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EMPIRICAL ANALYSIS ON WEAK FORM OF EFFICIENT MARKET HYPOTHESIS OF COMPANIES CONTRIBUTING TO NIFTY

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ABSTRACT

Before entering into any kind of business, an understanding of its market and its customers is necessary. The same is equally applicable on stock market and in-fact it would not be an exclamation if we say that it is mandatory for the people dealing or wish to enter into stock market to have knowledge of market movements. The market makers, researchers and investors are always eager to understand the price movements of different stocks. Lot of researches has been made with the application of different tests in order to understand the market efficiency. Such kind of research efforts have been made in the markets of developed as well as developing nations. In this research paper we have made an attempt to apply run test for the weak form of efficient market hypothesis on the companies contributing to Nifty. The monthly data of closing stock prices for last eight years of 46 companies contributing to Nifty have been considered. The price changes during the great global recession of 2008 have also been considered.

KEYWORDS: *Stock Market, NSE, Efficient Market Hypothesis, Weak Form, Run-Test.*

INTRODUCTION

According to Fama (1965)

> "An "efficient" market is defined as a market where there are large numbers of rational, profit-maximisers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants."

In other words, an efficient market is a market wherein share prices follow an independent path. As there are large numbers of investors in the market, the information is freely available to all the market participants, the investor posse's adequate knowledge to interpret the information, all types of information are discounted and readily reflects in the prices. Lastly, a single investor is not capable to influence the market.

Investopedia.com defines market efficiency as 'The degree to which stock prices reflects all available, relevant information.'

The Efficient Market Hypothesis asserts that the hypothesis is based on the basic fundamentals that there are efficient markets and the movements of prices are independent of the earlier price movements. This explains that demand and supply position affects the prices. Even an uninformed investor would be able to get returns as generous as those achieved by the experts, if he invests through a diversified portfolio.

On going through the details of Efficient Market Hypothesis, we find that there are three forms: weak form, semi-strong form and strong form. The market will be in a weak form when the historical price data is not useful to predict the future price movements. Therefore, it is not possible for an investor to have abnormal gains on the basis of historical data of share prices. On the other hand, the market will be considered under semi-strong form when there is a free flow of all the public and private information and all the relevant and available information is immediately incorporated and what we see is fully discounted current securities prices. Further, a strong form market is one where there is no such investors having privileged information to obtain superior investment results.

There are various statistical techniques which have been used by researchers to provide empirical evidence on the weak form of stock market. One of the popular statistical technique is Run-Test.

The Wald-Wolfowitz Test, popularly known as Run-Test, is a non-parametric test that is used for checking the randomness hypothesis for a two-valued data sequence. We can also understand in this way that this test is used to support the hypothesis that the elements of a sequential data are mutually independent.

REVIEW OF LITERATURE

Gupta Rakesh & Yang Junhao (2011) in Testing Weak Form Efficiency in the Indian capital Market has tested the weak form of efficiency for BSE and NSE in India for the period starting from 1997 to 2011. The data was collected and tested on daily, weekly & monthly frequencies. The authors have used three tests for different frequencies of data. The ADF, PP and KPSS test supports the weak form of efficiency for Quarterly data for the period of 2007-2011. For the earlier periods i.e., from 1997 to 2007 only PP test showed weak form inefficiency. When the analysis was done on monthly data, all the three tests showed weak form efficiency for the period from 2007 to 2011 but the results were not the same for earlier periods. All the three tests rejected weak form efficiency for daily and weekly data. The results achieve from the above research is not in favor for testing these for semi-strong form efficiency. The results also indicates that there is an increase in efficiency in Indian equity markets, the investors looking for diversification internationally can be benefited if they invest in Indian stock market.

Thomas E Asha, Kumar Dileep M. C (2010) has presented an Empirical Evidence on Weak Form Efficiency of Indian Stock Market. The researchers have used statistical tools like autocorrelation and run test for testing weak form market efficiency. The authors have also used one-sample Kolmogorov-smirnov test to see whether data series fits a particular distribution. The sample size taken for the study was 50 companies forming NSE Nifty index. The data was taken for the period of six years. The results showed that it was weak form inefficient, so it made good chances to have abnormal returns by understanding past share price behavior.

