

IS KARACHI STOCK MARKET WEAK FORM EFFICIENT?

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Abstract

This study was conducted to analyze the weak form of market efficiency in Karachi Stock Market. Daily, weekly and Monthly data was collected ranging from 1998 to 2012. Data was analyzed using Unit Root Test, Run Test and KS test. Results reported that Karachi Stock Market was weak form inefficient. Technical and Fundamental Analysts do have the opportunity to get abnormal returns using stock valuation techniques.

Keywords: stock market, efficient, Karachi, commerce

INTRODUCTION

The concept of market efficiency remains still debatable among academic researchers. When we see the evidences supporting market efficiency in academic literature it seems that these concepts are realistic and practical. However, while going through the performance of mutual funds and other investment agencies in recent past, one may be skeptical on its validity in many equity markets of the world. Mutual Funds have shown tremendous progress in last few decades which is shown by an increase in their number and growth. The concept of Fama and French (1970) about Market Efficiency has been supported by many studies but still academic researcher raises many questions on the idea of treating every investor in similar fashion. The arguments which critiques gave opposing the theory is that how a knowledgeable and experienced investor can behave in the same way in which an ordinary and inexperienced investor does.

According to Fama and French (1970) stock prices are not predictable. They support their idea with certain assumptions like access to information is costless, number of investors responds to information quickly and numbers of

investors are engaged in equity markets. Their study keep its importance on the basis of the idea that if information is equal and nobody can make himself superior in terms of information then it is practically almost impossible for him to get abnormal benefits from the market. It looks real that if everybody in the market knows what others know then buyers and sellers are looking at the same picture from different sides. Why would a seller be ready to give his part of benefit to others in such type of situation? It looks real that if both are equal in terms of information then nobody will be ready to put his money in the pocket of the other. Prices in such type of market will adjust so quickly in response to new information that nobody will find the time gape to buy any undervalued share. According to the concept of market efficiency prices are already reflecting all available information. Simply saying, in an efficient market any abnormal return earned by fund managers are successful gambles which may be just because of their luck.

But on the other hand, is it possible for everybody to have the same information as the others have? Is it rational to expect similar type of behavior from everybody in the market? Is it really possible to treat every investor to always respond in a right way? These may be questions in minds of the most of the critics to market efficiency concept. If we consider that investors do have equal information but it still never proves that they will use the information in similar way. Studies are evident that liquidity needs, time horizons and risk preferences drives investment strategies otherwise every investor would behave in similar style (Blanc and Rachlinski 2005).

Expecting every investor to behave rationally would be impossible every time. However, it might look real in some particular situations where information becomes a common perception. However, our point here is that it would be a case only when many of the irrational investors are kicked out of the market and remaining are the rational ones or the one who become rational after losing parts of their wealth. If we consider that investors value securities on the basis of some predetermined formulas and methods then using the same

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information with similar kind of tests, investors would not be reacting differently. However, their reactions to such information are subject to the timing of their decisions based on their risk preference and liquidity needs. But the problem here is that how an investor will get to know that what other investors would be doing with the same information and when they will be doing this and how much time a security takes to get it accurately priced. Point here is that if investors are using same kind of tools for their valuations then one cannot avoid thinking of the future price movements at least in the same direction.

However, it would become difficult to end up the discussion supporting one kind of opinion in light of mixed thoughts. In next part of this study few studies have been mentioned which have tested this concept and mixed results are found.

LITERATURE REVIEW

Brown and Easton (1988) this study was conducted to test the weak form efficiency of the London market for 3 percent Consoles and data used were taken from the period of year 1821 to 1860. It was concluded that market was efficient in the weak form sense.

Nassir et. Al. (1993) examined the weak form efficiency of Kuala Lumpur Stock Exchange (KLSE). The data used in this research were taken from the period of 1977 to 1989. The data was analyzed using unit root analysis and the results showed that KLSE is weak form efficient. Pandey (2003) investigated the weak form efficiency of Indian stock market. This study was carried out using the data belonging to the period from Januarys 1996 to June 2002. The analysis of three popular stock indices was done by the researcher with the help of run test and the autocorrelation function ACF (k). The results depicted that the Indian stock market is weak form efficient.

