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Weak from Efficiency on Return from Information Technology Stocks – A Paradigm from India

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ABSTRACT

Weak from efficiency is a stage that current price fully reflects all the information contained in the history of past prices and denies the utility of charting and technical analysis. This issue has been researched worldwide over a long period and the vast predominance of indications exists, however, the Information Technology (IT) stocks were not analyzed that much. The current study examines the weak from efficiency or random walk in return on Indian IT stocks for the period from 1st August 2006 to 31st July 2012, which comprises 1491 available days. Descriptive statistics, Kolmogorov Smirnov test, Unit root test and Run test were applied on the major Indian IT Stocks Indices CNX IT National Stock Exchange of India (NSE). Based on the result, it was observed that Indian IT stocks market was efficient and does not follow random walk during the elected study period.

KEYWORDS: Informational Efficiency, IT Stocks, NSE, Random Walk and Weak from Efficiency

Introduction

The term "efficiency" is much significant in finance and economics, of course not only those two, the efficiency is a vital factor for anything and everything. The capital market is major source for capital rising and financing, also it will be one of the key indicator for country's economy. An essential question pertaining to capital markets is their efficiency, is it weak-from efficiency, semi-strong from efficiency and strong from efficiency?

The Efficient Markets Hypothesis (EMH) is known as one of the mainstays of contemporary finance theory, and many literatures in the subject since the 1960's (when it was first proposed) used to note about it.

First, it's essential to know what market efficiency is in order to understand what is weak from marker efficiency or random walk. If prices of securities digest and imitate the information about them, then the situations is treated as Markets are efficient. The extent to which the financial markets take on board with pertinent information into the prices is an important issue. If the prices fully reflect all relevant information instantaneously, then market prices could be unfailingly used for various economic decisions. For instance, a firm can assess the potential impact of increased dividends by measuring the price impact created by the dividend increase. Similarly, a firm can assess the value of a new investment taken up by ascertaining the impact on its market price on the announcement of the investment decision.

Weak from Efficiency

The weak-form efficiency or random walk would be displayed by a market when the consecutive price changes (returns) are uncorrelated. This implies that any past pattern of price changes are unlikely to repeat by itself in the market. Hence, technical analysis that uses past price or volume trends do not to help achieve superior returns in the market.

Review of Literature

Chiang T. C., Yang, S. Y. and Wang, T. S analyzed stock returns for a group of Asian economies in 2000 and found that most markets exhibit an autoregressive process rejecting weak form efficiency. Magnusson and Wydick tested the random walk hypothesis during the year 2002 in the study named "How Efficient are Africa's Emerging Stock Markets" and found that there is greater support for the African stock markets than for other emerging stock markets. Moustafa analyzed the behaviour of stock prices in United Arab Emirates (UAE) stock market in the year 2004. By employing the runs test and daily prices of the 43 stocks included in the Emirates market index covering the period commencing October 2, 2001 through September 1, 2003, Moustafa found that the stock prices in the UAE stock market followed the random walk model.

Dr. Ashish and Satish jointly during 2012 found that the Indian Capital market neither follow random walk model nor weak form efficient. They analyzed the market efficiency of Indian Capital Market in its weak form based on 'Nifty' of National Stock Exchange (NSE).

Scope and Objectives of the Study

IT industry has played a major role in the Indian economy during the last few years. A number of large, profitable Indian companies today belong to the IT sector and a great deal of investment interest is now focused on the IT sector.

Three types of informational efficiency (weak, semi-strong and strong) have been well identified by researchers in the field of capital markets throughout the world by analyzing the major indices or collections of major individual stocks. However, the IT stocks were not analyzed that much. Hence, the present study framed with below objectives.

- To know the rudiments of Indian IT stock indices
- To outline the trend of Indian IT stocks market index over the past
- To examine the weak from efficiency or random walk in Indian IT stock indices

Data and Methodology

The study used secondary data in nature which obtained from National Stock Exchange (NSE)'s official websites. Raw data includes daily closing values of CNX IT Index in order to reveal the real vivacious. The period of work covers from 1st August 2006 to 31st July 2012, it comprises 1491 available days. And the indices returns are measured as the continuously compounded daily percentage change in the stock value index in order to avoid the influences of extreme index values. Symbolically,

$$Rt = [Pt - (Pt1) / (Pt1)]*100$$

Where Rt is the return in the period 't', Pt is the daily closing stock price index of NSE-CNX IT Index at a particular time 't'; (Pt1) is the closing share price index for the preceding period. With aim to get empirical results, descriptive statistics, normality test, unit root test and run test have been employed, along with charts also given for clear and self explanatory.

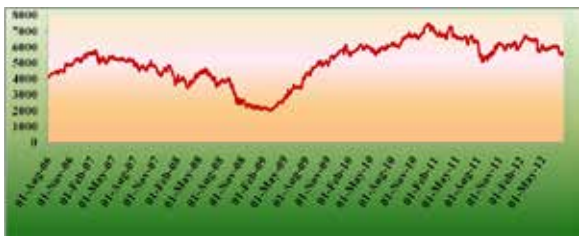
Indian IT Stocks Indices

A stock market index is created by selecting a group of stocks that are representative of the whole market or a specified sector or segment of the market. An Index is calculated with reference to a base period and a base index value.

Indian IT stock indices means, an index which deals with Indian IT stocks to confine the overall performance of IT equities. In order to have a good benchmark of the Indian IT sector, here we elected prominent indices as already marked above, namely NSE-CNX IT Index.

The index comprised of the most liquid and large capitalized Indian IT companies stocks, which provide investors and market intermediaries with a benchmark that captures the capital market performance of Indian IT companies. The CNX IT index is computed using free float market capitalization method.

