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## Validity of EMH in semi-strong form: An analytical study

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### Abstract

The semi-strong form of Efficient Market Hypothesis asserts that security prices adjust quickly and rapidly to all publically available information. In an efficient market, there is no chance of statistically significant abnormal returns to any investor as all information is immediately incorporated into the stock prices. This information can be any announcement by a firm or it can be a macroeconomic announcement. Under firm level announcements, the announcement of bonus issue plays a significant role on the investors' behaviour. Bonus shares are issued by a company when it intends to pay dividend by issuing shares. Bonus shares are declared when company has sufficient profit to declare dividend but either does not possess cash to pay it or does not want to part with it in order to implement some capital expenditure plans. Thus, bonus shares result in the capitalization of profit of the company.

**Keywords:** Semi-strong form, investors' behaviour, efficient markets hypothesis (EMH), bonus, India

### 1. Introduction

The market is efficient in semi strong form if the security prices reflect not only the information that contains the past time series of stock prices but also all publically available information. This means that the stock price is adjusted rapidly and in an unbiased way to all public announcements in newspapers, journals, corporate forecasting and annual reports.

Semi Strong form market is relevant for accounting profession, because accounting is the primary source of public information, through the issue of financial reporting. If stock market is efficient in semi strong form, then investors cannot achieve consistently above normal returns. On the other hand, if the investors can consistently obtain above normal return on trading at the time of the public announcement of specific information, then the stock market is inefficient with respect to this information.

The tests for semi strong market efficiency were performed by examining the market reaction towards financial accounting reports and accounting announcements or non-accounting announcements. Non-accounting information is tested by previous empirical researches, stock splits, block trading, dividend announcements, macro-economic factors (interest rate, inflation and money supply), tax effect, firm size and second hand information. On the other hand, the accounting events are the following: earning announcement, other information in accounting report, changes in accounting principles.

### 1.2 Market Reaction to Accounting Information

Harmon (1984) <sup>[12]</sup> investigated the relative importance of earning versus fund flow, by examining the association between market reaction with earnings variables and fund variables. He found that earnings are more associated with market reaction than fund flows. Judy Rayburn (1986) <sup>[13]</sup> examined the ability of operation cash flow and accrual data in order to explain the relative change in equity value (return). She found that cash flow measures, aggregate accrual and current accrual are consistent with the information set used in value equity security (Abnormal Return). Wilson (1987) <sup>[14]</sup> reported a positive association between total accruals and cash flow from operation with stock return. He concluded from his research that total accruals and cash flow from operation taken together have incremental information content beyond earnings. Garrod and Hadi (1998) <sup>[15]</sup>'s disaggregation of cash flows have incremental values than cash flows itself.

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### 1.3 Stock Splits

Fama, Fisher, Jensen and Roll (1969) <sup>[15]</sup> performed the first test for semi-strong market efficiency. Using risk-adjusted return to test for market efficiency with respect to the announcement of stock split, they found a considerable high abnormal return prior to the announcement of stock split. On the other hand, after the stock split, there is no extraordinary return, and the situation refers to exactly what EMH predicted. There is another study for stock split by Charest (1978 a) <sup>[16]</sup> which found that market is efficient with respect to stock split information.

### 1.4 Block Trades

Market efficiency means the security prices should reflect all the information. Block trading occurs when a large number of stocks are suddenly placed on the market for sale. This causes imbalances in the supply and demand in the market, as well as being perceived by the market as negative information. There are several empirical studies by Hess and Frost (1982) <sup>[17]</sup>, which investigated the effect of the sudden sale of a large number of stocks in the market. They found that there is a significant drop in price, but after a short period stock price rebounds to its prior level.

### 1.5 Dividend Announcements

Testing of EMH with respect to dividend announcement was performed by Abeyratana *et al.* (1993), who found a significant abnormal return following cash dividends announcement. Foster and Vickrey (1978) <sup>[18]</sup> found stock dividends have information content because the stock price rises at the time of stock dividends announcement. Hadi (2005) <sup>[19]</sup> found evidences from Kuwait that market reactions of the release dividend information. And that is consisted with efficient market hypothesis. Therefore, the previous results are inconsistent with the semi strong market efficiency. Bansal Monica (2010) <sup>[1]</sup> some evidence for and against the semi-strong form of market efficiency has been discovered in the following:

### 1.6 Information Announcements

This concerns the issue of whether trading in shares immediately following announcements of new information (for example announcements of dividends or profit figures) could produce abnormal returns. The evidence supports the EMH, and excess returns are nil. It has been discovered that most of the information in annual reports, profit or dividend announcements are reflected in share prices before the announcement is made.

### 1.7 Manipulation of Earnings

Published accounts are an important source of information about companies. An efficient market will incorporate this information into share prices. But, as is well known, there is a great deal of leeway when it comes to drawing up accounts. One way of altering accounts is to openly and honestly reflect the changing underlying economies of the business by changing, say, the depreciation policy.

