

## **Testing Of Efficient Market Hypothesis : A Study On Semi -Strong Form Efficiency Of Indian Stock Market**

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**ABSTRACT:** The main objectives of the present study is to examining semi- strong form efficiency of Indian stocks market by studying the effect of corporate information release on the price and trading volume of shares in the stock market. In an efficient market, when new piece of information is added to the market its impact will instantaneously reflected in the share price . So there is no scope for earning abnormal return based on new piece of information. Event study is used to measure the effect of an economics event on the value of firm. Here the semi strong form efficiency of the stock market is tested by analyzing the impact of corporate event announcement like bonus issue and stock split on the value of the firm. From the study it is found that the abnormal return is statistically insignificant and Indian capital market is efficient in semi- strong form.

**KEY WORDS:** Semi strong form, Average abnormal return (AAR) Cumulative average abnormal return (CAAR).

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### **I INTRODUCTION**

An efficient capital market is one in which securities price fully impounded the return implication of that item. In an efficient market securities price fully reflect all available information about the past. When a new piece of information is added to the market its impact will be instantaneously incorporate in share price and so no one can earn abnormal return based on that information. There are number of factors like technical factors, fundamental factors can cause change in the return of securities. A study on these factors and its impact on share price have generate considerable interest among all stake holders in the market . The present study examine semi strong form market efficiency of Indian stock market by taking cooperate earning announcement as a yard stick. According to EMH when an earning announcement are publicly announced, the share price immediately reflect this information, therefore we use quarterly earning announcement as an event to test semi strong form efficiency of Indian stock market. Here the research analyze the impact of stock split and bonus issue on equity price by using event study analysis.

### **II STATEMENT OF THE PROBLEM**

Most share holders in the capital market are interested to know the impact of cooperate announcement like quarterly earnings announcement , bonus issues, right issue, stock split, merger, buy back of share and its impact on security price and if there is any scope to earn abnormal return by using such surprise information. Researchers around the world have try to find out answer to this question . According to EMH, stock price is fully reflect all the available information in efficient way. Through the study researcher measure the variability of security price consequent upon the release of corporate information regarding bonus issue and stock split. Event methodology has been used to measure the reaction of stock price to these public announcement.

Bonus issue simply means the distribution of additional stocks made to existing share holders in proportion to their current investment. Bonus issue date is known to all well in advance therefore it doesn't contain no new information. So we can't expect any major price reaction incorporated with bonus announcement. While stock split company divides its existing shares into multiple shares to boost the liquidity of shares. Through stock split every share holder get additional stock without paying to the issuing company. The announcement about stock split does not contain any information to affect stock price in a way that lead to abnormal positive return, even if there is any information content associated with announcement of stock split it should be reflected in the form of abnormal return on the announcement day itself.

According to EMH stock split and bonus announcement should not show any abnormal return on or during either announcement date or execution date. But lot of studies in US and European stock market shows

that stock split and bonus announcement lead to abnormal positive return on and around announcement date .So the present study analyze whether abnormal return is associated with stock split and bonus issue.

### **III LITERATURE REVIEW**

1) Remya Ramachandran (2013) conducted a study to test semi strong form efficiency of Indian stock market. Event study analysis is used to measure impact of corporate announcement (such as stock split and bonus announcement) on firms stock price and trading volume. Companies which announce stocks split and bonus announcement from 1<sup>st</sup> APRIL 2004 TO 2009 31<sup>st</sup> march is taken for the study.It is concluded that information release of dividend, bonus issue and stock split does not influence the security return. So the investors cannot abnormal return based on the release of corporate information and Indian stock market is efficient in semi strong form.

2) Koustuba Kanti Ray(2011) through his study examine the semi strong form market efficiency in Indian stock market by using event study approach. The event considered in his paper are bonus issue and stock split that took place in the market from 1996 to 2008. The result suggest that the Indian stock market react to stock split announcement but not to bonus issue and the change liquidity is significant for stock split at 1% significance level, where as with 5% level of significance both bonus issue and stock shows change in liquidity from pre to post event period.

