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Conceptual Study on Efficient Market Hypothesis for the World Markets: Finding Opportunities for Indian Stock Markets

It is an established fact that efficient and developed financial markets can lead to increased economic growth by improving the efficiency of allocation and utilization of savings in the economy. But the primary requirement of the capital market is allocation of ownership of the economy's capital stock. Also the ideal situation of the market exists when the prices of different securities provide accurate signals for the investment decisions to the investors, who can choose such securities that represent ownership of firms' activities under the assumption that security prices at any time fully reflect all available information. All this can be very well studied by understanding the share price behavior of the stock in any market and whether the same are envisaged in future by any perfunctory means; if so, any class of investors are able to earn unswerving and extensive success in investment matters.
This conceptual paper attempts to accumulate the theoretical evidence of Stock market efficiency across the globe and exemplify its possibility for the Indian markets. The world markets including Indian stock markets reveal a mixed form of results and therefore it can be concluded that the market efficiency study from the Indian markets front is very primordial in nature and lacks the modern existence of research.

Keywords: Financial Markets, Market Efficiency, Weak-form of market efficiency

1. Introduction

In the year 1991, India instigated the wave of financial liberalization with deregulation of interest rates and market-based allocation of resources, which have pervaded competition in the financial markets. In the light of these developments, it is expected that financial markets in India have achieved some degree of maturity and integration. Numerous researchers have concluded from their research, that globalization has made different financial markets of the world more integrated. The fact of financial market being integrated does not hold true if efficiency does not exist in these markets. This is also coupled with another actuality that a financial market that is well developed is considered to be an efficient one and thus is well integrated with the other financial market with similar characteristics. A distinctive trait of any stock market is its price behaviour. Price behaviour means the direction in which the share prices tend to move and this movement of share prices evolved the concept of the Efficient Market Theory. This is principally concerned by investigating the share price behaviour and whether the these are envisaged in future by any perfunctory means; if so, than any class of investors are able to earn unswerving and extensive success in investment matters.

Michael Firt has indentified that majority of researchers involved in these studies have been (a) academics, who were interested in determining the efficiency of stock markets in socio-economic terms and (b) practicing investors and investment advisory firms, who sought to derive profitable investment strategies. The efficient market hypothesis states that asset prices in financial markets should reflect all the available

information. According to the hypothesis, the market adjusts to the new as well as the available information so quickly that no techniques of fundamental and technical selection of a portfolio of stocks or an individual stock can be employed for its consistent outperformance.

The Indian market may symbolize the potential to exploit anomalies, which the stock markets of developed economies are considered to show. Also, the developed economies are considered as mature ones in comparison with the developing economies and thus any publicly available information revealed is impounded into the prices of securities rapidly and in an unbiased manner in these mature economies. This leaves no opportunity to the speculators or arbitrageurs for these price prediction phenomena and therefore abnormal or above average profits cannot be produced, which in turn will make the market more integrated and developed.

The present research paper attempts to accumulate the empirical evidences of Stock market efficiency and exemplify its possibility for the Indian markets. Though Stock market efficiency can be considered to be a heavily explored concept worldwide, its presence in the Indian context is not really strong. Also it is very important from the financial theory viewpoint, because whenever more powerful statistical techniques are developed, their application to this area becomes very important as it may give revolutionary results. Market efficiency not only helps predict the market movements but also guides in formulation of various models and strategies based on their results, which enables us to explain the market behaviour. The objective of this research paper is to find the empirical results related to the stock market efficiency associated with the different stock markets of the world including India and summarize its findings for the Indian markets. Thus this paper will give researcher a detailed idea about the studies done in different countries of the world and opportunities lying there for Indian markets. It will also lead the researcher to recognize the gap between the research already done for the Indian markets in the past and the research done in other world markets.
The entire paper is structured in the following way: Section 1 deals with the introduction of the topic and Section 2 discusses the concept and theory of the Efficient Market Hypothesis. Section 3 details about the empirical evidence of stock market efficiency of different countries of the world, Section 4 discusses the empirical results of Indian markets and finally, Section 5 concludes the topic.

