

An Empirical Study on Efficiency of Sectoral Indices of Indian Stock Market with Reference to BSE Bankex.

Subhramaya Nayak

Ph.D. Scholar, Berhampur University

Prof Gouri Sankar Lall

Professor , Department of Commerce , Berhampur University

Abstract:

In the field of finance the term Efficient Market Hypothesis is the most debatable topic among the experts and researcher of the finance. The efficient market hypothesis states that the share price reflects all the information available in the market and trade in its fair value. Many researchers have been attempting to establish the efficiency of the stock market in different countries. In India also a number of research work has been done in this respect. In this paper attempt has been made to test the weak form of market efficiency of the sectoral indices on the Indian stock market by taking data from the BSE . The period of study covers a period of five years from 1st January 2015 to 31st December 2019 of banking sector of BSE which is commonly known as BSE Bankex. Statistical tools such as Run test for stationarity and ADF unit root test has been used to derive the result for the efficiency of Banking Sector of BSE ltd. The result shows that the BSE Bankex does not satisfy the weak form of market efficiency hypothesis.

Key words: Run test, Weak form of efficiency, BSE , Bankex

Introduction:

Efficient market means a market where the share prices follow an independent path . Some factors which creates favorable condition for efficient market are large number of investors in the market , free flow of information to all the investors , investors are capable to interpret the information's available in the market , etc . Whenever a market is efficient the price of the shares move independently and the prices are influenced by the demand and supply. Several regulatory changes has been taken place in Indian stock market to bring the efficiency in the stock market like online trading system , depository system , introduction of derivatives , provision to check insider trading , etc . We can say that the study of the market efficiency becomes vital for all the investors in the market. This has lead to many researchers to conduct market efficiency study in the various stock markets across the world. In India also a lot of research has been done in this field. The present study will study the efficiency of the Banking sector stocks of the Bombay stock Exchange Ltd.

Statement of the problem

The present market condition is creating a lot of conflicts among the investors while going for the investment decisions. The investors should have some basic idea about the market and they should know whether the share prices are moving independently or not . To know this it is very important to know about the efficiency level of the stock market. The efficiency test will help the investors to judge whether the market reflects the whole of the information related to the share or not. If the efficiency test is established them a particular market can be said to be dependable. In this project we have made the efficiency study of the sectoral indices of Indian stock market with special reference to Banking sector of Bombay Stock exchange.

1.1. Literature review

Several studies were conducted by researchers all over the world for testing the market efficiency . The weak form of efficiency test for Bombay stock exchange and National stock exchange of India was conducted by Basu and Gupta in 2007 by taking daily data for period 1991 to 2006 .They have used unit root tests named ADF , PP and KPSS for their study purpose and found that Bombay Stock exchange and National Stock exchange are not following weak form of efficiency . A study by Samuel and Yacout in the year 1981 on weak form of efficiency on Nigerian stock exchange by taking the performance of twenty one

stocks listed in Nigerian stock exchange from 1978 to 1979 . Auto correlation tests were conducted for weekly data and the result did not find the existence of random walk behavior of the stock price . A study was conducted by Coory and Wickermalsgle in 2005 on South Asian securities exchange of India , Bangladesh , Srilanka and Pakistan with applying the unit root test and ERS test and the result was that the stock market was not weak form of efficient . A study was conducted by Abraham , Seyyed and Al- sakran in 2002 on Kuwait , Saudi Arabia and Baharain stock exchange by using variance ratio test and run test by taking the weekly data from October 1992 to December 1998. In the result they found that the test dismissed the random walk hypothesis .

Awad and Dara-ghma was conducted a test on Palestinian stock exchange in the year 2009 by using ADF test , Phillips – Perron test , unit root test , serial correlation and run test . in the result they found that there was an absence of weak form of efficiency in the Palestinian stock exchange. In the study of El-Erian and Kumar in the year 1995 by using the run test and serial correlations test on the stock markets of Turkey and Jordan found the absence of weak form efficiency

Based on an analysis of 70 companies listed in the “A” list category on the Bombay stock exchange , the paper by Belgaumi was an attempt to test the weak form of efficiency of the Indian stock market in vikalpa (April- June , 1995) . By subjecting the weekly share prices to Serial Correlation Analysis and Run test , Belgaumi finds that the Indian stock exchanges are efficient in the weak form and that the independent assumption regarding the movement of share prices over short period holds good.

Using daily price quotation of 93 actively traded shares for the period January 1988 to April 1990 , S.K. Chaudhuri makes an attempt to examine the serial independence of the share price changes . He had applied the serial correlation and run test to daily log price changes . the result of their study did not support the hypothesis of weak form of market efficiency .

