AN EVIDENCE ON FAIR MARKET VALUE USING EFFICIENT MARKET HYPOTHESIS ON NIFTY IT INDEX

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ABSTRACT

The effectiveness of the stock market draws investors to make investments. Without deals in the stock market, an efficient market means that stock prices are accurate. In other words, a market that is efficient will reflect a share's market price as a fair approximation of its underlying value. Fair market value is derived from stock prices using the Efficient Market Hypothesis. The current study investigates the randomness of the price fluctuations of the ten IT stocks that were chosen and traded on the National Stock Exchange (NSE). The effectiveness of the stocks was assessed using the Runs test, which comprises observed runs, upper and lower limits. For the twelve-month period from June 2021 to May 2022, the closing price data has been gathered. From the returned upper and lower limit and observed runs for five IT stocks, null and alternate hypotheses have been determined. The investigation shows that the chosen IT stocks were under Semi-Strong operating efficiency. Overall, the hypothesis of selected stocks were above Semi- Strong hence null hypothesis is accepted.

KEYWORDS: Efficient Market Hypothesis, National Stock Exchange, Runs Test.

I. INTRODUCTION

The present study on the Efficient Market Hypothesis on NIFTY IT Index where all the essential information is represented in the stock prices, market efficiency states that outperforming the market is impossible. It believes that price movements are unexpected and is based on the information that arrives at random intervals. The Efficient Market Hypothesis (EMH), is a financial market that is efficient when its prices accurately represent all available information regarding value. The tools that are used to know the EMH are the Observed Runs Test, Mean, Standard Deviation Upward trend and the Downwardtrend of the index prices listed in the NSE or NIFTY.

Weak EMH: The trade volumes and historical prices serve as the information. Since everyone has access to more information than just historical trading data, although having the most support, this category is the least important. It's either conceivable or unlikely for investors to outperform the market. It has an intriguing implication that technical analysis would be useless.

Semi-Strong EMH: This version is interesting because, as investors, we have access to that information. Analying the stock is pointless if the Semi-strong is accurate. The technical analysis will try to identify winners and losers if the Semi-strong EMH is accurate.

Strong EMH: This is based on all available information, both private and public. Using information for trading is prohibited since doing so entails exploiting the general public and driving them away from stock trading. Corporate executives have the right to purchase their company's shares, but they are required to notify the government before doing so.

II.STATEMENT OF PROBLEM

The current study is based on the Efficient Market Hypothesis and uses the runs test to determine whether the selected companies on Nifty IT are in weak, semi-strong, or strong stockcircumstances. Null Hypothesis study has been carried out as a result. Hence, the present studybecomes relevant to analyze the performance and its form with the selected IT stocks under service sector from NSE.

III. OBJECTIVES OF THE STUDY

- To analyze the closing stock price on top five NIFTY IT Stocks.
- To investigate the Mean and the Standard Deviation on top five NIFTY IT Stocks.
- To examine the upper limit and lower limit using Runs Test.
- To determine the Null and Alternative hypothesis based on the Runs Test.

IV.SCOPE OF THE STUDY

The present study on the Efficient Market Hypothesis help to analyze the closing prices on theNIFTY IT and to determine the hypothesis based on the observed Runs test and also helps to know about the upper limit and the lower limit for the IT. Indian Stock Market is a booming market and it also fluctuate with companies' stocks. The stocks listed on the NSE are chosen for testing a moderately strong version of the efficient market hypothesis because they offer important information about the randomness of stock prices that prevail on the NSE and the existence of any appreciable discrepancy between past and future security prices.

V.REVIEW OF LITERATURE

1. Ms Pooja Yadav and C.A. Dr. D.S. Patil, (2019). For a long time, forecasting and building models of stock price behaviour have piqued the interest of economists, statisticians, and financial analysts in relation to the financial markets. This analysis shows that if stock returns behave randomly, the Indian stock market is efficient. The results demonstrate that the knowledge contained in previous stock prices may not be fully represented by Indian stock prices. Taking advantage of these opportunities, investors can achieve tremendous gains.

2. Samuel O. Onyuma, (2020). The microstructure of the securities markets has changed as a result of advancements in computerized trading. Electronic markets are progressively taking the place of the conventional physically convened markets used by stock exchanges across the world. To increase liquidity and transparency in trading, the Exchange should think about pursuing full market automation by enabling online and internet securities trading and using mobile money transfer platforms to pay for stock transactions. This would be in addition to the adoption of margin trading and a hybrid trading system.