2. Efficient market hypothesis

The Efficient Market Hypothesis was an evolutionary concept developed from the PhD dissertation of Eugene Fama in the year 1960. Fama convincingly made the argument that in an active market which includes many well-informed and intelligent investors, securities will be appropriately priced and reflect all available information. If a market is efficient, no information or analysis can be expected to result in the outperformance of an appropriate benchmark. Market Efficiency elucidates the relationship between information and share prices in the capital market literature. It examines the degree, the pace, and the accuracy of the available information being incorporated into security prices. The efficient market hypothesis states that asset prices in financial markets should reflect all available information; as a consequence, prices should always be consistent with fundamentals. Traditionally, EMH distinguishes three levels of market efficiency; weak-form, semi-strong form and strong form comprised of different levels of information.

2.1 Weak-form of market efficiency

Weak-form efficiency exists when security prices reflect all the information contained in the history of past prices and returns. If stock markets are weak-form efficient, then investors cannot earn super-normal profits (excess profits) from trading strategies based on past prices or returns. Therefore, stock returns are not predictable. Share prices exhibit no serial dependencies, meaning that there are no "patterns" to asset prices. This implies that future price movements are determined entirely by information not contained in the price series and hence a price follows a random walk.

2.2 Semi-strong form of market efficiency

Semi-strong form efficiency states that security prices reflect all publicly available information. Investors, who base all their decisions on the information that becomes public, cannot gain above-average returns. It means that share prices adjust to publicly available new information very rapidly and in an unbiased fash-

ion, so that no excess returns can be earned by trading on that information. Semi-strong-form efficiency implies that neither fundamental analysis nor technical analysis techniques will be able to reliably produce excess returns.

2.3 Strong form of market efficiency

Under *strong form efficiency*, all information - even apparent company secrets – is incorporated in security prices and thus no investor can earn excess profit by trading on public or non-public information. It was the strong belief of the traditional analysts that stock markets are efficient because stock prices reflect the true market value of future dividends. Share prices here reflect all information, public and private, and no one can earn excess returns.

3. Literature review: market efficiency

This literature review will give an idea about different forms of efficiency being tested in different markets throughout the world giving diverse results. The below mentioned literature review is conducted to support the idea of establishing the approach of testing the Market Efficiency in Indian Markets.

3.1 Studies done for the American Region

Ojah & Karemera (1999) used multiple variance ratio and auto-regressive fractionally integrated moving-average tests considering the data of new US-dollar-based national equity indices for the period of 1987 to 1997. They used Variance ratio tests, Geweke and Porter-Huddak test (GPH) for random walk and different Market Efficiency Tests. It was found that emerging equity market prices of Argentina, Brazil, Chile and Mexico essentially followed a random walk based on multiple variance ratio test and GPH, *whereas direct tests of market efficiency revealed that all the markets other than Chile are weak-form efficient.* Therefore a message conveyed to international investors of these stock exchanges is that historical information of stock prices can be used to predict the future returns, as the future long-term returns are not dependent on past returns.

Sonje, Alajbeg & Buras (2010) analyzed the daily and monthly data of Croatia (Zagreb Stock Exchange) and US stock markets New York Stock Exchange (NYSE) for the period 1997 to 2010, where 2008-2009 was the period of crisis. Tests employed were statistical test of autocorrelation and to find out the simple trading rule that would exceed returns of stock index in the long run*. It was found that daily data indicate a high degree of efficiency in the US markets before crisis but the Croatian markets were inefficient but not at the highest level of confidence.* Both ZSE and NYSE are found to have significant deviations of the autocorrelation coefficient from zero at monthly frequencies with larger variations of price changes across time.

Bornholt & Malin (2011) investigated the performance of the 52 week high strategy on developing and emerging markets. Monthly prices with reinvested gross dividends and 52-week high price of 44 Morgan Stanley Capital International indices and time taken for the study is from 1970 to 2009. The methodologies employed were the descriptive statistics, the 52-week strategy, and the momentum strategy. The study revealed the mixed results for the emerging and developed markets. It was also seen that momentum strategy earns significantly larger profits than the 52-week strategy for both developed and emerging markets. Thus it was concluded that 52-week strategy is not as reliable as the momentum one.

