ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 2, February 2018

"Testing the Weak Form of Efficiency of the Indian Stock Market"

[1] Feeroj N. Pathan, [2] Rupesh Rebba, [3] Bharat Pawar
[1] Asst. Prof. DIEMS, Aurangabad, [2] Asst. Prof. DIEMS, Aurangabad, [3] Asst. Prof. DIEMS, Aurangabad

Abstract: **The leading stock exchange of India BSE & NSE attracts the attention of researchers and analysts in view of recent fluctuations in investments levels and the global financial disorder. The efficiency tests conducted till now have produced contradictory results therefore it is difficult to comment on Indian stock market efficiency. So researchers found it interesting to examine the impact of various macro-economic factors on Indian stock market. Stock market efficiency is one of the important parameters to measure the efficiency of a financial system and especially in developing countries like India. In efficient markets, all transactions are done with the help of new information available about the economy, industries and companies. This paper therefore is an attempt to seek evidence by using the monthly data for stock indices of the Bombay Stock Exchange & National Stock Exchange for the period of January 2008 to Jan 2018.**

Keywords**: Market efficiency, Efficient market Hypothesis (EMH), Weak form market efficiency, Semi strong form, Strong form market efficiency.**

I. INTRODUCTION

The theory's origins went back to the beginning of the century but it had come to prominence ago a decade or so before. Eugene Fama of the University of Chicago had defined it as price of a financial asset reflects all available information that is relevant to its value. An important debate among stock market investors and analyst is that whether the market is efficient – which means whether it reflects all the available information to market participants for investment and analysis at any point of time. The efficient market hypothesis (EMH) believes that all stocks are perfectly priced according to their inherent investment properties and all market participants have equal knowledge about it. At initial stage it might be easy to see a number of deficiencies in the efficient market theory which was created in the 1970s by Eugene Fama. At the same time it's important to look at its relevancy in the current investing environment. The efficient market hypothesis is an investment theory which states that it is impossible to "beat the market" because stock market efficiency causes current share prices to always include and reflect all market relevant information. According to the Efficient Market hypothesis stocks/securities always trade at their fair value on stock exchanges which make it impossible for every investor to either purchase undervalued stocks or sell stocks for overstated prices. As such, it should be impossible to do better than the overall market through expert stock selection or market timing. The only way for an investor to obtain higher returns is by purchasing riskier investments but financial theories are subjective so there are no proven laws in finance, but rather ideas that try to explain how the market works.

Forms of efficiency

The Efficient Market Hypothesis is categorized into three major levels depending on the type of information assumed to be used by the market in setting prices of stock these are:

Weak form of EMH: The weak form of EMH assumes that current stock prices fully reflect all currently available security market information. It contends that past price and volume data have no relationship with the future direction of security prices. It concludes that excess returns cannot be achieved using technical analysis.

The weak form of the theory also known as the 'Random Walk' says that the current price of the stocks already fully reflect all the information that is contained in the historical sequence of the prices. The weak-form of the EMH states that the sequence of past price returns contains no information about future price returns

Semi-strong form of EMH: The semi-strong form of EMH assumes that current stock prices adjust rapidly to the release of all new public information. It contends that security prices have factored in available market and non-market public information. It concludes that excess returns cannot be achieved using fundamental analysis.

The strong-form of the EMH states that the security prices reflect all the information available both public and private at any point of time but in reality not all investor has such inside information. It contends that market, non-market and inside information is all factored into security prices and that no one has monopolistic access to relevant information. It assumes a perfect market and concludes that excess returns are impossible to achieve consistently.

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 2, February 2018

Problems with EMH

First the efficient market hypothesis assumes that all investors perceive all available information in precisely the same manner. The numerous methods for analyzing and valuing stocks pose some problems for the validity of the EMH. If one investor looks for undervalued market opportunities while another investor evaluates a stock on the basis of its growth potential, these two investors will already have arrived at a different assessment of the stock's fair market value. Therefore, one argument against the EMH points out that, since investor's value stocks differently, it is impossible to ascertain what a stock should be worth under an efficient market.

Secondly, under the efficient market hypothesis, no single investor is ever able to attain greater profitability than another with the same amount of invested funds According to the EMH, if one investor is profitable, it means the entire universe of investors is profitable. In reality, this is not necessarily the case.

Thirdly (and closely related to the second point), under the efficient market hypothesis, no investor should ever be able to beat the market, however, many examples of investors who have consistently beat the market - you need look no further than Warren Buffett to find an example of someone who's managed to beat the averages year after year.

II. REVIEW OF LITERATURE

Pandy A. (2003) he examined three popular stock indices to test the efficiency level in Indian Stock market and the random walk nature of the stock market by using the run test and the autocorrelation function for the period from January 1996 to June 2002. He concluded that the series of stock indices in the India Stock Market are unfair random time series. The auto correlation analysis of his study indicates that the behavior of share prices does not confirm the applicability of the random walk model in the Indian stock market. Thus there are undervalued securities in the market and the investors can always excess returns by correctly picking them.

