

Testing Weak form of Market Efficiency: A Study on Indian Stock Market

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Abstract

The efficiency of stock have great influence on return on investment. This particular study focuses on testing weak form of market efficiency wherein future market trend can be predicted using past data. Three year daily closing points were taken from official website of Bombay stock exchange (SENSEX) commencing from 1st April 2015 to 31st March 2018. Run test was used to analyse data. In conclusion study shows that market can be outperform and thus violates random walk theory.

Keywords

Indian Stock Market, Market Efficiency, Market Trend, Bombay Stock Exchange (SENSEX)

I. Introduction

Stock Market Efficiencies has been a fascinating topic in financial market research. Many research scholars have worked on this topic to test which form of market efficiency is applicable on Indian Stock Market. A notion had been evolved over the period of time due to extensive research on this topic that stock market are efficient and the prices reflect all the information available in the market. In general we can say that the prices of the stocks reflects expectations of investors which are shaped mainly by the available information. How frequently the market absorb all the available information and translates these information into prices is called as Market Efficiency.

The concept of Efficient Market is strongly based on the idea that in the stock market the share prices or returns are unpredictable as they follow an independent path. The share price and market returns are said to have been following independent path due to the presence of various Micro and Macro Level Economic Factors. In an efficient market as the prices follow an independent path and do not follow any regular patterns, therefore it is impossible to beat the market. According to Efficient Market Theory, neither Technical nor Fundamental Analysis can help the investors to outperform the market, this is because it believed that past prices contain no useful information and cannot predict the future change, today's price is totally independent from past price so it is waste of time to analyse past return and on the basis of result attempt or expect to make profit from market.

The historical background of Efficient Market Theory dates back to the year 1900. The concept of Efficient Market Hypothesis was first expressed by Louis Bachelier, a French mathematician in 1900. In his dissertation, "*The Theory of speculation*" he has suggested that price fluctuation are random and do not follow any regular pattern. This topic gained more prominence in 1956 when, Paul Samuelsson took interest in Bachelier's work and he circulated this among economists. Samulson was the first who provided the formal economic argument for efficient market. In 1965, the term "*Efficient Market*" was defined by Fama at first time, Fama explained how the theory of EMH challenges to both

technical and financial analysts. In the year 1970 Fama classified Efficient Market Hypothesis into three categories according to the level of information reflected in market prices. The three types of Market Efficiency are Weak Form, Semi Strong Form and Strong Form.

A, Weak Form of Market Efficiency

Under Weak Form of Market Efficiency the type of information which is used is information relating to historical price and volume data. In weak form of market efficiency stock prices reflect by all available trading information which can be derived from the market data such as past price, trading volume etc. so nobody should be able to outperform the market using something that everyone else knows. If the markets are efficient in weak form, technical trading rules cannot be used to make profit on a consistent basis.

B. Semi Strong Form of Market Efficiency

Under Semi Strong Form publicly available information are incorporated into current stock prices. Publicly available information includes past price information plus company's annual reports, announcements by the company and several other macro-economic factors such as (inflation, unemployment etc.) and others. Some information (to the extent anticipated in advance) is discounted even before the event is announced and some before the event took place. Such matters like earnings reports, bonus, and rights affect the market even in anticipation before the formal announcements. Semi Strong Form of Market Efficiency implies that, Share Prices adjust to publicly available information very rapidly such that no one should be able to outperform the market using something that "everybody else knows".

C. Strong Form of Market Efficiency

In strong form of efficiency stock prices quickly reflect all types of information which include public information plus companies inside or private information. Thus, it is the combination of public and private information that is incorporated into current prices. This form implies that even companies management cannot make profit from inside information; they cannot take advantage of inside affairs or important decision or strategies to beat the market.

II. Review of Literature

Many studies have been carried out till date by different scholars to test the various forms of Capital Market Efficiencies applicable on Indian Stock Market. Some of the findings pertaining to testing of Weak Form of Market Efficiency are summarised below;

Zabiulla (2001) tested the Market Efficiency of Indian Stock Market in its Weak Form using data set of BSE Sensitive Index. For the purpose of analysis he applied Unit root tests, autocorrelation test and runs test. Based on the results of these model he concluded that Indian Capital Market neither follow random walk model nor is a weak form efficient.

P.Srinivasan (2010) conducted the study to determine the validity of weak form of efficiency for two major stock markets in India. The data which was used in this study comprises of daily observation over the span from 1st July 1997 to 31st August 2010. The statistical tools adapted in this study were unit root tests namely, Augmented Dickey-Fuller (1979) test and the Phillips-Perron (1988) test. The findings of the study were Indian stock markets does not show characteristics of random walk and as such are not efficient in the weak form implying that stock prices remain predictable

A.Q.Khan, Sana Ikram and Mariyam Mehtab (2011) tested the market efficiency of Indian Capital Market in its Weak Form based upon the indices of two major stock exchanges i.e., NSE and BSE by applying RUN Test the results of his study proved that the Indian Capital Market neither follows random walk model nor is a weak form efficient.