3) M Raja (2010) in his study empirically examined the information efficiency of capital market with regard to bonus issue announcement are leased by the IT companies. The result of the study showed that there is a positive reaction of security price to bonus announcement in the Indian capital market for the IT sector in general are efficient, but not perfectly efficient to bonus issue. This information inefficiency can be used by the investors for making abnormal return at any point of announcement period.

4) N.Kannan and malathi Srivasan (2007) suggest that there was no evidence to semi strong form of EMH .The magnitude and direction of abnormal return surrounding event various across stocks indicate that company specific and event specific factor might lead to situation of negligible abnormal return surrounding events and validating EMH. The concept of normal return should be widened to factor premium for as many risks as identifiable perhaps this might lead to a situation of negligible abnormal return surrounding event and validity EMH.

5) Lukose Jijo Narayana (2002) examined the reaction of stock split announcement on share price around the date of announcement of stock splits and ex-split date. From the study it was found that on the date of announcement there was abnormal return of 5.25 percent and on day +1 ,2.42 percent .The result of the abnormal return around the ex split day shows that much of the abnormal returns take place on day 0(3.68%) and day +1 (2.04%).

### **IV OBJECTIVES OF THE STUDY**

- To study the security price reaction to corporate information release.
- To empirically test the validity of efficient market hypothesis in semi strong form in Indian stock market.

#### **Hypothesis of the study**

H0: The abnormal return is not statistically significant ie market is efficient in semi strong form.

H1: The abnormal return is statistically significant ie capital market is not efficient in semi strong form

#### **Limitation of the study**

- Findings are applicable in the situation in which prevail during the study period.
- Only two events (such as stock split and bonus issue) was taken for the event analysis and also the event study does not consider factors such as inflation, interest rate etc which would have the effect on the stock price.

### **V METHODOLOGY**

Stock split and bonus issue are purely cosmetics events .How ever many studies over the world shows that stock market effects are widely associated with bonus issue and stock split. Through this study we measure the impact of stock split and bonus issue on share price. Event analysis technique is used to measure how quickly these events are reflected in assets price. Events window measure if there is any evidence of abnormal return behaviour in the stock market.The 121 days surrounding the announcement of earning s(ie t=-60,.....0,.....+60) is design as event period .-60,-59,-58.....-1 as the 60 days prior to the event,0 as the event day and +1,+2,+3.....+60 as the 60 days after the event.The analysis for each event is conducted separately.one year period data is collected for the study .

In the present study to examine the information flow in the equity price, we compute the expected return (ER) abnormal return(AR) and average abnormal return (AAR) and cumulative abnormal return

(CAAR) on the event day over 60 days before and 60 days after the event day. Further AAR is statistically tested by using t test. The market model of Sharpe is used to measure the return on stock.

**Risk-Return and Sharp Model**

The return of each security is represented by the following equation:

$$R_i = \alpha_i + \beta_i R_m + e_i$$

Here,

$R_i$  = Excess return on security

$\alpha_i$  = Intercept of straight line or Alpha coefficient

$R_m$  = Expected return on market

$e_i$  = Random error or error term which mean of zero and S.D which is constant

$\beta_i$  = Beta of Shares

The mean value of  $e_i$  is zero and hence the equation becomes

$$R_i = \alpha_i + \beta_i R_m$$

The equation has the two coefficients or terms. The alpha value is the value of  $R_i$  in the equation when the value of  $R_m$  is zero, in other words it is part of return which is realized from the security even if the market return is zero. This is the non market (unsystematic) component of security's return. The beta coefficient is the slope of the regression line and it measures the sensitivity of the stock's return to the movement in the market's return. This is the systematic component of the security's return.