## 2. Review of Literature

Worthington and Higgs (2004) <sup>[20]</sup> tested random walks in sixteen developed markets: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom, and four emerging stock markets: Czech Republic, Hungary, Poland and

Russian. They used daily returns of market value weighted equity indices in US dollars for sixteen developed markets from December 31, 1987 to May 28, 2003, and for four emerging stock markets from December 30, 1994 to May 28, 2003. Using various methods including serial correlation, runs, three types of unit root (Augmented Dickey-Fuller, Phillips-Perron and KPSS) and multiple variance ratio tests, they concluded that the random walk hypothesis was not rejected in major European developed markets.

Ntim, Opong and Danbolt (2007) <sup>[21]</sup> examined the weak form EMH of the Ghana Stock Market using a new robust non-parametric variance-ratios test in addition to its parametric alternative and concluded that stock returns were conclusively not efficient in the weak form, neither from the perspective of the strict random walk nor in the relaxed martingale difference sequence sense. Unlike previous evidence, the finding was robust to thin-trading, sub-sample periods as well as the choice of dataset. Consistent with prior studies, the results of the parametric variance-ratios test were ambiguous. By contrast, its non-parametric alternative provided conclusive results.

Worthington and Higgs (2008) <sup>[22]</sup> found that Germany and Netherlands were weak form efficient under both serial correlation and runs tests, while Ireland, Portugal and the United Kingdom are efficient under one test or the other. Thus, rests of the markets did not follow a random walk. The ADF and Phillips-Perron unit root tests rejected the null hypothesis in the all twenty emerging and developed markets, while the KPSS unit root tests failed to reject the null hypothesis excluding the Netherlands, Portugal and Poland. From the variance ratio test, the null hypotheses of homoscedastic and heteroskedastic were not rejected in the United Kingdom, Germany, Ireland, Hungary, Portugal and Sweden. The rejection of the null hypothesis of the homoscedastic but not the heteroskedastic, random walk was found for France, Finland, Netherlands, Norway and Spain. The most restrictive notion of a random walk indicated that it was not possible to predict either future price movements or volatility on the basis of information from past prices is found to be in Germany, Ireland, Portugal, Sweden and the United Kingdom. France, Finland, Netherlands, Norway and Spain satisfy at least some of the requirements of a strict random walk. Among the emerging markets, only Hungary satisfied the strictest requirements for a random walk in daily returns.

Kupukile (2009) aimed to find evidence supporting the presence of the weak form efficiency of several emerging African stock markets by using both parametric as well as non parametric tests. The results indicated that none of the markets were characterised by random walks with the exception of the South African stock market. On the other hand, this study aimed to detect the presence of the day of the week effects of these African stock markets. Results showed the existence of day of the week effects, that was the typical negative Monday and positive Friday effects in several stock markets.

Tang, Chong and Yeap (2010) <sup>[23]</sup> tested the efficient market hypothesis on the Malaysian stock market under both bullish and bearish periods covering from 1985 to 2009. The bullish and bearish periods are first identified by using the Bry and Boschan (1971) <sup>[24]</sup> algorithm, following by Geweke and Porter Hudak's (1983) <sup>[25]</sup> test for the diagnosis of market efficiency. The results showed persistent long memory under the earlier periods of this study, suggesting

the possibility to predict stock prices especially before the 1997 financial crisis.

### 3. Objective of the Study

The main objective of this research paper is to study validity of EMH in semi-strong form in the Indian Stock Market.

### 4. Analysis and Interpretation

Table 1 has reported the results of AARs and CAARs obtained during the period 1996-1997 for 20 days before and after the announcement of the event through the Sharpe's Single Index Model. AAR is not found significant

on the event day at any level of significance, but found significant on t+16 day and t+20 day at 5 per cent. It is found significant on t-7 day at 5 per cent level and on t-1, t-11, t-16 and t-19 significant at 10 per cent level. Cumulative average abnormal returns is found significant on the event day at 5 per cent level and it is continuously significant for 11 days i.e. t-1 to t-11 days at 5 per cent level and on 12 day, 14 day, 15 day and 16 day at 10 per cent level before the announcement of the event. CAAR is found significant for four days i.e. t+1 to t+3 and t+6 and t+20 days at 5 per cent level. It is found significant on t+4, t+5, t+7 to t+11, t+16, t+17 and t+19 days at 10 per cent level.