Murthy, Washser and Wingendar (2011) extend the empirical literature on the efficiency of stock markets in the US using the daily closing values of Dow Jones Industrial average, NASDAQ and S & P 500 index covering the period 1971 to 2009. They applied various unit root test to ascertain whether the stock prices are mean reverting. If there is an absence of unit root in the time series, that data can be in trend and if the unit root is present in the series, it implies that stock prices are unpredictable. The findings led to a conclusion that the three *US stock markets are non-stationary even with two structural breaks and thus US stock markets are not easily predictable.*

3.2 Studies done for the African Region

(Olowe) studied the weak-form of efficiency of the Nigerian stock exchange to see whether the prices are adjustable to historical information or not. Correlation analysis is used on the monthly data for the period of 1981 to 1992. Technical trading rules were also used as one of the statistical measures for the purchase or sales decision of a stock. It was found that security prices always adjust to the historical price information and supports the work of Samuels and Yacout (1981) and Ayadi (1983) *and discovered that the Nigerian Stock Markets are weak-form efficient*.

3.3 Studies done for European Region

Jaffe and Westerfield (1985) found similar behavior patterns of stock returns in the stock markets of the United Kingdom, Japan, Canada and Australia, when observed using the day of th0e week effect. Their results indicated consistently negative returns on Monday (close Monday to close Friday) throughout the period of 55 years. They also observed that in periods with Saturday trading, Friday's returns were generally lower than those of Saturday. Thomas (2002) in his study about trend and calendar effects in stock returns of 207 stocks from the Swedish stock market for a period of 1987 to 1996 found that the day-of-the-week effect have influenced the returns significantly. Based on the study conducted by Dimitrios and Katerina (2003) on the day-of-the-week effect anomaly in the French stock Exchange, and Bildik (1999) examining stock market returns and trading activity in the emerging market of Istanbul Stock Exchange using daily closing values of the ISE-100 index from 1988 to 1999 observed the highest volatility on Monday.

Lapodis (2003) investigated the issue of whether financial market liberalization announcement in Greece has had any effect on the efficient operation of its equity markets (Athens Stock exchange). Different Regression models were used to test the efficiency: Recursive residuals, the test of structural change and the test of randomness and charts and graphs were also used. The three opening dates were identified and the test was employed on these dates. The results obtained are aligned with these dates where in under KPSS of efficiency test, unit root was observed and the null hypothesis of level stationary and trend stationary for all lag truncation parameters got rejected and concluded *that the market was fairly efficient before liberalization; before the announcement was made.*

Ajayi, Mehdian & Perry (2004) found that the eastern European region of Europe is untapped in the existing literature on the Day of the week effect, which has mainly focused on the area of the US. To contribute towards this gap, researchers attempted to investigate the day of the week stock turn around anomaly on Eleven Eastern European Markets (EEEM). The data used are the daily closing prices of all the eleven stock markets for the period of their inception till 2006. The results revealed negative Monday returns in six of the eleven stock markets and positive Monday returns in the remaining five, but are found significantly positive in only one of the countries. The difference of mean tests indicated that Monday returns are significantly lower than the rest of the week only in case of one stock market, whereas the difference of variance tests showed that volatility of the market on Monday is significantly higher than the volatility during rest of the week in four of the EEEM's. *It was also found that no trading rule based on predictable pattern for Monday can be exploited to produce abnormal rate of returns for these markets. No consistent evidence was found to support the presence of any significant daily patterns in the stock market returns of the* EEEM.

Filis (2006) tested the efficiency level of the Athens Stock Exchange (ASE) for the period 2000 to 2002. The Unit root test was applied initially, then standard random walk test and lastly rank tests were used to test the efficiency of the market. Further GARCH effects were applied on the residuals of the random walk regression equations. The idea behind the application of GARCH was to see whether the result draws any conclusion regarding any volatility clustering on ASE. If ASE is Semi-strong form efficient, then no volatility is expected to be found in the index. Results showed that ASE is weak-form efficient based on random walk test. Also the volatility clustering in ASE was found to be significant for both years. *It was further concluded that ASE was neither semi-strong nor strong-form efficient based on the fact that since May 2001 the market ranks as mature market.*

Borges (2011) investigated the weak form of efficiency for the Portuguese Benchmark Index (PSI 20), index of Lisbon Stock Market from 1991 to 2006. This can be one more research added to the category of emerging markets. Serial correlation test, run test, ADF test and multiple variance ratio tests are used for the hy-

pothesis of stock markets following a random walk. The data taken for study are further categorized into daily, weekly and monthly returns for the whole period and five different subperiods showing different trends in the markets. M*ixed evidences are found out on the whole and the results revealed that the PSE follows a random walk behaviour* since 2000 with a decrease in the serial dependence of returns.