3. Colin M, et all (2022). One of the biggest and most intricate markets in the world financial system is the U.S. stock market. This market has changed at many structural and temporal dimensionsthroughout the last few decades. We analyze extensive market data longitudinally in order to measure non-stationary dynamics across the system. These advancements have encouraged thecreation of a vibrant machine trading ecology, which results

in qualitative variations in trading behavior at both human and machine time scales.

VI. HYPOTHESIS

1. Null Hypothesis (H_0) : Observed run lie between Upper Control and the Lower Controllimit of the share price movement of the NIFTY IT Stocks.

2. Alternative Hypothesis (H₁): Observed run does not lie between Upper Control and theLower Control limit of the share price moment of the NIFTY IT Stocks.

VII. RESEARCH DESIGN

The present study involves Descriptive and Analytical Research in nature, emphases the value of the IT stocks and its Performance .The study falls on secondary data that has been collected from NationalStock Exchange (NSE). The study uses the closing price of the stock and the opening market value of the company.

VIII.DATA TYPE

Primary Data: The present study does not avail any first-hand information.

Secondary Data: The present study involves to obtain data from NSE official website, historical stock prices from June 2021- May 2022.

IX. SAMPLING TECHNIQUE

The present study adopts Convenience sampling Technique, The chosen IT stocks from NIFTYIT Index.

X.POPULATION:

There are Ten Companies listed on the Nifty It. They are Wipro Limited, HCL Limited, Infosys Limited, TCS Limited, Tech Mahindra, Conforge, Mphasis, Larsen & Turbo Infotech Limited, L & T Services Limited, Mind Tree Limited.

XI. SAMPLE SIZE

For the study five IT Stocks were selected from NSE NIFTY IT Index.

XII. STATISTICAL TOOLS & TECHNIQUES

Runs Test- Run test is test that determines two-valued sequence of data supports of randomness. By taking the data in the prescribed, the data having a positive shift with a "+" sign and the data having a negative shift with a "-" sign, one may determine the randomness of this distribution. Testing the independence of stock prices entails: Number of positive runs (r), Number of negative runs (n2), and N1+N2 is the total number of observations for each categoryare observed.

Mean(\mu) =[2(n1*n2)/n1+n2] +1

Standard Deviation (σ) = $\sqrt{[2n1*n2(2n1*n2-n1-n2)/(n1+n2)2(n1+n2-1)]}$

Upper Limit- μ +1.96*Standard Deviation.

Lower Limit- μ -1.96*Standard Deviation.

a. DATA ANALYSIS ON THE CLOSING PRICE OF WIPRO LIMITED FROM JUNE-2021 TO MAY-2022

MONTHS	CLOSING	PRICE
	PRICE	CHANGES
Jun-21	548.72	****
Jul-21	560.88	+
Aug-21	616.20	+
Sep-21	662.02	+
Oct-21	673.89	+
Nov-21	651.82	_
Dec-21	666.07	+
Jan-22	643.29	-
Feb-22	564.12	-
Mar-22	592.15	+
Apr-22	554.99	-
May-22	473.34	-

Total Runs Observed = 6

No. of Positive Runs (n1) = 6

No.of Negative Runs (n2) = 5.

 $Mean(\mu)=[2(n1*n2)/n1+n2]+1$

= [2(6*5)/5+6] +1

(µ) =6.455

Standard Deviation (σ)= $\sqrt{[2n1*n2(2n1*n2-n1-n2)/(n1+n2)2(n1+n2-1)]}$

 $= \sqrt{[2*6*5(2*6*5-6-5)/(6+5)2(6+5-1)](\sigma)} = 1.56$

Upper Limit=9.51Lower Limit=3.40



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100	0 lun-21	0 Jul-21	0 Aug-21	0 Sep-21	0 Oct-21	0 Nov-21	0 Dec-21	0 Jan-22	0 Feb-22	0 Mar-22	0 Apr-22	0 Mav-

INTERPRETATION: The data in the above chart represents the stock price changes of the Wipro Limited where the calculated mean sound as 6.455 and the standard deviation as 1.56. Therefore, Null Hypothesis is accepted for the Wipro Limited as the observed run (6) lies between the upper limit (9.51) and the lower limit is (3.50) for the company and the alternativehypothesis rejected.

b. DATA ANALYSIS ON THE CLOSING PRICE OF INFOSYS LIMITED FROM JUNE-2021 TO MAY-2022

MONTHS	CLOSING PRICE	PRICE CHANGES
Jun-21	1473.16	****
Jul-21	1575.02	+
Aug-21	1695.63	+
Sep-21	1703.07	+
Oct-21	1716.41	+
Nov-21	1735.22	+
Dec-21	1781.58	+
Jan-22	1829.05	+
Feb-22	1729.06	-
Mar-22	1835.57	+
Apr-22	1693.68	-
May-22	1500.12	-