Mittal K Satish & Jain Sonal (2009) in Stock Market Behavior: Evidence from Indian Stock Market has presented results by testing the weak form of efficiency and the efficient market hypothesis on Indian stock market in the form of random walk. The data for the year 2007-08 was used from three indices namely S & P, CNX 500, and BSE 200. In order to see the anomalies in the price movements in the form of abnormal stock returns in India analysis of Monday effect, Friday Effect, and the days of the week effects has been done. The researchers have used Unit Root Test, T-Test, Run Test, Serial Correlation and Annova. The results showed that the anomalies do not exist in the Indian Stock market and the market can be considered informational efficient.

Gupta Rakesh & Basu K. Parikshit (2007) in their paper title, weak form efficiency in Indian stock market has tested the weak form of efficiency for Indian equity markets for the period starting from 1991 to 2006. The authors have used Runs Test and LOMAC variance ratio test in order test the weak form and random walk hypothesis. The authors have calculated daily returns by using daily index values of BSE and NSE in India. The results showed that the test statistics were more negative than the critical value by which it can be concluded that the markets are not efficient in weak form.

Poshakwale Sunil (1996) in his paper has find out empirical evidence on weak form efficiency and day of the week effect in the Indian Stock Market on Bombay Stock Exchange for the period 1987 to 1994. The results showed the proof that there is a presence of day of a week effect

and the stock market is not in weak form efficient. To find the randomness of the series Run Test was used and the results showed that the hypothesis that the series is random is rejected. The author has also applied the Serial Correlation Coefficient Test, the results revealed that the null hypothesis is rejected and there are first order autocorrelations present in the series. The paper also presents day of the effect on the returns of BSENI which showed that there is a Friday effect on the returns form BSENI and indicates that there is a non-random nature of stock prices in BSE.

OBJECTIVES AND HYPOTHESIS

1. To test the independency of successive price changes during the time period of eight years for 46 stocks contributing to Nifty and test whether it is weak form efficient.

H_0: Null Hypothesis: Price Change is Random

H_1: Alternate Hypothesis: Price Change is not Random

RESEARCH METHODOLOGY

In this study, we discuss and provide empirical evidence on weak form of efficient market hypothesis.

The judgmental sampling is used for the study and the share prices of the Companies which are listed on NSE and included in Nifty as on April 10, 2015 have been taken. To provide depth to the study and to increase its coverage, we have taken the monthly data of closing share prices for last eight years ending on March 31, 2015. This has made our sample of 46 companies as the data for 4 companies were not available for the time period considered. The four companies that were excluded are Bajaj Auto, Coal India, NMDC and Power Grid. The data was collected from the website of moneycontrol.com

The prominent statistical technique used to confirm the hypothesis is Run Test. The Hypothesis was tested at 20 per cent significance level at which the 'Z' value is 1.28.

The following formula has been used:

$$\mu = \frac{2N_1N_2}{N_1 + N_2} + 1$$

$$\sigma = \sqrt{\frac{2N_1N_2(2N_1N_2 - N_1 - N_2)}{(N_1 + N_2)^2(N_1 + N_2 - 1)}}$$

SCOPE OF THE STUDY

The prices of the scrips are between the financial year 2007-08 and 2014-15. Hence, the results are valid for this period only. Since, the test has concluded the weak form, further the capital market can be tested for semi-strong form.