**BETA VALUE**

Beta is the slope of the characteristic regression line. Beta describes the relationship between the stock's return and the index returns. The systematic risk of a security is measured by a statistical measure called Beta. This can be positive or negative. If Beta is one, one percent changes in the market index return causes exactly one percent changes in the stock return. It indicates that the stock moves in tandem with the market. If the portfolio is efficient, the Beta measures the systematic risk effectively .

$$\beta = \frac{N \sum XY - \sum X \sum Y}{N \sum X^2 - (\sum X)^2}$$

N = Number of items

X = Market return (Independent Variable)

Y = Stock return (Dependent Variable)

Y =  $\frac{\text{Today's stock price} - \text{Yesterday's stock price}}{\text{Yesterday's stock price}} \times 100$

**ALPHA VALUE**

The intercept of the characteristic regression line is Alpha . It indicates that the stock return is independent of the market return. A positive value of alpha is a healthy sign. Positive alpha values would yield profitable return. According to portfolio theory, in a well-diversified portfolio the average value of alpha of all stocks turns out to be zero. The alpha is calculated using the following equation.

$$\alpha_i = R_i - (\beta_i \times R_m)$$

Where,

$R_i$  = Average return of stock

$\beta_i$  = Beta value of stock  $R_m$  = Return of the market

**T-TEST:**

T- test is performed to test the significance of abnormal return. For applying t-test in context of small samples the t value is calculated first of all and then compared with the table value of t at certain level of significance for given degrees of freedom. If the calculated value of t exceeds the table value (say  $t_{0.05}$ ) we infer that the difference is significant at 5% level but if it is less than the concerning table value of the t, the difference is not treated as significant.

The formula for t test:

$$t = \frac{\bar{x} - \mu}{S.E}$$

$\bar{x}$  = Mean of the sample

$\mu$  = Mean of the universe

S.E = Standard Error, it is (Standard Deviation/ $\sqrt{\text{Total No.}}$ )

The formula for calculating abnormal return is:-

$$AR = R_{it} - E(R_{it})$$

$R_{it}$  = Actual Return

AAR is the deviation of actual return of a security from the expected return. The computed AAR is accumulated over a long period to find out cumulative average abnormal return (CAAR). **Sample design**

Companies that announce stock split or bonus issue for the last 5 years were taken from a current constituents of S&PCNX 500. The reason for selecting the S&PCNX500 is that it is the India first broad based bench mark of Indian capital Market . While collecting data Some stocks are excluded due to following reason:

- 1) Companies for which bonus issue coincide with other events such as right issue, merger etc.
- 2) Companies for which announcement date is not available with accurately.
- 3) Companies for which trading data either on price or volume is not available for entire or significant period of events window.

Days	Average Abnormal Return	Cumulative Abnormal Return	Days	Average Abnormal Return	Cumulative Abnormal Return
-60	0.411385	0.411384512	1	-2.218677458	-52.71735549
-59	1.837458	2.248842906	2	-2.136686434	-54.85404192
-58	0.335544	2.584386704	3	-1.142818093	-55.99686002
-57	0.35621	2.940596651	4	-0.032929722	-56.02978974

After implementing such criteria 10 companies constituted as sample for the study.