Guidi, Gupta and Maheshwari (2011) tested the weak form of efficient market hypothesis for central and eastern European (CEE) equity markets for the period 1999 to 2009. The study uses autocorrelation analysis at the first stage to examine whether the consecutive returns are independent of each other, then the run test is used and lastly the variance ratio tests are also conducted to examine whether the increment exists in the series, under the assumptions of homoscedastic and heteroscedastic random walks. At last, the day-of-the-week effect is tested by using GARCH. The results showed different inferences, where Autocorrelation analysis indicated that the return of *CEE indices does not follow Random walk and this was identified especially when the CEE joined the European Union (EU), whereas the efficiency of stock markets improved after they joined the CEE which is indicated by the Run test.* The Variance Ratio test suggested that random walk hypothesis was rejected for two indices from the seven selected indices of the EU. Also the OLS results for day of the week effect reveal that CEE equity markets show different patterns.

3.4 Studies done for the Asian Region (excluding India)

Chakraborty (2006) investigated the weak form of efficiency of the Pakitstan Stock Market; i.e the Karachi Stock Exchange (KSE 100 Index) for the period January 1996 to November 2005, but this was categorized in two different periods; (Jan 1996 to Dec 2000) and (Jan 2001 to Nov 2005) by using the Run Test, Tradition serial correlation test and the Variance ratio test. Further, this paper attempts to develop a predictive model using the ARMA approach, in case the result of various tests rejects the random walk hypothesis for the Pakistan stock market. Building this model can help predict future price movements and future trading strategies can be built accordingly. Serial autocorrelation result was conflicting with the the Random Walk Hypothesis and suggested the existence of the pattern in daily price movement of KSE. The Run Test indicated the presence of positive serial correlation among successive price changes. The results of VAR were also found to be consistent with the previous two tools, where a predominance of positive serial correlation was observed. *Thus it was concluded that there was a rejection of Random Walk Hypothesis during the entire sample period as well as the first subperiod. However for the second subperiod the results were mixed* because VAR showed significant results for some lags and insignificant for others. Therefore we can presume that the *KSE are moving toward the path of efficiency.* The ARMA model was found to be appropriate for the future predictability of stock returns for KSE.

Cooray & Wickremasinghe (2007) examined the efficiency of post deregulation of stock markets of India, Sri Lanka, Pakistan and Bangladesh for the period of 1996 to 2005. The techniques used were the Augmented Dickey Fuller test (ADF), Phillips Pherron(PP), the Dickey fuler generalized least square (DF-GLS)and Elliot Rothenberg Stock (ERS) to study the weak-form efficiency of the selected stock markets. The classical unit root test supports the weak form of efficiency for the stock markets of all the countries, whereas DF-GLS and ERS did not support the stock market of Bangladesh. The Multivariate co-integration test revealed that the market shares a long run stochastic trend and with this the validity of existence of semi-strong form of efficient market hypothesis for the South Asian stock markets was rejected. Meanwhile the results of Granger causality showed that none of the markets returns caused the returns of the other three markets. *This means that all the markets are highly integrated with one another and do not give the predictive power to earn excess returns to domestic as well as foreign investors of South Asian Stock Markets.*

Azad (2007) studied the three East Asian Stock Markets, namely, China, Japan and South Korea and examined whether these markets are individually or jointly efficient and whether the contagion exists between the co-integrated markets. The methodology used was the unit root tests, variance ratio tests, Engle-granger and Gregory Hansen co-integration tests. Daily closing prices of SSE composite, China, Japan's, Nikkie 225 stock average and KSE stock price index of South Korea for the period of 1996 to 2006 were used. *It was found that the Chinese stock market is inefficient, whereas the Japanese and south Korean markets are efficient, but all these 3 markets are jointly inefficient.*

(Hunnah and Power 2007) examined the weak-form of efficiency for the Saudi Stock Market using two trading rules; the filter rule test and the moving average strategy was implemented on the weekly data of 45 companies spanning the period 1990 to 2000. The author concluded that the filter rule and the moving average

come out to be profitable, as share price movements can be predicted for most of the companies in the Saudi Stock Market. But this difference in performance is barely statistically significant. *Thus Saudi Stock Market is found to be more efficient as compared to other efficient markets* and also proven to show different results, when compared with the similar kind of study done by Al-Razeen (1997) and Khababa (1998) and the reason recognized by the author was the introduction of ESIS trading mechanism in the exchange.