**Table 1:** AARs and CAARs under Single Index Model (1996-97)

Days	AARs	t stat for AARs	CAARs	t stat for CAARs
-20	-0.047	-0.132	-0.047	-0.132
-19	-1.467	-2.146*	-1.514	-2.058
-18	0.363	0.761	-1.151	-1.313
-17	-0.116	-0.254	-1.266	-1.284
-16	-1.637	-2.463*	-2.903	-2.462*
-15	-0.598	-0.686	-3.501	-2.444*
-14	-0.278	-0.293	-3.779	-2.244*
-13	0.555	1.424	-3.224	-1.882
-12	-1.850	-1.713	-5.074	-2.569*
-11	-0.774	-2.290*	-5.848	-2.952**
-10	-0.076	-0.225	-5.924	-2.975**
-9	0.116	0.271	-5.808	-2.862**
-8	-1.907	-1.880	-7.715	-3.458**
-7	-1.104	-4.949**	-8.820	-3.991**
-6	-1.076	-0.988	-9.896	-4.096**
-5	0.065	0.078	-9.830	-3.857**
-4	-0.072	-0.081	-9.903	-3.682**
-3	-0.069	-0.159	-9.972	-3.671**
-2	1.075	1.025	-8.897	-3.084**
-1	-0.854	-2.596*	-9.751	-3.380**
0	0.581	0.414	-9.170	-2.938**
1	-2.774	-1.481	-11.944	-3.463**
2	-1.146	-0.784	-13.090	-3.559**
3	1.866	1.335	-11.224	-2.888**
4	0.954	2.021	-10.270	-2.632*
5	-0.461	-0.996	-10.732	-2.740*
6	-0.864	-0.666	-11.596	-2.833**
7	0.711	0.634	-10.885	-2.572*
8	0.385	0.757	-10.500	-2.469*
9	0.362	0.875	-10.138	-2.382*
10	-0.117	-0.196	-10.255	-2.388*
11	0.797	0.918	-9.458	-2.159*
12	1.178	0.785	-8.280	-1.810
13	-1.494	-1.642	-9.774	-2.096
14	-0.129	-0.362	-9.903	-2.127
15	0.315	1.225	-9.588	-2.069
16	-1.222	-3.253**	-10.810	-2.333*
17	-0.413	-0.803	-11.223	-2.411*
18	1.513	1.223	-9.710	-2.026
19	-2.872	-1.777	-12.582	-2.522*
20	-1.419	-4.247**	-14.000	-2.812**

**Source:** Data compiled from CMIE Prowess Database.

\*\*Significant at 5 per cent level of significance \*Significant at 10 per cent level of significance.

**Table 2:** AARs & CAARs under Single Index Model (1997-1998)

Days	AARs	t stat for AARs	CAARs	t stat for CAARs
-20	-0.708	-0.487	-0.708	-0.487
-19	-1.021	-0.570	-1.728	-0.754
-18	2.021	2.228*	0.293	0.122
-17	1.080	1.719	1.373	0.575
-16	0.129	0.260	1.502	0.637
-15	-0.179	-0.214	1.322	0.530
-14	0.545	0.781	1.867	0.726
-13	-0.945	-1.515	0.923	0.351
-12	0.084	0.099	1.006	0.365
-11	3.417	2.701**	4.423	1.466
-10	1.385	1.070	5.808	1.778
-9	-1.627	-3.481**	4.181	1.282
-8	-1.741	-1.663	2.440	0.712
-7	-0.846	-0.915	1.594	0.449
-6	0.383	0.689	1.977	0.554
-5	0.040	0.101	2.017	0.567
-4	-0.910	-0.947	1.107	0.301
-3	-0.234	-0.218	0.873	0.228
-2	0.571	0.845	1.443	0.371
-1	0.386	0.443	1.830	0.460
0	6.519	2.356*	8.349	1.859
1	-0.242	-0.426	8.107	1.799
2	0.167	0.402	8.274	1.841
3	-0.558	-0.897	7.715	1.704
4	0.077	0.103	7.792	1.699
5	-0.107	-0.214	7.686	1.673
6	-0.604	-1.225	7.082	1.539
7	0.002	0.003	7.084	1.520
8	-1.954	-1.330	5.129	1.057
9	-0.050	-0.047	5.079	1.024
10	0.871	1.006	5.950	1.181
11	0.340	0.451	6.291	1.236
12	0.188	0.282	6.479	1.263
13	-0.147	-0.090	6.332	1.187
14	-0.258	-0.304	6.074	1.124
15	-0.541	-0.792	5.532	1.017
16	-0.227	-0.325	5.305	0.968
17	0.268	0.299	5.573	1.004
18	0.304	0.269	5.877	1.038
19	-1.686	-1.677	4.191	0.729
20	-0.089	-0.101	4.102	0.705

**Source:** Data compiled from CMIE Prowess Database.

\*\*Significant at 5 per cent level of significance \*Significant at 10 per cent level of significance.

## 5. Conclusion

During 1997-1998, as shown in the Table 2, AAR is found significant on the event day at 10 per cent level but found insignificant continuously for 20 days i.e. from t+1 to t+20 day after announcement day. However, it is found significant on t-9 and t-11 days at 5 per cent level during the event window. Although there are 39 days having positive CAAR but not found significant for any day during the event window.

Semi Strong form market is relevant for accounting profession, because accounting is the primary source of public information, through the issue of financial reporting. If stock market is efficient in semi strong form, then investors cannot achieve consistently above normal returns. On the other hand, if the investors can consistently obtain above normal return on trading at the time of the public announcement of specific information, then the stock market is inefficient with respect to this information.

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