Hartika Arora (2013) conducted the study to test weak form of efficient market hypothesis and random walk hypothesis based upon the daily data for the index of the Indian Stock Market that is S&P CNX NIFTY for the period of 1st January 2000 to 31st December 2011. The results of his study depicted that the Indian Stock Market do not show evidence of weak form of market efficiency.

Ravi Kumar Gupta (2014) made an effort to see whether Indian Stock Market are Efficient or not. The different statistical tools that he used to carry out the analysis the data were Unit Root test, Runs test and Kolmogorov-Smirnov test (K-S test) with the help of software Eviews5. The findings of his study revealed that Indian stock market does not move randomly it means there is dependency of current security prices on the past. He concluded that past information are not completely adjusted so Indian stock market is weak form efficient but it is not consistently following it.

Neeraj Kumar Gupta and Ashwin Gedam (2014) conducted the study to find out the market efficiency using run test. The study was based upon the selected stock price selected from NSE. The findings of their study was that in almost all the cases the stock prices except one company that is Tech Mahindra, the stock prices are independent of the past prices. Thus this study concludes that market is weakly efficient in most of the cases except one that is Tech Mahindra.

Dr. Srikanth Parthasarthy (2016) conducted the study to examine weak form market efficiency of the major stock indices in the Indian stock market. The results of his study show that Indian Stock is not Weak Form of Efficient and investors can make abnormal profits by analysing past prices.

Prof. Mrityunjaya B Chavannavar and Poonam V. Patel (2016) in their study on Efficiency on Indian Stock Market. Tested weak form of Market Efficiency using Auto correlation test and run test and the findings of their study reveals that Indian Stock Markets are efficient in both Weak and Semi Strong Form.

Sharma Rakesh Kumar and Kiran Ravi (2017) in their study on "Testing Weak Form of Market Efficiency of Bombay Stock Exchange and National Stock Exchange" concluded that monthly returns do not follow random walks in both the stock exchanges. This applies to both BSE and NSE, hence proving them as weak and inefficient.

III. Objectives of Study

- To test whether Indian Stock Market follow Random Walk Model or not.
- To test whether Indian Stock Market are Weak Form of Market Efficient or not.

IV. Research Methodology

The study seeks to test weak form of market efficiency of Indian Stock Market. The research is conducted for BSE SENSEX. The data used in this study consists of daily closing points of BSE SENSEX for the period of 3 years, commencing from 1st April 2015 to 31st March 2018.

In this study for judging the randomness in the behaviour of stock market the RUN Test is applied. RUN Test is a Non Parametric Test in this test we consider a series of successive price changes over a certain period of time in order to determine whether the successive price changes are independent or not.

V. Hypothesis

- Null Hypothesis (H_0)
There is no interdependence in successive price changes of individual securities.
- Alternate Hypothesis (H_1)
There exists an interdependence between the successive price changes of individual securities.

VI. Result and Discussion

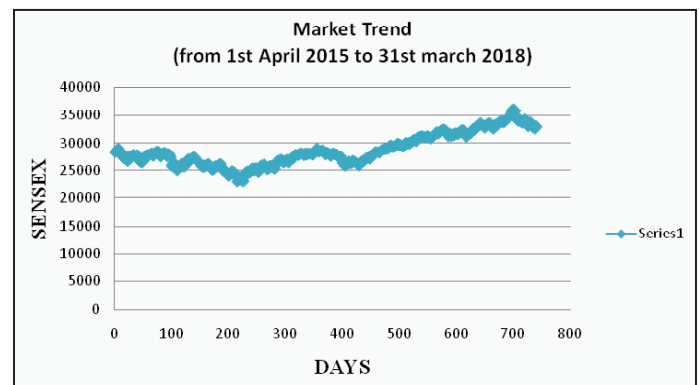


Table 1: Runs Test of Daily Returns of SENSEX (1st April 2015 to 31st March 2018)

Variable	Key Word	Sensex
Mean	M	28678.89
Total runs(R)	R	8
Number of Observation(n)	n	741
Cases<Mean(n0)	n0	458
Cases>=Mean(n1)	n1	283
Expected no. Of runs(E(R))	E(R)	350.83536
Variance of runs (Var(R))	Var(R)	164.91208
STDEV of Runs(SDEV(R))	STDEV(R)	12.84181
Standard Value(Z)	Z	-26.69681
Likelihood of total number of runs > expected	P value	0.00

The negative Z value demonstrates positive serial correlation. Positive correlation refers to dependency upon past prices thus violets the law of random walk theory. The above table depicts the p value = 0.00 which rejects the null hypothesis that shows

that there is no interdependence of the market on past trends or values. Moreover it shows that in limited span of time market follow trends thus investor can earn abnormal profits by looking and finding out the various trends in short run.

VII. Conclusion

To conclude in current study the ability to predict future prices of Indian stock exchange was analysed. To test this three year three year data of Bombay stock exchange was analysed commencing from 1st April 2015 to 31st March 2018. This particular study was conducted by using Run test. The results of the study shows that market follows certain trend and violates random walk theory hence investors can outperform the market by predicting and analysing various trends. Moreover it also shows that market is not efficient enough that to adjust readily by the news regarding the factors which may affect the prices of the stock market so there may be chances where investor who are in touch with factors may outperform market.

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