Islam, Sethopong & Clark (2007) conducted non parametric tests of market efficiency for an emerging stock market, the Thai Stock Market. It was noticed that financial crises made the Thai stock market very volatile and stock prices dropped by 70% by the end of 1997. The results of this study showed that there is an autocorrelation on the Thai stock market returns especially during the post crises period. Run tests results also rejected the null hypothesis and stated the Thai Stock Markets to be inefficient and also that *there was an absence of market efficiency in this market*. This inefficiency was due to the violation of the necessary conditions for the efficient market and also implied financial and institutional imperfections. This leads to the conclusion that Thai financial policies and regulations related to liberalization, deregulation and privatization have generated a perceived inconsistency and a tendency to produce instability.

Asiri (2008) seeks to measure the behaviour of stock prices in the Bahrain Stock Exchange and whether a weak form of market efficiency exists in the market or not. Random walk models such as Unit root tests, Autoregressive integrated moving average and exponential smoothening methods are used and all these tests support the hypothesis of securities of the *Bahrain Stock Exchange, the market follows a random walk and it is weak-form efficient.*

Mobarak, Mollah and Bhuyan (2008) studied the return series of the Bangladesh, Dhaka Stock Exchange (DSE) to find whether it is independent and follows a random walk. The sample taken for the study was all the companies listed on the DSE for the period of 1988 to 2000. They examined the efficiency of DSE by using both parametric as well as non-parametric tests. The results of Kolmogrov Smirnov, normality test and run test, a part of non-parametric test and Auto correlation test, auto regressive model and ARIMA model, being parametric tests showed that the security return *does not follow a random walk* and the significant auto-correlation coefficient at different lags rejected the null hypothesis of weak-form efficiency. *This result revealed the fact that the DSE is not efficient and the information passed on in the market is not absorbed quickly leaving an opportunity for the investors to earn excess rate of return*.

Benjelloun & Squalli (2008) observed that there have been no studies on the efficiency of the Qatari equity market done till date. Within this context, some light was thrown on whether the use of general indexes may disguise sectoral efficiency by investigating the weak form of efficiency in the equity markets of Qatar, Saudi Arabia, and the United Arab Emirates for which tests used are the variance ratio test and the run test. The random walk hypothesis is rejected in the Exchanges of 3 countries whereas some of the sectors of each exchange accept the hypothesis of the sectors following random walk. His research is supported by the following literature.

Wickremasinghe (2011) examined the causal relationship between All share price index (ASPI) and macro economic variables in Sri Lanka in order to study the validity of semi-strong form of the Efficient Market Hypothesis. Macro economic variables taken for the study were GDP, Money supply and the US dollar Exchange rate. The methodology used to prove the same are the unit roots and co integration, Error Correction Model and Variance decomposition analysis. The results of the Johansen cointegration test indicate that there is one cointegrating relationship between the stock prices and the macroeconomic variables. So he proceeded to estimate the error-correction models to examine both short and long-run causal relationships and found three feedback or bi-directional causal relationships, which were between the ASPI and the three-month FDR, the ASPI and the US share price and the ASPI and the GDP. Bi-directional causal relationships were found from the ASPI to the consumer price index, the ASPI to the M1 and the ASPI to the USD exchange rate. *The results refute the existence of semi strong form of the EMH as both short and long-run causal relationship between the prices and macro variables* were indicated and thus it indicated that stock prices in Sri Lanka can be predicted by using macro economic variables.

3.5 Studies done for the Indian region

Boer and Fell (1993) concluded that the Indian stock markets are second in row after China representing an untapped market and also that India is now the world's fourth largest economy after the US, Japan and China and strongly attracts participation of major financial institutions and industries from the world. The data der-

taken for the study are from 1991 onwards due to the announcement of liberalization policies in India in 1991, for the reason that it can help maximize the consistency of the underlying political and economic scenarios. Also the stock option trading was introduced in the year 2001, which may have an impact on the efficiency of the stock market. Findings were found consistent with DeBondt and Thaler (1985, 1987) who showed that *the stock market is inefficient in long term and a trader can earn abnormal profits by analyzing past returns*. Lastly, it was discovered by researchers that the BSE can be considered as one of the emerging matured markets and is moving nearer to the developed economies and their markets. Moreover, it provides an opportunity for the further integration of the Indian Capital markets into the global investment sphere.