-56	1.41586	4.35645655	5	-1.195893465	-57.2256832
-55	1.600682	5.957138552	6	-1.996563391	-59.2222466
-54	-1.0182	4.938939561	7	-1.306214021	-60.52846062
-53	3.563542	8.502481468	8	-1.293482539	-61.82194316
-52	1.068001	9.570481992	9	0.335392303	-61.48655085
-51	1.209474	10.77995582	10	0.403715539	-61.08283531
-50	-1.37087	9.409084974	11	-0.319807406	-61.40264272
-49	-0.58549	8.823592266	12	-0.240328393	-61.64297111
-48	-1.12412	7.699472896	13	0.666510064	-60.97646105
-47	0.81102	8.510492415	14	-0.756177675	-61.73263872
-46	0.085435	8.595926925	15	0.398229966	-61.33440876
-45	0.878281	9.47420795	16	-0.865268871	-62.19967763
-44	-0.74724	8.726964253	17	0.175876942	-62.02380069
-43	-1.04734	7.679619769	18	0.018707541	-62.00509315
-42	0.392706	8.072325623	19	-1.146571061	-63.15166421
-41	-0.695	7.377330493	20	0.481089973	-62.67057423
-40	0.385584	7.762914326	21	-0.007091988	-62.67766622
-39	-1.3636	6.399314575	22	-0.707856595	-63.38552282
-38	-2.1939	4.205413596	23	-0.592240797	-63.97776361
-37	0.250318	4.455731551	24	0.423208854	-63.55455476
-36	-0.38698	4.068753399	25	0.932803904	-62.62175086
-35	1.483866	5.552619414	26	-0.175913055	-62.79766391
-34	-0.64777	4.904844904	27	1.732822504	-61.06484141
-33	0.679393	5.584237987	28	-0.971785509	-62.03662692
-32	-0.56027	5.023972725	29	-0.219885376	-62.25651229
-31	0.360223	5.38419586	30	0.724545616	-61.53196668
-30	0.820192	6.204387414	31	0.512409803	-61.01955687
-29	-0.204	6.00038275	32	-1.857079876	-62.87663675
-28	0.25022	6.250603043	33	-1.005665316	-63.88230206
-27	1.402484	7.653087101	34	0.462238271	-63.42006379
-26	-0.94894	6.70414934	35	1.146776955	-62.27328684
-25	-0.39934	6.304809181	36	-2.308613372	-64.58190021
-24	0.534231	6.839039985	37	0.725480268	-63.85641994
-23	0.120908	6.95994816	38	-1.167640995	-65.02406094
-22	-0.75919	6.20075982	39	0.058680111	-64.96538083
-21	1.935161	8.135921238	40	-0.206736651	-65.17211748
-20	0.363333	8.499254528	41	0.370298394	-64.80181908
-19	0.524333	9.023587936	42	1.192546329	-63.60927276

-18	0.672515	9.696102481	43	-0.489461609	-64.09873436
-17	0.246186	9.942288293	44	0.05565217	-64.04308219
-16	0.751551	10.69383957	45	-1.172360776	-65.21544297
-15	0.347893	11.0417329	46	-0.087955103	-65.30339807
-14	1.084412	12.12614479	47	0.416694942	-64.88670313
-13	0.780187	12.90633132	48	-1.506582872	-66.393286
-12	-0.66845	12.2378819	49	0.473777038	-65.91950897
-11	-1.1116	11.12627931	50	-0.269338561	-66.18884753
-10	-0.25392	10.87235767	51	-0.395538567	-66.58438609
-9	0.677747	11.55010507	52	2.002721189	-64.58166491
-8	0.627067	12.17717172	53	0.912928815	-63.66873609
-7	-0.25103	11.92614577	54	0.246798024	-63.42193807
-6	-0.24515	11.6809944	55	-0.618413382	-64.04035145
-5	-0.52455	11.15644284	56	-1.082349251	-65.1227007
-4	0.150089	11.30653188	57	-0.532217152	-65.65491785
-3	0.382003	11.68853521	58	0.000764485	-65.65415337
-2	-0.84229	10.84624566	59	-0.329937383	-65.98409075
-1	-61.4485	-50.60222579	60	-0.511396484	-66.49548723
0th day(event day)	0.103548	-50.49867803			