Barua and Raghunathan argued in his paper in Vikalpa , july to September 1986 that the Indian capital market was inefficient based on an illustration.

In his paper by Ranganathan and Subramanian was an attempt to test imperically the weak form of efficient markets hypothesis using the frequency domain approach of spectral analysis . The results of the analysis show that there are some periodic cycles in the price movements which run counter to the assertion of weak form of efficient market hypothesis .

1.2. Need and importance of the study

The investors while investing in the stock market should know about all the information's those are available in the market for the particular stock. They should not invest only by doing the fundamental and technical analysis of the stock and the sector they are investing. they have to know about the impact of the available information in the stock's price behavior that means whether the stock is moving independently or it is reflecting all the information's available in the market. The efficient market hypothesis states that the share prices reflect all the information available in the market and trade in its fair value. Whenever a market is efficient the price of the shares move independently and the prices are influenced by the demand and supply so the investors should not neglect this point while investing.

1.3. Objective of the study

The main objectives of the study are:

- 1- To study and understand the sectoral indices in the stock market.
- 2- To study the weak form of the efficiency of the Banking Sector indices of BSE Ltd.

1.4. Methodology

All the data for the study is collected from the secondary sources, basically from the website of BSE Ltd and no primary data has been used in this study. The period of the study is five years from 1st January 2015 to 31st December 2019 of banking sector of BSE. Data will be collected for the BSE Bankex indices. The daily closing prices of the indices is collected over the period of five years.

For the evaluation of the study the following test will be applied.

For the test of stationarity, ADF unit root test will be done

For test of the weak form of efficiency run test will be applied.

1.5. Limitation of the study

As such there is no limitation in this study because the data is availed without any problem in the website of BSE Ltd. The only limitation of this study is that the findings of the run test and other co linearity are not constant for all the time to come. In other words this study is

significant for the present time only and will lose its importance as the time passes away. We have to do the same study again and again for different times.

2.1. Data Analysis:

The data collected from the websites of the BSE Ltd, for five years has been used for analysis of our project. Before doing the run test and other tests for the test of efficiency of the stock market indices, the data series have to be tested for the unit root existence. The existence of the unit root indicates that the data is not stationary. This means that the test statistics will yield different results for different a period which is not desirable. To test the existence of the unit root I have applied the ADF (Augmented Dickey Fuller) test. The results of the test have been presented in the table -1.

Table-1

At Original Value			
Lag Length: 0 (Automatic - based on SIC, maxlag=22)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.138002	0.9434
Test critical values:	1% level	-3.43544	
	5% level	-2.863676	
	10% level	-2.567957	
At First Difference			
Lag Length: 0 (Automatic - based on SIC, maxlag=22)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-33.65672	0.0000
Test critical values:	1% level	-3.435445	
	5% level	-2.863678	
	10% level	-2.567958	

Source: Authors own calculations

The results of the ADF test as shown in the table -1 reflect that the original values of the Bankex data are not stationary. This is confirmed by the fact that the p-value of the first test of the original data is 0.94 so we accept the null hypothesis. Therefore the data was converted to its first difference and ADF test was done again. The ADF test results of the 1st difference data was found to be stationary as the p-value is less than 0.05. When the run test was conducted the data was taken in its first difference format.

Run test

The run test is done test the weak for of efficiency of the market. In this test run reflects the number of unidirectional movements in the market. When the positive returns changes to negative return then one run changes and vice versa. Then we have to count the number of runs to apply the run test. As the sample size of this data set is very large so the help of the SPSS software has been taken for conducting the run test. The results of the test have been shown in table below.

Table-2
Runs Test

	VAR00001
Test Value ^a	26643.12
Cases < Test Value	617
Cases >= Test Value	617
Total Cases	1234
Number of Runs	8
Z	-34.744
Asymp. Sig. (2-tailed)	.000

Source: Authors own calculations

Form the results of the run test for the whole period study of the sectoral indices shows that the p-values of banking sector indices is less than 0.05. This indicates that we can reject the null hypothesis and accept the alternate hypothesis. This lead to the conclusion that the time series of the whole period data of the sectoral indices does not follow the random walk. This lead to conclusion that the BSE Bankex is not efficient.

Conclusions:

The investor's need some sort of assurance towards their investment decision, accessing the market efficiency is one of such assurance. Output of this paper reveals that the sectorial index of bank stock i.e. the Bankex is not a stationary time series. We can say that the statistical properties vary across the time. This leads to the conclusion that the data will not yield statistical significant and reliable output. The results of the run test also leads to the conclusion that the banking sector is not efficient in its market pricing. In other words no investors can predict the future price on the basis of the past date. This creates another research question that if the past information's are deciding the future prices then what are

the other factors that fix the market price of the stocks. This leads to the future scope of the research.

