



## THE ASSOCIATION BETWEEN CHANGES IN KEY RATES AND RATIOS OF RESERVE BANK OF INDIA AND STOCK RETURNS – AN ANALYTICAL STUDY WITH SPECIAL REFERENCE TO NSE

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### **Abstract**

*There have been numerous studies conducted by researchers on the Indian capital market efficiency. Most of the studies have attempted to study the Indian capital market in weak form and semi strong form of efficiency with various corporate announcements like stock split, buy back of shares, mergers and acquisitions etc. This paper has made an attempt to study the key rates and ratios of Reserve Bank of India on pricing of stocks with special reference to Automobile industry listed on NSE. The sample taken for the study includes 9 top companies based on market capitalisation in the automobile industry. Event study methodology using CAAR has been used to analyse the data. A 30 day event window around the announcement date and 244 days stock prices have been taken to find intercept, slope and standard error before the announcement date. At 5% level of significance, the study concludes that the Indian capital market is inefficient to changes in key rates and ratios of RBI.*

**Key words:** Capital market efficiency, CAAR t test

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## **Introduction**

The development of any country depends upon the existence of well developed capital market and its efficient functioning. This will in turn facilitate the flow of funds to more productive activities. The number of players in capital market including institutional investors has increased considerably in the past decade.

A capital market is said to be efficient with respect to an information item if the prices of securities fully impound the return of that stock. Several studies have empirically tested the reaction of security prices to the release of different information. Eugene Fama (1960) classifies the market efficiency into the following three categories depending on the information set that is fully reflected in the security prices.

- a. Weak Form of efficiency, popularly known as Random Walk Theory, is the category in which the current stock prices reflect all the information that is contained in the historical sequence of prices.
- b. Semi Strong Form of efficiency is the category in which current market prices not only reflect all information content of historical prices but also reflect all the Information, which is publicly available about the companies being studied.
- c. Strong Form of efficiency, is the category in which current market prices reflect all information whether it is publicly available or private information (insider's Information).

The capital markets play a vital role in any economy from allocation of capital and risk to policy making. If there is any single factor that makes a huge impact in improving the GDP of a country, it is the effective allocation of capital to the industry and the government. Capital markets are the best channel to route the savings into long term productive use. A developed and vibrant capital market will immensely contribute towards speedy economic growth and development.

### **Statement of problem**

The investors play a vital role in deciding the vibrancy of a capital market. Information





available regarding a stock or bond is the key to decide the pattern of investment. Efficiently market hypotheses assume that asset prices and returns are determined by the investors. Investors use the past information, analyse the relevant information to determine the prices of assets. Corporate event announcements add significant value to determine the value of a share.

The changes in the key ratios and rates of RBI affect not only the behaviour of businesses but also the capital market. Monetary policy instruments are used for affecting the liquidity in the system and also cost of borrowing. Also, one of the methods of valuing a company is to take the sum of all expected future cash flows from the company discounted back to the present. This price of a stock fluctuates as a result of difference expectations that investors have about the company at different times. To test the market efficiency an economic model of required prices/returns is required.

For investors, it is important to know the extent to which their stock market holdings are vulnerable to monetary policy shocks. For policymakers, it is crucial to understand how monetary policy affects the real economy through its influence on stock prices. This paper attempts to resolve the difficulties involved in understanding the effect of monetary policy on stock prices.

### **Objectives of the study**

1. To test the sensitivity of stock returns to changes in key rates and ratios of RBI.
2. To analyse the efficiency of such announcements on stock prices.

