CHAPTER-1

AN EMPIRICAL TEST OF WEAK FORM EFFICIENCY IN PAKISTANI STOCK EXCHANGE using WRIGHT RANK AND SIGN TEST

BACKGROUND

Investors or the people who dealt in the stock exchange market or investors who invest indifferent type of securities or tradable products in stock market estimates the price of the stock on the grounds of the expected cash flow to be collected in future from investment in stock and they also determine the risk associated whit the investment in stock exchange market.

As indicated by (Fama, 1965a) the Efficient Market Hypothesis (EMH), in his published article abbot market efficiency, an efficient market is one where returns can't be subjugated through do trading in a particular pattern. The hypothesis of the efficient market is concerned with the concept of WR (random walk) or irregular walk, which is found in finance related studies which represent irregular or random changes in stock prices to such an extent that the present prices of stock in market can't be anticipated from data available of past prices. The concept of irregular(random) walk is that the change in progressive prices are autonomous, the same distribution of the variable that are random in nature suggest that the series or set of changes in prices has no memory and past changes in prices can't be followed to anticipate the future in any significant pattern. A notable number of studies abut market efficiency has conducted after the seminal work of (Fama, 1965a) to examine the level of efficiency of the market in developed markets of the world adopting a number of different procedures. The examination of EMH has been persistent getting a great reaction because of two fundamental realities; I) efficiency that is related to information perform an important part when investor take a portfolio decision and that results have important affects on portfolio investor and manager; ii) differing and instable outcomes, even after the executive or broad announced work in this field calls for differentiated methodologies with modified techniques. In recent era government and as well as business and organization accept this truth that the capital market of a country play a remarkable role in the economy growth of that country, where the

capital market is that specific an organized place in premises of which different long term loans , equities, and other securities are communicate. Capital market is a place from where businesses, organizations, and government as well acquire loans, and raise their capital funds against different securities and other tradable instruments. Furthermore Bonds market and stock market are fundamental categories of the capital market. The reflection of the information due to variations in the prices of securities and the adjustment of the prices with the arrival of new information are basics and important characteristics of the capital market there for the people involved in dealing in capital markets cannot extract extra return on the basis of these information rooming in the capital markets. In this regard a concept known (Efficient Market Hypothesis) oppose that all the information available in the capital market due to the reflection by capital market and it is further suggested by the EMH that no investor or other people who deal in capital market cannot earn an excessive amount of return by making the public, private, and historically held information as base. In the very recent two decade the important role of the capital markets of stock markets is addressed in under developing countries as well. As we know that economies have different indicators in this regard due to the important role of stock markets the capital markets are given the title as now capital markets play a role of leading indicator of the economies , with this we can predict about the economy's position before a specific event accrue. In developed countries the investor considers the progressing capital market as a golden and profitable opportunities for investment either short term investment either long term investments. In capital market the investor mostly confront with two type of situations such as either the investor will loss or the investor will win but this winning or losing outcomes are deeply dependent on the investment strategy, investment nature, and the instruments in which the investor made the investment. But as the capital market is important window of opportunity for investors there for only the existence of the capital market is not important but the existence of the efficient market is very important because in the market which is not efficient will provide a change to earn a bulk amount of profit which will ultimately confront the other investors with a huge amount of loss. There for the efficient market is right of every investor to keep the environment of business in balance. It is stated by different authors that the efficient market will redirect the information to level where the marginal benefits of acting on bases the information available did not over cross the cost accrued due gathering of information. It is claimed by Jensen that if

for example that if transactional costs are supposed at 1 cent and on other hand if the investor is getting a return which is not normal say 1 cent then this situation is to be consider in the premises of the efficient market. Furthermore an author worked on this field name Fama. He worked on market efficient, according to Fame the term market efficiency is as an organized place where all the investors having rational mind work under competition with each other, efficient market is a place where this is struggled by every investor to track the future value of the stock market, a place where everyone who participate in stock market can the available information in free from the market. Fama introduced a term as "Instantaneous adjustment" this means that efficient market has an instant adjustment behavior to the information or the market can adjust its price to any change. According to Fama the change in price of an individual security is independent. Levy is another author who worked on three different major techniques to test the random walk model (RMM). The first technique used by Levy to test Random Walk Model is Serial Correlation, the second Technique used by Levy is known as Runs Test, and the last approach followed by Levy is known as simulation model to test the independency of variation in successive prices in stock market. In actual situation the efficient market does not work 100% but perhaps will be taken as standard or benchmark for the analysis for efficient market performance. First time the distinction among weak and strong form of efficiency, Fama did further work in this regard. At first he work on weak form of efficiency market, according to him weak form of efficient market is that market where historical information of previous prices and information of previous returns is full reflected by stock prices in the market in such a way that nobody can extract excessive amount of return on based of these information. Second the discuss the Semi-strong market efficiency as the market place where all public information is fully reflect by securities prices and this reflected public information must know to all the investors who deal in capital market but on the bases of these information no investor can earn excessive amount of return on the basis of this information. The third form of market efficiency, according to Fama Strong market efficiency or strong efficient market is that place where all private and public information reflected by stock price in stock market is available to all people who deal in stock market, all the investors must know the available information in such a way that no investor is able to earn excessive amount of returns by making the available information as base.

To developed an efficient market it is needed to suppose that there are a few investors who are well informed and have enough information and this situation it is needed to be assumed that the system of prices is more informative. Information timing, information availability, information quality, and information cost are some limitations, the equilibrium number of those individual who participate in economy and the number of individual who are informed and number of those individual who are not informed will depend on the above mentioned limitations. As per Fama view if the cost of transaction is low in the market then that market will be working efficiently. Some other authors proposed a new and a distinctive approach named as Trading Rule was developed for those who want to avail the tax advantage. After trading period, in the year end investors tend to sell those stocks whose performance was not good during the previous working days, they do this for the sake of to escape for the tax burden, there for investors show some loss on the stock sold and get tax reduction advantages but when new year get start the investors begin to buy back that stocks on some other high process but keeping the margin of tax advantage and that amount of buying the securities back. This kind of situation develop a negative and downward force on the price of stocks in the capital market while at the end of year in December this behavior will positively affect the values of the equity stocks in the stock market, in January buying of these securities back it provide an opportunity to the investors to earn an excessive amount of profit. There for this irregular situation provide a chance to investors to earn excessive amount of profit which fail the theory of efficient market. LO and Mackinlay are authors suggest another approach know as Test of Variance Ratio to know that is the future prices of assets or return on investment can be estimated or not or predictable or not. The variance of the data based on time series is compared with different interval in this test. If we assume that Random Walk is present in time series data then we can conclude that the Q time the variance of the one period difference must be Q period variance. To investigate the Random Walk under two diverse suppositions such as homoscedastic andhetroskedastic the test of variance ratio is used. Other authors suggest some different techniques such as test of multiple ratios. Variance of ratio tests and the tests of variance of multiple ratio are the same but the only change behavior is that the test of variance of the ratio predict only the individual interval while on other hand the test of multiple variance of ratio predigest the result of all he intervals jointly. Stock market will be known as efficient market and will have a RW if the variance of ratio

is sameto 1, but as concern to the practical investigation of the efficiency of the market, there are different opinions on the efficiency of the market and one of the most persistence issue in the previous studies empirical work of the capital market. Mahmood did empirical work on efficient market hypothesis in Pakistani market. According to him the efficiency of the market of 100 index of KSE, the 8 stocks were selected and a technique called ANOVA to enumerate the data and analyze the day of the weak affect and the effect of the month. The results show that there are not effects of day weak or effect of month therefore market is efficient, but on other hand another author from Pakistan name Hassan et al, argued that there is no efficiency in the stock exchange of the Karachi stock market. In Hassan investigation four different techniques is use in investigation to examine the stock exchange market in Karachi, multiple ratio tests, unit root test, and the test of serial correlation test. January and other irregularities provide an opportunities to the investors to earn excessive amount of returns therefore these type of irregularities play a role of barriers to develop efficient market. From the results of *SaqibNisar* in the field of market efficiency suggest that there would no concept of undervalue and overvalue in the weak for of market efficiency, and there for investors are not able to make an excessive and abnormal amount of profits at the presence of risk by making the technical analysis as base. The WFME suggest that the previous prices in market and other all relevant information is completely reflected by the current securities prices, there for in long term, in the market, the investors have an opportunity to earn an irregular return. Since the Random Walk hypothesis shows a vigorouscharacter in the conception of the WFME. To improve complete system of stock trading and develop an efficient market we need to ambers a strong, and efficient audit and information technology in this regard only providing the facility of software of trading, the account of trading, the account of investors are not enough but to link all the sectors of finance, is needed, it is needed to upgrade all the list of registered house of brokers, the activities of investors and companies with stock exchange to online system. To develop an efficient market to lower the transactional is needed furthermore we need to make sure the availability of all the information free and equal to all the investor.

A rising economy is a middle stage between the developed and emerging economy. Contrasted with developing markets, developing bazaars are generally segregated from capital bazaars of different nations and have comparatively low connection with

establishedbazaars. But throughout, amid 2periods gigantic measure of investmentflow from established economies because of globalize and advance of financial markets have pulled in the authors to examine the pattern of changes mentioned above on the efficiency of the market of developing markets. Accordingly specific consideration is given by authors to discover inclines in developing markets. Though the giving of qualitative markets during the development stage of developing economies is fewer and the consequential is weak market with control and limitations.

Normal or rational people who want to invest in the stock market. There are three types of market efficiency.

1.1 Weak Form Efficiency

Weak-form efficiency is one of the three diverse degrees of EMH(efficient market hypothesis), it argues that movements of frail frame effectiveness is hypothetical, advocates attest that key examination can be utilized to distinguish underestimated and exaggerated stocks. In this way, sharp speculators searching for gainful organizations can procure benefits by inquiring about money related explanations

1.1.1 BREAKING DOWN 'Weak Form Efficiency'

The EMH (Frail frame effectiveness) likewise called as the hypothesis of arbitrary walk. It declares that the costs of future securities are arbitrary and the pastevent cannot affect it. The developers of the efficiency ofweak form asserts that all those information which are not certified but roomed is reproduced in stock prices and this is how past information and current market prices are not associated or we can say there is no relation

For first time the efficiency of weak market was offered by an economics professor Princeton Burton G. Malkiel in his 1973 book "A Random Walk Down Wall Street." In addition the book through light on the concept of random walk , offering the EMH and other 2 levels where prices of stock reflect previous evidences, information regarding present and future as well.

1.1.2 How to employ the weak form market efficiency concept

The random nature of the stock prices is a fundamental principle of efficiency of weak form market which make it not possible to discover the prototype of prices of the stock ,furthermore it take advantage from the price movement in the market,

specially the daily stock price movement is fully not dependent to each other, but these prices are supposed prices not existent in market, furthermore, the previous profit boom or growth do not forecast the future or current growth of earning.

The weak-form efficiencyis not in a position to provide valid and correct technical analysis it is not the obvious responsibility of the weak-form-efficiency to explain that the fundamental analysis, at a specific time can be faulty. As consequences it is not every easy, as per weak-from-efficiency , to break the market, particularly not in long term but in short term, such as if an individual consented to this form of efficiency, then he/she consider the is no option to a financial advisor a portfolio manager who is efficient and proactive.In its place, a person who have made some investment (investor) supporter for efficiency of weak form suppose that they can suppose that they can randomly pick an investment or a portfolio having little risk.

There is not price movement adaptation by those markets who have not weak form efficiency let's take an example if an individual came to know that there is a down wards movement in stock price and a upward movement on Friday then is can be supposed that , that individual who know this movement mechanism of process movement then that individual can earn profit by buying stock on Monday and sell on Friday, but on contras if there is a downward movement in prices on Monday but not any clear increase in stock on Friday then it is inferred that this market has a weak form of efficiency.

1.2 Semi-Strong Form of Efficiency

The market semi- strong efficiency is that type of EMH which explain that all the information to available to the public is gathered into the available current share prices of the stock market, this statement means that there is no need of perfect and fundamental or technical method of analysis is present to avail for achieving high profits or gains. The under discussion category of the efficient market hypothesis advise just information available according to this the information available publically cannot give benefit to those investors who try to earn higher and abnormal profits on investments they have made. In stock market all other form of information available for the price of the stock but no there is no presence of any technical or fundamental analysis get high gains.

1.2.1 'Semi-Strong Form (BREAKING DOWN)

There are two primary classifications of analysis of securities: one is fundamental and the other one is technical classification. The Fundamental investigators inquire about metrics of performance of business for example, growth of sale and earnings expansion;subsequently these are recognized to be forerunners to share significance development. As it were, they are known as ancestor state. The analysis knows as technical analysis is just intrigued by history based actions of prices, not business executions. Professionals devote hours penetrating for patterns and trends in cost to affirm share value ups and downs. There is additionally a gathering of individuals who accept both technical analysis and fundamental analysis are much the same as psychics. These people have faith in a hypothesis alluded to as the productive market speculation or hypothesis , which asserts that the market is universal and no measure of examination can enable financial specialists or investors to accomplish high returns.

1.2.2 Efficient Market Hypothesis (EMH)

The members who participate in market mirror the market. This is the essential rule of the effective market speculation of hypothesis, a hypothesis that advantages that the market's capacity to be all knowing, and subsequently great. Experts who trust stocks are exaggerated or belittled or over esteem or underestimate aren't right in light of the way that the market reliably knows the right a motivation to designate a stock, or so the beneficial exhibit theory speculation states. There are degrees of certainty around this speculation; in any case, and they are implied as the fragile, semi-strong and strong structures. The semi solid shape falls in the middle.

1.2.3 Semi-Strong Form of EMH

To know the about the forms of EMH such as weak and strong clarifies the semi-solid shape. A weak form of effective market hypothesis is confidence in productive market theory, and believes that market research capacity is weak and may sometimes be less effective. A strong frame or believes that all open data is known, but only an inner void can be used to gain an edge over any market participant. The semi-solid shape shines sharply in the center. He believes the market is well known with all the open data; as it may, there may be certain opportunities to exploit commercial misconceptions. Although influential, the semi-solid form of EMH does not

compromise financial expert intrigues or price adjustments for energy, not data. The hypothesis of good market speculation remains controversial, and the semi-solid sponsor is the key to the debate.

1.3 Strong Form Efficiency

Efficiency of strong form's productivity is the most grounded part of market proficiency or efficiency and declares that all information in a market, regardless of whether priorpublic, is distributed for in a stock's cost. Professionals of strong form of proficiency or efficiency trust that not by any means insider information can give a financial specialist favorable position. This level of market effectiveness suggests that benefits surpassing ordinary returns can't be made, paying little heed to the measure of research or data speculators approach.

1.3.1 BREAKING DOWN Strong Form Efficiency

Strong Form Efficiency Strong shape of hypothesis of efficient market is a factor of the productive market speculation and is thought about piece of the irregular walk hypothesis. Strong form of efficiencyexpresses that securities costs, and along these lines the by and large showcase, are not irregular and are affected by past occasions. This proficiency is at the contrary end of frail frame productivity, which expresses that past occasions have no impact on current securities costs and value developments. The idea driving solid frame proficiency was produced for first time

The concept behind strong form efficiency was developed for first time by Princeton professor of economics Burton G. Malkiel in his 1973 book "A Random Walk Down Wall Street." The book supported two types of the arbitrary walk hypothesis. The frame that clarifies solid shape proficiency expresses that it is difficult to reliably outflank the market because of the way that all data, both open and restrictive, is reflected in current market costs, and it is in this way difficult to acquire long haul unusual returns.

1.3.2 Example of Strong Form Efficiency

My cases of strong form of effectiveness incorporate a type of insider data since solid shape proficiency is the main piece of the productive market speculation that considers restrictive data. Nonetheless, the productivity hypothesis states that in spite of mainstream thinking, harboring some kind of inside data won't enable a financial

specialist to acquire remarkable yields in the market. Assume, for example, that the CTO of an open development association assumes that his association will begin to lose customers and livelihoods. After the internal rollout of another thing feature to beta analyzers, the CTO's sentiments of fear are certified and he understands that the specialist rollout will be a flop. This would be considered insider information.

The CTO chooses to take up a short position individually organization, successfully wagering against the stock value development. In the event that the stock value decays, he is ready to benefit, and the other way around. In any case, much to the CTO's dismay, when the item highlight is discharged to people in general, the stock cost is unaffected and does not decay, despite the fact that clients are not upbeat. The market would be thought to be solid frame effective in light of the fact that even the insider data of the item tumble was at that point evaluated into the stock. The CTO would lose cash in this scenario.

The phenomena of Market Efficiency was first provided a formal status and get practically in used in the in pioneer work of (Fama, 1970) this term means that how much a stoke or any other market is efficient to provide information further that information will decide the price of instruments dealt in that specific market. Makin discuss mores specific the concept (EMH) Efficient Market Hypothesis explain the term efficient market as “the market where the flow of information is instantly and accurately bounced and reflected in the price of current securities in that particular market” this concept is defined by many other others such as (Rubinstein, 1975), (Beaver, 1981), (Jensen, 1978), (Black, 1986), (Decorogna, Muller, Olesen, & Pictet, 2011), (Malkiel, 2003), (Timmermann & Granger, 2004) and (Milionis, 2007) according to the above authors this is not astonishing to study the financial market efficiency in many different ways which has been examined before such as if we talk in fashion of empirical findings, done noticed that even after a large number of articles have been published before a very long time, there is still the economists are not agree upon whether business markets or financial markets have efficiency or not.