FACTS AND FINDINGS

The facts and findings have been presented as follows:

Scrip	(+) N1	(-)N2	mu	sigma	UL	LL	Observed Runs	Null Hypothesis
ACC	52	43	48.07	4.80	54.22	41.93	58	Rejected
AMBUJA CEMENTS	57	38	46.60	4.65	52.55	40.65	49	Accepted
Asian Paints	60	35	45.21	4.51	50.98	39.44	48	Accepted
Axis Bank	56	39	46.98	4.69	52.98	40.98	42	Accepted
BoB	54	41	47.61	4.76	53.70	41.52	42	Accepted
BHEL	48	47	48.49	4.85	54.70	42.29	46	Accepted
BPCL	52	43	48.07	4.80	54.22	41.93	53	Accepted
BHARTI	46	49	48.45	4.84	54.65	42.25	59	Rejected
CAIRN	55	40	47.32	4.73	53.36	41.27	48	Accepted
CIPLA	53	42	47.86	4.78	53.98	41.74	55	Rejected
DRREDDYS	60	35	45.21	4.51	50.98	39.44	46	Accepted
GAIL	56	39	46.98	4.69	52.98	40.98	46	Accepted
GRASIM	50	45	48.37	4.83	54.56	42.18	44	Accepted
HCLTECH	57	38	46.60	4.65	52.55	40.65	48	Accepted
HDFCBANK	55	40	47.32	4.73	53.36	41.27	46	Accepted
HEROMOTOCORP	50	45	48.37	4.83	54.56	42.18	52	Accepted
HINDALCO	46	49	48.45	4.84	54.65	42.25	45	Accepted
HUL	56	39	46.98	4.69	52.98	40.98	44	Accepted
HDFC	55	40	47.32	4.73	53.36	41.27	46	Accepted
ITC	60	35	45.21	4.51	50.98	39.44	52	Rejected
ICICI BANK	50	45	48.37	4.83	54.56	42.18	52	Accepted
IDFC	44	51	48.24	4.82	54.41	42.07	42	Rejected
IDEACELLULAR	52	43	48.07	4.80	54.22	41.93	53	Accepted
INDUSINDBANK	61	34	44.66	4.45	50.36	38.97	40	Accepted
INFOSYS	54	41	47.61	4.76	53.70	41.52	53	Accepted
KOTAKMAHINDRA	58	37	46.18	4.61	52.08	40.28	48	Accepted
L&T	48	47	48.49	4.85	54.70	42.29	52	Accepted
LUPIN	58	37	46.18	4.61	52.08	40.28	51	Accepted
M&M	57	38	46.60	4.65	52.55	40.65	43	Accepted
MARUTI	55	40	47.32	4.73	53.36	41.27	43	Accepted
NTPC	40	55	47.32	4.73	53.36	41.27	55	Rejected
ONGC	49	46	48.45	4.84	54.65	42.25	54	Accepted
PNB	51	44	48.24	4.82	54.41	42.07	44	Accepted
RIL	47	48	48.49	4.85	54.70	42.29	46	Accepted
SESASTERLITE	41	54	47.61	4.76	53.70	41.52	47	Accepted
SBIN	47	48	48.49	4.85	54.70	42.29	48	Accepted
SUNPHARMA	60	35	45.21	4.51	50.98	39.44	47	Accepted
TCS	52	43	48.07	4.80	54.22	41.93	55	Rejected
TATAMOTORS	56	39	46.98	4.69	52.98	40.98	48	Accepted
TATAPOWER	48	47	48.49	4.85	54.70	42.29	57	Rejected
TATASTEEL	40	55	47.32	4.73	53.36	41.27	50	Accepted

TECHMAHINDRA	50	45	48.37	4.83	54.56	42.18	47	Accepted
ULTRATECHCEMENT	52	43	48.07	4.80	54.22	41.93	42	Accepted
WIPRO	50	45	48.37	4.83	54.56	42.18	47	Accepted
YESBANK	55	40	47.32	4.73	53.36	41.27	42	Accepted
ZEEENT	50	45	48.37	4.83	54.56	42.18	54	Accepted

LIMITATION OF THE STUDY

1. The findings are subject to the limitations of run-test.

CONCLUSION

The data analysis was done in Microsoft Excel, null hypothesis was accepted for 38 stocks out of 46 stocks. Hence, we can say that National Stock Exchange is weak form efficient. We have also considered the price changes during the great global recession of 2008.

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