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Market Efficiency of Indian Stock Market: A Study of Announcement of Stock Split, Bonus and Rights in BSE Market

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Abstract: Efficiency of stock markets is an essential characteristic to provide fair investment opportunities to all class of investors. It suggests that no investor shall be able to make abnormal gains using any information or by way of analysis. Weakly efficient markets showcase randomness in movement of prices. Both BSE and NSE are reliable and can be considered to check the efficiency of Indian stock markets. But, BSE SENSEX being an older index facilitates better availability of data and a comparison of efficiency over the past two decades. In this modern technological era, the researcher has mainly focused on market efficiency of Indian Stock market from the announcement of stock split, bonus and rights issued by the corporate companies in BSE market. For this purpose, data has been collected from BSE from the period of January 2016 to December 2016. In order to find the efficiency of stock market, descriptive statistics have been used like mean, median, maximum, minimum, skewness, kurtosis and Jarque-Bera test for every announcement of stock split, bonus and rights issues. Further, GARCH(1,1) model also used for examining the volatility of the market. The results showed the bonus and rights issues were normally distributed and stock split was not normally distributed during the study period. The impact of past volatility on the current announcements have indicating that volatility shocks are quite persistent and takes longer time to dissipate.

Keywords: Market efficiency; Indian Stock Market; Stock Split; Bonus; Rights

I. Introduction

The Government's economic policy might provide support or restrain an industry's development. For example, it can impose restrictive import quotas and/or tariffs, increase/decrease customs duty, favorable or unfavorable tax legislations, etc., which may substantially lessen or improve the profits of a particular industry [1]. The movement of share price is unpredictable in any economy. In some studies micro economic variables like dividend per share, earning per share and book value per share have got importance in others macro variables like bank rate of interest, union budget, inflation rate and foreign currency have been highlighted. Hence annual budget is one such event which may have impact on stock market [2].

The Union Budget of India also referred to as the Annual financial statement in the Article 112 of the Constitution of India, is the annual budget of the Republic of India. It is presented each year on the last working day of February by the Finance Minister of India in Parliament. The budget, which is presented by means of the financial bill and the Appropriation bill, has to be passed by the Houses before it can come into effect on April 1, the start of India's financial year. Does this publicly available information affect the security prices in the manner predicted by the Budget analysts? What is the speed of adjustment of security prices to Budget announcements? These are the questions which are investigated in this study. The efficient-market hypothesis (EMH) states that it is not possible for an investor to outperform the market because all available information is already built into all stock prices. Investors who agree with this statement tend to buy index funds that track the overall market performance. There are three major versions of the hypothesis, namely, "weak", "semi-strong", and "strong". The semi-strong form of the EMH claims both that prices reflect all publicly available information and that prices instantly change to reflect new public information [3].

II. Review of Literature

Studies in other countries of the world have suggested distinct levels of efficiency of markets. Reference [4] used the variance test ratio and evidenced the weak form of efficiency for Budapest stock exchange. Reference [5] concluded the same for Hong Kong Stock. On similar grounds, Reference [6] also studied the weak form of efficiency for Chinese, Hong Kong and Singapore Stock market. The study used the variance test ratio and summarized that Hong Kong Stock market holds the weak form of efficiency and the Singapore stock market does not possess the traits of random walk and Chinese stock market showed variability in results. Class A shares hold the random walk hypothesis but this is not true for class B shares. Reference [7] examined the random walk

hypothesis for Indian stock markets using the conditional variance and GARCH model. He concluded that Indian stock market is not efficient in respect to weak form of efficiency. Reference [8] tested the randomness of Istanbul stock exchange using autocorrelation and runs test and found that the Istanbul stock exchange does not exhibit weak form of market efficiency. Reference [9] found that in the short run New York stock exchange is weak form efficient. The study also tested the Business cycle and relation between volumes and prices. Both were found to be statistically insignificant. Reference [10] tried to explore the impact of budget on stock market volatility and analyses how returns vary with it. The main aim is to help investors gain knowledge about volatility present in different months, thereby they can invest cautiously. The study found that the values of co-efficient of variation and standard deviation pertaining to the market capitalization of NSE are slightly more volatile when compared to BSE. Reference [11] investigated cash dividend announcement effect of the stocks traded in the Dhaka Stock Exchange from 2006 to 2010. It was found that in 2006, 2007 and 2009 market has reacted over the announcement in the event date. Some sectors like Food & Auxiliary, Fuel and Miscellaneous have impacted the market both in the event and post event date across the years considered.

III. Methodological Framework

In order to examine the market efficiency of Indian stock market through various announcements of the BSE 100 companies on its stock prices, the researcher has collected January 2016 to December 2016 daily sector wise stock prices of BSE 100 companies. In this regards event study methodology has employed. The event study methodology is well accepted and has been used in a variety of research such as examine return variances trading volume. Event studies also serve an important purpose in capital market research as a way of testing market efficiency. Systematically nonzero abnormal security returns that persist after a particular type of corporate event are inconsistent with market efficiency. Accordingly, event studies focusing on long- horizons following an event can provide key evidence on market efficiency [12]. The present study is based on secondary data relating to share prices, stock split, bonus and rights announcement dates and the value of index around these days. The data were obtained from the website of BSE. Additional information was obtained from Bombay Stock Exchange Official Directory and the BSE website. Extensive use of books, journals and magazines were made for collecting required background information.

IV. Results and Discussion

A. Descriptive Statistics of Daily Returns of Split, Bonus and Rights

A summary of descriptive statistics of returns series of Stock Split, Bonus issue and Rights issue of a year from January 2016 to December 2016 is presented in Table 1. Mean, maximum, minimum, standard deviation, skewness and kurtosis have been used and discussed in the following table. In order to find the normality of the data, Jarque-Bera test also employed with the support of following hypothesis testing.