In the research study of(Fama, 1970) about Efficient Market he traces the great classical classification of information available to people participates in market and further he arranged the concept of EMH into the Weak, Semi-Strong, and Strong form. He was the first one who classifies the EMH in to three forms as mentioned

above. This research study centers on the Weak-form edition of market, which attests that the price of security completely mirror or reflect all the information comprised in the history of past prices of the market. Indeed, even in this weak-form classification, the tremendous assortment of literature can be furthermore subdivided into no less than two main groups. The primary strand of studies examines the predictive behavior of security returns dependent on past prices change. All the more particularly, past examinations in this sub-classification provide a wide range of test that are statistical to distinguish distinctive sorts of deviations from an irregular stroll in financial time series, for example, linear serial correlations, unit root, low-dimensional chaos, nonlinear serial reliance and long memory (literature study in coming section). The second faction of researches inspects the profitability of strategies of trading depending on returns of past, for example, rules of technical trading (survey paper by (Park & Irwin, 2007), constriction strategies (Chou, Wei, & Chung, 2007) argued that there is no body agree upon definition of market effectiveness which is standard, there for we follow the edition offered by Fama. Fama give stresses on the rapidness and accurate response of adjustment of price of the securities due to the arrival of new information in the market. All though more particularly, this study construes the efficiency of the market form the privilege price of stock market. The stock market is one where which changes in prices of securities are totally irregular and not predictable. In this way, the presence of important serial reliance in return of stock series, in a specific outcomes automatic correlation, would entail investors‟ mis-react" to fro example under and over pricing of securities in market reaction of pricing to the availability of information in the market although this is a proposition on efficiency of the market which is still under a tremendous debate further details can be found in the work of (Boudoukh, Richardson, & Whitelaw, 1994) the above efficiency of information (informational efficiency)and explanation of serial reliance(dependence) in progressive(successive) price changes has a powerful theoretically base and is broadly followed in present research studies, as in following;

The famous model of behavior by (Barberis, Shleifer, & Vishny, 1998), (Daniel, Hirshleifer, & Subrahmanyam, 1998) and (Hong & Stein, 1999) recognized that how over and under response of the investors to the new produced information which can give a rise to the positive return of lagged-correlations.(Boudoukh, Richardson, & Whitelaw, 1994)Argued that market investors are referred to a avers ground which

causes them not to keep their self up-to-date and their priors adequately even if there is new information available. Subsequently, prices of stock at first do under-response (under-react)to news of information availableto the public and stock returns are positively -lagged-correlated over short-term Rather than psychological grounds, the under-response and positive return lagged-correlations in Hong&Stein's model emerge as a result of slowly dispersal of information over the investors and public, and news seekers and investors limited as rational in this ground as they follow just half information to keep update their self and priors.. Daniel et al disprove the basic assumption that the presence of positive return auto-correlations is because of under-response (under-reaction). Rather, these researchers' assets that it is better categorized as a market over-response to news announced in the market. In other model, investors are very much confidence or we can say that in the other model the investors are overconfidence in detecting the information about market initially the individual would be leaded prices of the stock to over-response situations, referred to self-attribution grounds, investors turn out in to more confidence or careless when information is announced to public. , the two kinds of cognitive grounds of investors cause proceeding over-response and consequently over-response and there for positive serial interrelation in stock returns at short-term. The positive response traderof(De Long, Shleifer, Summers, & Waldmann, 1990b),model differentiate returns that are positive lagged-correlation as the outcome of over-response nature of the market as well. The model of them demonstrates that a positive feedback trading plan or strategy is followed by noise type of traders; the returns of the stock will be positively lagged-correlated because of the pressure of the prices. One another model in the field of market efficiency offered by (Froot & Perold, 1995) demonstrate that the gradually propagation of wide ranged information of the market caused in positive serial correlation in return of stock index, however the researchers did not recognized whether are these the signs of over or under response of market. The idea of market effectiveness by in vast associated with the informational efficiency in the markets. In framework with the financial market it subjected to the inclusion of the presence of data in deciding the price of current security. Effectiveness does not need the price of the security must be equivalent to the actual value of the security, all it needs the balance in the market. There is an equivalent opportunities of costs to be higher or lower than the actual value of the security anytime, all it needs these radiations from the actual value to be random and the problems to be equitable. Therefore, the market

is effectively asserts that the price adjustment of the market in and inequitable manner, the announcement of the new and comparative information in the market (Khalid, 2014).

1.4 Research Problem

A plenty of research work has been done on Pakistan Stock Exchange. To investigate whether Pakistan Stock Exchange is efficient or not? Based on efficiency of market investor can gain some abnormal returns through various strategies or portfolio diversification. Market efficiency has been tested by technical analysis tools while need to investigate by sophisticated and modern econometrics model like Wright Rank and Sign test.

A lot of work has also been done on the area covering all the three form of market efficiency especially the weak form of market efficiency. The studies conducted so far were mostly based on the assumption of normality of data. In previous studies the data was either non-normal or converted to normal data by manipulation and thus the reliability of results effected. In actual situation this assumption is seldom true and thus a need arise to test it in the absence of normal data. The study fill the gap by applying different model having a capacity to deal abnormal data and thus to check that whether Pakistan stock exchange is efficient or not.

1.5 Research Question

Following inquiries are to be replied in this paper

1. Whether the stock costs in PSX take after an arbitrary walk?
2. Is it conceivable to trap the market and make irregular benefits reliably not at times based on past accessible value data?
3. Is specialized examination worth any incentive in PSX?

1.6 Objectives of the Study

1. The primary goal of this examination is
   To test the productivity of the Pakistan Stock Exchange (PSX 100 record), by investigating the everyday insights of PSX 100 index record.
2. To search for the marvel of powerless type of EMH, i.e., regardless of whether the past stock costs track a way or not and whether they are able to do or not to be utilized to foresee the forthcoming changes of the stock prices.
3. To discover the effect on economy.

Research Hypotheses

In this exploration following speculation will be investigated

Ho1 Pakistan Stock Exchange (PSX) takes after irregular walk.

Ho2 Technical analysis has no predictive power for future price patterns of Stock prices.

1.7 Significance of the Study

The results of this study will benefit individuals, investors, brokers and listed companies, mediation of companies, and in particular individual trading and commodity markets. The study will also identify the usefulness and utility of different technical tools, while the shareholders will be able to use the most appropriate indicator, thus benefiting from the information available. The study will also benefit students in the education sector who want to conduct technical analysis studies. The findings allow the market to become effective over the long term. Applying on true bases will benefits the maximum investors and it will lead to enhance the efficiency of stock market.

CHAPTER-2

LITERATURE REVIEW

(Fama, 1970)Highlighted weak-form of EMH a bit wider in his empirical work about three form of EMH such as Weak-from, Semi-strong, and strong-form the empirical research studies preceding 1970 by a large number of authors examine auto or lagged correlation tests and rules of technical trading, and their outcomes firmly recommend that securities exchanges market referred as weak-form efficient. After two periods of ten years in 1970 Fama carry out another (second) review about efficiency of market but this time his research study focuses on to broaden the EMH weak-form to examine the likelihood or chances (probability) of return by adopting some other variables for example ratio of dividend price, ratio of EPS (earning per share) ratio of BM (book to market value) and a number of other statistical tool such as interest rates instead of making Past Returns as milestone of his study. The tests for the semi-Strong form of EMH and strong-frame EMH are rearranged as event based research studies and these tests were conducted for private data or information, individually. His survey indicates proof of increase in return consistency predicted from the past

returns, the yields from dividends and various variable which are used as term-structure , yet the author contends that these results may be deceptive and ought to be met with skepticism or a situation where one may be in doubt.

Another author conducted study in China stocks markets. (Hin, 2006)Hin investigate Random Walk hypothesis in his study to estimate the validity of weak-form of efficient markets for china two stock markets, furthermore his study through light on the concept of day of week effect on the markets of the china. As pre the results of this study the stock markets of china have weak form of efficiency. The hypothesis for the Random Walk for the China stock market is rejected by the result of root test, serial lagged-correlation test, runs test etc. the efficient market hypothesis base argue that returns for process of the stocks are not depended and distributed differently it is further argue that there if not link among the previous prices history and the predictability of the future prices and returns, some previous studies have provided evidence of rejection of the null hypothesis on weak-form of efficient markets while on other hand other authors provided evidence who support the hypothesis of weak-form of efficient markets. Another author studies an impossibility of completely reflection in Fama definition. If complete information is reflected by the stock prices in the stock market then there is no logic for searching the information by investors for to decide what kind of stock is to be buy and what kind of stock to be sold in the stock market (Grossman, 1980). Grossman with the assistance of another author noticed this paradox and proposed a new model in which it is suggested the prices reflect half information in the market. Informed and unformed investors were root base of their theory. If we suppose that the markets are efficient, thecost and information is associated, and then the investors who are fully informed will not be in a position to obtain any extra compensation form the investors who are not informed, therefore in the market the information will be fully reflected by the price of the stock. Furthermore typical noise in his proposed model, suggest that all information would not reflected by price of the sock in the market. If the price of stock in the market are full of information, then there would a small amount of motivation and incentive for the investors for to search and pay for excessive information gathering for decision about investment in stock market. The rational investors estimate each security for its basic value estimated by the NPV (net present value) of futures cash flow if the security discounted by factor of risk this means that all the information is reflected by

the prices of the securities in the market and the relevant information is properly value by prices of the securities in the market. When the costs of trading and cost of information is zero in that situation the hypothesis of efficient market is true, therefore in this above scenario there will not be a financial incentive for the investors to pay for the information gathering which is reflected by the stock prices. Not so strong bur enough reliable version of the market efficiency hypothesis argue that the stock prices will reflect the information till that level where the marginal benefits of performance on behalf of the available information does not exceed the cost of collection information, but if the investor are not rational the hypothesis of the efficient market persist to have its value and as a result all the information is fully reflected by the stock prices in the stock market. If there is a large amount of the rational investor the techniques for trading are not correlated, then their trades cancel on another and since there is no effect on the stock market while on other hand the stock price will keep on to be valued with fundamentals consistently (Pesaran, 2005). The assumption in the hypothesis of efficient market argue that individual who participate in the market formulate rationally their decision about buying and selling of stock in the stock market, the relevant determent of the stock in the capital or stock market. The hypothesis of the efficient market is comprised with joint hypothesis of specific equilibrium model to profits collectively with the supposition of expectation that is rational. In the direction of to accept, reject or prove or disprove the hypothesis of the efficient market. A return model is needed to specifically mention against those with which genuine return can be coordinate. In the event that it is discovered that the unpredictable (strange) returns not ready to conjecture the AA it isn't conceivable to dismiss the proficient market theory.(Dorina and Simina 2007) looked for weak form of market productivity in eight developing securities exchanges. Their analysis involved creating states of Slovenia, Poland, Lithuania, Hungary, Romania, Turkey, Slovakia, and Czech Republic. The analyst used Serial connection LM test, Q - test, BDStestRuns test connected to residuals produced by ARMA models what's more, found that you can discover direct and non-straight conditions in an expansive number of securities exchanges. In an extremely surprising paper, (Ball 2009)negatively remarked on an excess of confidence in showcase effectiveness and considered it answerable as one of the real purposes behind the end of Lehman Brothers and other expansive money related institutions. This filled in as a further inspiration for this examination, as it demonstrated its basic for investors.(Lee, 2010) examined the

Stationary of genuine offer costs for 32 created and 26 creating nations from January 1999 to May 2007 and recommended that securities exchanges are not productive. For the free-coast side, an exact investigation by (Cox, Brammer et al. 2004) explored more than 500 UK organizations to assess for that connection between institutional shareholding and socially mindful conduct.

Their outcomes demonstrated that there's positive connection between's corporate social execution and long haul institutional venture. To the subject of market effectiveness in Pakistan, constrained research work has been completed and distributed to test industry effectiveness and check for nothing buoy of offers irregularity consequently arrangement. (Husain 1997) confirmed that KSE100 Index won't devour a Random Walk Model. (Husain and Uppal 1999) make utilize of ARCH and GARCH models to research exchanging stocks instability in Pakistan. They discovered that instability have declined definitely following the advancement in the capital markets. (Chakraborty 2006) utilized difference proportion and serial connection tests to assess for that frail shape productivity from 1996 to 2000. The specialist dismissed the arbitrary walk speculation. The costs securities and offers do Irregular walk and are firmly interrelated to the hypothesis of EMH(Kendall and A. B 1953) was the creator who included Random Walk in back investigations. The specialists explored 22 British stocks and found that costs for the most part don't take after any cycles they additionally show up sensibly irregular. (Fama 1965) begin confirm that specialized investigation can't be used to estimate the expenses in long haul. (Andrew 1999)proposed there is autocorrelation in stock rates to put it quickly run. (Lo, Mamaysky et al. 2000)proposed that a number of chic numerical technique can certainly provide us with a number ofprojectinginfluence. It can be practical that this further random the stock prices, the greater will be efficient the marketplace.(Malkiel 2003) also discovered proof that it's extremely hard to generate unusual return in prices of stock in long period.

Very much newly (Yen & Lee, 2008)give a sequential analysis of experientialevidences regarding the EMH in the course of past five centuries. Their study unmistakably shows so as to the EMH does not having benefits for long time from the level of strong help or support it got in the brilliant and golden time of the 1960s, yet rather than it has gone under persevering hit as of the different school of behavioral finance in the 1990s. Apart from the analysis over here we have some

other remarkable research studies having a particular theme for example as (1) (Fama, 1970)studies the experimentalstudy on event based research work, along with an attention on that research works o paper offering on findings long-term profits anomaly of under-and over-responses to available newly information; (2) (Malkiel, 2003) and (Schwert, 2003) examine those research studies providing proof in stock return based on statistically significant pattern which is predictable; (3) (Park & Irwin, 2007) survey the evidences about the rules of technical trading probability in an assortment in a speculative natured markets, comprising 66 published research papers about stock market from 1960 to 2004. (Lim, 2009) Review the main point as weak-form of EMH of the review of the literature that investigates the like hood of or probability or the return rooting from past variations in prices.

In section 2.2 we will discuss the mainstream weak-form EMH literature review offered by other authors about the inspection of predictabilityreturnfromthe price change in past. It is important that the quantity of empirical research studies has developed immensely, but the studies conducted afterward of Famahave to a great extent rejected this strand of review of literature. The principle goal of (Lim, 2009)research study was is to demonstrate that extra insight of knowledge, past the decision of market effectiveness/inefficiency, can be gotten from those statistical tests of weak-form EMH talked about in Section 2.2. Evading the progressing discussion between defenders of EMH and champions of behavioral finance, a developing literature has moved its concentration to analyzing market efficiency in the relative instead of absolute sense. In another advance study in the same field by (Lo A. , 2004) and (Lo A. , 2005) offers another concept to the contradicting group who offered EMH and behavioral finance, working on a transformative angle of efficiency of market he offer a concept as adaptive markets hypothesis (AMH), the empirical studies' results of developing market efficiency. We well give the motivation factors beyond the empirical study which analyzes the existence of stock price diverge from an irregular investigation after some time for 50 stock markets by methods of the rolling bicorrelationstatistical test. Father more a Cross-sectional regression is then used to recognize those components that can represent the documented cross-country changes or variation where the Malaysian Stock Exchange Market is used as case study.

2.1 The review of literature about mainstream Weak-form EMH

This section 2.2 discuss the literature rives about the weak-form EMH that inspects the stock yield predictability back from past price changes. The participial (empirical) examinations are sorted out in light of the idea on not permanent (temporal) reliance on their statistical tests are intended to notice. It important identification that in a prior research papers, for example(Andreou, Pittis, & Spanos, 2001)mark out the development of different models that are statistical for data that have a speculative price since the mid twentieth century, and these investigators or researchers cover the not permanent or temporal reliance or dependence examined here additionally. The overpowering proofs of the predictable pattern taken from past returns are discovered by our studywhollyspecially those stock markets that are emerging. At the same time as these research studies asserts the subsistence of reliance of dependence which is temporal is against with weak-form of EHM it is since that the investment opportunities that are profitable i.e. (forrules of trading technical or past-return stand on investment strategies) here in this study our emphasis is on that the proofs provide information is not bounced completely and immediately into present price of stock

2.1.1 Linear Serial Correlations

The very initial tools that are used in Weak-EMH are serial correlation test and spectral analysis which is found in the literature of forged by Fama and (Granger & Morgenstern, 1963) correspondingly. These statistical methods or techniques are investigating the minimum prohibitive sort of the irregular (random) WH that is model of RW 3 by (Campbell, Lo, & MacKinlay, 1997) which needs merely uncorrelatedness of the change of the price, because of Lo and MacKinay know as Seminal work, here the primary tool for testing the (VR) variance ratio test are emerged either the return of series stock consecutively uncorrelated. (Charles & Darné, 2009b) Asserts and offers a closer and a wider study on his current growth. The VR (variance ratio) test depends on the arithmetical property that price of stock takes an irregular (random) walk, at that point the difference of period-k times the variance of return of one period of stock price. Therefore as per the null hypothesis of uncorrelated serial returns of stock the Variance Ratio can be defined as the variation of period-k returns, there must be equivalency in the variance of return of one time-period among any other holding K-period. Another remarkable improvement in the test of Variance Ratio is comprised of some new parameters known as non-parametric tests this new innovation is presented by (Wright, 2000)his proposition is dependent

on stock return's symbols and level based on returns which follows exact distribution .

It is usual in empirical application during different studies to investigate the VR for many investment periods or holding eras, and the decision of non-RW is p announced when estimated statistic of ratio variance is expressively not the same from unity. Though, this dissimilar comparison over all pre-chosen holding periods can prompt over-dismissal of the null hypothesis. To overcome the general test canvas, joint testing systems has been offered in the study, among others, this is proposed by (Richardson & Smith, 1991), (Chow & Denning, 1993), (Whang & Kim, 2003), (Chen & Deo, 2003)and (Kim & Shamsuddin, 2008). As concern the weak-form EMH the tests of multiple variance is in good turn for firm but in comparison instead of a number of new methodological refinements to the present serially correlation test such as (Lobato, Nankervis, & Savin, 2002), (Horowitz, Lobato, Nankervis, & Svain, 2006) and test that is spectral-based by (Durlauf, 1991), (Deo, 2000)asserts that we don't identify any implication of the above mentioned innovated arithmetical tools on data of stock market, with (McPherson, Palardy, & Vilasuso, 2005) and (McPherson & Palardy, 2007) recognized merely two studies who find implication of improved statistical tools.

More than the past five decades the practical (empirical) investigation and research studies find a extraordinary growth but it is not possible to provide a full evaluation here. As (Lim & Brooks, 2006) the offered a list contain of a number of published papers from the period 1965 to the period 2005 era but here is study is focusing in the new and fresh studies about efficiency of the stock markets which investigate un-correlatedness of the series of the stock market. Non-exhaustive list as is taken as base by Lim and Broks, in a total number of 92 papers only 57 paper investigate the efficiency test of markets on one solitary country, comprise of the stock markets of 25 countries while the rest of article did only comparative analysis, moreover on a local level or at the level of division of markets status. In the concept of empirical proof, the study of the same markets under investigation are contradicts with each other, this is due to the differences in simple periods and implication of methodologies and procedures. Now to offer an insight to the disagreement of the findings or controversy, here in this study we take china as a case study, as the WF of EMH of efficiencyof the china the stock market of shanghai and Shenhen has been selected to

strict type of analysis, comprise of books presented by (Groenewold, 2004), on other hand (Laurence, Cai, & Qian, 1997), (Liu, Song, & Romilly, 1997), (Long, Payne, & Feng, 1999) and (Lima & Tabak, 2004)assets that the stock exchange market of the china are weak-form efficientas there is no serial linear correlations among the return of the stock exchange markets. These effectiveness findings are very shocking given the generally shared observation that the Chinese stocks markets are exceedingly speculative based, driven mainly by rumors surrounding in markets and individual sentiments of investor. While on other hand (Mookerjee & Yu, 1999) comes at the last decision that a similar market is not sufficient since their lagged-correlation based tests dismiss or the reject the random walk hypothesis, among those research studies that discover proof of predictability of return, yet abstain from extracting or inferring on inefficiency as these researchers are careful that the obvious predictability could be misleading legged-correlations comprised by thin trading. (see (Darrat & Zhong, 2000), (Lee, Chen, & Rui, 2001), (Groenewold, Tang, & Wu, 2003), (Groenewold, 2004), (Seddighi & Nian, 2004), (Fifield & Jetty, 2008)(Zhang & Li, 2008), and (Charles & Darné, 2009a) add further more to this developing list of papers about efficiency of Chinese stock exchange markets, however their implication of a battery of test of VR or variance ration yield mixed results and findings.

