

An Empirical Study On Efficient Market Hypothesis in Selected Stocks of Private Sector Banks in India

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ABSTRACT - Market efficiency states how well prices of stocks in share market replicate all available market information therefore it contends that markets are efficient, do not give any further scope for making surplus profits through investing as everything is readily, equally and exactly priced. This indicates that there would be slight hope of outperforming the market, even though the investors can get market returns through passive index investing. Further EMH believes that in stock market, all the time stocks trade at reasonable value due to which it becomes unmanageable for the investors to obtain underrated stocks and sell stocks at inflated price. The main purpose of the research is to investigate which sort of an efficient market hypothesis is in Prevalence and randomness in specifically chosen five dominant shares of private sector banks in India. Axis Bank, HDFC Bank, Kotak Mahindra Bank, ICICI Bank, Indusland Bank closing prices of shares are considered on a Day-wise, Weekly-wise and Monthly-wise. Additionally, for the purpose of this study for the period From 1st Jan 2017 to 1st Jan 2022. Generally, run test is used to understand the market efficiency therefore in order to analyze the market efficiency run test is considered in the present study. The stock price of the chosen Banks is extracted from the official website of NSE. The outcome validates that Daily return of all the chosen shares of private Sector Banks and weekly yield of HDFC bank does not pursue a random walk that indicates that market seems to be not efficient for that period whereas other selected private sector bank's weekly and monthly return except the monthly return of Kotak Mahindra Bank follows a random walk that means market is efficient during specific period chosen for the study.

KEYWORDS: EMH, Market Efficiency, runs test, NSE, stocks, randomness.

I. INTRODUCTION

Market efficiency is the Condition in which a market projects all the available information pertaining to a market. The efficient market hypothesis has its origins in 1960's and during these periods most of the research studies conducted were concluded the capital market as an efficient market starting from Fama (1965) and Samuelson (1965) but then most of the research studies conducted during subsequent year the theory and its all other three forms of hypothesis such as weak, semi-strong and strong were invalidated by many researchers, academicians who conducted research on this theory. The EMH explains, whenever a new market receives new info, it would directly get replicated on stock prices, both the information on past stock prices and fundamental analysis would help an investor to predict future prices or generate returns more than those of a portfolio of indiscriminately chosen stocks. The researcher analyses the latest outcomes of three schools of thought that tests the EMH based on their assertions

proof of foreseeable forms in stock prices occurs. (by Burton G. Malkiel, 2003). The EMH claims, markets are proficient in pricing as it is already done accurately and fairly leaving no scope to earn more profits by investing in securities. This theory suggests that people who would like to invest in market can have only a little expectation of whipping the market even though market revenues could be complemented through passive index investing. Even though this theory is a keystone of contemporary financial theory, the EMH is extremely debatable and frequently wrangled. Supporters claim that it is useless to quest for underrated stocks or to foresee stock price movements in the market with the help of either fundamental or technical analysis. Additionally, even though many academicians' support EMH through a large body of evidence, an equal volume of opposition too exists. For an instance, investors like Warren Buffett have proven this definition wrong as had constantly beaten the market over long periods. According to this theory there are three levels of efficiency

have been discussed based on the all the available information and prices set.

II. THE THREE FORMS OF EFFICIENCY ARE

1. **Weak Form of Efficiency:** This kind of efficiencies defines a market as efficient merely when current market prices completely reflect all information pertaining to past prices of shares.

2. **Semi- Strong form of Efficiency:** -This kind, states that current market prices imitate both the past prices as well as publicly available information such as Company's financial statement, important announcements of the company, and other economic factors of a nation.

3. **Strong form of Efficiency:** - This kind of efficiency is the rigorous type of the (EMH), in which all the data relating to a market is stated such as Public or private which is reflected on the stock prices. This level of market efficiency suggests that proceeds beyond average returns might not be realized irrespective of the lot of study or statistics available to investors in the market.

III. REVIEW OF LITERATURE

Three kinds of market Informational efficiency such as strong, semi-strong, and weak were greatly recognized in the capital market by the researchers all around the world. Charting and technical analysis uses have been completely ignored and it states current prices of shares completely projects the entire information included in the records of historical prices, this was highlighted in weak efficiency. This was studied in India over prolonged period of time and the awe-inspiring majority of proof, for an instance, Barua (1980, 1987); Sharma (1983); Ramachandran (1985); Sharma and Kennedy (1977); Gupta (1985) is in support of weak form of efficiency. There are some limited research studies like (Kulkarni (1978) and Chaudhury (1991a, b, c)) which were not in favor of it. According to the above indication, the research studies of **Bhat and Pandey (1987)**, study seem to be contradictory to EMH theory as they concluded in their research study done by conducting the survey through the questionnaire that the beneficiaries and those who prepares of accounting information of any company in India disbelieve that the market efficient is in somewhat three kinds.