Vaidyanathan & Gali (1994) have found supportive evidence for the weak form of efficiency of the Bombay Stock Exchange (BSE). The daily closing prices of ten actively traded shares on BSE were studied over four different periods of time. Earlier tests such as the Filter rule test and the run test were used to find the existence of the weak form of efficiency on the BSE. The results confirmed the presence of weak-form market efficiency in the BSE.

Pethe & Karnik (2000) attempted to establish an inter-relationship between stock prices and important macro economic variable in the context of the Indian Markets. The variables used were the Exchange rate of rupee vis-à-vis the dollar, the prime lending rate, the narrow money supply, the broad money supply and the index of industrial production. The econometric analyses used for this study are techniques such as state of the art like unit root tests, co-integration tests and the error correction model. *Researchers are not able to get some concrete output from the undergone analyses and concluded that the Indian stock markets are demand driven and there is a lack of co-integration between the stock prices and various selected economic variablse, therefore the leap-fogging strategies adopted by their policy makers still do not show any success and there is a long way to go to make the markets more integrated and efficient.*

Poshakwale (2002) examined the random walk hypothesis of the emerging Indian Stock Markets by studying the daily closing prices of 100 actively traded stocks of the Bombay Stock Exchange (BSE) for the period of 1990 to 1998. Descriptive statistics, Independent and identical distribution tests, conditional volatility, nonlinearity, nonstationarity and ARCH were used as statistical measures. As per Poshakwale, this is considered as the first study that has examined the random walk hypothesis by testing for the nonlinear dependence using a large disaggregated daily data from the Indian Stock Market. It was found that a majority of the daily return stocks are of non-linear dependence in the ARCH type conditional hetroscedasticity. The *statistical evidence rejected the random walk model for the Indian Stock Markets; further research is required in this market as it is considered as one of the emerging markets of the world and requires more sophisticated form of research tools.*

Mahendra and Damini (2006) tested the efficiency of the Indian Stock Market through a number of hypotheses such as the week day effect, the day of the week effects, January & April effect, which are examined by applying a variety of statistical measures such as Multiple Regression using dummy variable, F and T tests to test the significance. The data comprise weekly data of the BSE for the period 1979 to 1998 and daily data for the NSE for the period 1990 to 1998. Monday returns are found not to be negative thereby contradicting the negative Monday effect, Tuesday returns are found to be negative but not significant as also found by Agrawal and Tandon (1994) and Dubois and Louvet(1996). Moreover, *returns for all four days were lower than Monday even for the calendar time hypothesis but only Tuesday and Wednesday are found to be significant for the BSE. On the National Stock Exchange (NSE), Tuesday and Thursday were lower than Monday but only Tuesday was significant. Also the January effect cannot be found in Indian markets study and thus it can be concluded that the overall results found are interesting and contradict some of the findings elsewhere.*

Sarkar & Mukhopadhyay (2006) tried to adopt a systematic approach for studying the predictability and nonlinear dependence in returns with due emphasis on the specification for the conditional first and second order moments for the Indian Markets. The tests used were the ADF and PP to find whether the series taken is stationary or not. Further automatic variance ratio tests were applied on the daily data of BSESENSEX, S&P CNX NIFTY, BSE 100 and DOLLEX for the period of 1986 to 2000. *It was found that the day of the week effect was present in most of the cases and daily level seasonality was found to be present.* Statistical evidence in favor of 2 structural breaks was also observed in the Indian Stock Markets, one in the middle of 1992 and other in 1996.

Locke and Gupta (2009) examined the BSE by applying the Contrarian strategy for the period 1991 to 2001, used by DeBondt and Thaler (1985, 1987). Data used were the mid-market closing prices of the BSE 500. The similar kind of study was also taken up by Ahmad and Hussain (2001) on the Malaysian Stock Ex-

change. Researchers devoted the study to the Indian market based on the reason: a) as mentioned by Ko-roglou (2009) tries to compare the distribution of returns of five East Asian Emerging markets Korea, Malaysia, Philippines, Taiwan and Thailand, where focus is given on the deviation from normality of stock returns before and after a financial liberalization reform using two modeling approaches ARCH and GARCH essentially reveals how biased the results can be when there is no provision for other breaks. The results suggested that the lack of provision for breaks in mean or volatility dynamics that may or may not be related either directly or indirectly to the examined financial liberalization reform can lead to severe bias when measuring the deviations of the returns from normality. *South Korea and the Philippines seems to have improved stock market efficiency by letting their markets be open for foreign investors whereas Malaysia, Taiwan and Thailand seem to have worsened theirs.*