Chart No.1
Line Plot of NSE-CNX IT Indices



Analytical Results and Discussions

Table No.1
Descriptive Statistics of NSE-CNX IT Indices

Descriptions	Statistic/Std Err	NSE CNX IT
N	Statistic	1491.00
Minimum	Statistic	-9.69
Maximum	Statistic	12.43
Mean	Statistic	0.04
Std. Deviation	Statistic	1.95
Skewness	Statistic	0.14
	Std. Error	0.06
Kurtosis	Statistic	3.38
	Std. Error	0.13

Source: Computed based on data from NSE

The table no.1 demonstrating the descriptive statistics NSE's IT stocks indices named CNX IT. From the table, observed that minimum and maximum return were -9.69 and 12.43 respectively during the elected study period. In case of mean and standard deviations, CNX IT was generated the result with 0.04 and 1.95 respectively.

By Skewness result confirmed that CNX IT was rightly skewed distribution - most values were concentrated on left of the mean, with extreme values to the right. Kurtosis revealed results as leptokurtic distribution in CNX IT during the period of study, sharper than a normal distribution, with values concentrated around the mean and thicker tails. This means high probability for extreme values.

Normality Test

The key assumption for investigating the random walk model is normality. Here, the return series of NSE CNX IT should be normal. In below, the series were analyzed with Kolmogorov Smirnov Test to check the assumption of normality and monitored as "normal."

Table No.2
Normality Test Result of NSE CNX IT Indices

Descriptions		CNX IT
N		1491
Most Extreme Differences	Absolute	0.074491145
	Positive	0.074491145
	Negative	-0.06640794
Kolmogorov-Smirnov Z	Normal	2.876361518
Asymp. Sig. (2-tailed)		0

Source: Computed based on data from NSE

Unit Root and Serial/Autocorrelations Test

Empirical work based on time series data assumes that the underlying time series is stationary. Broadly speaking a data series is said to be stationary if its mean and variance are constant (non-changing) over time and the value of covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time at which the covariance is computed [Gujarati (2003)]. A unit root test has been applied to check whether a series is stationary or not. Stationarity condition has been tested using Augmented Dickey Fuller (ADF) [Dickey and Fuller (1979, 1981), Gujarati (2003), Enders (1995)]. The decision rule of ADF test is: If computed t* is greater than ADF critical value ==> not reject null hypothesis, i.e., unit root exists. If computed t* lower than ADF critical value ==> reject null hypothesis, i.e., unit root does not exist.

To test the serial/autocorrelations, the Durbin and Watson (DW) test was applied. If DW statistic is two or near to two, then the series have no autocorrelation. If the value of DW statistic is moving away from two and going towards zero, then there is positive autocorrelation; And if this value is more than two but less than four, then the series have negative autocorrelation.

Run Test

Run Test is a statistical procedure that examines whether a string of data is occurring randomly given a specific distribution. A run is defined as a series of increasing values or a series of decreasing values. The number of increasing, or decreasing, values is the length of the run. In a random data set, the probability that the (I+1)th value is larger or smaller than the Ith value follows a binomial distribution, which forms the basis of the runs test.

Ho: The NSE CNX IT Indices follow random walk or weak from efficient

Table No.3
Augmented Dickey-Fuller Unit Root and Durbin & Watson Test on NSE CNX IT

Null Hypothesis H(0): NSE CNX IT has a unit root and autocorrelations			
Exogenous: Constant			
Lag Length: 2 (Automatic Based on AIC, MAXLAG=10)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-24.123835	0.000000
Test critical values:	1% level	-3.434581	
	5% level	-2.863289	
	10% level	-2.567726	
R-squared	0.49	Mean dependent var	0.00
Adjusted R-squared	0.11	S.D. dependent var	2.73
S.E. of regression	1.94	Akaike info criterion	4.17
Sum squared resid	5613.39	Schwarz criterion	4.18
Log likelihood	-3099.20	F-statistic	485.10
Durbin-Watson stat	2.00	Prob(F-statistic)	0.00

Source: Computed based on data from NSE

By applying the decision rule, the null hypothesis got rejected, no unit root and found there were stationary in CNX IT during the study period from 1st August 2006 to 31st July 2012, also no autocorrelations.

Table No.4
Run Test Result of NSE CNX IT Indices

Descriptions	NSE CNX IT
Test Value(a)	0.01
Cases < Test Value	745.00
Cases >= Test Value	746.00
Number of Runs	718.00
Z	-1.48
Asymp. Sig. (2-tailed)	0.14

Source: Computed based (Median) on data from NSE

In order to test the significant difference between the actual number of runs and expected number of runs the test statistics employed will be 'Z'. The null hypothesis for this test is that the observed series are random. The null hypothesis is rejected if the calculated number of runs falls outside the 95% confidence interval (μ-1.96 $\sigma \leq k \leq \mu + 1.96\ \sigma$) and is accepted if the value lies in between ±1.96. The z-value is tested at 5% significant level, that is, one cannot reject the null hypothesis with 95% confidence level or in other words there are 5% chances of rejecting a null hypothesis when it is true. The present study's Z values falls outside the critical value of ±1.96, hence null hypothesis got rejected and deduced that CNX IT doesn't follow random walk and not weak from efficient during the elected study period.

Conclusion

Ups and downs are common in capital market, good earnings and payouts by IT stocks could be the stimulant for recuperation from downs in case. The magnitude of IT stocks in the on the whole direction of the stock market, and national capital formation process far compensates the number of listed IT companies are major areas need to be concentrated more and more. This study concentrated on major informational efficiency and found with the help from many statistical tools that "Indian IT Stocks neither follows random walk nor weak from efficient."

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