1. **Gayathri P Pillai, Arjun Pillai (2021):** In this article the researchers were trying to understand the kind of market efficiency with respect to Indian stock market, and to understand the impact of Covid-19 on Indian stock market. In this study the researcher is also trying to establish the relationship between the new information relating to events that are happening in the country like Covid pandemic and changes in the share prices of shares at Indian stock market. Probabilities were huge to gain abnormal gain in a trading day when

the study shows the study portrays the closing price to be effective for some of the days. This enable anyone to analyses the several aspects which are needed to be taken into consideration at the time of taking decision to invest in the market. It is also to be noted that fundamental and technical analysis alone cannot help the investor in decision making as investors behavioral aspects and market sentiments also to be given immense significance while considering decisions to invest in stock market.

2. **Dr. Anshul Sharma, Shyam Kumar, Mr. Somesh Kumar (2020):** In this research article the researcher had conducted a survey by analyzing the share prices of organisations. It has been found out from the study that out of the 10 organisations which were considered as sample 8 organisations share prices have moved on random basis within the time frame considered for this study. At the same time the share price movement of ITC and HUL company were non-random during the time period of the study. Further in the study it can be understood that the null hypothesis has been accepted along with the support of findings that the capital market in India is efficient in weak form as the share prices movement are autonomous of one another within the time period of the study.
3. **Narayan Parab, Ramashanthi Naik, Y.V Reddy(2021):** The researcher had concluded in the study that there are some significant findings in the study which is pertaining to certain particular economic events as they were only studied but fluctuations in stock prices due to these events were not considered for the study and this was one of the major limitations to the study. Therefore, the present study can be certainly improved with the help of volatility analysis using GARCH or EGARCH Models. However, it can be highlighted that National Stock exchange is capable enough at recuperating from these extensive declines, which in turn it enables investors and traders to formulate appropriate strategies. It is also sure that investors could explore the opportunities throughout economic events to gather shares of those companies in which they would like to invest on a long-term basis by adopting suitable fundamental analysis. Moreover, in order to protect the interest of retail investors the market regulators and policy makers are suggested to analyze the impact of economic events and create considerable awareness amongst them in the Country.
4. **Prasid Gurung, Soumitra Sarkar(2023):** The Present study uses the various statistical tools such as the Run Test, Auto-Correlation function and Unit Root test and summarizes the outcomes of run test, Auto-correlation Function and two-unit root test i.e., Augmented Dickey Fuller test and Philips-Perron, confirms that the

conclusions that the daily, weekly and monthly stock return series of the 17 stocks of BSE Green Index do not follow the 'Random Walk Hypothesis' which is also the significant findings of the study and henceforth discards all the three hypotheses of the study. It also Supports the experiential findings of this study, the study concluded that the notion of the Efficient Market Hypothesis does not hold good in the BSE Green Index of the Indian Stock Market and this finding would be very authoritative to the investors concerned about their investment decisions with regard to sustainability practices.