### **Review of literature**

#### **Efficient market hypothesis in International scenario**

Westfall Tara (2010) researched on Stock split announcement – A test of market efficiency for the period January 2007 to January 2008. The sample for the study consisted of 30 randomly selected two for one split announcements for the above period on NYSE and NASDAQ. Standard risk adjusted event study methodology was employed. Regression analysis was performed using actual daily return of each company (dependent variable) and the corresponding S&P 500 daily return (independent



variable) over the pre event period to obtain intercept alpha and the standardised coefficient beta. To get normal expected returns, risk adjusted method (Market model) was used. Excess returns were calculated by taking the difference in actual return and expected return. Paired t test was employed for difference in actual daily average return and expected daily average return. The study found that there is positive market reaction prior to firm's announcements of regular two for one stock splits. Results also support efficient market theory at semi strong form level as documented by FAMA (1970). T test of AER and CAER both tested difference from zero that is there exists positive market reaction prior to firm's announcements of regular two for one stock splits. Richard and Dan Li (2010) studied price discovery in municipal bonds, an important OTC market. As in markets for consumer goods, prices “rise faster than they fall.” Round-trip profits to dealers on retail trades increase in rising markets but do not decrease in falling markets. Further, effective half-spreads increase or decrease more when movements in fundamentals favor dealers. Yield spreads relative to Treasuries also adjust with asymmetric speed in rising and falling markets. They concluded that intraday price dispersion is asymmetric in rising and falling markets, as consumer search theory would predict. Jack Bao and wand (2011) examined the illiquidity of corporate bonds and its asset-pricing implications and show that the illiquidity in corporate bonds is substantial, significantly greater than what can be explained by bid–ask spreads. In aggregate, changes in market-level illiquidity explain a substantial part of the time variation in yield spreads of high-rated (AAA through A) bonds, overshadowing the credit risk component. In the cross-section, the bond-level illiquidity measure explains individual bond yield spreads with large economic significance. Short horizon return predictability is used to examine whether the PEAD is directly associated with market efficiency. They confirm the significance of the market efficiency variable and find that market efficiency dominates the other variables.

### **Efficient market hypothesis in Indian scenario**

Raja. M & Sudhahar Clement (2010) made a study on Empirical test of Indian Stock Market of efficiency in respect of bonus announcement. The sample consisted of all IT companies listed in BSE (list A and B1) for the period 2000 to 2007. He employed daily





returns, security returns variability (SRV), Average security returns variability (ASRV), average abnormal returns (AAR), cumulative abnormal returns (CAR); these were considered and t test was tested. His findings were that security prices reacted on announcements for bonus issue and Indian market for IT sector in general are efficient but not perfectly efficient to the announcement for bonus issue. Alpana in 2011 attempted to investigate weak form efficiency of Indian foreign exchange market by employing parametric tests like Ljung box test, unit root test, Lo markinlay variance ratio and Chow Denning multiple variance ratio test and non parametric tests like weight's rank and sign test to conclude that there is randomness in GBP, AUD, NZD and JPY in Indian market.

### **Monetary policy and efficiency of capital market in Indian and International scenario**

Tripathy Naliniprava (2011) investigated the market efficiency and causal relationship between selected Macroeconomic variables and the Indian stock market during the period January 2005 to February 2011 by using Ljung-Box Q test, Breusch-Godfrey LM test, Unit Root test and Granger Causality test. The study confirms the presence of autocorrelation in the Indian stock market and macro economic variables which implies that the market fell into form of Efficient Market Hypothesis. Further the Granger-causality test shows evidence of bidirectional relationship between interest rate and stock market, exchange rate and stock market, international stock market and BSE volume, exchange rate and BSE volume. So it suggests that any change of exchange rate, interest rate and international market significantly influence the stock market in the economy and vice versa. The study also reported unidirectional causality running from international stock market to domestic stock market, interest rate, exchange rate and inflation rate, indicating sizeable influence in the stock market movement in the considered period. The study points out that the Indian stock market is sensitive towards changing behaviour of international market, exchange rate and interest rate in the economy and they can be used to predict stock market price fluctuations.

#### **Scope of the study**

The present study limits to the efficiency of stock returns of Automobile industry during a short term for companies listed on NSE for the changes in the key ratios announced by RBI.