The work remain persist to increase in the past at slow rate in the three year, along with more and more stress on stocks markets that are emerging.(Squalli, 2006) investigated the efficiency of the weak-form of two separate stocks exchanges markets such as stock exchange market in Arab Emirates market, the Abu Dubai Commercial Market in short (DFM) and stocks exchanges market of Abu Dhabi Securities markets in short form (ADSM). The previous mentioned exchanges markets are very much younger as started work in the year of 2000. All most many of the financial sectors in DFM and ADSM respectively are consistently inefficient this conclusion is extracted from the outcomes of the many tests of ratios.

As same to above the similar outcomes or results of the return of stock exchange serially correlated also presented by (Chakraborty, 2006) and (Hassan & Chowdhury, 2008) their study was concern with Pakistan and Bangladesh stock exchange markets. A number of studies are conducted as reexamination of data of stock exchange market in Asia is promoted by a number of developers of methodology to VR variance ratio test such as(Hoque, Kim, & Pyun, 2007), from Korean , Taiwan

and stock exchange of Thailand (Smith, 2008) from Egypt, Nigeria, South Africa, Tunisia evidences about Stock Exchange Markets are given by (Smith, 2009). To wind up our research study with conclusion, here two investigations are of high value (1) as standard tool or procedure the test of Variance Ratio have been recognized by all most researchers, but here are still a notable number of research studies depending only on that legged-correlation or auto-correlation we can call it as conventional auto-correlation test (2)little attention need by the efficiency of already developed and grown stock exchange markets, though(DePenya & Gil-Alana, 2007), (Lovatt, Boswell, & Noor, 2007), (Jirasakuldech, Emekter, & Lee, 2008), and (Hung, Lee, & Pai, 2009) are among the rare recent additions the research study about the efficiency of the market.

2.1.2 The Test of Unit Root

One another statistical test supported and approved by the number of author's concern with conducting research studies in weak-form of EMH is Unit Root test. As we are familiar with that some earliest authors used a Conventional Unit root test specially the famous test know as (ADF) Augmented Dickey-Fuller test, this revealed that the those stocks market are non-stationary who have a log levels of prices of Stock. So it is concluded by them that the under the observation are recognized as Weak-Form Efficient. As a summary of outcomes previously provided by two authors such as (Lean & Smyth, 2007) but here this study follows the very up to date and recent research papers that have adopted the test of Structural-break. The contention given for the previous is that if a Structural-break is available in the data, there is a probability the break is taken as the presence of a unit root. On one hand the procedure followed is more processed to permit multiple Structure Breaks. On other contras it from the ground of justification of Panel Unit Root it is asserted that when there is a small sample size then there will be a little power of unit root test this is recognized as pace of data rather than the observation occurrence pattern or frequency.

(Narayan & Smyth, 2007)After keep in view the existence of the Structural Breaks in the trend discovered that the indices of price for stock exchange markets in G7 countries comprise a unit root, but in the study of Naryan when he employs the (LM) Lagrnange Multiplier the test of unit root along two structural breaks then the G7

price of stock indices merely reach Stationarity. The price stock indices in eight Asian countries adopted an irregular or random walk process by (Lean & Smyth, 2007).Panel LM test unit root support this findings along one break while findings of Panel as an alternative offered stock prices are as mean reverting when permitting for two structural breaks. The WFE of the emerging Istanbul equity market is proclaimed by (Ozdemir, 2008) since with two structural breaks characterized its main index of price. (Narayan & Prasad, 2007) Implying three distinctive panel unit root testing approaches on seventeen European countries indices of price of stock, and the null hypothesis of a unit root can't be rejected in all cases. With two unit root panel test following the same procedure (Narayan & Narayan, 2007) in his study the null hypothesis is also not rejected under the unit root for the selected countries as sample of the study.by adding up all the results from abovementioned studies it is asserted that in the logarithmic price level there is existence of the unit root . This is not as wondering because (Campbell, Lo, & MacKinlay, 1997)address that return of stocks have grate lucrative properties as compare to price for example asergodicity and Stationarity. the proofs of Stationarity in prices of stock merely come out as emerges when the LM panel test unit root along two structural breaks are applied in studies of (Lean and Smyth, 2007; Narayan, 2008).

In identifyingstatioinaritydue to little power of ADF unit root test When the understudy data developing procedures is categorized by a non-linear process. (Caner & Hansen, 2001) Offered a test of UR built on unrestricted TAR Threshold Auto-regressive model. This recent TAR test is adopted by (Narayan P. K., 2005) and the same by the same author (Narayan P. , 2006) (Qian, Song, & Zhou, 2008) the result from the above three investigations is that the stock price indices under investigation show threshold nonlinearity along (Narayan P. K., 2005) and (Qian, Song, & Zhou, 2008) providing UR test in 2 same area but on other hand (Narayan P. , 2006)asserts a half unit root area in the United State stock price index. (Koustas, Lamarche, & Serletis, 2008) re- investigating the U.S. stock market data employing statistical structure in which the null hypothesis of a unit root is investigated in contrast to the alternative of globally stationarity three-regimes self-exciting threshold auto-regressive (SETAR) procedure or process. Their outcomes demonstrate the internal regime is described by a unit root while the two external regime are very much attracted a by a stationarity autoregressive method. This structured body of the

literature of the different studies utilizes UR tests as well that enable the alternative hypothesis to integrate the non-linear areas in smooth exponential transition form of auto-aggressive procedure or process. (Lim & Liew, 2007)(Hasanov, 2009a), (Hasanov, 2009b) and the process of transitional auto-regression(Kim, Stern, & Stern, 2009) the uses of these nonlinear UR tests persistently demonstrate strong proofs of mean inversion in prices of stock. Instead of all the advance methodologies or procedures (Rahman & Saadi, 2008) talked about that unit root test is a compulsory pre-requisite for the purpose of hypothesis of the irregular or random walk but is not an enough situation, here further particularly, the availability of the test of the unit root is not enough to apply to random walk because the series of the returns should be serially uncorrelated as well or serially not dependent (independent).

2.1.3 Non-linear serial dependence

It is asserted that the normality assumption and supposition is somewhat forbidden for financial time series, many researchers reprimand the implication of legged-correlation-based methodology in testing the weak-frame EMH. This is due to that all pure whitenoise (i.e. an irregular or RWnot dependent and identically distributed in short (i.i.d.) consistent increase or increments) are white noise. Serially uncorrelated), yet the in opposition isn't true till the series is regularly distributed. (Hinich & Patterson, 1985) Criticized on (Jenkins & Watts, 1986) and the findings of the (Box & Jenkins, 1970) for not giving the clear and meaning full definition of the whiteness and independence in their studies. As per the studies of (Hinich & Patterson, 1985) and other many authors early conducted the studies in this field. certainly suppose or assume that the observed time series is created from a Gaussian procedure and test for white noise implying structure and pattern of connection , consequently not giving attention to the possible non-linear connections between a price changes that are consecutive in nature. According to a statistical view, the difference among the concept of white noise and concept of pure white noise is nontrivial at that time when there is availability of non-linear dependence or the non-linear is present. Three decades before the above logic was discoveredby(Granger & Andersen, 1978)those lagged-correlation-based tests have no power in contrast to nonlinear procedures with zero lagged-correlation, for example, the bilinear auto-regressive, nonlinear moving average and threshold auto-regressive procedures. A deceptive conclusive end in good terms of the efficiency of the market could be conveyed when test of VR variance

ratio data or results are not significant. by taking this work as base , the work done during the period of 1980s observe the improvement of new statistical devices fit for controlling hidden nonlinear structures in already investigated serially uncorrelated data of stock exchange markets (for early experimental proof) see ((Hinich & Patterson, 1985), (Brockett, Hinich, & Patterson, 1988), (De Gooijer, 1989), (Scheinkman & LeBaron, 1989).

It is an important discovery by our study it obvious that the "chaos theory", began from the physical sciences, that has gotten the favor of economist and financial analysts in the mid-1980s. The "Chaos Theory" is a problem because it was difficult to decide whether is there is availability of the Chaos Theory in the stock exchange markets, since the availability of the Chaos Theory propose short-term return predictability potential but this is contradictive whit weak-form EMH further details are available in (LeBaron, 1994) and (Barnett & Serletis, 2000). On the other extreme (Brock & Hommes, 1998) according to their study if a uniform and heterogeneous expectation between investors is confront with a test model called standard asset pricing model then the Chaos Theory be implemented and arise in the stock pricing. For more details about the standard asset pricing model see the research study of (Hommes & Wagener, 2009) many of the past empirical studies apply the dimension estimate of the correlation suggested by (Grassberger & Procaccia, 1983) to notice the low-dimension of Cahotic dynamics in the returns of stock then see (Scheinkman & LeBaron, 1989), (Kohers, Pandey, & Kohers, 1997), (Barkoulas & Travlos, 1998), (Yadav, Paudyal, & Pope, 1999). Some other corresponding methodologies are adopted empirical studies.(Yadav, Paudyal, & Pope, 1999). Test of closed return can be traced form (Gilmore, 1993), (Gilmore, 1996) and (McKenzie, 2001). The different findings track out for the above mentioned studies there no low dimensional chaos in the series of the stock return, the presence of the non-linear serial reliance is revealed by the above studies instead of doing more and further investigation analysis in this field. The above negative assertion on the Chaos Theory it is still holed still when a high improve and advanced Chaos test or larger amount of sample size is been selected. For example (Abhyankar, Copeland, & Wong, 1995), (Abhyankar, Copeland, & Wong, 1997) use intraday data with high as an approach to extend the quantity of examination, yet still their Lyapunov type point measure demonstrates no indisputable verification of Chaos while on the opposite side critical and enhanced

methods are created and offered by (Whang and Linton 1999) and each other creator as (Shintani and Linton 2004) are those who develop the standard blunder for the neural framework Lyapunov type estimator, and consequently give a formal factual test to for Chaos. Experimental examinations receive the above refined structure to each day stock returns dismiss the invalid speculation of bedlam hypothesis too. It is attested that the examination for chaotic changes or elements in the stock trade advertise information remainder an ambiguous goal, the fundamental enthusiasm among creators has obscured and their thought has since turned to nonlinear stochastic dependence or reliance. This has been added to a colossal improvement or development of nonlinearity tests to the extent that a full review or audit isn't conceivable. Over all the present test is sort in two wide classifications, the principal class involve every one of the tests extricate without a specific non-direct and different choices. This class is comprehensively received in stock trade showcase examines by(Hinich 1982), (McLeod and Li 1983), (Tsay 1986), the second gathering incorporates testing linearity against an especially specific nonlinear model apply the Lagrange multiplier, likelihood proportion or Wald test. The unmistakable nonlinear alternatives considered in the investigations are one invigorating limit autoregressive (SETAR) - type non-linearity. The rich and expanding hypothetical examinations continues giving empiricists with cutting edge non-direct measurable devices for testing the sporadic or arbitrary walk speculation. A rundown of those experimental examinations distributed over the 1985-2005 period is given by(Lim and Brooks 2006) All their distributed 42 papers report overwhelming confirmation of nonlinear serial dependence transversely finished worldwide stock trades showcase with different market structure parts, demonstrating that the watched highlights are adjusted truth of information of the stock trade showcase. Exceptionally refreshed examination is directed by (Patterson and Ashley 2000) offer a „nonlinearity cluster of tools‟ that gives accommodating access to a assurance of the best instruments open for measurably recognizing nonlinearity in the creating component of a given time arrangement. The battery of nonlinearity tests consolidated into the group of instruments is the Engle LM test (Engle 1982)

2.1.4 Long memory

memory is embody by a slacked relationship that decay at a hyperbolic level or rate or , equivalency, and unbounded range at zero recurrence, for example, by (Mandelbrot

1971) declares that the presence of long memory derives not as much as the ideal arbitraging furthermore, the consequent pieces don't take after arbitrary walk procedure.(Lo 1991) Develop another test called the Modified R/S test that works for the presence of here and now dependence, and re-examination the earlier claim of overall confirmation of long memory. Strikingly with prior disclosures, nor any of the altered R/S measurements in his examination ponders are measurably noteworthy at the five percent level in any time of test or sub-period for step by step and month to month U.S. stock file return series. In extremely later a long time, the Rescaled difference (R/S) measurably offered by (Giraitis, Kokoszka et al. 2003) has created as a battling measurable test for perceiving long memory (for suggestion).An another method to manage recognize long memory in the monetary financial matters thinks about is the quick estimating of an auto-backward somewhat coordinated moving normal model, showed as ARFIMA (p, d, q), where d is the fractional differencing parameter. (For more clarification about partially incorporated methods, advise with the inquire about survey paper of (Baillie 1996). Under this procedure, a method shows long memory when $d \neq 0$ furthermore, the sign of d will choose the idea of the methodology. Besides especially, for d (0, 0.5), the included outcome the slacked connections wander to a level which isn't limited and the ARFIMA technique is said to show persevering conduct. On the opposite side, the aggregate of the slacked connections proselytes to zero for d (- 0.5, 0) and the long memory is called hostile to tireless. Diverse technique have been proposed to assess this fragmentary differencing parameter, yet the semi-parametric GPH test (George, Hwang et al. 2008) while "the nearby whittle estimator is created and proposed by (Robinson 1995) remain noticeable in suggestion exactly. In another change, the new rapidly expanding interdisciplinary field of econophysics has seen a resurgence of energy for long memory; anyway its consideration is on the Hurst type (H), which is applicable with the factional differencing parameter by the d fairness =H-0. 56. The distinctive method are inferred to derive the Hurst type is exhibited by our examination consider while surveying the investigation of new securities exchanges information, for instance the R/S examination by (Cajueiro and Tabak 2005b), V/S analysis (Cajueiro and Tabak 2005a).

2.1.5 Some Other Statistical contributions

The headway of new statistical tests in the econometric field has been advancing rapidly, with theirexperimental of empirical implications. We mentioned in this subsection two categories of time tool for analysis still to be followed in the expending stock exchange markets the innovator or developers of the tests except by their self. Initial, many test Statistics have been offered for testing whether stock returns are martingale different grouping (m.d.s.), or Equivalently , regardless of whether stock price take adopt a martingale procedure or not such as (Hinich & D.M., 1992), (Domínguez & Lobato, 2003), (Kuan & Lee, 2004) and others.

(m.d.s) statistical test of are intended to catch linear and non-linear serial dependence in mean, however they don't force any confinements on the dynamics in conditional variance and other higher-ordermoments that are conditional, on second category, provide thataindependently and indistinguishably distributeprocedure is time reversible, testing for time reversibility (TR) gives an substituteway to look at the random walk conduct of stock prices. Though the recommendation on the best way to test for time reversibility has been insinuated as early done by (Brillinger & Rosenblatt, 1967)

2.2 First Empirical Issue: what Factors are Associated with a Higher Degree of Market Efficiency?

Although a great number of the mainstream of weak- form of EMH studies centers around testing the predictability of the returns of the stock for which the improved statistical testing procedures are been implying, a few research study do make the additional moves to recognize the determinants of efficiency of the market by methods of sub-period investigation. Subsection 2.3.1 gives a short overview of this single-country, sub-period studies, yet bad luckily they don't reveal much insight into the factors of market effectiveness or factors which determine the efficiency of the market. The primary hurdle in these procedures is their emphasis on the notion of all-or-nothing about the efficiency of the market. Noting this weakness, Subsection 2.3.2 provides details about the advantages of the efficiency of the relative market and the current empiricaltools and studies, specifically those identified and related with the weak-form EMH. The last subsection then highlights the problem countered in 3rd chapter.

2.2.1 Sub-period analysis on the determinants of market efficiency

In the period of the progress toward financialliberalizationin developed countries a notable number of authors discuss the issue of whether the opening of these developing markets to outside investors has any constructive effect, by analyzing the condition of informationalefficiency after the period of liberalization and after the period of liberalization. This investigation is significantly more relevant after the 1997 financial crisis in Asianprovides that there is much argument in the circles of policies to switch the past liberalizationencountered by forcing some type of capital controls, but some studies as (Maghyereh & Omet, 2002) asserts that liberalization of financial has effect less or has not effect on the efficiency of the markets, as evidence are provided from the Amman Stock exchange market as Amman Stock Exchange Market remains not efficient after liberalization of finance.

Different other components taken in consideration in the past studies about the efficiency by many authors comprised of variation in the regulatory structure, the selection of a system where trade can be done online and electronically is known as "electronic trading system" , the execution of a price limits framework and the happening of financial crisis. In the work of Lim 2008a and 2008c it is presented, that however the test of efficiency are held on sub-periods of before-and after-changes in all the above mentioned exact empirical investigation, their structure of the research still emphasizing on investigating whether the random-walk hypothesis can be rejected or accepted in those pre-decided sub-samples.in the other scenario the stock exchange market underresearch study is aimed to endure a full alteration from a position which is not efficient to a completely efficient position one under the result of the event. Therefore, it isn't shocking to know that a large portion of these research studies are not capable to perceive the impact of their proposed factors on the efficiency of markets. This happens when the followed statistical tests either reject or accept the null hypothesis of random walk in both sub-periods. Aside from the above shortcoming or weakness, the sub-period structure investigation is as well referred to the following limitations: (1) it doesn't overcome other conceivable confounding components that may influence efficiency of the market in the window long period; (2) the investigation is on a country wise that frequently does not prompt indisputable evidence; (3) the portrayal of market efficiency as a dichotomous zero-one variable

prevent the expansion from a solitary country sub-period research study to a more extensive multi-country study by means of cross-sectional or panel regression.

2.2.2 Absolute market efficiency versus relative market efficiency

Many research studies it is provided that the studies conducted in past contain with investigating the obsolete version of efficiency of market, Lim (2008a) point out the that very little knowledge is available about over a number of markets and what attributes are related with a more elevated amount of information about efficiency, even after over four decades of experimental research studies. As indicated by the authors, the mind-boggling proofs and results of non-linear serial dependence over worldwide stock exchanges markets that no market is efficient perfectly. Perfect efficiency is form of idealization which is unachievable in practical (Campbell, Lo, & MacKinlay, 1997). Refer to the work of (Grossman & Stiglitz, 1980) these 3 research studies come up with that if markets have perfect efficiency, there is no benefit earned by information assembling in this case there will be little motivation to do trade and markets will collapse in the end .there for, there must be adequate benefit or profit centered chance or inefficiencies to repay investors and traders against cost of doing trade and data collection. The concept or relative efficiency is offered, which is the one market efficiency estimated against another, for instance the New York Stock Exchange market versus the Paris Bourse, future markets versus spot markets, or sale(auction) markets versus merchant(dealer) markets. They contend that this idea is more practical and suitable as compare to all-or- nothing concept adopted by a number of efficiency studies that are conventional in nature (Campbell, Lo, & MacKinlay, 1997). Lim (2008a) deal with this reviews because an empirical tool of relative efficiency will empower the author not merely to decide what level of information about efficiency have changes across different countries , but additionally to recognize the fundamental contributing elements as well.