Hassan et. Al. (2003) this study was conducted to test the weak form efficiency of Kuwait Stock Exchange. The data used in this research was taken from the period of 1996-1999. Various tests applied in this including EGARCH and GARCH-M. The results depicted that Kuwait stock exchange is weak form efficient.

Moustafa, (2004) examined the weak form efficiency of United Arab Emirates (UAE) stock market by observing the behavior of stock

prices. Data was taken from the period of October 2, 2001 to September 1, 2003. The nonparametric run test was applied on the 43 stock of the emirates market and the returns from all the 43 markets didn't follow the normal distribution. The result of UAE stock market showed weak form efficiency.

Worthington and Higgs (2006) examined the weak form of market efficiency in Asian equity markets. Markets which were included in this study were from emerging and developed equity markets, from total 15 equity markets ten markets were emerging and five were developed markets. The data used in this research was taken for the period of 31 Dec 1986 to 28 May 2003. Coefficient and runs tests, Augmented Dickey-Fuller, Phillips-Peron and Kwiatkowski, Phillips, Schmidt and Shin unit root tests and multiple variance ratio tests were used in this research. Except Taiwan and Australia all markets showed weak form efficiency

Mobareket. et. Al. (2008) examined the weak form efficiency of Bangladesh's Dhaka Stock Exchange. The data was collected from 1988 to 2000 and various test were used in this research including Non-parametric (Kolmogrov – Smirnov normality test and run test) and parametric test (Auto-correlation test, Autoregressive model, ARIMA model). The result showed that security returns do not follow the random walk model and the significant auto-correlation coefficient at different lags rejects the null hypothesis of weak-form efficiency.

Angelovet. et. Al. (2009) tested the presence of weak-form efficiency in the Bulgarian stock market. The data used in this study was taken for the period from October 2000 to November 2006. Statistical tests applied on the data were; estimated autocorrelation functions and the variances of the stock prices and the random walk test with the drift model. The result showed no convergence towards weak-form efficiency in that period they examined.

Awad and Daraghma(2009) This research examines the weak form efficiency of Palestine Security Exchange (PSE) and the data used in this research were extracted from the period of 01, 1998 to October, 30, 2008. The weak level of 35 stocks listed in the market was observed by applying Parametric and nonparametric tests on

Alquds index, general index, and sector indices. The parametric tests include serial correlation test, and Augmented Dickey-Fuller (ADF) unit root tests. The nonparametric tests include runs test, and Phillips-Peron (PP) unit root test. These tests concluded that the PSE is inefficient at weak level

Srinivasan (2010) examined the validity of weak form efficiency for two major stock markets of India; National stock Exchange (NSE) and Bombay Stock Exchange (BSE). He used data from 1997 to 2010. The random walk hypothesis test was used with unit root tests namely; Augmented Dickey-Fuller (1979) test and the Phillips-Peron (1988) test. This research showed that Indian markets are not weak form efficient.

Hamid et. Al.(2010) This research was conducted to test the weak form market efficiency of the stock market returns of Pakistan, India, Sri Lanka, China, Korea, Hong Kong, Indonesia, Malaysia, Philippine, Singapore, Thailand, Taiwan, Japan and Australia. Data used in this research were taken from the period of January 2004 to December 2009. Autocorrelation, Ljung-Box Q-statistic Test, Runs Test, Unit Root Test and the Variance Ratio were various tests used in this research. The results showed that that these equity markets were not weak form efficient.

Ntimet. Al. (2011) the purpose of this research was to test the weak form efficiency of a set of 24 African continent-wide stock price indices and those of eight individual African national stocks. The period for which data was collected was from 1986 to 1989. The 32 stock price indices were investigated with the help of variance ratio test based on ranks and signs. The returns from majority of African continent stock price indices showed weak form efficiency.

Nawaz et. Al. (2013) investigated the weak form efficiency of Karachi Stock Market using daily, weekly and monthly stock prices. Data was used ranging 15 years from July 1997 to April 2012. Data was analyzed using unit root tests, run test and Kolmogrov Smirnov Tests. Results of this study showed that monthly returns of Karachi Stock Market were normally distributed while daily and weekly returns were not normally distributed.