Total observed Runs=4

No. of Positive Runs(n1) =8 No. of Negative Runs(n2) =3 $Mean(\mu)=[2(n1*n2)/n1+n2]+1$

= [2(8*3)/8+3] +1

(µ) =5.364

Standard Deviation (σ)= $\sqrt{[2n1*n2(2n1*n2-n1-n2)/(n1+n2)2(n1+n2-1)]}$

 $= \sqrt{[2*8*3(2*8*3-8-3)/(8+3)2(8+3-1)]}$

 $(\sigma) = 1.44$

Upper Limit= 8.19

Lower Limit= 2.54



INTERPRETATION: The data in the above chart represents the stock price changes of the INFOSYS LTD where the calculated mean sound as 5.364 and the standard deviation as 1.44. Therefore, Null Hypothesis is accepted for the Infosys ltd as the observed run (4) lies between the upper limit (8.19) and the lower limit is (2.54) for the company and the alternative hypothesis rejected.

c. DATA ANALYSIS ON THE CLOSING PRICE OF TECH MAHINDRAFROM JUNE-2021 TO MAY-2022

MONTHS	CLOSING PRICE	PRICE CHANGES
Jun-21	1061.56	****
Jul-21	1096.02	+
Aug-21	1360.36	+
Sep-21	1448.43	+
Oct-21	1465.00	+
Nov-21	1548.81	+
Dec-21	1662.71	+
Jan-22	1650.55	-
Feb-22	1432.07	-
Mar-22	1489.73	+

Apr-22	1370.04	-
May-22	1180.37	-

Total observed Runs=4

No. of Positive Runs(n1) =7 No. of Negative Runs(n2) =4 Mean(μ)=[2(n1*n2)/n1+n2] +1

= [2(7*4)/7+4] +1

(µ) =6.091

Standard Deviation (σ)= $\sqrt{[2n1*n2(2n1*n2-n1-n2)/(n1+n2)2(n1+n2-1)]}$

$$= \sqrt{[2*7*4(2*7*4-7-4)/(7+4)2(7+4-1)](\sigma)} = 1.21$$

Upper Limit= 8.46

Lower Limit= 3.72



INTERPRETATION: The data in the above chart represents the stock price changes of the Tech Mahindra where the calculated mean sound as 6.091 and the standard deviation as 1.21. Therefore, Null Hypothesis is accepted for the Tech Mahindra as the observed run (4) lies between the upper limit (8.46) and the lower limit is 3.72) for the company and the alternative hypothesis rejected.

d. DATA ANALYSIS ON THE CLOSING PRICE OF L & T TECHNOLOGYSERVICES LIMITED FROM JUNE-2021 TO MAY-2022

MONTHS	CLOSING PRICE	PRICE CHANGES
Jun-21	2,811.40	****
Jul-21	3,217.10	+
Aug-21	3,769.34	+
Sep-21	4,494.81	+
Oct-21	4,711.40	+
Nov-21	5,231.94	+

Dec-21	5,399.48	+
Jan-22	5,292.75	-
Feb-22	4,502.97	-
Mar-22	4,846.26	+
Apr-22	4,514.47	-
May-22	3,645.21	-

Total observed Runs=4

No. of Positive Runs(n1) =7 No. of Negative Runs(n2) =4 Mean(μ)=[2(n1*n2)/n1+n2] +1

= [2(7*4)/7+4] +1

(µ) =6.091

Standard Deviation (σ)= $\sqrt{[2n1*n2(2n1*n2-n1-n2)/(n1+n2)^2(n1+n2-1)]}$

 $=\sqrt{[2*7*4(2*7*4-7-4)/(7+4)^2(7+4-1)]}$

 $(\sigma) = 1.44$ Upper Limit= 8.91 Lower Limit= 3.27



INTERPRETATION: The data in the above chart represents the price changes of the L&T Technology Services Limited of the equity share where the calculated mean for the price changes is 6.091 and the stand deviation for the data is 1.44 where the Hypothesis is accepted for the L&T Technology Services Limited as the observed run

(4) lies between the upper limit (8.91) and the lower limit is (3.27) for the company.