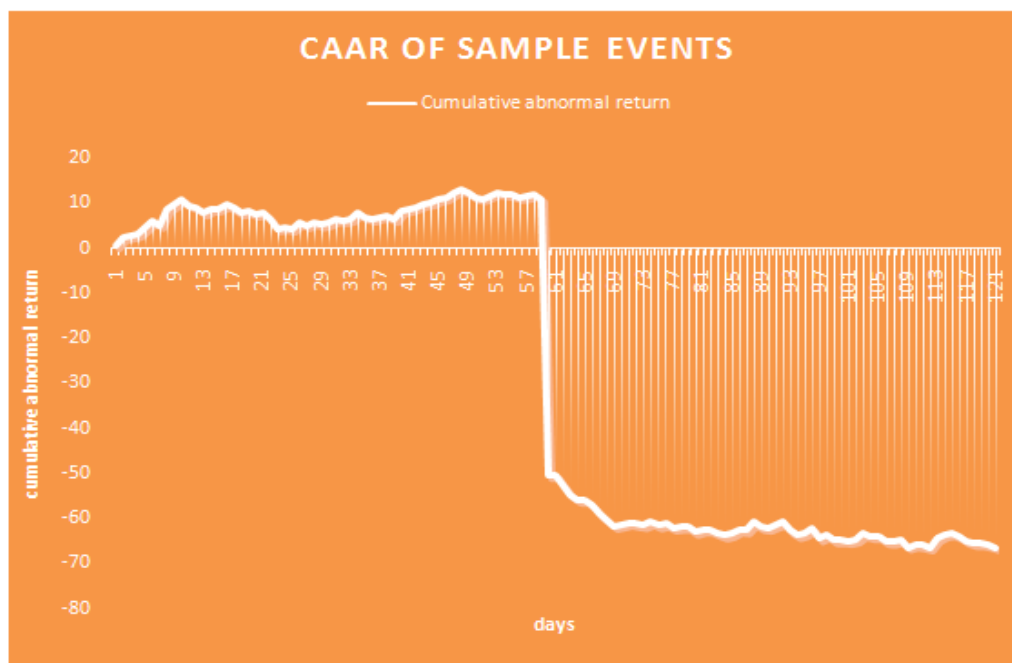
**Table1: Showing The Average Abnormal Return And Cumulative Abnormal Return Of Sample Companies**

**VI FINDINGS OF THE STUDY**

The present study analyse whether Indian stock market is efficient in semi strong form and empirically test the reaction stock price to corporate earning information ( such as stock splitand bonus issue) .Event analysis and t test are performed to measure the semi strong form market efficiency of Indian stock market . An event study was conducted using a60 days event window. It was found that stock showing positive abnormal return on the 9 th day itself. on the announcement day there is negative cumulative abnormal return of - 50.602259 is expressed .The AAR for day t1(-2.21% ) ,t2(-2.21%)t3 (-1.142%) t4 (-0.033) t5 (-1.96),all these shows negative returns .In general the AAR and CAAR is found to be in accordance the expectation of the general Market.

POPULATION MEAN ( $\mu$ )	SAMPLE MEAN $\bar{X}$	STANDARD DEVIATION $\sigma$	NO. OF OBSERVATIONS N	DEGREE OF FREEDOM (N-1)	STANDARD ERROR (SE) $\frac{\sigma}{\sqrt{N}}$	t value $\frac{\bar{X} - \mu}{SE}$	Table Value At $\alpha=0.05$
0	-0.5495	5.6673	121	120	0.5152	-1.006	1.978

Table Showing Result of t Test



From the above table shows that the calculated value of the  $t$  is less than the table value of the  $t$ , so  $H_0$  is accepted. From the study it is inferred that the information release of the stock split and bonus issue do not influence in the security return in any significant way and the market react to stable manner on an average. So investors cannot earn abnormal return by using such cooperative information. Therefore the present study support null hypothesis that Indian stock market efficient in semi strong form.

## VII CONCLUSION

The present study was under taken to test whether Indian stock market is efficient in semi strong form. The analysis reveals that the information release of stock split and bonus issue do not influence securing price in any significant manner. The result of ARR and CAAR indicate that the investors would not able to earn abnormal return by analyzing the quarterly learning announcement. The study concluded that the market correct the price downward after the initial period of trading around the eventdays. By accepting null hypothesis we conclude that Indian stock market is efficient in semi strong form

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