Omar et. Al. (2013) investigated the behavior of Karachi Stock Market using the daily, weekly

and monthly stock price indexes. Data was analyzed using descriptive statistics, Unit Root test, Run Test and KS Test. Results indicated that Karachi Stock Market is not weak form efficient.

DATA AND METHODOLOGY

Daily, Weekly and Monthly data ranging from 1998 to 2012 is used. The continuous compounded rate of return is calculated using the following formula for daily, weekly and monthly stock market indexes of Karachi Stock Market.

$$Return=Rt_{mid}=Ln (MID_t/MID_{t-1})$$

Where

Rt_{mid} =Return of market index

Ln =Natural Log

MID_t =Market index at times t

MID_{t-1} =Market index at times $t-1$

Hypothesis

H1: Daily, Weekly and Monthly Stock Prices are non random in KSE.

H0: Daily, Weekly and Monthly Stock prices in KSE are random.

DATA ANALYSIS

INSERT TABLE-1 HERE

Descriptive statistics are used to analyze the characteristics of selected sample data. In this study we have daily, weekly and monthly index of Karachi stock exchange. Mean indicates the average return of an index for given period and standard deviation indicates the risk associated with those returns. Karachi Stock market is offering similar returns in case of daily, weekly and monthly data. However, in case of monthly data deviation is more as compared to daily and weekly prices.

INSERT TABLE-2 HERE

Unit Root Test is used to analyze if any time series is stationary. If a series is not stationary at level it may become stationary after taking its first difference. Before using unit root test appropriate lag structure for the data should be specified. Unit root test is used on lagged values of a series. Lag structure is decided using VAR methodology. Appropriate Lag Length is considered where SC (Shawarz Criteria) is found minimum. In case of daily data 2 days Lag was found, In case of weekly data lag structure depending on SC Values is 2 weeks

and monthly data showed lag length minimum at 1 month.

INSERT TABLE-3 HERE

Unit root test is used to check the stationarity of data. It was found that KSE Returns were non stationary at levels but becomes stationary after first differencing. It means that Karachi Stock Market is not following random walks. Market is not weak form efficient in case of daily data. In weekly data results were very similar to daily data results because all the series were non stationary initially and becomes stationary after first differencing. It means that KSE do not follow random walk and technical analysts can take the benefits by carefully analyzing the past trends in prices.

Similar results were found in case of monthly data. Karachi Stock Market returns were non stationary initially and become stationary after first differencing. The concept of weak form efficiency do not exists in Karachi Stock Market. Investors with superior information and having technical analysis skills can outperform.

INSERT TABLE-4 HERE

Run Test measures actual runs with expected number of runs. According to the results of run test KSE returns are not normally distributed in case of daily data. Weekly data also shows that KSE returns are not normally distributed. KSE returns are non random also in case of monthly data.

INSERT TABLE-5 HERE

Run Test measures actual runs with expected number of runs. According to the results of run test KSE returns are not normally distributed in case of daily weekly and monthly data. Returns are non random in Karachi Stock Market index.

INSERT TABLE-6 HERE

Kolmogrov Srinov (KS) Test is used to check that whether data fits to a particular distribution. Significant value for daily, weekly and monthly KSE index represents that Karachi Stock Market Returns are normally not distributed and Karachi Stock Market is weak form inefficient. **Conclusion**

This study was conducted to explore the weak form efficiency of Karachi stock market. In recent past Karachi Stock Market index gained highest index value in its history. In year 2012 and 2013 Index value surpass the level of 17000. Investors overvalue their capabilities to earn more in such kind of situations. This study was conducted using the data which cover the time

periods in which market has faced many ups and downs. Stock market crash of 1997, period of increasing index value in year 2007 and 2008, stock market crash of 2008 and 2009, recovery of prices in 2010 and ultimately record increase in KSE Index in 2012. This dynamic situation and behavior of market is analyzed using statistical tests but all these tests fails to prove efficiency of the Karachi Stock Market.