Khan and Sana (2010) in their study examined the efficiency of the Indian Capital Market in its semi strong form of Efficient Market Hypothesis (EMH). They tested efficiency in relation to the impact of Foreign Institutional Investors (FII's) mainly on the Indian Capital Market. For this purpose, two major stock indices of Indian stock market i.e. National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) that represent the Indian Capital Market have been taken. The results of their study suggested that the FII's do have significant impact on Indian Capital Market, further they suggested that Indian Capital Market is semi-strong form efficient.

Gimba (2010) tested the Weak-form Efficient Market Hypothesis of the NSE by hypothesizing Normal distribution and Random walk of the return series. They considered all Daily and weekly share index and five most traded and oldest bank stocks of the National stock Exchange from January 2007 to December 2009 for the daily data and from June 2005 to Dec. 2009 for the weekly data. The findings derived from the autocorrelation tests for the observed returns conclusively reject the null hypothesis of the existence of a random walk for the market index and four out of the five selected individual shares.

Gupta and Yang (2011) tested the weak form efficiency or random walk hypothesis for the two major equity markets Bombay Stock Exchange and National Stock Exchange in India for the period 1997 to 2011. all three methods ADF, PP and KPSS tests support the weak form efficiency for later sample period 2007 to 2011 but there was minor conflict for earlier period 1997 to 2007 in which only PP test shows weak form inefficiency; for monthly data. For daily and weekly data, all three test methods of testing reject weak form efficiency during all sample periods.

Dr. A. Patrick & Mrs. R. Sushama (2011) conducted weak form of efficiency study between NSE & New York Stock Exchange (NYSE) for the period from June 2000 to June 2004 and they concluded that there were undervalued securities in the NYSE and the investors could make excess returns by correctly picking them.

Abdullah and Ashikh (2012) in their study found that the Saudi Stock Exchange (SSE) returns show significant linear serial dependence. The hypothesis of market efficiency has been strongly rejected based on the results from the linearity tests. They concluded that the Saudi stock Exchange is inefficient in the weak-form of the Efficient Market Hypothesis. The result of the study also reveals evidence of day-of-the-week effects in the Saudi Stock Exchange, both in mean (returns) and variance (volatility) equation.

Mayowa Gabriel Ajao (2012) in their study consisted of all securities traded in the Nigerian Stock Exchange and the month end value of the All Share Index from 2001 to 2010 constitute the data analyzed. They used serial correlation technique for analyzing the data and the distributive pattern while runs test was used to test for randomness of share price movement. The serial correlation result of their study shows that the correlation coefficients did not violate the two-standard error test.

Khan (2013) examined market efficiency in four emerging stock markets from the South Asian region which were Bangladesh, India, Pakistan and Sri Lanka over the 1993 to 2010 time period. The result of their study reflects that there was a relationship between the equity price changes of the markets being studied. Their returns were co-integrated over a

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 2, February 2018

medium term. These markets cooperated with each other through various membership bodies.

Dr. Nishi Sharma (2013) in her study tested the weak form of Efficient Market Hypothesis to 13 sector specific indices at Bombay Stock Exchange (BSE) from 2006-2012. Her analysis was based on Autocorrelation, Jarque-Bera (JB) test.

Das and Mishra (2013) in their study did run test analysis on eight selected Nifty companies from 1st January 2009 to 30th November, 2012. They concluded that there was weak form market efficiency in all these 8 stocks. However according to them the inadequate information flow into the stock market, the inefficient communication system, the insufficient understanding of financial information by local investors, the poor skills among some stockbrokers, the low level of automation and the interference of regulatory authorities in the determination of assets' prices were the factors which prevented markets from being efficient.

Haritika Arora (2013) in her study tested S&P CNX Nifty from 1 January 2000 to 31 Dec 2011 and she concluded that Indian Stock market did not show any evidence of weak form of market efficiency. Statistical analysis were done with help of Augmented Dickey and Fuller (ADF) test, Auto-correlation test (Breusch-Godfrey Serial Correlation LM Test), Ljung-Box Q test, Auto-regression, ARIMA model, portmanteau BDS test and GARCH(1,1) model.

III. METHODOLOGY

Objective of study

1. To investigate whether Indian Stock Market is weak form efficient or not.
2. To empirically test whether Indian Stock Market follows random walk or not.

Hypothesis

Ho= There is no inter-dependence in consecutive price changes of securities.

H1= There is inter-dependence in consecutive price changes of Securities.

Scope of the Study: The study is based on monthly closing values of the S&P BSE Sensex and CNX Nifty for the sample period of January 2008 to January 2018. We assume the sample period is sufficient enough to evaluate the information unevenness especially after the huge economic policy changes in Indian economy like introduction of GST and Demonetization.

IV. DATA ANALYSIS & INTERPRETATION

Descriptive analysis is done to know the standard deviation, maximum and minimum closing figures of the S&P BSE INDEX and CNX NIFTY INDEXF then Run test is done to check the randomness in the series Run test is also used to test weak-form efficiency.