The advantages of this idea have seen the evidence of a group of research studies that inspects efficiency of the market in the relative as opposed to obsolete form, the model of market as R-square statistic (Morck, Yeung, & Yu, 2000). The initial two methodologies explain relative effectiveness as the sum of private firm-particular information being included into prices of stock by means of exchanging by educated and informed financial investors or traders, though the delay measures of price is

intended to catch the speed with which prices of stock consolidate information over market. In the market microstructure studies, the probability of trading based on information (Easley, Kiefer, & O‟Hara, 1997) and the errors of pricing by (Hasbrouck, 1993) are two mainstream measures of price of stock the behavior of information when high recurrence transaction information are present. Though, it is hard to link a portion of the above measures to the classic scientific classification of data sets plot in the work of Fama.

Although get back to the weak-form EMH, the lagged-correlation coefficient absolute value has been adapted to measure how fairly the price of stock adopt a random walk. avocation if the above statement is that a more clearer and nearer to a random walk benchmark and henceforth show less lagged-correlation in either the positive or negative way (Gu & Finnerty, 2002), (Boehmer, Saar, & Yu, 2005), (Alexander & Peterson, 2008) and other. Getting inspiration by the attractive statistics of the variance ratio, some of the studies form the above applies its absolute deviation taken from the studies as (Gu & Finnerty, 2002) (Griffin, Kelly, & Nardari, 2007a 2008b)(Chordia, Roll, & Subrahmanyam, 2008) and others. Since that the variance ratio can be communicated as one in addition to a total of the lagged-correlation coefficients returns of stock with positive and some diminishing weights. These lagged-correlation-based tools empower the previously mentioned research studies to analyze, in cross-sectional or panel regression structure , the effect on efficiency of market realized by different factors for example trade volume, return instability, liquidation of market, restriction of short sale confinements, and institutional proprietorship.

In the studies about long-memory of returns of stock, many studies have followed the Hurst Exponent to enumerate the stock market efficiency in this regard the work of (Di Matteo, Aste, & Dacorogna, 2005) can take in consideration he reveal the propensity for “mature liquid markets” to hold the value that is smaller than 0.5 which is value of comprehensive Hurts exponent. While on the other hand according to him the market that in category of less developed having value greater than 0.5, (Cajueiro & Tabak, 2008a) graded country stock indices by methods for the Hurst exponent and locate that progressive markets generally are more effective and efficient as compare to their developing business sector partners. By following this indices of stock market (Eom, Choi, Oh, & Jung, 2008a), (Eom, Oh, & Jung, 2008c) argued an empowered

positive connection among the Hurst exponent and the hit rate from the closest neighbor forecasting technique, proposing that lower level of effectiveness relates to a high predictability of change in future prices (Cajueiro & Tabak, 2005a) (Brooks, Maharaj, & Pellegrini, 2008) and (Lim K. , 2008b) investigate the components that recorded for the cross-sectional changes in their measured Hurst exponent. Some of other authors such as (Zunino, Tabak, Figliola, Pérez, Garavaglia, & Rosso, 2008) followed the multiracial detruded changes inspection to assess the multifractality level of 32 stock market. These researchers then discovered vigorous proofs of a negative association amongst multifractality and the phase of market growth by methods of binary reliant variable model. Other improved devices from statistical physic science that have been received for evaluating the level of market effectiveness are the inexact entropy statistic.

2.2.3 How the first empirical issue iscountered?

It is generally accepted and realized that the daily returns of stock markets show positive lagged-correlation as in the work of (Ahn, Boudoukh, Richardson, & Whitela, 2002). But though the means of these serial relationship designs is still under discussion, specifically its application on efficiency of the as by market (Boudoukh, Richardson, & Whitelaw, 1994) arrange the predominant perspectives into three schools of thought. The main school of thought, the followers, trusts the rationality process of market information and the presence of return lagged-correlations is because of thin trading or business(Lo & MacKinlay, 1988), (Lo & MacKinlay, 1990a) in process of trading the frictions (Cohen, Hawawini, Maier, Schwartz, & D.K., 1980) and cost of transaction (Mech, 1993) that can't not be beneficially subjugated . on the other side the Revisionists, shield the efficiency of the stock market productivity on the grounds that lagged-correlations may replicate time-variation symmetry expected returns created by normal or rational investor intentions which can be defined in the structure of inter-temporal models of assets pricing. The 3rd school of thought, trust that markets are not reasonable (rational) and beneficial(profitable) therefore different procedures in trading are present even on base of a risk-adjusted ground. For example, a few existing behavioral models show that psychological inclinations like overconfidence in an investor, self-attribution and conservatism can define why investor do under-or over-respond or react to information revealed, therefore creating positive return lagged-correlations over short horizons.

Lai et al. (2006) investigated a random hypothesis on the Malaysian stock market using the daily repayment of the compound interest indices of Kuala Lumpur Stock Exchange since 1977. Month of January until 1999 December. The study is based on a comprehensive selection period and four parts to determine if there are any structural achievements and important economic events. This study uses Lo's and MacKinlay's spread coefficient test, and it was found that there was no further price change on the Kuala Lumpur stock market. China (2008) explored the selective features of the Malaysian stock market using the Kuala Lumpur Composite Index as the main mission of the Malaysian Securities Market. This study examined the entire selection period and two continuous periods in order to take account of structural disruptions in 2007-2008. During the Asian period due to the financial crisis. Similar to Lai et al. (2006) A Lo and MacKinlay dispersion coefficient test has been performed, which shows that the Malaysian stock market can be described as the average return process by overturning the overlapping principle.

Awad and Daraghma (2009) Uses unit root tests using the Dickey-Fuller (ADF) test and Series Correlation Tests to test the random theory and effective market hypothesis of PSE using the PSE's available indexes. This study analyzes the Al-Quds Index, which is the main index of the PSE, the general index and industry indicators, which comprise five sub-indices: the banking industry index, the insurance industry index, the service industry indicator, the industrial sector index and the investment sector index. The test uses non-parametric tests, i.e. the test and the Phillips-Peron (PP) test. Empirical results indicate that the yield on securities on the Palestinian Stock Exchange is not random at the time of the investigation and to show predictability based on historical data.

The same research methodology was used by Al-Jafari (2011a) to investigate the effectiveness of the Kuwaiti Stock Exchange's weak form in 2001. June 17 By 2010 December 8th. The results indicate that the Kuwaiti Stock Exchange does not take random walk and is inefficient in a weak form. Al-Jafari (2011b) used similar methods to Awad and Daraghma (2009) and AlJafari (2011a) to investigate the weakness of the Bahraini securities market since 2003. February 1 By 2010 November 30 It was found that similar empirical results were obtained, the stock market does not take into account casual walks and ineffective at a weak level. Al-Ahmad (2012) tested the weakness of the Damascus Stock Exchange (DSE) in 2009. December 31 - 2011 November 30, using autocorrelation test, test test, unit root test, dispersion ratio test and GARCH (1.1) model. In this study, a sensitivity analysis was carried out using a shortening method to reduce the impact of large negative consequences of the political instability in Syria. The results of the research rejected the model of random habits and showed that the stock market in a weak form is not effective.

Al-Saleh and Al-Ajmi (2012) The Saudi equity market survey, which consists of eight industrial indices and a composite index, shows uneven results. The series correlation tests rejected the null hypothesis of random selection, with the exception of insurance and telecommunications industry indices. All single root test results show that all indices are poorly ineffective using test results, with the exception of cement, insurance and telecommunications industry indicators. The empirical results obtained by applying the Lo and MacKinlay dispersion relationship test can not exclude random climbers for all indices except for the banking sector and the composite index. Using Chen and Deo's multiple variance tests, similar empirical results are presented showing that all the indices under study are performed randomly. On the contrary, the test results for the rank and sign test and the ChowDenning multiplier dispersion tests reject the hypothesis of random referrals for most indices. However, the indices for insurance, telecommunications and cement industry show random behavior characteristics using a similar test.

Hoque et al. (2007) A randomized hypothesis has been reviewed for eight new equity markets in Asia: Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand. The study uses the Wright rank and sign, the Whang Kim

partial sample, and Lo-MacKinlay and Chow-Denning tests. Empirical results show that in 1990-2004, Indonesia, Malaysia, Philippines, Singapore and Thailand have shown great predictive behavior in their weekly return series, while Taiwan and Korea have shown great unpredictable patterns in the same series.

Chaudhuri and Wu (2003) are investigating stock price indices for the random crossing characteristics and internal reversal processes in the seventeen emerging markets, including Argentina, Brazil, Chile, Colombia, Greece, India, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan. Philippines, Taiwan, Thailand, Venezuela and Zimbabwe. The purpose of the research is to test the average change in stock prices in the case of a structural breakdown since 1985. Month of January.Until 1997 February. The problem of market liberalization was investigated. The hypothesis tested uses Dickey and Fuller (ADF) tests and Phillips-Perron (PP) tests.

The Zivot-Andrews (1992) test is used to test the hypothesis of a random recurrence with structural interruptions. With the inclusion of structural changes in the trend function, the findings suggest that stock markets in ten countries can be described as internal return processes that do not follow an accidental walks. These stock markets are in Argentina, Brazil, Taiwan, Zimbabwe, Colombia, Greece, Malaysia, Philippines, India and Venezuela. Chang and Ting (2000) have investigated Taiwan's securities market since 1971. January 9 Until 1996 January 6, Using the Lo and MacKinlay Dispersion Ratio Test. Weekly, monthly quarterly and annual fluctuations in stock price index are used for casual pedestrian testing. The findings reveal that the hypothesis of incident acceleration is rejected due to the weekly weight market index, and the zero case hypothesiscannot be excluded using monthly, quarterly, and yearly market indices.

Instead of a continuous debate, it is need to through light on a new related problem, and that is that whether any empirical investigation of independent variable for lagged-correlation for return of stock is offered by any one of the above mentioned schools of thoughts? (Ogden, 1997), (Ahn, Boudoukh, Richardson, & Whitela, 2002), The appropriate answer is no to the above question. This is proved from the methodologies taken by prevailing empirical investigation of empirical research studies to separate the 3 competing hypothesis. (Anderson, Eom, Hahn, & Park, 2008), Luckily, a wide number of expended theoretical models do forecasting about the components of return lagged-correlations, which is comprised of the variable return of stock (Sentana & Wadhwani, 1992) volume of trading, (Gu & Finnerty, 2002), adopted the method of absolute value of the lagged-correlation coefficient

and ratio of variance subtract one to track the changing level of efficiency of the market for the industry of Dow Jones Average more than 103 years since 1896 to 1998. Generally the magnitude of yearly lagged-correlation displays a diminishing pattern since the late 1970s. Their resulting regression scrutiny demonstrates that the level of weak-form effectiveness is negatively associated with return variations and volume of trading.

In chapter 3 more details is given by following (Gu & Finnerty, 2002)furthermore it is investigated that the elements that are related with a higher level of efficiency of the information. The absolute value of the ratio of the variance subtract one is chosen as the metric of relative weak-form efficiency of the market since its elements are in very high amount will grounded theoretically. Though in chapter three the empirical analysis is not same but different to (Gu& Finnerty) at least in 3 perspective To begin with, rather than a single country, the yearly information are extracted from 23 progressing countries over the caompe time period frame sonce 1992 to 2006. Second, regrissio of fixed or non-variable impacts panel n is used to indentify not just the changes of index return lagged-correlations over differentd countries yet over differetn time periods. Third, aside from return instability and volume of trading , Chapter 3 brought the untested suggestions of(Basu & Morey, 2005) to information, inspecting the impact of trade and financial candidness on pattern of weak-form stock markets efficiency.

2.3 Second Empirical Issue: Why Does Market Efficiency Evolve over Time?

The utilization of sub-period investigation in the standard of efficiency as Weak form of EMH research examines demonstrates the commonality of creators concerning the non-static qualities for proficiency of the market. The idea about the evolvement of proficiency of market over a depicted time period is clarify in a decent way independent from anyone else (and Mathur 2006) who compose as "The genuine fundamental market structure of advantage costs is as yet obscure. Be that as it may, we do realize that, for a timeframe, it carries on as indicated by the established meaning of an effective market; at that point, for a period, it carries on so that specialists can methodically discover peculiarities to the conduct expected of an effective market". In such way, the traits of the market microstructure, cutoff to arbitrage, mental inclinations, and nose example of exchanging and the nearness of

flawed market are those potential factors that can offer a blast to times of departure from showcase proficiency. At the macrostructure level, it isn't unreasonable to aside from that proficiency of the market to create or develop after some timedue to changes in vast scale or large scale level foundations, control of market and data advancements. To explore the evolving level of effectiveness of market after some time, Lo (2004, 2005) proposes another version of the EMH got from formative measures. Our work and detail on the AMH adaptive markets hypothesis (AMH) are provided in Subsection 2.4.1

2.3.1Adaptive markets hypothesis (AMH)

With the problem of financial behavior and the rational behavior of humans regarding the contras group of EMH with AMH (Lo 2004, 2005)provide information in a manner such as that the important inside information can be extracted from the view point of the biology and require a transformative substitute to efficiency of the market. Furthermore particularly he suggests the recent pattern of adaptive markets hypothesis (AMH) in which the EMH can exist together along behavioral finance in a psychological predictable way. The AMH has taken a long time to detail since the idea of auditing the money related markets from a Section organic perspective is done by(Farmer and Lo 1999). This idea of formative has been followed up by Lo and Agriculturist past to it is formalized by Lo as the AMH and besides clarified in Lo (2005). It is of extraordinary enthusiasm to observe that the crucial arrangement that AMH have been stirred by numerous creators of thinks about: restricted judiciousness in financial matters, complex framework, transformative science, formative brain science look into and conduct nature. Nonetheless, that transformative financial aspects viewpoint is by and by a developed branch in financial aspects after the fundamental work of (Nelson and Winter 1982) the employments of transformative thoughts in the money related settings are constrained. The AMH is an essential leap forward that gives not simply trade off to the present discussion in finance, yet additionally cotes application to the practice of investment management.

Smith and others (2002) Investigates African stock markets consisting of South Africa, five medium-sized markets (Egypt, Kenya, Morocco, Nigeria and Zimbabwe) and two small new markets (Botswana and Mauritius). Nine market indices reflecting relevant equity markets have been under consideration since 1990. Month of January.Until 1998 August. In this study, Chow and Denning multiplier variance

coefficient tests were used to test market efficiency and random walker characteristics. The results indicate that Botswana, Mauritius, Egypt, Kenya, Morocco, Nigeria and Zimbabwe stock markets have rejected the hypothesis of incidental resistance, while the South African market has accidentally walked. Smith and Ryoo (2003) studied five fast-growing European markets: Greece, Hungary, Poland, Portugal and Turkey in 1991. April 3 Until the last year of 1998 In august The empirical results of Chow and Denning (1993) show that the stock market in Istanbul happened at random, while the other four markets rejected the hypothesis of random sampling. It has been established that liquidity is an important factor determining the character of casual walks for the stock market.

They contend that this idea is more practical and suitable as compare to all-or-nothing concept adopted by a number of efficiency studies that are conventional in nature (Campbell, Lo, & MacKinlay, 1997). Lim (2008a) deal with this reviews because an empirical tool of relative efficiency will empower the author not merely to decide what level of information about efficiency have changes across different countries , but additionally to recognize the fundamental contributing elements as well.

The advantages of this idea have seen the evidence of a group of research studies that inspects efficiency of the market in the relative as opposed to obsolete form, the model of market as R-square statistic (Morck, Yeung, & Yu, 2000). The initial two methodologies explain relative effectiveness as the sum of private firm-particular information being included into prices of stock by means of exchanging by educated and informed financial investors or traders, though the delay measures of price is intended to catch the speed with which prices of stock consolidate information over market. In the market microstructure studies, the probability of trading based on information (Easley, Kiefer, & O‟‟Hara, 1997) and the errors of pricing by (Hasbrouck, 1993) are two mainstream measures of price of stock the behavior of information when high recurrence transaction information are present. Though, it is hard to link a portion of the above measures to the classic scientific classification of data sets plot in the work of Fama.

Although get back to the weak-form EMH, the lagged-correlation coefficient absolute value has been adapted to measure how fairly the price of stock adopt a random walk. avocation if the above statement is that a more clearer and nearer to a random walk benchmark and henceforth show less lagged-correlation in either the positive or negative way (Gu & Finnerty, 2002), (Boehmer, Saar, & Yu, 2005), (Alexander & Peterson, 2008) and other. Getting inspiration by the attractive statistics of the variance ratio, some of the studies form the above applies its absolute deviation taken from the studies as (Gu & Finnerty, 2002) (Griffin, Kelly, & Nardari, 2007a 2008b)(Chordia, Roll, & Subrahmanyam, 2008) and others. Since that the variance ratio can be communicated as one in addition to a total of the lagged-correlation coefficients returns of stock with positive and some diminishing weights. These lagged-correlation-based tools empower the previously mentioned research studies to

analyze, in cross-sectional or panel regression structure , the effect on efficiency of market realized by different factors for example trade volume, return instability, liquidation of market, restriction of short sale confinements, and institutional proprietorship.

In the studies about long-memory of returns of stock, many studies have followed the Hurst Exponent to enumerate the stock market efficiency in this regard the work of (Di Matteo, Aste, & Dacorogna, 2005) can take in consideration he reveal the propensity for "mature liquid markets" to hold the value that is smaller than 0.5 which is value of comprehensive Hurts exponent. While on the other hand according to him the market that in category of less developed having value greater than 0.5, (Cajueiro & Tabak, 2008a) graded country stock indices by methods for the Hurst exponent and locate that progressive markets generally are more effective and efficient as compare to their developing business sector partners. By following this indices of stock market (Eom, Choi, Oh, & Jung, 2008a), (Eom, Oh, & Jung, 2008c) argued an empowered positive connection among the Hurst exponent and the hit rate from the closest neighbor forecasting technique, proposing that lower level of effectiveness relates to a high predictability of change in future prices (Cajueiro & Tabak, 2005a) (Brooks, Maharaj, & Pellegrini, 2008) and (Lim K. , 2008b) investigate the components that recorded for the cross-sectional changes in their measured Hurst exponent. Some of other authors such as (Zunino, Tabak, Figliola, Pérez, Garavaglia, & Rosso, 2008) followed the multiracial detruded changes inspection to assess the multifractality level of 32 stock market. These researchers then discovered vigorous proofs of a negative association amongst multifractality and the phase of market growth by methods of binary reliant variable model.