REFERENCES

- Abraham, A., Seyyed, F., & Alsakran, S. (2002), "Testing the random behavior and efficiency of the gulf stock markets", *The Financial Review*, 37(3), 469-480.
- Agelov, (2009), "Testing the weak-form efficiency of the Bulgarian Stock Market", *Discussions Paper, DP/71/2009*
- Ang, J., & Pohlman, R. (1978), "A note on the price behaviors of Far Eastern Stocks", *Journal of International Business Studies*, 1, 103 - 107.
- Awad, I. and Daraghma, Z. (2009), "Testing the Weak-Form Efficiency of the Palestinian Securities Market", *International Research Journal of Finance and Economics*, ISSUE 32, PP 7-17.
- Bilal Nawaz, Asma Sarfraz, Haroon Hussain and Mohsin Altaf, "An empirical investigation on the existence of weak form efficiency: The case of Karachi stock Exchange", *Management Science Letters* 3 (2013)
- Borges, M. R. (2008), "Efficient market hypothesis in European Stock Markets", *working paper series, W/P 20/2008/DE/CIEF, School of Economics and Management, Technical University of Lisbon.*
- Branes, P. (1986), "Thin trading and stock market efficiency: A case of the Kuala Lumpur Stock Exchange", *Journal of Business Finance & Accounting*, 13(4), 609-617.
- Brown, L., & Easton, A. (1989), "Weak-form efficiency in the nineteenth century: A study of daily prices in the London Market for 3 per cent Consols", 1821-1860. *Economica* 56, 61-70.
- Chan, K.C., Gup, B.E., & Pan, M.S. (1992), "An Empirical Analysis of Stock Prices in Major Asian Markets and United States" *The Financial Review*, 27(2), 289-307.

- Fama, E. (1965) "The Behavior of Stock Market Prices", *Journal of Business*, 38, 34-105.
- Fama, E.F. (1970), "Efficient Capital Markets: A Review of Theory and Empirical Work", *The Journal of Finance*, 25, 383-417.
- Hassan, A., Abdullah, M. S., Shah, Z. A., (2007) "Testing of Random Walks and Market Efficiency in an Emerging Market: An empirical investigation", *The Business Review, Cambridge*; Dec 2007; 9, 1; ABI/INFORM Global pg. 271
- Hawawini, G. (1984), "European Equity Markets: Price Behavior and Efficiency", *Monograph Series in Finance and Economics* (Saloman Center, New York University).
- Huang, B. (1995). "Do Asian Stock Market prices follow random walks? Evidence from the variance ratio test", *Applied Financial Economics*, 5, 251 – 256.
- La Blanc, Gregory and Rachlinski, Jeffrey J., "In Praise of Investor Irrationality" (2005). Cornell Law Faculty Publications. Paper 21.
- Latham, M. (1985). "Defining capital market efficiency". Finance working paper 150 *Institute for Business and Economic Research*, University of California, Berkeley,
- Lima, E. J. A., & Tabak, B.M. (2004). "Tests of the random walk hypothesis for equity markets: Evidence from China, Hong Kong and Singapore", *Applied Economics Letters*, 11, 255-258.
- Lo, A., & Mackinlay, C. (1988), "Stock markets do not follow random walks: Evidence from a simple specification test", *Review of Financial Studies*, 1, 41 – 66.
- Lo, A. W. (1997). "Market Efficiency: Stock Market Behavior in Theory and Practice", Volume I and II, Chethenham, UK. An Elgar Reference Collection.
- Mobarek, A., Mollah, A. S., and Bhuyan, R (2008) "Market Efficiency in Emerging Stock Market: Evidence from Bangladesh", *Journal of Emerging Market Finance* 2008; 7; 17
- Mobarek, A., & Keasey, K. (2000). "Weak-form market efficiency of an emerging Market: Evidence from Dhaka Stock Market of Bangladesh", *ENBS Conference held on Oslo*.
- Moustafa, M.A. (2004), "Testing the weak-form efficiency of the United Arab Emirates stock market." *International Journal of Business*, 9(3), 309-325.
- Omar, M., Hussain, H., Bhatti, G. A., and Altaf, M., "Testing of random walks in Karachi stock exchange", *Elixir Online Journal*, 54 (2013) 12293-12299
- Niblock, S., & Sloan, K. (2007). "Are Chinese Stock Markets Weak-form Efficient?" *Paper presented at the 12th Finsia-Melbourne Centre for Financial Studies Banking and Finance Conference, Melbourne*.
- Srinivasan, P. (2010). "Testing weak-form efficiency of Indian Stock Markets", *Asia Pacific Journal of Research in Business Management*, 1(2).
- Ntim, G.C., Kwaku K. Opong, Jo Danbolt and Dewotor, S., F., (2011), "Testing the weak-form efficiency in African Stock Markets", *Journal of Managerial Finance*, Vol. 37(3), PP 195- 218.
- Suleman, M.T., Hamid, K., Ali Shah, S.Z., and Akkash, R. S.I., (2010) "Testing the weak form of efficient market hypothesis: Empirical evidence from Asia-Pacific Markets" *International Research Journal of Finance and Economics*, 58, 121.
- Pandeyy, A (2003) "Efficiency of Indian Stock Market", *International Research Journal of Finance and Economics*, Issue 32/2009
- Worthington, AC and Higgs, H, (2006), "Weak-form market efficiency in Asian emerging and developed equity markets: Comparative tests of random walk behavior", *Accounting Research Journal*, 19(1), 54-63