References

- Abeysekera, S. P. (2001). "Efficient markets hypothesis and the emerging capital market in Sri Lanka: Evidence from the Colombo stock exchange—a note." *Journal of Business Finance & Accounting* 28(1-2): 249-261.
- Abraham, A., et al. (2002). "Testing the random walk behavior and efficiency of the Gulf stock markets." *Financial Review*
- Awad, I. & Daraghma, K. (2009). Palestinian stock exchange weak form efficiency test. *International Research Journal of Finance and Economics*
- Blume, L. D. (2008). *The New Palgrave Dictionary of Economics*. New York.
- Branes, P. (1986). Market efficiency testing of Kuala Lumpur Stock Exchange. *Journal of Business Finance and Accounting*, 13(4) winter, 609-617.
- Cooray, A. & Wickremasinghe, G. (2005). The Efficiency of stock market of South African region. Discussion Paper. University of Tasmania.
- Darrat, A. F. and Zhong, M. (2000). The random-walk hypothesis test: a model comparison approach. *The Financial Review*, Vol. 35, No. 3, pp. 105-124.
- Dickey, D.A. and Fuller, W.A. (1979). Distributions of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of American Statistical Association*, 74(366), 427-481.
- El-Erian, M. & Manmohan, S. Kumar. (1995). Emerging Equity Markets in the Middle eastern countries. *IMF staff papers*, IMF, 42(2), 313-343.
- Fawson, C, Glover, T. F., Fang, W. and Chang, T. (1996). Testing the Weak-Form Efficiency of the share market of Taiwan. *Applied Economics Letters*, pp. 3, 663-667.
- Fama, E.F. (1970). Efficient capital market: A review of Theory and Empirical Work. *Journal of Finance*, vol. 25, 383-417.
- Grossmann, S. J. and Stiglitz, J. E. Impossibility of informationally efficient market. *Journal of Finance*, Vol. 31, 573-538.
- Gupta, R. & Basu, PK. (2007). Testing Weak Form Efficiency of Indian Stock Markets. *International Business & Economics Research Journal*, Vol. 6, No. 3, pp. 57-64.
- Gujarati, D.N. (2003). *Basic Econometrics*. New Delhi: The McGraw-Hill Companies (4th edition).

- Khandoker, M.S.H., Siddik, M.N.A. & Azam, M. 2011, Tests of Weak-form Market Efficiency of Dhaka Stock Exchange: Evidence from Bank Sector of Bangladesh, *Interdisciplinary Journal of Research in Business*, vol. 1, no. 9, pp.47- 60.
- Lo, A, & Mackinlay, C .(1988). Stock market not follow Random Walk:Evidence from simple specification test . *Review of Financial Studies*, vol.1,pp-41-66.
- Moustafa, M. A.(2004),Testing the Weak-Form Efficiency of the United Arab Emirates stock market. *International Journal of Business*, Vol. 29, No. 3, pp. 310-325.
- M Ranganathan , Subramanian , Weak form of Efficient Market Hypothesis : A Spectral Analytic Investigation , *Vikalpa* , Vol 18 , No. 2 , April – June 1993 .
- M S Belgaumi , Efficiency of the Indian Stock Market : An Empirical Study , *Vikalpa* , Vol 20 , No. 2 , April – June 1995 .
- Nisar, S.& Hanif,M. (2012). Testing Weak Form efficiency of South Asian Market. *World Applied Sciences Journal* , 17 (4): 414-427.
- Phillips, P. and Perron, P. (1988). Testing for a Unit Root in Time Series Regression. *Journal of Bio-metrica*, 75(2),335-346.
- Siddik, M.& Azam, M.(2011). Weak-form Market Efficiency test of Dhaka Stock Exchange:An empirical evidence from Banking Sector of Bangladesh. *Interdisciplinary Journal of Research in Business*, vol. 1, no. 9, pp.47- 60.
- Samuels, J.M.& Yacout, M. (1981). *Stock Exchange in Developing Countries, Savings and Development*.
- Summer, L. H. (1986),”Does the stock market rationally reflect fundamental values?”, *The Journal of Finance*, Vol.41(3), pp.591-601.
- Tsay, R.S. (2010). *Analysis of Financial Time Series*. New York: Wiley-Interscience Second Edition.
- Tse, Y. K. and Tung, S. H. (1992),” Forecasting volatility in the Singapore stock market”, *Asia Pacific Journal of Management*, 9, 1-13.
- Walter Enders, (1995). *Applied Econometrics Time Series*, John Wiley and Sons, New York.
- Zakoian, J M (1990), *Threshold Heteroskedastic Models*, Paris:CREST, INSEE.