India, elections place a vital role in financial market. The present study has been emphasize on three elections periods of 2004, 2009 and 2014. The bi-variate correlation indicates that there is an association between liquidity variable of liquidity in the bank and liquidity in the country with nifty returns, granger causality test has been applied and found that liquidity in the country and with the banks are influence the market indicator nifty. The Sharpe performance method role has been applied on three election and found that nifty is performance is well stronger than market returns performance.

LIMITATIONS

1. In the process of converting data stationary under ADF lag variable has been considered for 1 year period for all the past, pre and during the elections period for all the general elections period.
2. Only commercial bank deposits are considered for the study.

FURTHER RESEARCH

Liquidity in the bank and with the system data has been consider in RBI and found that the market influence by this two liquidity variable. Hence there is the further scope to do reserve in the area by consider various economic factors influence during the elections period.

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