## Methodology

**Sample** The companies selected for this study are those which form part of National stock exchange (NSE). Since the objective of the study is to study if key ratios announced by RBI have an impact on share prices, top Automobiles and Auto ancillaries companies have been chosen. Market capitalisation is taken as a base to choose the top 9 companies under the industry as given under Shine.com.

**Data** The data on the key ratios were obtained from RBI website under the head statistics on Indian Economy. The key date for the study is taken as 18<sup>th</sup> July 2013 on which there has been a change in Bank rate, policy repo rate, reverses repo rate, Marginal Standing facility rate and base rate. The daily closing prices from 15/6/2012 to 2/9/2013 of the selected companies and NIFTY Auto are taken from NSE website. 244 days daily closing prices have been considered to calculate alpha and beta of the model.

Methodology Event study methodology has been used to assess the average returns (AR), Average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) around the event date. Average abnormal returns and CAAR were computed for 60 days surrounding (30 days before and 30 days after) the event date. To examine the stock prices reactions to changes in the key ratios as announced by RBI, expected returns, ARs, AARs and CAARs are computed. A 30 day window has been selected around 18th July 2013 i.e. 6th June 2013 to 2<sup>nd</sup> September 2013.

The market model adopted for the study is

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + e_{it}$$

For  $E(R_{it})$  = Expected return on share during the time period 't',  $\alpha_i$  = Intercept of a straight line or alpha coefficient of ith security,  $\beta_i$  = Slope of a straight line or beta coefficient of ith security,  $R_{mt}$  = Expected return on index (nifty auto) during period t, and  $e_{it}$  = Error term with mean zero and standard deviation which is a constant during time period 't'.

## Analysis based on results of the model

The results of this study are given in table 1. The AAR shows the average deviation of the returns of the ith stock from their normal returns with the market index i.e. nifty auto. The CAAR is the cumulative deviations of the securities returns from their normal relationship with the market over the period surrounding the event date (from -30<sup>th</sup> day to +29<sup>th</sup> day). This shows the cumulative effects of the residuals of all stocks.





**Table 1**  
**AAR t test**

Automobile industry	E r	AR	AAR	AR t test	Null Hypotheses
Eicher Motors Ltd	0.003205	-0.00094	-0.05356	-2.99309	Accepted
Accel Frontline Ltd	-0.000472	-0.05204	-0.00133	-0.04636	Accepted
Amara Raja Batteries Ltd	-1.55E-05	-0.00541	0.024862	0.623543	Accepted
Automotive Axiles Ltd	-0.002229	0.021691	0.031037	1.727824	Accepted
Bosch Ltd	0.000569	0.002761	0.03107	3.504771	Accepted
DIC India Ltd	-0.000936	0.018363	0.015426	1.086516	Accepted
Gabriel India Ltd	-0.001371	-0.0175	-0.14361	-3.5173	Accepted
HMT ltd	0.001075	-0.00626	0.007678	0.259169	Accepted
Hindustan Motors Ltd	0.001499	0.001499	0.104793	2.986871	Accepted

**Footnote: E r = Expected returns, AR = Abnormal returns, AAR = Average abnormal returns**

H0 : There is no significant difference between stock returns before and after announcement of changes in key ratios of RBI.

H1 : There is significant difference between stock returns before and after announcement of changes in key ratios of RBI. The critical value for t test at 9 degrees of freedom @ 5% level of significance is 3.690. From observing the above table it is seen that the null hypothesis is accepted for all companies.

### Summary and Conclusion

From the analysis it can be seen that the companies calculated t value is within the table value 3.690. Therefore the null hypothesis is accepted. It can be concluded that the announcement of change in the key ratios of RBI during July 2013 has not made any significant difference in the stock returns of the Automobile Industry.

The analysis also shows that the number of days on which negative returns are earned is more than the number of days on which positive returns are recorded. The trend of negative returns pronounced after the event date is more significant than the positive returns. Therefore the market is inefficient to announcement of monetary policy made by RBI in the short term.



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