



**INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH
TECHNOLOGY**

**Testing the Weak-Form Efficient Market Hypothesis: Using CNX Media from the
Emerging National Stock Exchange**

Ms. K.Hemalatha^{*1}, Dr. V. R. Nedunchezian²

^{*1}Assistant Professor, Sri Krishna Institute of Management, Kuniamuthur, Coimbatore, Tamil Nadu, India

²Professor, KCT BS, Kumaraguru College of Technology, Chinnavedampatti, Coimbatore, Tamil Nadu,
India

ktp_hemalatha@yahoo.in

Abstract

Capital market is one of the significant phases of every financial institution and now it's playing a strategic role in a country's economic growth. On the other hands, it gives flexibility for investor to choose investment based on their preference. Today India boasts of being the third largest television market in the world. Entertainment Industry in India has registered an explosive growth in last two decades making it one of the fastest growing industries in India. The purpose of this study is to test the Weak Form Efficient Market Hypothesis in National Stock Exchange by taking the Daily closing prices of 5 media companies in CNX Media. The three conventional ways: Augmented Dickey Fuller Test, Autocorrelation and run-test are used to prove the evidences of weak form market efficiency. The evidences have confirmed that during 2013, National Stock Exchanges is not efficient in a weak form.

Keywords: CNX Media, Weak form Efficiency, Autocorrelation, Runs Test & not efficient

Introduction

Capital market is one of the significant phases of every financial institution and now it's playing a strategic role in a country's economic growth. Today, Indian market confirms to best international practices and standards both in terms of structure and in terms of operating efficiency. It facilitates the exchange of funds between company as demander and investor as supplier. These markets channel, the wealth of savers to those who can put it to long-term productive use, such as companies or governments making long-term investments. The existence of capital market enables company to obtain an alternative source of fund. One aspect of capital market conditions that might become consideration before deciding to invest is the market efficiency.

Stock market efficiency is an important concept for understanding the working of the capital markets particularly in emerging stock market such as India. The term of market efficiency, which is found in the capital market literature, is used to elaborate the relationship between the information and the share price. In 1970, Fama proposed the Efficient Market Theory and defined capital market efficiency as the market in which prices fully reflect all available information. Depending on the meaning

of "all available information", the market efficiency is distinguished into three categories, the weak-form, the semi strong form and the strong form. The testing on Weak Form Efficient Market Hypothesis focuses on the study to prove the existence of return predictability. The theory states that if the market is efficient in a weak form, future share price will not be able to be predicted by the series of historical share price. For that reason, the use of technical analysis will be violated.

Media Sector

Entertainment Industry in India has registered an explosive growth in last two decades making it one of the fastest growing industries in India. Television is one of the major mass media of India and is a huge industry and has thousands of programs in all the states of India. Today India boasts of being the third largest television market in the world. The Indian media & entertainment (M&E) sector a growth is around 12% to touch Rs 92,000 crore in 2013, as per an annual FICCI-KPMG report.

Review of Literature

Dr. Ayhan Kapusuzoglu (2013) probed to examine under Istanbul Stock Exchange (ISE) National 100 index whether weak form market efficiency exists or not under efficiency market hypothesis. The period of the study is 1996 to 2012. It was determined that the related set not shows random walk and in other words, ISE National 100 market is not an efficient market in weak form.

Suresh Chandra Das, Bishnupriya Mishra (2013) tested the eight stocks of National Stock Exchange and tries to investigate the efficiency of Indian stock market. Runs test has been applied to test the random walk hypothesis i.e., weak form efficiency. This study has addressed the subject by testing the Random Walk Hypothesis and to some extent tries to formulate hypothesis by taking into account the daily prices of eight stocks. The Indian stock market is being information efficient, at least in the weak form.

Chu V. Nguyen, Chia-Han Chang & Thai D. Nguyen (2012) investigated whether the Taiwan Stock market is weakly efficient by modifying and estimating Dockery and Kavussanos' multivariate model using a set of panel data. The Taiwan equity market is characterized as high-tech, one of the most liquid markets on the globe, well and strictly regulated, and in an advanced emerging economy. The study found that the Taiwan stock market is not information ally efficient, which may be attributable to the lack of broadness and depth of the market.

D Mbululu and C Chipeta (2012) investigated the Day-of-the-week effect on skewness and kurtosis Evidence from the nine economic sectors of the JSE. The empirical results of this study show no evidence of the day-of-the-week effect on skewness and kurtosis for eight of the nine JSE stock market sectors. The study found that the day-of-the-week effect does not exist on the major JSE stock market sectors and that the JSE is weak-form efficient

Misra Vandna (2012) tested weak form of efficiency of Indian stock market for the period of 2001-2011. The study offers supportive evidence for rejection of weak form of efficiency in Indian stock market by endorsing absence of randomness and independence in selected return series. It reveals drifts in market efficiency which offers avenues for devising profitable trading strategies to market participants

Chien-Ping Chen1 & Massoud Metghalchi (2012) investigate the predictive power of various trading rules with different combinations of the most popular indicators in technical analysis for the Brazilian stock index (BOVESPA) over the

period of 5/1/1996 to 3/1/2011. Although few multiple-indicator trading models show profitability, their predictive power is eliminated after considering the possible interest earning from money market in the days out of stock market. The results support strongly the weak form of market efficiency for the Brazilian stock market.