5. **Yunus Karaömer, Songül Kakilli Acaravci (2022):** The current Study focused to analyzing the efficacy of cryptocurrency market based on adaptive market hypothesis. It was also understood how this market varies based on daily records of past data relating to Bitcoin, Ethereum, Litecoin, Ripple and Cardano. The conformism of cryptocurrencies to the normal distribution was observed by the Jarque-Bera test and their stationarity was tested by unit root tests. In addition, the daily yields of cryptocurrencies examined by tge means of 500-days rolling window method to understand the time-varying feature of the cryptocurrency market efficiency. It is concluded in the study that the Results are steady with the Adaptive Market Hypothesis and specify that the cryptocurrency market efficiency fluctuates for a specific period of time. In addition, this market fluctuates and usually resembles to optimistic or adverse updates or actions in a market.
6. **Philip S. Russel, Violet M. Torbey (2023):** In this present study it is made clear that Indisputably, the studies conducted on Efficient Market Hypothesis have provided significant contribution to our understanding on the securities market. Nevertheless, there seems to be increasing disapproval with the theory. As only a inadequate study on the current literature projects that disparagement of EMH has grew both voice and momentum during recent years. Whereas it is factual that the market retorts to novel data, and this is now evident that information is not the only variable which affects the valuation of security. Hence Recent years have observed a new wave of researchers who have offered thought provoking, hypothetical influences and backing experiential indication to display that security prices could diverge from their equipoise values due to psychological aspects, trends, and noise trading.
7. **Barua S.K and Srinivasa G (1991)** Concludes on the defilement of risk return parity along with the proof of the orderly mispricing of convertible financial instruments in the market and also emphasis this is an indication of arbitrage opportunity. Nevertheless, the research paper triggered a heated argument on whether the arbitrage opportunity was actually risk-free factor and after a lot discussion the mispricing of convertible securities remains a mysterious in congruity. There are very few studies are done related to the behavior of Interest rates related to fixed income bearing instruments, it has been also concluded in the study that the interest rates in India have been slowly unregulated since 1991 nevertheless the transformation to a total free market regime is expected to happen in the country.
8. **Barua and Raghunathan (1990a), Sundaram (1991) and Obaidullah (1991), Sinha (1992):** examines the fundamental aspects such as growth of dividend and Payout ratios are consistent with the observed price earnings. The study also focused on answering to the question on Pricing in India market steady with risk return parity hypothesized by the Capital Asset Pricing Model (CAPM).
9. **Subramaniam (1989): "The Impact of Political and Economic Events on Stock Behavior"** Studied, the Market seems to react very proficiently to political events happening in the country. These events affect share values which is featured with low intricacy and high precision. The market faces more trouble due to vague and complex political events happening in the country
10. **Bhat (1988)** studied by considering the year 1971-1985 he understands the association amongst the market indices of regional market and the indices of Indian stock market using monthly data. He concludes that the regional price indicators are affected instantly by the indices of Indian stock market, and also mentions that the research which he conducted may not be sufficient to judge the presence of an unified national market.
11. **Srinivasan (1988)** Concludes that the relationship holds good according to CAPM only in the long run. The rationality of CAPM is crucial as number of checks belonging to EMH obliquely presume the legitimacy of the CAPM. It has also been highlighted in the study that Both CAPM with its detailed test and also competing Arbitrage Pricing Theory are very significant scope for impending research.
12. **Dixit (1986)** Concludes that the most prominent determinant of share prices is its dividend no other factors much affect the shares prices in the market this issue is also supported by the standard theories of fundamental value.
13. **Ramachandran (1985) and Srinivasan (1988):** Highlighted in their research study that Indian market efficient in responding to the events pertaining to bonus issues and rights issues declared by the companies, but the basic questions is that to what extent it reflects on the share prices of the companies.

Therefore, the present study tries to understand the implications of Bonus issues and rights issue declared by the company to their shareholders.

IV. NEED OF THE STUDY

The current study would surely be beneficial to the investors who wish to invest in the share market on banking sector's Companies stocks as this study helps them analyze price movements of banking sector's stocks are random or not and also can examine the market efficiency. Thus, this sort of research studies would contribute in strengthening capital market as it enables the investors to take appropriate decisions pertaining to investment at the right time.

V. OBJECTIVES OF THE STUDY

1. To examine the level of market efficiency in the certain chosen banking segment stocks.
2. To appraise how the past stock prices of chosen banking sector stocks reflect on the future prices of the stocks.
3. To examine price variation of specific chosen banking sector stocks is random or not.

VI. RESEARCH METHODOLOGY

6.1 Research Hypothesis H01: price change of selected private sector banks stocks is random.

6.2 The present research study is empirical in nature.

6.3 Sample size: For this study five private bank's share prices have been considered for five financial years, the share prices of Axis Bank Ltd., HDFC Bank Ltd., Indus land Bank Ltd., ICICI Bank Ltd., and Kotak Mahindra Bank Ltd., taken into consideration for the study thus the data which is required for the study has been extracted from the official website of BSE.

6.4 Sampling Design: for the purpose of the study, five private banks operating in India have been taken into consideration.

6.5 Duration of the Study: This study is conducted for a span of 5 financial years spanning from 1st Jan 2017 to 1st Jan 2022.

6.6 Data Collection: Data is collected from secondary sources

6.7 Secondary Sources: the secondary data required for the study is obtained from official websites of stock market and remaining required secondary data for the study is also gathered from News Paper, magazines, textbooks and Journals.