e. DATA ANALYSIS ON THE CLOSING PRICE OF MIND TREELIMITED FROM JUNE-2021 TO MAY-2022

MONTHS	CLOSING PRICE	PRICE CHANGES
Jun-21	2,469.52	****
Jul-21	2,657.70	+
Aug-21	3,137.39	+
Sep-21	4,083.08	+
Oct-21	4,451.04	+
Nov-21	4,747.56	+
Dec-21	4,562.66	-
Jan-22	4,353.60	-
Feb-22	3,878.55	-
Mar-22	4,082.32	+
Apr-22	3,960.08	-
May-22	3,053.20	-

Total observed Runs=4

No. of Positive Runs(n1) = 6

No. of Negative Runs(n2) =5Mean(μ)=[2(n1*n2)/n1+n2]

= [2(6*5)/6+5] +1

(µ) =6.455

Standard Deviation (σ)= $\sqrt{[2n1*n2(2n1*n2-n1-n2)/(n1+n2)2(n1+n2-1)]}$

 $=\sqrt{[2*6*5(2*6*5-6-5)/(6+5)2(6+5-1)](\sigma)}=1.55$



Upper Limit= 9.49

Lower Limit= 3.42



INTERPRETATION: The data in the above chart represents the price changes of the Mind Tree Limited of the equity share where the calculated mean for the price changes is 6.455 and the stand deviation for the data is 1.55 where the Hypothesis is accepted for the Mind Tree Limited as the observed run (4) lies between the upper limit (9.49) and the lower limit is (3.42) for the company.

XIII. A STUDY ON THE MARKET HYPOTHESIS OF THE SELECTEDCOMPANIES FROM NIFTY (OBSERVED RUNS)

1. Null Hypothesis (H_0) : Observed run lie between Upper Control and the Lower Controllimit of the share price movement of the NIFTY IT Stocks.

2. Alternative Hypothesis (H₁): Observed run does not lie between Upper Control and theLower Control limit of the share price moment of the NIFTY IT Stocks

COMPANY NAME		ME AN	S D	UPP ER LI MI T	LOW ER LIM IT	OBSERV ED RUNS	HYPOTHESI STESTING
WIPRO LIMITED	5	6.45 5	1 5 6	9.51	3.4	6	H ₀ ACCEPTED
INFOSYS LIMITED	3	5.36 4	1 4 4	8.19	2.54	4	H ₀ ACCEPTED

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TECH MAHINDRA	4	6.09 1	1 2 1	8.46	3.72	4	H ₀ ACCEPTED
L & T TECHNOLOGY SERVICES LIMITED	4	6.09 1	1 4 4	8.91	3.27	4	H ₀ ACCEPTED
MIND-TREE LIMITED	5	6.45 5	1 5 5	9.49	3.42	4	H ₀ ACCEPTED



INTERPRETATION: The data is the above cart represents the result of the runs test for 5 companies, using the upper and lower limit. Out of the five IT companies, it is found that Tech Mahindra has the best performance since June 2021- May 2022. All the observed runs fall within the upper & lower limit, Wipro limited has '6' runs, Infosys Limited has '4' runs, Tech Mahindra has '4' runs, L & TTechnology Services Limited has'4' runs, Mind Tree Limited has '4' runs, so there is no significant difference between the observed runs that lies between upper limit and lower limit. So Null Hypothesis is Accepted and the Alternative Hypothesis is rejected.

XIV. FINDINGS:

• From the Study it is observed that there is uptrend and downtrend in stock prices fromJune 2021-May 2022 of Wipro Limited and it is less volatile. Therefore, the company has more positive runs is more compared to negative runs.

• From June 2021 to May 2022, Infosys Limited stock prices show an increase and a downturn, but they are less erratic than usual. As a result, the company experiences more positive runs than bad runs.

• From June 2021 to May 2022, Tech Mahindra stock prices show an increase and a decrease, although they are less volatile than usual. As a result, the firm has more good runs than bad runs.

• Although less volatile than normal, L & T Services Limited stock prices show a rise and a decline from June 2021 to May 2022. The outcome is that the company enjoys more profitable runs than unsuccessful ones.

• The stock prices of Mind Tree Limited show an upswing and a downswing from June 2021 to May 2022, but they are less unpredictable than typical. As a result, the business has more successful than unsuccessful periods.

XV. CONCLUSION: The present study concludes that the information on stock market and the company performance at stock exchange improves the knowledge of traders to forecast future stock values. The chosen Nifty IT stocks were analyzed based on closing prices obtained from the NSE for the past one year between June 2021 to May 2022. Out of the five IT companies, it is found that Tech Mahindra has the best performance since June 2021- May 2022.From the study All of the chosen stocks were determined to be Semi-Strong efficient according to EMH after the Run test was run. The study also helps to serve the interest of the customers/investors to find market value of respective IT companies and its performance at the stock exchange.

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