Null Hypothesis (H₀): The data is normally distributed for Stock Split, Bonus Issues and Rights Issue during the study period.

Table 1 Descriptive Statistics of Daily Returns of Split, Bonus and Rights

Tools	Stock Split	Bonus Issue	Rights Issue
Mean	-0.018	0.075	0.201
Median	0.222	0.090	0.347
Maximum	0.840	1.208	2.197
Minimum	-5.753	-0.976	-1.539
Std. Dev.	1.202	0.487	0.834
Skewness	-4.043	-0.019	-0.182
Kurtosis	19.969	3.127	2.996
Jarque-Bera	412.218	0.020	0.154
'p' Value	0.000*	0.990 ^{NS}	0.926 ^{NS}

Note: * - Significant at 1% level; ** - Significant at 5% level; NS – Not Significant

The Table 1 shows that during the study period from January 2016 to December 2016, Bonus Issue and Rights Issue showed sign of positive average daily returns and Stock Split showed sign of negative average daily returns. The highest average daily return was shown by Rights Issue which has 0.201%, followed by Bonus Issue with 0.075% and the lowest return was of Stock Split with -0.018%. As far as, volatility was concerned the standard deviation of Stock Split was highest at 1.202%, thereafter Rights Issue with standard deviation of 0.834% and the lowest volatility was present in Bonus Issue with 0.487%. It can be seen that Stock Split has lower return as well as more volatile as compared to Bonus Issue and Rights Issue with high return and less volatile.

The coefficient of the skewness was found to be significant with negative for Stock Split and coefficients of the skewness for Bonus Issue and Rights Issue were found to be not significant with negative. The negative skewness implies that the return distributions of the shares traded in the market during the study period have a higher probability of earning returns greater than the mean.

Similarly, the coefficients of kurtosis were found to be positive and were significantly higher than 3 except Rights Issue which was normal distribution as 3, indicating highly leptokurtic distribution compared to the normal

distribution. That means Stock split and Bonus issues were having more risky to investment during the study period than Rights issues. The Jarque-Bera test statistic was indicated that the null hypothesis is accepted for Bonus Issue and Rights issue and rejected in Stock split. So, it is noted that data in Bonus issues and rights issues were normally distributed and Stock Split was not normally distributed.

B. GARCH (1,1) Model

The table 2 reports the results of GARCH (1,1) model for the return series of Stock Split, Bonus Issue and Rights Issue for the period of one year from January 2016 to December 2016. ' ω ' represents variance equation coefficients of constant, ' α ' represents ARCH coefficient and ' β ' represents GARCH (1,1) coefficient.

Table 2 Results of GARCH (1,1) Model

Variable	Stock Split	Bonus Issue	Rights Issue
ω	-0.001262 ^{NS}	0.028061 ^{NS}	0.106601 ^{NS}
α	-1.158276*	-1.032481*	-1.015547*
β	-0.360088*	-0.342099*	-0.355615*
R-squared	0.598292	0.698078	0.674482
Adjusted R-squared	0.558121	0.685498	0.660918
Log Likelihood	-2.215117	0.974311	-17.13253
Akaike info criterion	1.202520	0.309668	1.702502
Schwarz criterion	1.404564	0.551610	1.944444
Durbin-Watson stat	0.269395	0.592608	0.564010

Note : *-Significant at 1% level; ** - Significant at 5% level; NS-Not Significant

The table 2 showed that in the variance equation, the first three coefficients ω (constant), ARCH term (α) was -1.158276 and GARCH term (β) was -0.360088 for Stock Split; ω (constant), ARCH term (α) was -1.032481 and GARCH term (β) was -0.342099 for Bonus Issue and ω (constant), ARCH term (α) was -1.015547 and GARCH term (β) was -0.355615 for Rights Issue. For the GARCH (1,1) model all three coefficients were statistically significant and exhibited the expected sign. The value of α and β indicated that, news about volatility from the previous periods have not an explanatory power on current volatility. The sum of the two estimated ARCH and GARCH coefficients; $\alpha + \beta$ (persistence coefficients) in the GARCH (1,1) was -1.2902, very close to one which was required to have a mean reverting variance process, indicating that volatility shocks are quite persistent and takes longer time to dissipate. It is an indication of a covariance stationary model with a high degree of persistence. The impact of past volatility on the current volatility in comparison to impact of past shocks on the conditional volatility in equity market in India and even the impact of news has reduced in most recent years.

V. Findings and Conclusion

- It could be found from the analysis that Stock Split has lower return as well as more volatile as compared to Bonus Issue and Rights Issue with high return and less volatile.
- Except rights issue, stock split and bonus issue has highly leptokurtic distribution. It indicates Stock split and Bonus issues were having more risky to investment during the study period than Rights issues.
- From the GARCH coefficients, it indicates volatility shocks are quite persistent and takes longer time to dissipate. The impact of past volatility on the current announcements have indicating that volatility shocks are quite persistent and takes longer time to dissipate.
- The overall results suggest that Indian stock market holds for weak form of efficiency and the prices in the stock market move in a random fashion. This implies that the theory of technical analysis does not hold and any investor cannot make abnormal gains using the patterns predicted by past prices.
- Efficiency of weak form also suggests that Indian stock markets are open for retail investors who cannot keep a constant watch of prices and perform tedious analysis. However, accepting BSE as an indicator of Indian stock markets, it can be concluded that Indian stock market holds for the weak form of efficiency and prices move in random walk.

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