6.8 Data Analysis: The data analysis has been done with the help of

- Tables
- Run test

VII. ANALYSIS AND INTERPRETATION

The study focuses on examining EMH by using run tests, run test is a non-parametric test which helps to test the casualness of the runs as well as arbitrariness in the behavior of stock market in India. a sequence of price changes for a specific period of time can be considered in run test and every price variation is can be chosen as a plus (+) if there is a proliferation in price or a minus (-) if there is a reduction in price. Further A run occurs when two successive variations are the same (i.e., ++ or --). When price fluctuations in a dissimilar route, such as +- or -+. The run finishes and a new run might start. In order to examine for unconventionality, number of runs for a specific sequence of price variations can be paralleled to expected values in the table for the number of run that must exist in a random series.

TABLE NO 1. DESCRIPTIVE STATISTICS OF RETURNS FOR STOCK PRICES OF CHOSEN PRIVATE SECTOR BANKS IN INDIA

Descriptive Statistics	Mean	Median	Minimum	Maximum	Std.Dev	Skewness	Kurtosis
Axis Bank							
Daily Return	608.7894	610.75	303.15	845.05	119.6027	758.65	-1.16818
Weekly Return	607.8974	614.025	301.25	808	116.062	-0.0956	-1.1425
Monthly Return	609.7617	616.075	379.3	808.5	119.0601	-0.09687	-1.16477
HDFC Bank							
Daily Return	1645.428	1577.1	765.45	2494.35	406.0549	0.080282	-0.94167
Weekly Return	1644.2531	1566.1521	861.25	2432.25	405.0571	0.0765	-0.96521
Monthly Return	1648.975	1581.925	862	2446.4	411.9615	0.105421	-0.97106
KOTAKMAHINDRA Bank							
Daily Return	1381.731	1333.825	694.9	2210.55	340.9995	0.199188	-0.88816
Weekly Return	1385.6521	1132.261	770.05	2225.65	335.1621	0.189121	1.12645
Monthly Return	1386.282	1349.375	772.55	2032.25	331.2365	0.142418	-0.89793

ICICI Bank Daily Return	420.5525	366.6	251.1	841.05	142.4146	0.989017	-0.16182
Weekly Return	418.25	365.213	265.12	820.31	140.213	1.0312	0.98521
Monthly Return	422.75	362.125	269.05	802.3	143.488	1.02157	-0.01011
INDUSLAND Bank Daily Return	1294.074	1403.25	301.2	2021.55	427.4421	-0.49394	-0.68114
Weekly Return	1292.0121	1486.25	320.12	2121.32	430.1254	-0.4875	-0.5621
Monthly Return	1290.16	1490.78	351.15	1994.4	439.928	-0.4987	-0.6891

The above table depicted the Daily, weekly, and monthly returns of series of five selected stocks of private sector banks has been calculated using descriptive statistics, the lowest average is being observed in Axis bank' s with the values daily (608.7894) weekly (607.8974) and monthly (609.7617) and highest monthly return is being observed in HDFC bank with the values daily (1645.428) weekly (1644.2531) and monthly (1648.975). further in the study risk is measured using standard deviation which is higher in Indus land Bank stocks.

In order to test the independence of stock prices we need

Total Number of runs(r)

Number of positive price variations(n1)

Number of negative price variations(n1)

Level of significance:

The run test is applied at 5% significance level where Z=1.96

TABLE NO 2: SHOWS THE DAILY, WEEKLY AND MONTHLY RETURNS OF STOCKS AND THEIR RUN TEST RESULTS

Company'sName	Time period	N	n1	n2	Observed runs	mean(μ)	s.d(σ)	Lower limit	Upper limit	Hypothesistesting (levelof significance)
Axis Bank	Daily Returns	1192	594	598	542	595.23	19.25	621.8	661.67	H0 is rejected
	Weekly returns	384	190	194	120	190.34	9.09	118.62	147.33	H0 is accepted
	Monthly returns	86	41	45	39	41.88	4.8	22.04	37.93	H0 is accepted
HDFC Bank	Daily Returns	1186	591	595	592	591.12	19.21	612.13	689.14	H0 is rejected
	Weekly returns	384	190	194	157	191.89	11.54	115.74	149.21	H0 is rejected
	Monthly returns	86	43	45	27	42.78	6.79	25.19	39.44	H0 is accepted
KOTAK MAHINDRA	Daily Returns	1162	582	580	568	579.89	27.36	578.69	678.7	H0 is rejected
	Weekly returns	384	190	194	137	191.02	8.78	115.02	146.31	H0 is accepted
	Monthly returns	86	41	45	43	42.78	7.25	21.63	35.54	H0 is rejected
ICICI Bank	Daily Returns	1172	586	586	578	585.89	12.98	599.63	669.32	H0 is rejected
	Weekly returns	384	190	194	162	191.89	9.08	146.5	178.17	H0 is accepted
	Monthly returns	86	46	40	36	42.54	6.71	22.53	43.08	H0 is accepted