Table 1

descriptive Statistics				
	Daily	Weekly	Monthly	
Mean	1.000097	1.000474	1.002052	
Median	1.00014	1.00083	1.002152	
Maximum	1.011604	1.014117	1.033726	
Minimum	0.989656	0.977977	0.95082	
Std. Dev.	0.001689	0.004003	0.009791	
Skewness	-0.18868	-1.0793	-0.78861	
Kurtosis	6.720106	7.47636	8.246405	
Jarque-Bera	1697.015	626.6949	177.5733	
Probability	0	0	0	
Sum	2913.283	609.2884	142.2914	

Table 2

Lag Structure				
Lag	Daily	Weekly	Monthly	
0	2.26466	2.261608	1.872202	
1	-5.62513	-3.87166	-2.1504*	
2	-5.6348*	-3.8836*	-2.12821	
3	-5.63237	-3.87789	-2.10588	
4	-5.63142	-3.87515	-2.06954	
5	-5.62912		-2.03232	
6	-5.62647		-2.00158	
7	-5.62373		-1.9644	
8			-1.92751	
9			-1.89035	
10			-1.8562	
11			-1.82728	
12			-1.79014	

Table 3

Unit Root Test					
	ADF LEVEL	ADF First Diff.	PP Level	PP First Diff.	
Daily	-1.571056	-35.36642*	-1.6425	-48.23566*	
Weekly	-1.688994	-14.97217*	-1.67688	-21.15598*	
Monthly	-1.736324	-8.519142*	-1.64198	-10.61657*	
Critical Values					
1%	-3.432366	-3.432367	-3.43237	-3.432366	
5%	-2.862316	-2.862317	-2.86232	-2.862316	
10%	-2.567228	-2.567228	-2.56723	-2.567228	

Table 4

Run Test (Mean)				
	Daily	Weekly	Monthly	
Test Value	1.0001	1.0008	1.0001	
Cases < Test Value	1456	304	1456	

Cases >= Test Value	1457	305	1457
Total Cases	2913	609	2913
Number of Runs	1374	259	1374
Z	-3.095	-3.772	-3.095
Asymp. Sig. (2-tailed)	0.002	0	0.002

Table 5

Run Test (Median)			
	Daily	Weekly	Monthly
Test Value ^a	1.00E+00	1.00E+00	1.00E+00
Cases < Test Value	1411	268	1411
Cases >= Test Value	1502	341	1502
Total Cases	2913	609	2913
Number of Runs	1362	255	1362
Z	-3.49	-3.796	-3.49
Asymp. Sig. (2-tailed)	0	0	0

Table 6

Test of Normality K-S			
	Statistic	Df	Sig.
Daily	0.097	2913	0
Weekly	0.116	609	0
Monthly	0.11	142	0