Gilmore and McManus (2003) examined the effectiveness of the three major emerging market economies of Central Europe (Czech, Hungarian and Polish) since 1995. July.Until 2000 September. This study used the Augmented Dickey Fuller (ADF) test, the Phillips-Perron (PP) test, and the Lo and MacKinlay dispersion ratio test for univariate analysis. The Johansen procedure has been used in multiple tests and applied model comparison trials using ARIMA, GARCH and NAÏVE models. Evidence from univariate analysis showed weak performance on three stock markets, and multi-factorial tests revealed that there is no common stochastic trend shared between the three markets, and profit from one market is not predictable due to other market information. The model comparison method showed strong evidence against the hypothesis of accidental acceleration.

Charles and Darné (2009) investigated the hypothesis of casual referrals on A and B shares in Shanghai and Shenzhen stock markets in 1992-2007. In the period Class A shares are denominated and sold in local currency, Renminbi (RMB) and designed for domestic investors. Class B shares are denominated in RMB, but are subscribed and sold in foreign currency. Three methods are used in this study: Whang-Kim sub-grip, Kim wild bootstrap tests and the conventional Chow-Denning test. The results

indicate that Class A shares are more effective than Class B shares. This may be due to differences in liquidity, market capitalization and information asymmetries.

Guidi and Gupta (2011) Examined the Effective Market Hypothesis (EMH) of the ASEAN Stock Market since 2000. Month of January. By 2011 In April These include the Indonesian, Malaysian, Philippine equity markets, Vietnam, Singapore and Thailand. The methods used in this study are Augmented Dickey-Fuller (ADF) test, Kwiatkowsky, Phillips, Schmidt and Shin (KPSS) tests, Vari-Test (VR) test, multiple dispersion ratio tests, Wright test and run test. Both ADF and KPSS tests show that the return on ASEAN equity markets does not lead to a random selection. The Lo-Mackinlay Variation Coefficient test, the Chow and Denning dispersion ratio test, and test results showed similar results that reject the hypothesis of random referrals for the entire stock market, with the exception of stock markets in Singapore and Thailand. Hand-held and significant differences suggest that only Singapore and Thai stock markets are inefficient. Karimera et al. Using the "Lo" and MacKinlay (1988) and Chow and Denning (1993) dispersion ratios tests to test local currency and US bullion return trends in emerging markets in 15 emerging markets: Argentina, Brazil, Chile, Hong Kong, Indonesia, Israel, Jordan, Korea, Malaysia, Mexico, Philippines, Singapore, Taiwan, Thailand and Turkey. The study covers 1986 Month of January. Ends in 1997 May. According to Lo and MacKinlay (1988), the random walk in Argentina, Hong Kong, Israel, Korea, Malaysia and Singapore, while Brazil, Chile, Jordan, Indonesia, Mexico, the Philippines, Taiwan, Thailand and Turkey do not take an occasional walk. When various variance coefficient tests are used, the five series, Chile, Indonesia, Jordan, Mexico and Turkey, which initially did not match the hypothesis of incidental conduct, are matched

Via combining the concepts of “bound rationality” and “satisfaction” by (Simon, 1955) with the evolutionary concept of LO, 2004 contends that a significant number of behavioral biases are in reality predictable with a transformative or evolutionary model of people learning and adjusting to a changing situation through „satisfying‟ heuristics. On the other side of the concept, it is the effect of evolutionary powers on financial institution e.g. stock exchanges, banks etc. market members that decides the market efficiency, and the execution of products of investment, industries and businesses. In short, the concepts that lead the AMH t in Lo (2005) are as: (1) people keep their best interests in mind; (2) people commit errors and mistakes; (3) people

learn and adjust, and do follow; (4) competition amongindividual bring the space for innovation and adaptation; (5) normal determination design market environment; (6) advancement andevolutiondecidesdynamics of market. In spite of its somewhat dynamic and subjective nature, the AMH offers various empiricalapplications for portfolio management. Initially, the premium for risk taking for equity or equity risk differedduringdifferent time periods as per the current stock market dynamics and the demographics attributes the investors in that specific dynamic (environment).second, number of opportunities for arbitrage increases in the financial markets vary time to time . Third, areas or item for investment experience cycles of supervision and performance that is inferior as reaction to changing the business environment, the flexibility of competitors in the industry sector and the extent of availability of opportunities of earning profits. Final, survival is at last the main target that in important for development or stock markets and technologies concern with finance.

With respect to the present framework of developing market efficiency, the second application need more development and need more explanation. In light of the evolutionary point of view, benefit opportunities present for during different times period, however they vanish before it is subjugated by investor, while new opportunities are constantly generated as lobby of people involve in market organizations and business dynamics change.

This is constant with the conjecture of (Grossman & Stiglitz, 1980)that the enough return should present to recompense the prices and cost of information collection and trading of investors. Actually (Daniel & Titman, 1999) have prior noted the conceivable concurrence of EMH and behavioral finance by presenting the term „adaptive efficiency". These researchers perceive the behavioral aspects of most members who are involve in market however in the meantime expect that different present investors who can distinguish and benefit from these components by looking at past trends of price. Furthermore particularly, in a market that is adaptively effective, opportunities of profits do emerge in information based on past history, however in the event that that financial specialists gain from the previous history of value, these chances of cost will gradually dissolve time to time.

An outcome of this proposal is that effectiveness of showcase isn't an all-or-none circumstance yet it is a property that contrasts diligently after some time and across

the business sectors. (Lo 2005) fights that development up to balance, , which is critical to the EMH, is neither guaranteed nor at risk to happen whenever. As needs be, it isn't right to acknowledge that the market must walk firmly toward some immaculate standard equilibrium level or flawless productivity. Rather, the AMH gathers more perplexing condition of market, for instance, cycles, patterns, air pockets, mains, and different ideas that occur in the monetary markets. Lo (2004, 2005) offers a strong case by preparing the rolling-first order slacked connection for month to month returns of the Poor's Standard and (S &P) complex Index from January 1871 to April 2003. His portrayal and graphical plotting of results reveals the level of adequacy, assessed by the main request slacked relationship coefficient, moves through time in a repeating process dull way with stunning result that the market of U.S .is more beneficial in the 1950s than in the previous 1990s. The analysts confirmed that this finding is a direct result of institutional jumpers dynamic in the stock trade showcase and also the passage and exit of various market individuals. The two inquire about examinations do perceive that such cycles are not ornamented by the EMH in principle, but rather present exploratory investigations expect markets are in symmetry state consistently

2.3.2 Empirical evidences of evolving market efficiency.

. A period changing parameter display was introduced for time in the investigation of stock trade advertise by (Emerson, Hall et al. 1997) assessed using the Kalman channel technique, to track the progression of market productivity after some time. In their model, the time-variety slacked connection coefficients are used to check the changing level of return consistency, and thusly creating frail shape outline advertise effectiveness. In the event that the market under examination ends up being moreefficient over distinctive time, the slacked relationship coefficient the smoothed time-variety is measures will gradually assemble toward zero and turn out as immaterial. Inlater, this structure is made formal by(Zalewska-Mitura and Hall 1990), as "test for developing productivity" (TEE). Since the creating markets in Bulgaria and Hungary are still to start with times of their change ,(Emerson, Hall et al. 1997) , (Zalewska-Mitura and Hall 1990)contend that it isn't conceivable to address the issue of whether the stock trade showcases in these advancement economies are profitable or not. As a general rule, it isn't generally substantial for as of late settled stock trades to be imagined productive since it requires at the cost disclosure method to wind up

known. In any case, as market microstructures uncovered, in a restricted time of time, the level of adequacy in this smaller scale or little markets will gradually increment.

The mainstream instrument in the finance studies to investigate the market's speed of adjustment of price to information revealed is earlier study by Fama et al. (1969). This study centers around the testing the fundamental application of the efficient markets hypotheses that it isn't workable for investors to extract positive irregular rates of return by making investing after the arrival of open information to the public. More particularly, the strategy tests whether the irregular returns, calculated by deducting expected ordinary returns from the actual returns, are essentially not the same as zero during the period of the financial event window. The particular event of premium or interest, (for example, news declaration relevant to earnings in investments, stock, mergers and acquisitions or payment of dividend) is chosen from the earlier. A substitute methodology is to first gather the data, any unusual trading results and then after this define the relevant information about that event for example in the work of (Cutler, Poterba, & Summers, 1989) take 50 greatest absolute percentage change of one-day in the element Index of S&P from 1946 to 1987, and next study concurrent information printed in the *New York Time*s to recognize the realist cause large fluctuation in the price of the stock. (Fair, 2002). The developing efficiency or Evolving Efficiency examination is followed in subsequent to tackle the efficiency that is evolving in other stock exchange market sin the growing economy of Eastern and Central Europe which is developed out form the former bloc of communist party and society such as shown in the (Zalewska-Mitura & Hall, 2000), (Rockinger & Urga, 2000), (Rockinger & Urga, 2001), and others. (Rockinger & Urga, 2000) Assert that this conduct shows as that this is the only one way because there is no independent variable for developing markets that can be taken to measure the growth rate of information efficiency. Though, it isn't shocking that the TEE investigation and implementation has extended to incorporate stock exchange market in Africa. (Jefferis & Smith, 2004). In the same improvement degree (Kvedaras & Basdevant, 2004) build up a ratio technique based on Time-variation, and therefore adopted in a procedure to extract the changing level efficiency of the stock exchange markets in Estonia, Latvia and Lithuania. However all the previously mentioned research studies centeredon developing markets, (Ito & Sugiyama, 2009)present that the created U.S.

stock exchange markets shows changing degrees of market effectiveness from 1955 to 2006.

The present form of efficiency (Weak-Form EMH0 is implied in the rolling sub-sample by a number of authors, this methodology noted the continuous change in prices of stock form the standard of random Walk during different time periods such as (1) the ratio of rolling variance test used in linear serial correlation by (Tabak, 2003),(Kim & Shamsuddin, 2008); (2) test of unit root by source of Rollin ADF by (Phengpis, 2006) a test of rolling bi-correlation by (Lim & Liew, 2007), test of rolling Hurts Exponent (Costa & Vasconcelos, 2003), (Cajueiro & Tabak, 2004c)(Cajueiro & Tabak, 2005b), (Cajueiro & Tabak, 2005a), (Cajueiro & Tabak, 2008a) rolling and some other test it is not possible to detailed all because of limited time.

The use of Rolling techniques basically encountered the variance in the stock price the standard of random Walk over different time periods. All previously mentioned studies point out strong proofs of developing (evolving) weak-form of efficiency form the efficient markets, along with the forecasting of AMH.

2.3.3 What explains additionally?

The past research studies and is results about evolving or developing market efficiency can be justified inside the structure of AMH; however the vast majority of the empirical research studies are published before the implementation of this new form of EMH. it is argued that the new technique will show how many time the random walk hypothesis is not accepted by the test measurement over the time frame full sample, the sub-sample proportion or percentage with a huge test measurement can be utilized to think about the relative effectiveness of those stock market which are taken as samples. Under this technique, a higher rate shows more steady variation from random Walk over the sample time frame, therefore efficiency of information at lower level. Chapter four of this study following the rolling bi-correlation test pushed by Lim and expends out his sample to a wide cross-sectional concept of stock exchanges markets over 50 countries.in out this empirical research study, though ,it don't only look at the efficiency at relative grounds of international stock exchanges market. Rather, we additionally investigate the components have explanatory power

over different countries variety in the level of stock price diversities from a random-Walk over different times.

The fundamental rationale behind our decision is that the ratio of variance has a long convention in empirical market micro-structure research studies. Furthermore particularly, an author breaks down the ratio of variance to the returns of trading compare with non-trading with the aim to bring new approach and new concept and show the relationship among the flow of information and the arrangement process of the price of the assets. For example,(French & Roll, 1986) calculated the ratio of variance every hour open-to-close return and close-to open outcome (returns) and locate that prices of stock are more unstable in working hours or hours of trading as compare to in the period of non-working hours or non-trading hours. The researcher credit this marvel to information that is available privately or private information delivered in the period of trading or business working hours. Though some other authors adopted a same method which propose in the contras, according to this method where the information published and provided to the public play a roll of main resource of variation in returns in short term e.g. details can be found in the work of (Harvey & Huang, 1991), (Fleming, Kirby, & Ostdiek, 2006) etc. It is important that the hourly open-to-close returns /and close-to-open ratio of variance test centers around the variation in short-term, which is intellectually different from the short vs long-term test for the ratio of variance for examining serial un-correlatedness. On other hand, the previously mentioned research studies look at the news-instability association ,while the structure of our study encounter the association of new serial interrelation. Somewhat same research work is done by (Ederington & Lee, 1993), (Ederington. & Lee, 1995) he analyze the rapidness of response to adjust to news published by contrasting the serial correlation of back to back intraday changes in price in period of declaration and non-declaration periods of news in stock exchange market.

As news are accounted for day to day trading hours in the media of Malaysian, we calculated the test of ratio variance for each working day in stock exchange market following minute-to-minute return stock exchange market. There is an expanding number of research studies infield of stock exchange market that take an infinitesimal perspective of time-series reliance by calculating lagged-correlations in intraday series of return with the presence of mostly often information of price of the stock on working days details can be track from the recent studies of (Tsutsui, Hirayama, Tanaka, & Uesugi, 2007), (Chordia, Roll, & Subrahmanyam, 2008) etc. though investigating the coefficient of lagged-correlation or ratio variance of daily activities of the industry, the information is comparatively not common buy rare but is not information that is totally new for example this concepts can be track for the study of (Wood, McInish, & Ord, 1985) Evaluate lagged-correlation coefficients from slacks one to 20 minutes for each working day, and after that process the %age of days for which the t-statistics for the coefficients of correlation are significant at the confidence 5% level, with the information of minute 495 1- return present for each

working day.(Bianco & Renò, 2006) Time-series of 751 working days for ratio of variance was developed, and after that inspect whether these developed ratios are related with measures of day to day variations volume of trading. Their results of regression demonstrate that the serial interrelation of returns that are intraday is significantly and positively identified with the two factors in the Italian stock index future markets. The similar structure has been followed by (Bianco & Renò, 2009) who point out a positive connection between day to day ratio of variance as well and total instability following information from S&P 500 Stock Index futures. In Chapter five, we imply the methodology of wild bootstrapped test of automatic variance recently offered by Kim investigate the return of 1-minute time series tracked for Malaysian Stock Exchange market on each identical working day. Then, for those days with significant return lagged-correlations, our study continue to decide if those days are related with real news rooming the market and the media.The EMH theory is included in the broad theory of valuation and asset pricing. In essence, we can distinguish four competing asset valuation methods: Fundamental approach, Technical approach, Effective market approach, which is commonly referred to as Effective Market Hypotheses (EMH) and The

Arbitrage Pricing (APT).

The basic method is based on the assumptions that each security is of fundamental value and that the internal value of each security is reflected in this security market. It is assumed that the essential economic and fundamental facts and characteristics relating to an enterprise or corporation are essential the value of securities issued by the company or corporation. So according to The rational investor's task is to rigorously analyze the underlying economic facts relating to assets in order to determine their core values as a prelude to detect inappropriate assets in the market.

Consequently, armed with information about rogue securities, a rational investor can develop profitable trading rules. (Okafor, 1983), (Bodie et al., 2008). On the other hand, the Technical Approach dismisses the quest to gain knowledge of intrinsic value as an insignificant decision of investors to buy or sell in the capital market. It is assumed that the value of the securities is determined by the supply and demand forces and that the prices of the securities are noticeable, characterized and recurring, which can be used to form a market for profitable trading rules. Therefore, from the point of view of technicians, the dependence on market prices and their models over time will signal that market transactions will be an optimal advantage (Francis, 1980).

An efficient market approach is based on EMH, which assumes that stock market prices fully reflect all available and relevant information about such securities and changes in security prices are random and unsystematic, as technicians say. From the EMH's perspective, therefore, there is no obvious and recurring stock pricing model that could be the basis for building reliable and profitable trading rules. (Hirt and Block, 1983) The culmination of EMH is the one-factor CAPM

According to which the expected return on assets is postulated. Although some authors, such as Roll (), believe that the CAPM is inadequate due to the difficulty in finding the right basis for a market portfolio, Ogbu (2012) The work carried out reflects the use of the All-Asset Market Portfolio test for single-factor CAPM.

It is expected that the discussions and disputes that have emerged due to the description of EMH are three levels of market efficiency: weak form, semi-strong forms and strong forms. (Bodie et al., 2008), (Ogbu, 2009). The weak form states that current market prices in 2009. Securities on the capital market fully reflect the information provided historical sequence of securities prices. Hence, the effectiveness of a weak form means that the knowledge of past security prices cannot be used to predict the future prices of this asset and to ensure uninterrupted high profitability. In the semi-strong form, all public information about securities, including historical information, already fully reflects current stock prices, so the investor cannot use fundamental analysis of securities to determine whether the asset is inappropriate or not to produce abnormal returns. On the other hand, the strong form states that all, and not just publicly available security information, fully reflects such security costs.

So that even those who have a privileged or something that can be considered as inside information can use such information to gain a better return on the market. Arbitration Pricing Theory (APT), in contrast to the EMF single-factor CAPM, postulates a multifactorial APT that summarizes a single-factor model to include several sources of systemic risk, with the exception of the beta factor. (Ross, 1976); (Chen, Roll and Ross, 1986). Despite the obvious contradictions inherent to these theories, it should be noted that each approach has its own advocates, and in practice most practitioners usually even use a combination of these methods for optimal solutions. The current document is based on EMH as an approach to effective pricing and asset selection in the capital market. Empirical literature: as has already been mentioned, the literature on financial economics is expanding, as the validity of EMH has been a good tool in the last three or four decades. Given the fact that capital markets are dynamic and constantly evolving, it is clear that discussions about market efficiency research will not be limited. Here is a brief overview of empirical literature.