INDUSLAND Bank	Daily Returns	1182	590	592	583	592.67	27.26	605.76	675.77	H0 is rejected
	Weekly returns	384	190	194	145	191.45	11.07	126.44	158.07	H0 is accepted
	Monthly returns	86	41	45	35	42.56	4.75	29.73	38.43	H0 is accepted

7.1 RUN TEST RESULTS

Axis Bank: In this bank we can say that the observed runs do not fall within either upper limit or lower limit therefore it is determined that the prices are dependent at 5% significance level(Ho is rejected) consequently the stock price variation pertaining to daily return of Axis is not random and at the same time weekly and monthly return of the bank falls under the upper limit and lower limit thus the prices are independent at 5% significance level (Ho accepted) therefore we can conclude here that the stock price of axis bank in weekly and monthly variation follows randomness.

HDFC Bank: in this bank we can notice that the observed runs do not fall within either upper limit or lower limit hence prices are reliant at 5% significance level (Ho is rejected) therefore the stock price variation pertaining to daily return of HDFC bank is not random and at the same time weekly return of this bank does not comes within lower and upper limits therefore prices are dependent at 5% significance level(Ho is rejected) thus the price change is not arbitrary whereas monthly yield of the bank falls within the upper limit and lower limit hence the prices are independent at 5% significance level (Ho accepted) therefore we can conclude here that the stock price of HDFC bank in monthly price change follows randomness.

Kotak Mahindra Bank: in this bank the observed runs of daily return do not fall within upper limit and lower limit thus prices are reliant on at 5% significance level (Ho is rejected) hence the stock price variation pertaining to daily return of HDFC bank is not random and at the same time weekly return of this bank also do fall within lower and upper limits therefore prices are independent at 5% significance level(Ho is accepted) thus the price change of Kotak Mahindra bank weekly prices are random whereas monthly return of the bank do not falls within the upper limit and lower limit hence the prices are dependent at 5% significance level (Ho rejected) therefore we can conclude here that the monthly stock price of Kotak Mahindra bank do not follow randomness.

ICICI Bank: in this bank we can say that the observed runs do not fall within either upper limit or lower limit therefore it can be determined that the prices are dependent at 5% significance level(Ho is rejected) therefore the stock price variation pertaining to daily return of ICICI is not random and at the same time weekly and monthly return of the bank falls under the upper limit and lower limit thus the prices are independent at 5% significance level (Ho accepted)

therefore we can conclude here that the stock price of ICICI bank in weekly and monthly variation follows randomness.

INDUSLAND Bank: : in this bank we can say that the observed runs do not fall within either upper limit or lower limit therefore we can conclude that the prices are dependent at 5% significance level(Ho is rejected) therefore the stock price variation pertaining to daily return of Indus land Bank is not random and at the same time weekly and monthly return of the bank falls under the upper limit and lower limit thus the prices are independent at 5% significance level (Ho accepted) therefore we can conclude here that the stock price of Indus land bank in weekly and monthly variation follows randomness.

VIII. FINDINGS

From the above study it can be observed that daily returns of all the selected five private sector banks and weekly returns of HDFC banks(Ho) has been rejected which indicates that the market is not efficient as well as not in weak form during those period wherein stock prices in the market move dependently during these consecutive days. Further monthly return (Ho) of all the five banks except (Kotak Mahindra) has been accepted that means that the stock prices of these five banks are in weak form and can move independently of each other during these times.

IX. CONCLUSIONS

The current study focused on understanding the various forms of Efficient market Hypothesis in order to understand the randomness of stock prices of selected five private sectors banks in India. The returns of all the five private sector banks stocks have been taken into consideration on Daily, Weekly and Monthly basis wherein Descriptive statistics is been used to understand their randomness. Hence from the above study it can be concluded that stock market for private sector banks in India is in weak form as per the weekly and monthly return of five selected private sector banks, as the share prices of these banks are moving independently and these series follows randomness reflecting future prices based on past prices. Hence stock market seems to be efficient in providing information which reflects on the complete prices in the market.

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