A Mishra & V Mishra (2011) used the two-regime threshold autoregressive model (TAR) with an autoregressive unit root to examine the efficiency of the Indian Stock Markets. Two reasons were identified for the recent contribution of literature in the emerging markets: 1) emerging markets are not characterized by a very well developed information disbursement mechanism. Therefore any news which is released may reach different groups of investors at different points of time from which a lead lag relationship will be created between the news and its reception, which gives investors an opportunity to earn abnormal rate of returns; 2) emerging markets often lack an institutional infrastructure to regulate financial markets. The authors identified many limitations regarding the fact that a majority of existing studies on market efficiency have relied on index data for the analysis. The first is that the conclusions, which hold for the full market may not hold the same of the individual stocks. The second is that the index is typically a portfolio of highly liquid stocks, which might not be the scenario for the individual stocks. The third is that the behavior of portfolio may be quite different from common stocks because of data aggregation and cross correlation between prices. Thus this study takes into consideration not only indices but also the individual stocks. The data taken for the study are two indices of the National Stock Exchange (NSE) and 10 common stocks for the period 1995 to 2005. 2 unit root tests were used; i.e. Augmented Dickey fuller and Phillips Pherron and KPSS to find out whether the data are free from non linear dependencies. The results of unit root tests agree with each other and suggest that there is a unit root in the data, whereas KPPS results showed that the null hypothesis of data being stationary was strongly rejected. The further random walk test in the presence of nonlinearity of data is divided into three subparts. In the first part, they conducted the Wald test for the presence of nonlinearity. The second part looks at the presence of unit roots of both regimes using one and two sided Wald test statistics. The third part explores the presence of a partial unit root. *They found the whole data set; i.e. the indices and individual stocks follow random walks as per unit root results.* The results of non-linear unit root test suggested that except for two stocks, a threshold nonlinear process characterizes the stocks and indices.

Jana & Meher (2012) examined the validity of a weak form of market efficiency on different indices from BSE & NSE. The Run test, the Serial Correlation test and the Generalized autoregressive conditional hetroscedasticity (GARCH) model is used to prove this. Daily closing prices from the period 2006 to 2011 were used on four indices from the BSE and four from the NSE, which are considered to be broad market indices of these stock markets. The Run test failed to provide any conclusive results to the researchers, but the test of serial correlation and GARCH showed that the returns are non random and hence the Indian Stock Markets are not weak-form efficient. There is also a volatility clustering found in GARCH which makes the markets inefficient.

4. Findings & conclusion

From the conducted literature review, it was found that the researchers have considered not only individual countries for their study but have also given an edge to the group of countries and have made a comparison between them. A Study in group has helped find out a more concrete outcome and a strong base of relationship is established between them.

American Markets studies exposed the mixed form of results. It was seen that in most of the cases, the North American markets are found to be efficient. The South American Stock Markets were also efficient other than Chile and thus give a predictive power to their stock market returns. With the application of the Adaptive Market Hypothesis for the stock market of America which is divided into two parts; 1) the degree of market efficiency fluctuates over time and 2) the degree of market efficiency is governed by market conditions, it was found that return predictability fluctuates over time and is largely ruled by changing market conditions. Also,

when the African Markets were studied, they also revealed the similar form of results and are observed as following a Random Walk and thus are weak-form efficient. It was observed that most of the European Markets studies were done in a group and the results found were also mixed in nature. The Stock Market of Athens was found to be weak-form efficient but when Semi Strong and Strong form of efficiency was tested on it, this was rejected. For Eleven Eastern European Markets it was also found that no trading rule based on predictable pattern for Monday can be exploited to produce an abnormal rate of returns for these markets. No consistent evidence was found to support the presence of any significant daily patterns in their stock market returns. Central and Eastern European Markets were observed to be inefficient before their joining the European Union (EU) and their efficiency got improved after they joined the EU. Also, the Future and Cash Market of Greece was very well integrated and efficient and the market of Lisbon was also found to be efficient.