Runs test would be used to see if stock prices follow a particular trend in terms of successive upward or downward price movement. It is a non-parametric test. It depends only on the sign of the price changes but not on the range of the price. They are essentially concerned with the direction of changes in the particular time series. The main drawback of using Runs Test is that it only looks at the number of positive or negative changes. By comparing the total number of runs in the data with the expected number of runs under random walk hypothesis, the test of the random walk hypothesis may be constructed. Positive Z indicates that there are too many runs in the sample whereas negative value of Z indicates that there are less runs than one would expect if the changes were random. The important advantages of this test are its simplicity and independence of extreme values in the sample. In order to compare the observed number of runs in the series, the expected number of runs is calculated according to the formula.

The standardized Z is defined as:

Runs Test $Z = (R-X)/\sigma$

R= number of runs

X= (2 n1n2 +1)

n1+ n2

$\sigma 2 = \frac{2\, n1n2\, (2\, n1n2-n1-\, n2)}{(n1+\, n2)2\, (n1+\, n2-1)}$

Where,

R is the real number of runs (i.e. A run is defined as a succession of similar events preceded and followed by a different event.)

n1+ n2 = number of observations in each category

σ = standard deviation

Z= Standard normal variant

The p-value would be the normal distribution of Z values which states the likelihood of happening will also be calculated.

The null hypothesis of the test is that the observed series is random variable. The null Hypothesis is rejected, when the expected number of runs is significantly different from the observed number of runs.

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
S&P BSE INDEX	121	21268.13	6112.88	8891.61	35965.02
CNX NIFTY INDEX	121	6441.70	1909.76	2755.10	11027.70

The test statics is:

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)
Vol 3, Issue 2, February 2018

Runs Test

	S&P BSE INDEX	CNX NIFTY INDEX
Test Value[a]	19426.71	5862.70
Cases < Test Value	60	60
Cases >= Test Value	61	61
Total Cases	121	121
Number of Runs	10	8
Z	-9.403	-9.768
Asymp. Sig. (2-tailed)	0.000	0.000

Median

The test is non-parametric and is independent of the normality and constant variance conditions. The null hypothesis of the test is that the observed series is random variable. If the expected number of runs is significantly different from the sum of observed runs, the test rejects the null hypothesis.
Above table displays the results of the runs test. It can be seen that the total number of runs are 10 and 8 for S&P BSE Index and CNX Nifty respectively. It also indicates zero observed significance level. Hence, the randomness hypothesis for both the series is rejected.

V. CONCLUSION

We finally conclude that Indian Stock markets do not exhibit weak form of market efficiency. This is important for Indian stock market because the efficiency of a market in processing information affects its allocated capacity and therefore it contributes to economic growth. In terms of policy implications the rejection of the weak form market efficiency hypothesis implies that addressing trading frictions, promoting timely disclosure and broadcasting of information to investors on the performance of listed companies and strengthening regulatory oversight are key elements in improving the efficiency of the capital market.

REFERENCES

Websites:
- www.bseindia.com
- www.nseindia.com
- www.forbes.com
- www.moneycontrol.com

Books:
- Prasanna Chandra (2008), 3rd Edition – Investment Analysis and Portfolio Management (p.276 to p.294)
- V.A. Avadhani, Investment Management.
- V.K. Bhalla, Security Analysis & Portfolio Management

Journal Papers:
- Dr. Sushil Kumar and Manisha Singh
- "Weak Form of Market Efficiency: A Study Of Selected Indian Stock Market Indices".
- Mr. Pushkar Dilip Parulekar
- "Evaluation of Weak form of Market Efficiency Theory for Selected five Companies from Nifty"
- Abhishek Parikh (2013), "Exploring Efficient Market Hypothesis and Excess Returns: An Empirical Study across Different Segments of Indian Equity Market"
- Haritika Arora (2013), "Testing Weak Form of Efficiency of Indian Stock Market", Pacific Business Review International, Volume
- Abdullah I. & Ashikh (2012) - "Testing the Weak-Form of Efficient Market Hypothesis and the Day-of-The-Week Effect in Saudi Stock Exchange: Linear Approach", International Review of Business Research Papers Vol. 8. No. 6. Pp. 27 – 54.
- Gupta Rakesh & Yang Junhao (2011) - "Testing Weak form Efficiency in the Indian Capital Market" International Research Journal of Finance and Economics.
- Gimba Victor K. (2010) - "Testing the Weak-form Efficiency Market Hypothesis: Evidence from Nigerian Stock Market",
- Khan A. Q & Ikram S. (2010) - "Testing Semi-Strong Form of Efficient Market Hypothesis in Relation to the Impact of Foreign Institutional Investors' (FII's)
- Pandey & Anand (2003) - "Efficiency of Indian Stock Market".
- R. Patel, Nikunj, Radadia, Nitesh, and Dhawan, Juhi (2012), "An Empirical Study on Weak-Form of Market Efficiency of Selected Asian Stock Markets".