Niblock and Sloan (2007) Explored the weak performance of Chinese equity markets using Shangai A, Shangai B, Shenzhen A, Shenzhen B, Hang Seng and Dow Jones Industrial Average (DJIA) 2002 March 4 - 2005 Indexes, examples of which are divided into two groups - since 2002 March 4 until 2003 December 31 and since 2004 1 January by 2005 December 31 The authors applied the Series Correlation Coefficient Test and the Variance Ratio Test to investigate the validity of the Random Walk (RWH) hypothesis, and when there is a link between market indicators, Cointegration and Granger Causality tests are performed. The results of the random conduct tests carried out by the authors reveal the predictability of the return on Chinese stock indices, thus supporting the claim that, despite continued financial liberalization. In addition, authors report that weekly return data did not show evidence of weakness inefficiency. West African Economic and Monetary Union on

the regional stock market titled Bourse Regionale des ValeursMobilieres (BRVM) using Lo and MacKinlay (1988), Chow and Denning (1993), and Wright (2000) on daily stock prices index over the period from 2002 January 2 until 2004 December 31 The study found that all three trials show that BRVM can not rule out the hypothesis of zero randomness, and therefore BRVM is weak. The Hameed and Ashraf Duo (2006) investigated whether the volatility of the Pact is different in the Pakistani equity market and also examines whether there is a viable risk and reward relationship on the market and ultimately to examine the impact of the reforms on 11 September. the volatility of the return to Pakistan. To achieve the goal, the authors used the generalized GARCH (p-q) methodology for volatility modeling and weakness-effectiveness analysis. Depending on the model, the effectiveness of the weak form is determined if the ARIMA term coefficients (mean square equation) are statistically insignificant. On the other hand, the variance equation with significant coefficients shows that investors reward additional risks over time. The authors' findings indicate that the return of the Pakistani stock market reflects persistence and volatility. In addition, the authors rejected the weak form of hypothesis, as it was found that past information helped predict future prices. In addition, it has been observed that the average dispersion hypothesis does not apply to the Pakistani stock market, as there is no evidence that investors are rewarded for higher risk. In his work, Gimba (2012) conducted a study to investigate the NSE's weak EMH, based on the hypothesis of the normal distribution and the casual exit from the return series using the daily and weekly NSE Total Share Index (ASI) and five (5)

the most sold and oldest stocks of NSE banks for daily data since 2009. month of January. by 2009 December, and since June. by 2009 December. for weekly data. The empirical results obtained using the automatic correlation testing methods for the observed returns rejected the null hypothesis of the presence of random walkers for the market index and 4 out of 5 selected individual stocks. Therefore, the author concludes that the weak form of NSE is ineffective and, therefore, it is recommended to recommend, among other things, the reduction of institutional securities market restrictions as much as possible. Indian stock market research Khan, Ikram and Mehtab (2011) The Indian capital markets market performance survey was weak based on the two indices of the Indian stock exchanges, NSE and BSE, using daily closing value indices from the year 2000. April 1 by 2010 March 31 The authors have used Run tests, and their results show that Indian capital markets are weak inefficient and that prices do not drop by accident. Another work, Ananzeh (2014) Made an Imperfect Performance Test on the Amman Stock Exchange (ASE) by using daily repayments and applying parametric and non-parametric tests. The findings show that Jarque-Berra (J-B) studies show that the distribution of daily returns is not normal, while Run tests determine that daytime performance is ineffective in a weak form. In addition, the results show that the ADF and P-P unit root tests show a weak inefficiency in return series. Taking into account the conclusions, the author concluded that the Aman Stock Exchange is inefficient in its weak form. Based on the related market efficiency study, Nigerian data, Emenike (2010) examined the weak

form of EMH in NSE, hypothezing the normal distribution and randomly entering a periodic return series using Nigerian data. The author

The NSE's short monthly ASI was analyzed in the third period of January-January 1985. December 1992, 1992; January, 1993 December 1999 And finally, in January, 2000 - December. Normality test was performed using Skewness, Kurtosis, Kolmorgonov-Sminov(K-S) and Q-Q normalality chart. The findings reveal that the returns from NSEs are not reflected in the normal distribution over all periods. In addition, the test work rejects the random return rate for all periods. The author concludes that NSE is not a mild form that is effective throughout the period under review and recommended strengthening the regulatory capacity of NSE and SEK in order to comply with market discipline. Additionally, Afego (2012) also examined the EMA for NSE by trying out casual walks in NSE ASI monthly index repayments in 1984-2009. Use "Run tests" during the period. The results of the study indicate that the return on the index reflects the predicted component and statistically significant deviations from randomness and therefore contradicts the weak EMH form. Therefore, the author recommended several policy strategies for NSE dispersal capabilities and improvement of information quality.

Another work with NSE data, Ajao and Osayuwu (2012 m.) Traced the weak form EMH, which uses all securities traded on the NSE, and monthly ASI monthly profits from 2001-2010. The authors used the serial

a correlation method that allows the independence of consistent price changes to be checked, and the pilot test is used to test the random fluctuations of stock price fluctuations. The authors report that the serial correlation coefficients did not infringe two standard errors test (insignificant) and the Box-Ljung statistics show that none of the serial correlation coefficients were not significant, the conclusions also indicate that the pattern of return distribution was roughly normal and, based on the strength of these findings, the authors concluded that the weak form of the NSE is effective. Another work that is worth mentioning is Nwosa and Oseni (2011) A duet in which authors analyzed the weak form of EMH in the NSE using data from 1986 to 2010. In the period Serial correlation coefficient and regression

the analysis has been used as an analysis tool, as well as the variables have also been tested for stationary use by using ADF and P-P unit root tests. The results of one root test clearly show that the variables are integrated into the first one. The results of the series correlation test show that the NSE is ineffective from an informational point of view, which means that NSE stock prices do not appear to be accidental. In addition, regression analysis of the findings shows that stock returns are large, so the previous

share price can successfully predict the current prices, which are significantly different from the weak form of efficiency dictate, so the authors recommend to take strict and proper supervision of the regulatory body. EMH tests have also been conducted on Asian emerging markets over the last decade or two. Worthington and Higgs (2006), for example, investigated the weak market efficiency of Asian stock markets, using the daily returns of ten (10) emerging markets (China, India, Indonesia, Korea, Malaysia, Pakistan, the Philippines, Sri Lanka, Taiwan and Thailand) and five (5) Developed markets (Australia, Hong Kong, Japan, New Zealand and Singapore) on occasional walks, using a series correlation coefficient test, testing, ADF, PP, Kwiatkaoski, Phillips, Schmidt and Shin unit tests, as well as Variation Coefficients tests. According to the authors, the results of these tests show that the series correlations and test results indicate that all markets are weak and inefficient. Tests of unitary roots show that the weakness of the form in all markets except

Australia and Taiwan. Continuing with the results of more stringent variation coefficient tests, it turned out that none of the emerging markets is not accidental, therefore they are not weak, and only developed markets are effective. Hong Kong, New Zealand and Japan meet the most stringent requirements Random Walking Criteria Immediately after East, Abrosimov, Dissanike and Linowski (2005), the work has been examining the weakness of the performance on Russian stock markets since 1995. September 1 Until 2001 May 1, using daily, weekly and monthly Russian trading system index (RTS) time series and working different methods for estimating the predictability of RTS index time series. The research of the single root, autocorrelation and dispersion ratio has been used, and the results show support for the choice of hypothesis of the Null Random Walk only for monthly data. However, further analysis of daily and weekly data using ARIMA and GARCH models does not provide enough evidence to justify market forecasting on the Russian stock market. Taking into account the capital markets in America, Chen and Metghalchi (2012) examined the forecasted power of various trading rules by applying the different combinations of the most popular indicators of the Brazilian stock index (BVESPA) analysis over the period from 1996. January 5 By January 3 2011. From the empirical results, it is seen that all the differences in sales-sales according to the combination of one, double and triple indicators in the t-test are insignificant. In other words,

technical trading rules cannot exceed the purchase and retention strategy. As a result, the authors concluded that general support was, in essence, a weak form of Brazilian equity market performance. Akberi and Mohammed (2014) The authors of the study sought to find evidence of a weak market efficiency for the KSE 100 index, using index returns for the period since 1992. January 1 Until 2013 April 30, and the return is subdivided into sub-periods. Non-parametric tests and parametric tests were used in the work. The running test was carried out in a series of 20 returning companies compared to the results of the index return series. In addition, a series of returns from the KSE 30 index of 20 companies based on the free distribution of shares was also analyzed during the test to check whether the increase in the number of variable shares increases the number of random variables in the series of repayments or not. Summarized results show that the KSE 100 index is a weak form of inefficiency, while companies returning a series from the KSE 30 index are more incidental than companies returning from the KSE100 index. Survey of Abdul Aziz FaridSaymeh (2013) Tried weak An effective form of hypothesis is the two emerging equity markets, namely the Amman Stock Exchange (ASE) and the Turkish Stock Exchange (BORSA Istanbul), examining their monthly indices for the period 2000-2011. So this is an empirical test to predict the impact of historical information in the future stock prices for two equity markets. The data used in the empirical analysis was collected from the historical records of the ASE and BORSA Istanbul markets for the period 2000-2011. Research by the author: Ljung Box Autocorrelation, Runs, Dickey-Fuller Unit Root, and Individual Variance Ratio Tests and by author, the results of the study showed controversial results. The test was rejected by the Random Walk characteristics, while Extended Dickey-Fuller tests showed that both markets are weak. The auto correlation tests also rejected the "Random Walk" hypothesis for both markets. However, according to Variance Ratio tests, the study reveals various results since they accepted BORSA in Istanbul and rejected ASE as a weak form. Based on these test results, the author concluded that there was insufficient evidence that ASE and BORSA Istanbul could be regarded as weak forms in efficient markets.

Hernandez-Mejia et al. (2014) the authors used ARCH family models to determine which model more accurately explains the historical results of the Mexican Equity Market Index (IPC). They analyzed market volatility using the return on IPC index over the period 2000-2008. In the period In order to analyze market variability, the

GARCH, EGARCH and TARCH models were compared in accordance with the traditional evaluation criteria and the report that in their conclusions the EGARCH model (1.1) has the best predictive power with Respect for the Mexican Securities Market. Goudarzi (2013) has investigated market performance in the Indian stock market modeling a single stylized return on assets. It means return on the Indian stock market. To achieve this, the author used the ADF test and the GARCH model, and the results indicate that the main series are stationary and therefore represent a return. Therefore, according to the results, the study concluded that the Indian stock market is weakly informally ineffective. In the light of the above survey, it is obvious that there were no disputes and may not be resolved in one way or another. This study contributes to the discussion by examining the level of effectiveness of the NSE weakness by using seven different tests from four different data sets that receive (28) different decision cells.

The inspirations for our research study at leastare doubled. at first, the broadly done worked by Morck et al argued that price of stock move jointly more in poor economies (developing markets) as in comparison with rich economies (developed markets). Their stock value synchronicity estimated, specifically the average market demonstrate model of R-square , has motivated broadly the research studies on stock exchange markets efficiency for example Lim and Brooks study. Merck et al contend that their synchronicity measure is associatedinversely with the measure of particular information of the firm included into the prices of the stock markets, where particular information of more firms react to a lower model of market know as R-square, and therefore a higher level of efficiency of information . Aside from matching the efficiency of the market of different countries, this number of research studies additionally investigates the basic determinants for the country wise heterogeneities in prices of the stock markets. Those recognized notable elements incorporate the level of private property rights safeguard like intellectual property rights etcMorck. Safeguarding the public investor, liberalization of the stock markets by Li, the transparency of corporate by (Jin & Myers, 2006), laws of securities by (Daouk, Lee, & Ng, 2006) etc. In an identical way, it is of great interest to decide if

country attributes, specifically the quality of macro scale institution, are leading the country wise changes in the level of prices of the stock variations from random-Walk over different time periods. The outcomes will give important and valuable contributions to policymakers in planning the suitable macro scale structure regarding ensure their stock exchange markets are efficient details can be found in the work of (Jung & Shiller, 2005).On second the financial liberalization not just provide may opportunities of international investors but financial liberalization also motivate the researchers to do research studies on stock exchange market wild international point of view. Particularly there is a massive number of increasing studies about stock markets which mangles the measuring element for country wise heterogeneities in the progress of the local or domestic stock markets (Claessens, Klingebiel, & Schmukler, 2006). Globalization of the activities of the stock exchange by Claessens, KlingebielSynchronicity of the stock market by Morck and Jin and Myers, the integration degree of stock return by (Carrieri, Errunza, & Hogan, 2007), the segmentation of the stock markets by (Bekaert, Harvey, Lundblad, & Siege, 2008). Chapter four explain another important issue to be encounter while conduction the cross- wise country studies such as the extant of price variation in stock due to random-walk over different time periods.

2.4 Third Empirical Issue: Can the Existence of Temporal Dependence be Associated with News Events?

This will be of very interest to investigate whether investors agree whit that time period in which market-moving public news is announced when if the presence of serial reliance in the series of the return result effect investor's misreaction towards information. This problem continued in chapter five following information about prices of intraday concern with stock markets of Malaysia, and the news rooming on the media sources. The underlying section shortly provides details on related studies which provide motivations to our research curiosity.

2.4.1 Event Study Versus event detection.

The mainstream instrument in the finance studies to investigate the market's speed of adjustment of price to information revealed is earlier study by Fama et al. (1969). This study centers around the testing the fundamental application of the efficient markets hypotheses that it isn't workable for investors to extract positive irregular rates of

return by making investing after the arrival of open information to the public. More particularly, the strategy tests whether the irregular returns, calculated by deducting expected ordinary returns from the actual returns, are essentially not the same as zero during the period of the financial event window. The particular event of premium or interest, (for example, news declaration relevant to earnings in investments, stock, mergers and acquisitions or payment of dividend) is chosen from the earlier.(Nawrocki, 1996)Argue that activities of economic are vital in creating transient reliance in data of financial markets. Concern with testing this assertion the researcher adopted the standard activities research study approach as far as in advance author is choosing those significant activities, i.e. the U.S. President Nixon's declaration of wages controls on 15/8/1971, the Arab oil ban against the U.S. on 17/10/1973, and due to this share trading market crashed on 19/10/1987. Accordingly, he calculated the everyday cross-sectional lagged-correlation coefficients utilizing a random selection of 125 products from the New York Stock Exchange market, which catch the everyday changes in the dependence of time-series. His outcomes demonstrate that, after President Nixon's declaration on Sunday, the cross-sectional serial correlation for the following business and trading days is significant statistically. Since the other two main declarations are discharged to the media on business and trading day, the result of two main activities are under significant lagged-correlation coefficient on day on which it was published to public. Some other authors followed an approach of to recognize that news effect that happen on the days their sample return series display critical non-linear serial dependence. These investigations guess that return's nonlinearities caused in light of the fact that investors are uncertain of how to respond when shocks based activities is happening in the market, and consequently they react lazily. Lim first split the day by day information of 10 rising Asian securities exchanges into equal length non-covered time opportunities of 50 experiments, followed by the utilization of the (Hinich M. , 1996) the test of bi-correlation is conducted to detect non-linearity in every sub-period. Following the sequence of critical financial, economical and political happens in developing markets gave by Geert Bekaert and Campbell Harvey, the coordinating technique demonstrates that the greater part of the sub-period along with a significant non-linearity agree with one happen or activates recorded in the order at least.(Romero-Meza, Bonilla, & Hinich, 2007) Lim followed the same method to deal with specific events that are accountable for the transient split open of important non-

linear dependence in the index of stock return series from Chile, Malaysia and China, separately. The impediment along with the above research studies is that the window of time regularly extends in excess of five other trading weeks, making it hard to pinpoint the correct event that responsible for extract non-linear stock price situation. To address this inadequacy, (Lim et al 2006) use intraday information with the interval of ten-minute to figure out the bi-correlation test for every working day. This shorter span of time empowers the researcher to recognize those day by day news announced that are addressed for one day which their Malaysian intraday return series show an important bi-correlation test measurement.The inspirations for our research study at leastare doubled. at first, the broadly done worked by Morck et al argued that price of stock move jointly more in poor economies (developing markets) as in comparison with rich economies (developed markets). Their stock value synchronicity estimated, specifically the average market demonstrate model of R-square , has motivated broadly the research studies on stock exchange markets efficiency for example Lim and Brooks study. Merck et al contend that their synchronicity measure is associatedinversely with the measure of particular information of the firm included into the prices of the stock markets, where particular information of more firms react to a lower model of market know as R-square, and therefore a higher level of efficiency of information . Aside from matching the efficiency of the market of different countries, this number of research studies additionally investigates the basic determinants for the country wise heterogeneities in prices of the stock markets. Those recognized notable elements incorporate the level of private property rights safeguard like intellectual property rights etcMorck. Safeguarding the public investor, liberalization of the stock markets by Li, the transparency of corporate by (Jin & Myers, 2006), laws of securities by (Daouk, Lee, & Ng, 2006) etc. In an identical way, it is of great interest to decide if country attributes, specifically the quality of macro scale institution, are leading the country wise changes in the level of prices of the stock variations from random-Walk over different time periods. The outcomes will give important and valuable contributions to policymakers in planning the suitable macro scale structure regarding ensure their stock exchange markets are efficient details can be found in the work of (Jung & Shiller, 2005).On second the financial liberalization not just provide may opportunities of international investors but financial liberalization also motivate the researchers to do research studies on stock exchange market wild international point of view. Particularly there is a massive

number of increasing studies about stock markets which mangles the measuring element for country wise heterogeneities in the progress of the local or domestic stock markets (Claessens, Klingebiel, & Schmukler, 2006). Globalization of the activities of the stock exchange by Claessens, KlingebielSynchronicity of the stock market by Morck and Jin and Myers, the integration degree of stock return by (Carrieri, Errunza, & Hogan, 2007), the segmentation of the stock markets by (Bekaert, Harvey, Lundblad, & Siege, 2008). A substitute methodology is to first gather the data, any unusual trading results and then after this define the relevant information about that event for example in the work of (Cutler, Poterba, & Summers, 1989) take 50 greatest absolute percentage change of one-day in the element Index of S&P from 1946 to 1987, and next study concurrent information printed in the *New York Time*s to recognize the realist cause large fluctuation in the price of the stock. (Fair, 2002)

2.4.2 Daily based temporary dependent and news events

(Nawrocki, 1996)Argue that activities of economic are vital in creating transient reliance in data of financial markets. Concern with testing this assertion the researcher adopted the standard activities research study approach as far as in advance author is choosing those significant activities, i.e. the U.S. President Nixon's declaration of wages controls on 15/8/1971, the Arab oil ban against the U.S. on 17/10/1973, and due to this share trading market crashed on 19/10/1987. Accordingly, he calculated the everyday cross-sectional lagged-correlation coefficients utilizing a random selection of 125 products from the New York Stock Exchange market, which catch the everyday changes in the dependence of time-series. His outcomes demonstrate that, after President Nixon's declaration on Sunday, the cross-sectional serial correlation for the following business and trading days is significant statistically. Since the other two main declarations are discharged to the media on business and trading day, the result of two main activities are under significant lagged-correlation coefficient on day on which it was published to public. Some other authors followed an approach of to recognize that news effect that happen on the days their sample return series display critical non-linear serial dependence. These investigations guess that return's nonlinearities caused in light of the fact that investors are uncertain of how to respond when shocks based activities is happening in the market, and consequently they react lazily. Lim first split the day by day information of 10 rising Asian securities exchanges into equal length non-covered time opportunities of 50

experiments, followed by the utilization of the (Hinich M. , 1996) the test of bi-correlation is conducted to detect non-linearity in every sub-period. Following the sequence of critical financial, economical and political happens in developing markets gave by Geert Bekaert and Campbell Harvey, the coordinating technique demonstrates that the greater part of the sub-period along with a significant non-linearity agree with one happen or activates recorded in the order at least.(Romero-Meza, Bonilla, & Hinich, 2007) Lim followed the same method to deal with specific events that are accountable for the transient split open of important non-linear dependence in the index of stock return series from Chile, Malaysia and China, separately. The impediment along with the above research studies is that the window of time regularly extends in excess of five other trading weeks, making it hard to pinpoint the correct event that responsible for extract non-linear stock price situation. To address this inadequacy, (Lim et al 2006) use intraday information with the interval of ten-minute to figure out the bi-correlation test for every working day. This shorter span of time empowers the researcher to recognize those day by day news announced that are addressed for one day which their Malaysian intraday return series show an important bi-correlation test measurement.The inspirations for our research study at leastare doubled. at first, the broadly done worked by Morck et al argued that price of stock move jointly more in poor economies (developing markets) as in comparison with rich economies (developed markets). Their stock value synchronicity estimated, specifically the average market demonstrate model of R-square , has motivated broadly the research studies on stock exchange markets efficiency for example Lim and Brooks study. Merck et al contend that their synchronicity measure is associatedinversely with the measure of particular information of the firm included into the prices of the stock markets, where particular information of more firms react to a lower model of market know as R-square, and therefore a higher level of efficiency of information . Aside from matching the efficiency of the market of different countries, this number of research studies additionally investigates the basic determinants for the country wise heterogeneities in prices of the stock markets. Those recognized notable elements incorporate the level of private property rights safeguard like intellectual property rights etcMorck. Safeguarding the public investor, liberalization of the stock markets by Li, the transparency of corporate by (Jin & Myers, 2006), laws of securities by (Daouk, Lee, & Ng, 2006) etc. In an identical way, it is of great interest to decide if country attributes, specifically the quality of

macro scale institution, are leading the country wise changes in the level of prices of the stock variations from random-Walk over different time periods. The outcomes will give important and valuable contributions to policymakers in planning the suitable macro scale structure regarding ensure their stock exchange markets are efficient details can be found in the work of (Jung & Shiller, 2005).On second the financial liberalization not just provide may opportunities of international investors but financial liberalization also motivate the researchers to do research studies on stock exchange market wild international point of view. Particularly there is a massive number of increasing studies about stock markets which mangles the measuring element for country wise heterogeneities in the progress of the local or domestic stock markets (Claessens, Klingebiel, & Schmukler, 2006). Globalization of the activities of the stock exchange by Claessens, KlingebielSynchronicity of the stock market by Morck and Jin and Myers, the integration degree of stock return by (Carrieri, Errunza, & Hogan, 2007), the segmentation of the stock markets by (Bekaert, Harvey, Lundblad, & Siege, 2008). Chapter four explain another important issue to be encounter while conduction the cross- wise country studies such as the extant of price variation in stock due to random-walk over different time periods.