The Asian Markets study mostly comprises countries such as India, Sri Lanka, Hong Kong, China, Malaysia, Thailand and other countries of the Middle East, which revealed a mixed form of results. The Indian markets, according to the studies, are proven to be inefficient in most of the cases and also there was an absence of the day of the week effect in the Indian Stock market. It was also observed that when some stock markets of Asian economies were studied in group, they are found to be well integrated. The Stock markets of China, Malaysia, Sri Lanka, South Korea, Philippines and Middle East are observed to be efficient ones and thus corroborating the hypothesis of prices following a random walk, whereas the Markets of Pakistan, Thailand and Bangladesh were found to be inefficient.

Finding for Indian Markets:

Findings: Stock Market Efficiency (Weak-form) for Indian Markets					
Author Name	Year	Objective	Variables used	Tests Used	Results
Vaidyanathan & Gali	1994	To examine the presence of weak-form of market efficiency	10 actively traded shares on BSE	Filter Rule test & Run test	Presence of Weak-form of Market Efficiency
Pethe & Karnik	2000	To establish an inter-relationship between stock prices and important macro economic variable	Stock prices, Rs/$ rate, IIP, PMR, BMS, NMS(*)	Unit root tests, co-integration tests and error correction model	Indian stock markets are demand-driven and there is a lack of co-integration and efficiency between the stock prices and various selected economic variables.
Poshakwale	2002	To examine the random walk hypothesis of emerging Indian Stock Markets	100 actively traded stock of BSE	Descriptive statistics, Independent and identical distribution tests, conditional volatility, nonlinearity, non stationarity & ARCH	*The statistical evidence rejected the random walk model for the Indian Stock Markets*

Findings: Stock Market Efficiency (Weak-form) for Indian Markets					
Author Name	**Year**	**Objective**	**Variables used**	**Tests Used**	**Results**
Mahendra & Damini	2006	To test the efficiency of Indian stock Markets through week day effect, day of the week effects, January & April effect	Actively traded shares of BSE and NSE	Multiple Regression using dummy variable, F and T test	The results found were contradictory to some of the findings found elsewhere. The negative Monday effect and positive Tuesday effect was not found in India as the Monday returns are positive and Tuesday returns are found to be negative in Indian Markets.
Sarkar & Mukhopadhyay	2006	To study the predictability and nonlinear dependence in returns on the conditional first and second order moments for the Indian Markets	BSESENSEX, S&P CNX NIFTY, BSE 100 and DOLLEX	ADF, PP(*) and Automatic Variance Ratio Test	It was found that day of the week effect was present in most of the cases and daily level seasonality was found to be present. Statistical evidence in favor of 2 structural breaks was also observed in the Indian Stock Markets, one in the middle of 1992 and the other in 1996.
Locke & Gupta	2009	To examine BSE by applying Contrarian Strategy	BSE 500	Contrarian Strategy	The existence of Contrarian returns was found in Indian Markets, which were consistent with the findings for developed markets of US & UK.
Jana & Meher	2012	To examine the validity of Weak-form of Market Efficiency on different indices from BSE & NSE	4 indices from BSE and 4 from NSE	Run test, Serial Correlation test and GARCH	Test of serial correlation and GARCH showed that the returns are non random and hence the Indian Stock Markets are not weak-form efficient

(*): BSE: Bombay Stock Exchange IIP: Index of Industrial Production, PMR: Prime Lending Rate, BMS: Broad Money Supply, NMS: Narrow Money Supply. ADF: Augmented Dickey Fuller Test, PP: Philips Pherron Test.

Thus it cannot be implicitly believed that the world markets follow a random walk nor that they do not as they have all revealed a mixed form of results. Also it was seen that the Indian Market studies were done in an early period which may be deficient in implementing various modern techniques and thus have given a biased result. With the changes in market and economy and also with the inception of innovative and more modern techniques, the same markets may give different results and healthier outlook to the Indian Markets. The stock markets of India are also not compared with the developed economies of the world as per the literature review and it was discovered that India is moving towards a more developed stage and can now be considered as one of the emerging economies competing vigorously with the developed economies of the world. Thus the study draws to the direction where it can be finally concluded that, though a number of market efficiency studies are done in the Indian context, the literature reveals them to be more primordial in nature.

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