Kabir M. Hassan, Waleed S. Al-Sultan & Jamal A. Al-Saleem (2003) examine the weak-form efficiency by taking into consideration the institution -al features of the KSE by using the non-linearity and EGARCH and GARCH-M to account for time-varying risk premium in the KSE. They found that the KSE is weak-form inefficient, even though the efficiency improves towards the end of 1990s.

Research Methodology

Research methodology is a way to systematically solve the research problems. It includes the overall research design, the sampling procedure, and Data collection method and analysis procedure

Statement of problem

The small and medium investors could be motivated to save and invest in the capital market only if their securities in the market are appropriately priced. But many did not know how to invest the money in correct indices in the Indian Share Market. Besides, the investors do not have any idea about which companies are best in India.

Objectives of the Study

- The main aim of the study is to examine the Market efficiency of the CNX Media indices listed in NSE.
- To examine the stationarity of share price returns of sample companies
- To determine the randomness in NSE Sample Companies

Period of the study

The sample period is 1st January 2013 to December 2014. The data consist of daily return of CNX Media in NSE.

Source and Collection of Data

The study mainly depends on secondary data. The required data are collected from the CMIE Prowess Corporate Database and www.nseindia.com.

Sample Selection

CNX Media taken as the sample for this study. There are a total of 15 companies in CNX Media index in NSE as on 1st March 2014, however only 5 companies out of 15 would be considered for the study .The 5 companies are selected based on the Market Capitalization

S.NO	NAME OF THE CNX MEDIA COMPANIES
1	Eros Intl Media Ltd.
2	PVR Ltd.
3	Sun TV Network Ltd.
4	TV18 Broadcast Ltd.
5	Zee Entertainment Enterprises Ltd.

Tools for Analysis

- Descriptive Statistics
- Augmented Dickey Fuller test
- Runs Test
- Autocorrelation Test

Runs Test

A runs test is a nonparametric statistical technique to test the likelihood that a series of price movements occurred by chance

- A run is an uninterrupted sequence of the same observation
- A runs test calculates the number of ways an observed number of runs could occur given the relative number of different observations and the probability of this number.

$$M = \frac{N(N + 1) - \sum_{i=1}^3 n_i^2}{N}$$

Where,

M = Expected number of runs

n_i = Number of price changes of each sign (i=1,2,3) and

N = Total number of price changes.

Autocorrelation Function Test

The autocorrelation function (ACF) test is the statistical tool used for measuring the index successive terms in given time series and dependence of the successive share price changes.

$$p_k = \frac{\sum_{t=1}^{n-k} (R_t - \bar{R})(R_{t+k} - \bar{R})}{\sum_{t=1}^n (R_t - \bar{R})^2}$$

Where,

K is the Number of lags

R_t represents the real rate of return

n is the total number of observations, and

P_k is the sample Autocorrelation function for the lag K

Hypothesis of the Study

The first hypothesis involves determining, whether the stock returns are Stationary. The null and alternative hypotheses are

1. **H0:** is a Unit Root test

H1: is Stationary

The second hypothesis involves determining, whether the stock returns are random across time. The null and alternative hypotheses are

2. **H0:** Returns of Nifty are random.

H1: Returns of Nifty are not random.

The third hypothesis involves determining, whether the stock returns are efficient or not. The null and alternative hypotheses are

3. **H0:** Indian stock markets are weak-form efficient

H1: Indian stock markets are not weak-form efficient

Table: 1
Descriptive Statistics for CNX Media Companies

S.No.	Company Name	Mean	S.D.	Skewness	Kurtosis
1	Erosmedia	-.0160	2.60349	-.555	3.280
2	PVR	-.0731	3.32907	.010	2.148
3	Sun TV	.1052	2.20450	.180	.359
4	TVBRDCST	-.0512	2.12793	.536	2.675
5	Zeel	.3618	2.35390	.589	1.204

Interpretation

Table-1 presents the descriptive statistics of media companies taken for the study. The mean values of the selected companies are positive during the study period from January 2013 to December 2013. The standard deviations of the selected companies are positive and which are plotted normally from the mean. The positive (Right Skewed Distribution) skewness value of the company are PVR, Sun TV, TVBRDCST, Zeel and it indicates that there is high probability of getting positive returns. The Erosmedia have negative (Left Skewed Distribution) skewness, which meant that the higher possibility of getting negative returns and the companies are positively / negatively deviated from Normal Distribution. The select the companies have kurtosis value greater than 3 (Leptokurtic distribution), which indicates unexpected return distributions are not normal.