2.4.3 The error of this study is encountered

Adopted approach offered by Lim et al. though measured the day to day test of ratio of variance rather than the bi-correlation results utilizing minute-to-minute information from the Malaysian stock exchange market. The fundamental rationale behind our decision is that the ratio of variance has a long convention in empirical market micro-structure research studies. Furthermore particularly, an author breaks down the ratio of variance to the returns of trading compare with non-trading with the aim to bring new approach and new concept and show the relationship among the flow of information and the arrangement process of the price of the assets. For example,(French & Roll, 1986) calculated the ratio of variance every hour open-to-close return and close-to open outcome (returns) and locate that prices of stock are more unstable in working hours or hours of trading as compare to in the period of non-working hours or non-trading hours. The researcher credit this marvel to information that is available privately or private information delivered in the period of

trading or business working hours. Though some other authors adopted a same method which propose in the contras, according to this method where the information published and provided to the public play a roll of main resource of variation in returns in short term e.g. details can be found in the work of (Harvey & Huang, 1991), (Fleming, Kirby, & Ostdiek, 2006) etc. It is important that the hourly open-to-close returns /and close-to-open ratio of variance test centers around the variation in short-term, which is intellectually different from the short vs long-term test for the ratio of variance for examining serial un-correlatedness. On other hand, the previously mentioned research studies look at the news-instability association ,while the structure of our study encounter the association of new serial interrelation. Somewhat same research work is done by (Ederington & Lee, 1993), (Ederington. & Lee, 1995) he analyze the rapidness of response to adjust to news published by contrasting the serial correlation of back to back intraday changes in price in period of declaration and non-declaration periods of news in stock exchange market.

As news are accounted for day to day trading hours in the media of Malaysian, we calculated the test of ratio variance for each working day in stock exchange market following minute-to-minute return stock exchange market. There is an expanding number of research studies infield of stock exchange market that take an infinitesimal perspective of time-series reliance by calculating lagged-correlations in intraday series of return with the presence of mostly often information of price of the stock on working days details can be track from the recent studies of (Tsutsui, Hirayama, Tanaka, & Uesugi, 2007), (Chordia, Roll, & Subrahmanyam, 2008) etc. though investigating the coefficient of lagged-correlation or ratio variance of daily activities of the industry, the information is comparatively not common buy rare but is not information that is totally new for example this concepts can be track for the study of (Wood, McInish, & Ord, 1985) Evaluate lagged-correlation coefficients from slacks one to 20 minutes for each working day, and after that process the %age of days for which the t-statistics for the coefficients of correlation are significant at the confidence 5% level, with the information of minute 495 1- return present for each working day.(Bianco & Renò, 2006) Time-series of 751 working days for ratio of variance was developed, and after that inspect whether these developed ratios are related with measures of day to day variations volume of trading. Their results of regression demonstrate that the serial interrelation of returns that are intraday is

significantly and positively identified with the two factors in the Italian stock index future markets. The similar structure has been followed by (Bianco & Renò, 2009) who point out a positive connection between day to day ratio of variance as well and total instability following information from S&P 500 Stock Index futures. In Chapter five, we imply the methodology of wild bootstrapped test of automatic variance recently offered by Kim investigate the return of 1-minute time series tracked for Malaysian Stock Exchange market on each identical working day. Then, for those days with significant return lagged-correlations, our study continue to decide if those days are related with real news rooming the market and the media. This study will assist to recognize those news prevailing in the market to which Malaysian investor mis-react

TECHNICAL TRADING RULES

Lai et al. (2006) examined the use of technical trading rules on the Malaysian stock market since 1977. Month of January until 1999 December. (FMA) and Floating-Point Average (VMA) to determine whether these technical rules can be sued in order to produce above the average return on the Malaysian stock market in four non-overlapping periods. The results indicate that the 60-day moving variable (VMA) rule was more profitable compared to the purchase and maintenance strategy, while the 60-day fixed rate variable (FMA) rule was set. Compared to the buy-and-hold strategy, it will receive significantly higher profits. Lai and Lau (2006) investigated the profitability of variable and fixed moving average applications, as well as trawl bag trading (TRB) in nine popular daily Asian market indices from 1988. Month of January.By 2003 December. The results of the studies provided strong evidence of the use of the Chinese, Thai, Taiwan, Malaysian, Singapore, Hong Kong, Korean and Indonesian equity markets, in particular the Floating Variable Average (VMA) and Fixed Variable Factor (FMA). Variables and fixed moving averages were 20 and 60 days long.

Paris and Vasquez (2000) examined the average of the breakthrough and the trading rules for trade expansion gains on the Chile stock market since 1987. January to 1998 September. The overall results are consistent with Brock et al. (1992), which provides strong support for a technical analysis strategy. It has been determined that purchasing signals constantly generate higher returns compared to signals sold. Gunasekarage and Power (2001) I analyzed the profitability of moving average rules using the four emerging capital market indices in South Asia: the Bombe Stock Exchange, the Columbia Stock Exchange, the Dock Stock Exchange and the Karate Stock Exchange. The findings reveal that the technical rules of trading provide predictive opportunities for these markets, and therefore rejects the null hypothesis that the returns obtained using variable averages are equal to those derived from the purchase and retention strategy. It has been shown that the application of this method increases the return on investors in South Asian markets.

Chang et al. (2004) Tested for forecasted power in emerging equity markets by using the moving average (VMA) and trade intermediate breaks (TRB) technical trading rules. The results show that only a few rules generate a positive surplus with regard to trading costs. This study tested different secondary samples for conducting research on the bear and bull markets. It has been shown that the variable value of the variable variable (VMA) trading rules does not seem to have a predictive power over the widely used trading rules of market participants. Metghalchi (2007) examined two medium-sized technical trading rules for the Austrian equity market, examples of which were since 1990. Month of January.Until 2006 May. This study uses the standard moving average rules (SMA) and the increasing flexible average rule (IMA). The results of the study showed that the moving average rules actually have predictive power, and the authors have identified recurring price trends for profitable trading.

Empirical results from this study indicate that technical trading rules may exceed the purchase and retention strategy.

Cheung et al. (2009) to investigate the profitability of two popular technical trading rules: Simple Moving Average (SMA) and Trade Volume (TRB) in Hong Kong since 1972. Until 2006 only the study shows that the one trading rule (1.50) rule can exceed the market. Taking into account the trade margin breach (TRB) rule, the returns achieved are quite small and insignificant. Hudson et al. (1996) repeated Brock et al. The study was carried out. (1992) Data on the UK since 1935 July. Until 1994 Month of January. The methodologies used are moving average rules and rules for trade unbundling. Empirical results have shown that using the technical examination of trade rules investors would not allow excess return to cover expensive trade.

CHAPTER-3

METHODOLOGY

There are mostly used two approaches in methodology like qualitative and quantitative. There are a lot of different approaches used in this methodology. Qualitative and quantitative have its own manner of theory construction and different techniques to collect data and their own ideological orientation.

Research Design

As technical analysis asserts that successive returns are dependent, the first part established statistical evidence whether or not the random walk hypothesis held for PSX-100 index from 2000 to 2015.

To test whether or no technical trading rules were able to predict future prices movements. In other words, whether or not average daily returns from technical trading were significantly and positively, larger than average daily sell day returns. Different trading rules are employs to test the phenomena through Wright Rank and Sign test analysis.

Population of the study

Pakistan stock exchange was established 18 September 1947. The first index introduced in Pakistan stock exchange was 50 index based on 50 companies. Now its operating 100 index. My population is from 18 September 1947 to 28th June 2015

Sample of the Study

As this study selected Pakistan Stock Exchange 100 index. The sample of the study is closing prices of daily index of the companies from 7th march 2000 to 28th June 2015.

Source of the data

Data is collected from Pakistan stock exchange official website www.psx.com.pk

Nature of the study

The nature of my study is descriptive and causal research.

Wright Rank and Sign Based Test

For the analysis this study will use Wright Rank and Sign test. Parametric and non-Parametric test also used to avoid bias for non-normal distribution of data. The regression analysis will also apply to find out the impact on the economy.

Non parametric test include Runs test and Phillips- perron test, but this study only concerned with Wright Rank and sign test.

Parametric test include auto correlation coefficient, Box and pierce statistic etc.

3.1 Multiple Variance Ratio Test By Chow And Denning (1993)

$$z_1(q) = \max_{1 \le i \le L} |Z(q_i)| \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 1$$

$$z_2(q) = \max_{1 \le i \le L} |Z^*(q_i)| \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 2$$

3.2 Non-Parametric Variance Ratio Tests Using Ranks and Signs By Wright (2000)Rank-Based Variance Ratio Tests

This test is developed by Wright (2000) and its mathematical form is as under

$$r_{1t} = \frac{\left[r(Y_t) - \frac{T+1}{2}\right]}{\sqrt{\frac{(T-1)(T+1)}{12}}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 3$$

$$r_{2t=\emptyset^{-1}\left[\frac{r(Y_t)}{T+1}\right]} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 4$$

$$R_1 = \left[\frac{\frac{1}{Tk}\sum(r_{1t} + r_{1t-1} \dots + r_{1t-k+1})^2}{\frac{1}{T}\sum_{t=1}^{T} r_{1r}^2} - 1\right] x \left(\frac{2(2k-1)(k-1)}{3kT}\right)^{-1/2} \dots\dots\dots\dots 5$$

$$R_2 = \left[\frac{\frac{1}{Tk}\sum(r_{2t} + r_{2t-1} \dots + r_{2t-k+1})^2}{\frac{1}{T}\sum_{t=1}^{T} r_{2r}^2} - 1\right] x \left(\frac{2(2k-1)(k-1)}{3kT}\right)^{-1/2} \dots\dots\dots\dots 6$$

$\frac{1}{T}\sum_{t=1}^{T} r_{1t}^2 = 1$ *so this term may be omitted from the definition of* R_1 where as

$$\frac{1}{T}\sum_{t=1}^{T} r_{2t}^2 \approx 1 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 7$$

$$S_1 = \left[\frac{\frac{1}{Tk}\sum_{t=k}^{T} (S_t + S_{t-1} \ldots + S_{t-k+1})^2}{\frac{1}{T}\sum_{t=1}^{T} S_t^2} - 1\right] x \left(\frac{2(2k-1)(k-1)}{3kT}\right)^{-1/2} \ldots\ldots 8$$

CHAPTER-4

FINDINGS

Table 4.1 Descriptive Statistics

Descriptions	*return*	*Volume (in Millions)*
Mean	0.00091	80.76987214
Standard Error	0.000221	22.53181496
Median	0.001165	0
Mode	0	0
Standard Deviation	0.013535	1380.521931
Sample Variance	0.000183	1905840.802
Kurtosis	3.456966	1288.650858
Skewness	-0.17264	35.72004117
Range	0.163288	53888.2
Minimum	-0.07449	0
Maximum	0.088795	53888.2
Sum	3.413936	303210.1
Count	3753	3754
Confidence Level(95.0%)	0.000433	44.17579271

Note: Table no 2 shows the descriptions in column one, daily Returns in Column two and daily Volume (in Pakistani Rupees) in column three.

This chapter consists of three parts. The first portion show and describes the description statistics of Pakistan stock exchange market data. The second part explains the output in order to test the ability of prediction of various trading rules. At the end, the strategies of buy and hold are highlighted in order to find out which strategy can beat the market in terms of higher returns.

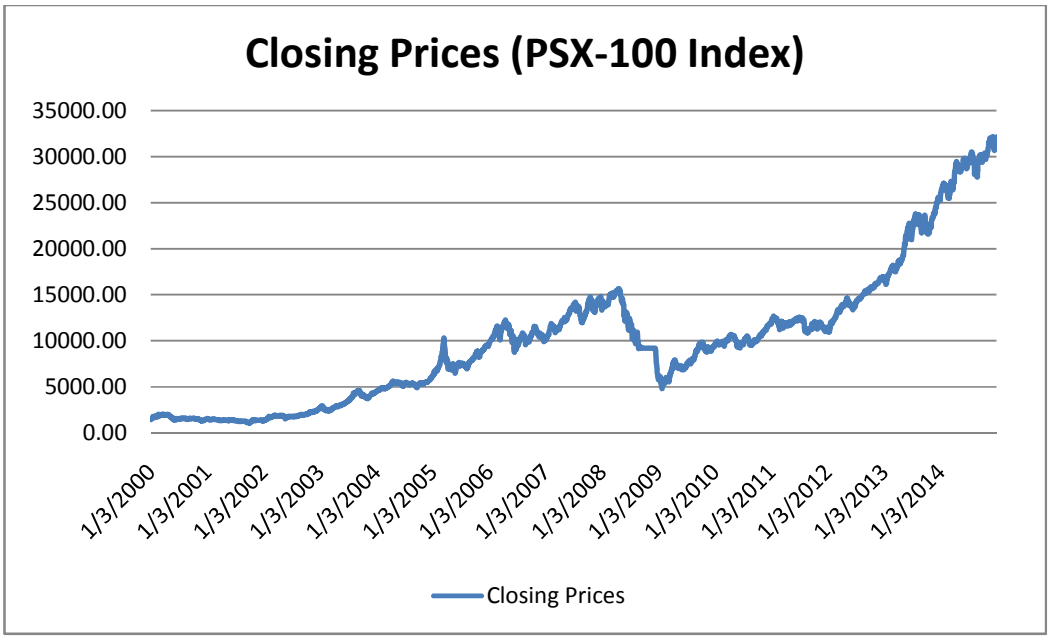
Descriptive Statistics:

The above table shows the descriptive statistics of the daily used in this study for the period of 15 years i.e. from July 2000 to September 2015. The daily volume of Pakistan Stock Exchange (PSX-100 Index) is considered to calculate the returns. The returns of the PSX-100 index is measured with the help of formula Returns (Ri) = P1

– P0 / P0 of closing index. The volume is in Pakistani Rupees which is shown in millions values. According to the data presented in the table, the average daily returns are 0.00091. It is close to zero having standard error of 0.000221 which shows that average is statistically significant for the sample assumed. The standard deviation having value of 0.013535 shows the larger variability of the returns. On the other hand, the skewness shows -0.17264 is lying in the range of -0.5 to 0.5. It indicates the normality of the distribution of the data. Likewise, kurtosis shows the value of 3.456966 which represents the leptokurtic in nature.

The volume is in Pakistani Rupees which is shown in millions values. According to the data presented in the table, the average daily volume is 80.76987214, having standard error of 22.53181496 which shows that average is statistically significant for the sample assumed. Similarly, the standard deviation having value of 1380.521931 shows the larger variability of the returns. On the other hand, the skewness shows 35.72004117. Likewise, kurtosis shows the value of 1288.650858 which represents the leptokurtic in nature.

Figure 4.1 Closing prices



In the figure 4.1, the graph of Pakistan Stock Exchange (PSX) 100 Index shows steady trend from 2000 to 2004 era while after that inclination (upward trend) started from 2004 to 2008 in macro-level while up and down can be seen focusing on

narrow-level. The index in 2000 was 1,457.07 point and in January 2004, it was 4,473.93 point while in December 2004, it reached to 6,218.40 point. At the beginning of 2005, the market showed a slight declination but after that, it was observed growing until 2008 and reached to the peak of 15,676.40 points in April 2008. The reason was the liberalization of the market which allowed foreigners to invest in PSX in President Musharraf era, therefore, upward trend has been shown in the market. As compare to other emerging markets, it was considered the best performance in terms of index points. A sudden declination can be seen in May, 2008 which depicts the country economic situation (unanticipated increase in interest rate-caused inflation) while on the political point of view, Benazir Bhutto terrorist attack was also the reason of that declination in the market. Up to the August 2008, the market situation was not stabile while after resignation of President Musharraf in August 2008 onwards the market index showed a growing trend in terms of market capitalization. Investors again participated in the market and upward trend was observed after that era in the market. At the end of December 2012, the market again reached to another milestone of 16,943.19 points in the history. In December 2014, it reached to 32,148.78 points which was considered another milestone for the emerging stock exchange.