Table - 2 Augmented Dickey Fuller Test for CNX Media Companies

S. No.	Company Name	Augmented Fuller Test	Dickey	Probability
1	Erosmedia	-13.83352		0.0000
2	PVR	-15.81008		0.0000
3	Sun TV	-16.88855		0.0000
4	TVBRDCST	-15.21629		0.0000
5	Zeel	-15.97953		0.0000

Interpretation

Note: The significant value at 1%, 5%, 10% for Augmented Dickey Fuller Test are -3.4566, -2.8729 and -2.5729 respectively.

Table - 2 has given the test critical value for t-statistics by using Augmented Dickey Fuller (ADF) test for the volatility series. The p-value is less than or equal to a specified significance level, often 0.05 (5%), or 0.01 (1%) and even 0.1 (10%) reject the null hypothesis. The P- Value is 0.000 reject the null hypothesis in all significant. It found that the selected companies are stationary at 1%, 5%, 10%, but that does not imply that the null hypothesis is true. The data are merely consistent with it.

The other way to see this is that your test statistic is smaller (**in absolute value**) than the critical value. The critical values are -3.4566, -2.8729 and -2.5729. It is found that the ADF test statistic values are less than the Test Critical Values would reject the null hypothesis .So it identifies that the stock price return for the select companies are stationary

TABLE: 3 Runs Test Analysis with Mean Base for CNX Media Companies

Company Name	N	Z value	Significant value
Erosmedia	249	-1.791	.073
PVR	249	-.006	.995
Sun TV	249	1.461	.144
TVBRDCST	249	-.950	.342
Zeel	227	-1.128	.259

Interpretation

The result of the runs test is given in Table.3. The run test converts the total number of runs into a Z

statistics. All the 5 companies earned low Z value and those companies are Erosmedia, PVR, Sun TV, TVBRDCST & Zeel. These 5 companies follow random distribution. “There is random distribution in the returns of the NSE CNX Media index. It clearly indicated that the companies listed in CNX Media are random.

TABLE- 4 Calculation of Auto Correlations of CNX Media Companies

Lag	Erosmedia	PVR	Sun TV	TVBRDCST	Zeel
1	.125	-.008	-.073	.032	-.066
2	.066	.109	.023	-.069	-1.00
3	.036	-.019	.009	-.110	-.078
4	.016	-.047	.006	-.018	-.102
5	-.038	-.124	-.067	.066	.116
6	-.058	-.112	-.043	-.032	.062
7	.005	-.056	.044	-.044	.026
8	.035	-.125	-.043	.068	-.120
9	-.039	.082	-.042	-.032	.038
10	-.107	-.015	-.027	.044	.010
11	-.059	.129	-.071	-.073	.074
12	.031	-.043	-.043	-.063	-.023

Interpretation

Tables-4 reveals the results of autocorrelation of CNX Media stocks during the study period. It is understood from the above table that out of 12 lag only one lag has positive in Erosmedia & PVR, two lag has positive in TVBRDCST & Zeel.

The analysis of autocorrelation in Pharma index shows that 5 companies were not significant. It clearly indicated that the companies listed in CNX Media index are inefficient.

Conclusion

This paper examines the Market efficiency in CNX Media index listed in NSE. Probed with different tests are Augmented Dickey Fuller Test, Runs Test and Autocorrelation and find similar results. The results of these tests find that the companies listed in CNX Media are not efficient. The results support the common notion that the equity markets in the emerging economies are not efficient.

Reference

- [1] Grieb, T. and M.G. Reyes, 1999, "Random Walk Tests for Latin America Equity Indices and Individual Firms", *Journal of Financial Research* 4, 371-383.
- [2] Fama, E., 1991, *Efficient Capital Markets II*, *Journal of Finance*, 46, 1575-1618.
- [3] Poshakwale, 1996, "Evidence on Weak Form Efficiency and Day of the Week Effect in the Indian Stock Market", *Finance India*, 10, 605-616.
- [4] P.Ayuningtyas, "The Efficient Market Hypothesis: Testing on Jakarta Stock Exchange Year 2005-2006," *Bachelor thesis, School. Buss. Mng., ITB., Indonesia, 2007.*
- [5] Grieb, T., and Geyes, M.R., 1999, "Random walk tests for Latin American equity indexes and individual firms", *The Journal of Financial Research*, XXII (4), 371-383.
Kok, K.L., and Goh, K.L., 1994, "Weak form efficiency and mean reversion in the Malaysian stock market", *Asia Pacific Development Journal*, 1(2), 137-152