Figure 4.2 Volume

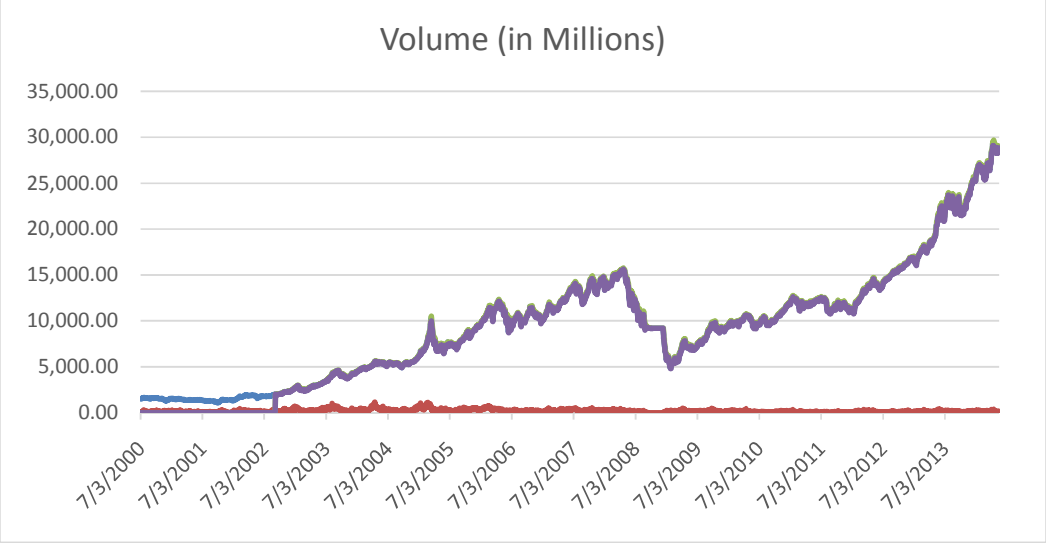


Figure 4.2 depicts the daily volume data of Pakistan Stock Exchange from January 2000 to December 2013. The data of volume is in millions of Pakistani rupees. The

graph shows steady trend from 2000 to med 2003 era while after that inclination (upward trend) started from 2004 to 2008 in macro-level while up and down can be seen focusing on narrow-level. The volume in 2000 to 2003 under 500 million and in February 2004 onwards, it was reached to 500 million plus rupees. At the beginning of 2005, the market showed a slight declination it crossed 1 billion volume, after that, it was observed growing until 2008 and reached to the peak of 1.5 billion in April 2008. The reason was the liberalization of the market which allowed foreigners to invest in PSX in President Musharraf era, therefore, upward trend has been shown in the market. As compare to other emerging markets, it was considered the best performance in terms of volume. A sudden declination can be seen in May, 2008 which depicts the country economic situation (unanticipated increase in interest rate-caused inflation) while on the political point of view, Benazir Bhutto terrorism attack was also the reason of that declination in the market. Up to the August 2008, the market situation was not stabile while after resignation of President Musharraf in August 2008 onwards the market volume showed a growing trend in terms of market capitalization. Investors again participated in the market and upward trend was observed after that era in the market. At the beginning of 2013, the market again reached to another milestone of 2 billion rupees in the history. In December 2013, it reached to 2.5 billion rupees which was considered another milestone for the emerging stock exchange. After thoroughly investigation of the figure, investor can predict the trend of the market and can make a decision based on the data inclination or declination in the market volume. This phenomenon can be utilized by the investor to forecast the future trend and beat the market in terms of access returns as compare to other investors in the market.

Table 4.2 Wright Rank based Variance ratio test having heteroscedasticity

Null Hypothesis: CLOSE is a martingale
Date: 06/30/18 Time: 07:55
Sample: 7/03/2000 9/28/2015
Included observations: 3747 (after adjustments)
Heteroskedasticity robust standard error estimates
User-specified lags: 2 4 8 16

Joint Tests	Value	df	Probability
Max |z| (at period 2)*	3.882882	3747	0.0004

Individual Tests

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	1.141203	0.036366	3.882882	0.0001
4	1.239849	0.063882	3.754572	0.0002
8	1.337668	0.092497	3.650584	0.0003
16	1.447000	0.127468	3.506770	0.0005

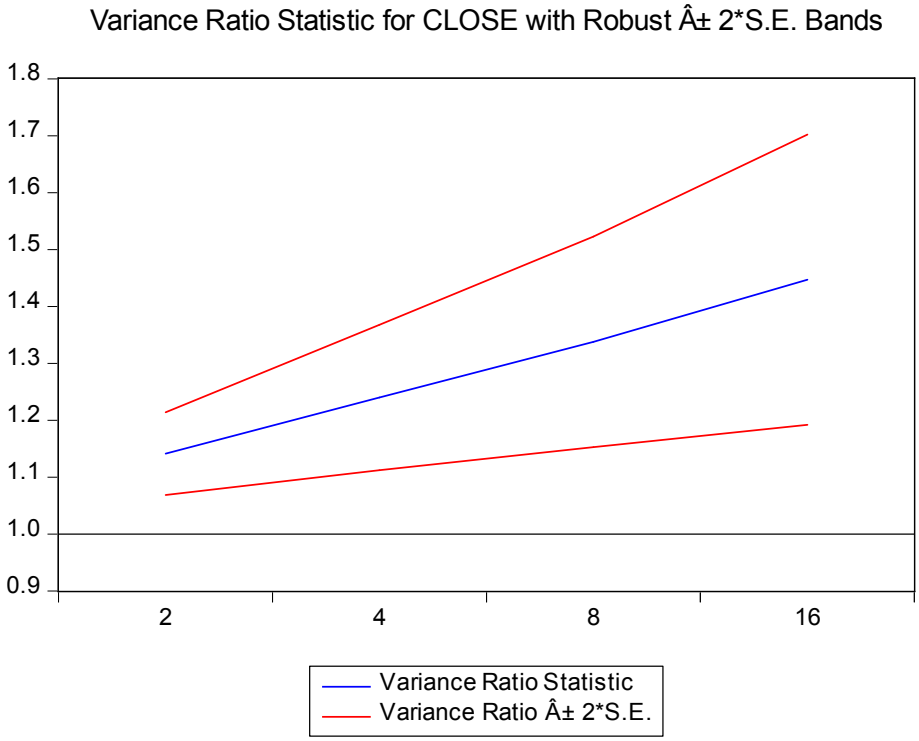
*Probability approximation using studentized maximum modulus with parameter value 4 and infinite degrees of freedom

Test Details (Mean = 8.24699756552)

Period	Variance	Var. Ratio	Obs.
1	23024.2	--	3747
2	26275.3	1.14120	3746
4	28546.5	1.23985	3744
8	30798.7	1.33767	3740
16	33316.0	1.44700	3732

In these results, the Wald test are not displayed due to the use of Heteroskedastic robust standard errors (HRSE) in the test. The probability value of Joint tests as well as the individual tests are statistically significant at conventional levels which is 0.0004. These values are generated by utilizing the Wald Bootstrap. The Chow-Denning joint (CDJ) test statistic value is shown as 3.882882. It is statistically significant of 0.0004. It strogly rejects the null hypothesis. The null hypothesis is PSX 100-index is a martingale.

Figure 4.3 Wright Rank based Variance ratio test having homoscedasticity



The above graphical presentation shows whether to accept or reject the hypothesis. it shows the same results but heteroscdasticity in the data is allowed. On the horizontal axis, the various periods are assumed. On the vertical axis, the 1.0 shows the null hypothesis. The middle line shows the variance ratio statistic for various periods. The outer lines show the 2 times standard errors. The interaction of 1.0 indicates to accept the null hypotheses, as the figure shows no intercept here hence, we reject the null hypotheses. The lines above the 1.0 line specify to reject the null hypothesis of random walk model and accept the alternative hypothesis for all the periods of the study.

Table 4.3: Wright Rank based Variance Ratio Test (having Homoscedasticity)

Null Hypothesis: CLOSE is a random walk
Date: 06/30/18 Time: 07:57
Sample: 7/03/2000 9/28/2015
Included observations: 3747 (after adjustments)
Standard error estimates assume no heteroskedasticity
User-specified lags: 2 4 8 16
Test probabilities computed using permutation bootstrap: reps=1000, rng=kn, seed=1419206549

Joint Tests	Value	df	Probability
Max |z| (at period 16)	7.845404	3747	0.0000
Wald (Chi-Square)	86.71874	4	0.0000

Individual Tests

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	1.126785	0.016336	7.760874	0.0000
4	1.229257	0.030563	7.501211	0.0000
8	1.365297	0.048324	7.559351	0.0000
16	1.564150	0.071908	7.845404	0.0000

Test Details (Mean = 0)

Period	Variance	Var. Ratio	Obs.
1	1.00000	--	3747
2	1.12679	1.12679	3740
4	1.22926	1.22926	3726
8	1.36530	1.36530	3706
16	1.56415	1.56415	3666

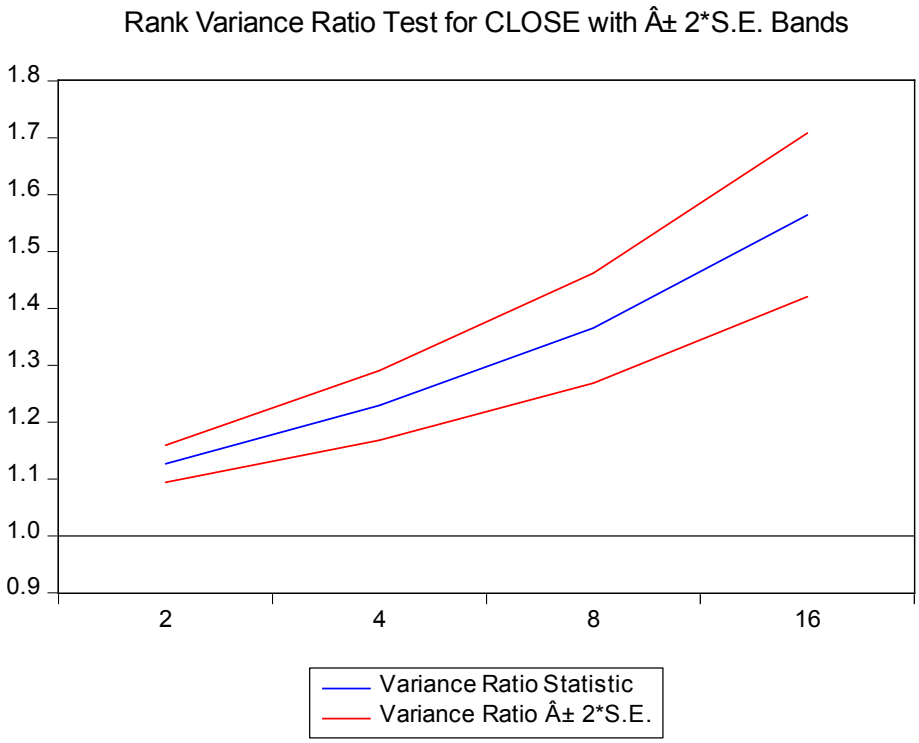
Signs and Ranks Test by Wright (2000):

Table 4.3 shows the Signs and Ranks based variance ratio (RBVR hereafter) test results. Following Wright (2000) approach, the outputs are based on the sample data of the study. The results are based on multiple periods i.e. 2, 4, 8, 16 in order to resemble the Wright (2000) approach, therefore, results are consists of two parts: the joint tests and lower portion test outputs. The first shows the test of joint null hypothesis. The proceeding one show the variance ratio test which is applied to individual periods separately. In joint tests Max |z| (at period 16), the statistic value is

7.845404. It is related to the individual tests having maximum period of 16 years. The p-value is 0.0000. It is obtained using the Studentised Maximum Modulus (SMM) having 3,747 degree of freedom. It specifies to reject the null hypothesis that is that index is a random walk. On the other hand, Wald (Chi-Square) statistic shows similar results. In joint test, having 4 degree of freedom, its p-value also specifies significant statistic value to reject the null hypothesis.

The output of individual tests also shows statistical significant values as z-values and its p-value also significant for all the periods. The results specify that null hypotheses for all the cases are rejected based on p-value which are significant in all the cases. In the Test Details, the estimated variances, and variance ratios are shown for each period.

Figure 4.4 Wright Rank test with Ties replaced with Average of Ties



The above graphical presentation shows whether to accept or reject the hypothesis. On the horizontal axis, the various periods are assumed. On the vertical axis, the 1.0 shows the null hypothesis. The middle line shows the variance ratio statistic for various periods. The outer lines show the 2 times standard errors. The interaction of 1.0 indicates to accept the null hypotheses, as the figure shows no intercept here

hence, we reject the null hypotheses. The lines above the 1.0 line specify to reject the null hypothesis of random walk model and accept the alternative hypothesis for all the periods of the study.

Table 4.4 Wright Rank Based Variance Ratio Test

Null Hypothesis: CLOSE is a martingale
Date: 06/30/18 Time: 07:58
Sample: 7/03/2000 9/28/2015
Included observations: 3747 (after adjustments)
Standard error estimates assume no heteroskedasticity
User-specified lags: 2 4 8 16
Test probabilities computed using permutation bootstrap: reps=1000, rng=kn, seed=1946934322

Joint Tests	Value	df	Probability
Max |z| (at period 16)	10.55428	3747	0.0000
Wald (Chi-Square)	126.3753	4	0.0000

Individual Tests

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	1.107553	0.016336	6.583596	0.0000
4	1.224980	0.030563	7.361252	0.0000
8	1.410462	0.048324	8.493965	0.0000
16	1.758940	0.071908	10.55428	0.0000

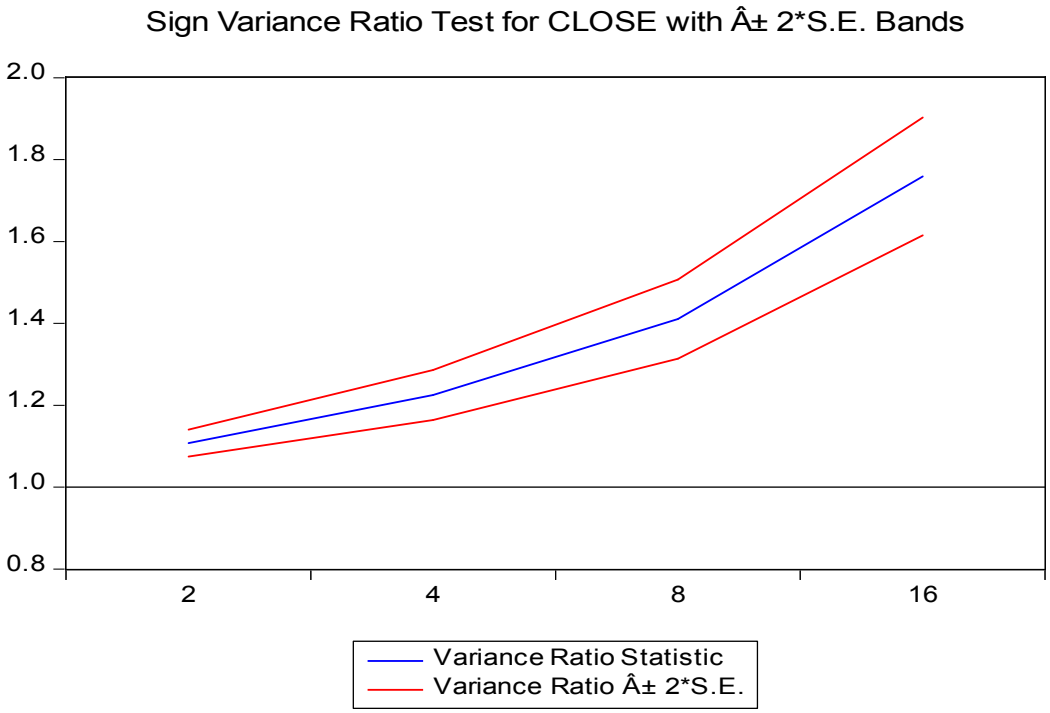
Test Details (Mean = 0)

Period	Variance	Var. Ratio	Obs.
1	1.00000	--	3747
2	1.10755	1.10755	3740
4	1.22498	1.22498	3726
8	1.41046	1.41046	3706
16	1.75894	1.75894	3666

The outputs shown in the above table No 4.4 are similar to previous result mentioned in table No 4.3 but here the heteroscdasticity is checked in this model in order to examine the statistical significance. In this model, the Wild Bootstrapping (WBT) approach is adopted. It has two point distributions. The first one is Knuth generator, 5,000 replications. The second one is 1,000 random number generator seed. Both are employed in this model along with heteroscdasticity. The heteroscdasticity robust standard error (HRSE) is investigated in the results. Similar to previous results, it also contains two portions, therefore, previous results are portrayed here.

The output shows that Wald test is no more exist. It is observed due to non-consistency of HRSE in the individual tests. The Chow-Denning joint test (CDJT) having value of 10.55428shows a bootstrap significance value of 0.0000. Both the values reinforced the preceding treatment that PSX 100-Index is not martingale. As compare to previous table, individual test is significant based on probability threshold value of less than 0.05. Although, it shows slight higher/lower as compare to the previous, value shows significant value for all periods level. All the ratios are ingredients/output of Wald bootstrap. All the results are similar to the results without heteroscdasticity, therefore, having consistency in the outputs. To conclude, after allowing for heteroscdasticity, the results reveal that there is no evidence for random walk. The conclusion is evidenced by graphical as well as empirical for all proposed levels.

Figure 4.5 Sign Based Variance Ratio Test



The above graphical presentation shows whether to accept or reject the hypothesis. On the horizontal axis, the various periods are assumed. On the vertical axis, the 1.0 shows the null hypothesis. The middle line shows the variance ratio statistic for various periods. The outer lines show the 2 times standard errors. The interaction of 1.0 indicates to accept the null hypotheses, as the figure shows no intercept here

hence, we reject the null hypotheses. The lines above the 1.0 line specify to reject the null hypothesis of random walk model and accept the alternative hypothesis for all the periods of the study.

CHAPTER-5

Conclusions

The technical trading rules regarding the prediction of future prices in PSX is being investigated and observed that equity market follows trend analysis which consists of continuity to a specific time period. Therefore technical analysis adopts some principles to forecast the future prices and it's also focus on trading volume as an indicator. On the other side, computer technology also plays a vital role for investors and researchers to test the models and predict the future trends of the market based on graphical and technical analysis of the data. Based on these technical analyses, they can easily beat the market and can earn excess return and beat the market. It also support in taking decisions regarding market condition and ability to invest in an appropriate time to avoid risk associated with their investment decision and future forecasting.

In this study the effect of technical analysis indicators on PSX is analyzed to represent the efficient market hypothesis in an emerging equity market. There are various rules and regulation applied by brokers and dealers in order to generate excess return from the benchmark or standard. This study results showed that technical analysis has the power of prediction of future prices in the emerging equity market of Pakistan. In order to achieve the basic purpose of the study two hypotheses are being tested. In this study the hypothesis that PSX follow random walk. In this study Wright Rank and Sign based variance ratio test is applied to test the random walk hypothesis. This test was developed by (Wright,2000) to test either the market is following random walk or not the results are not in alliance with the first hypothesis and reject the hypothesis that PSX follows random walk. The findings of the study are similar with previous study as (Frennberg& Hansson, 1992; Gustafsson, 2012;Sąfvenblad, 2000). Our results are statistically significant and consistent as compare to these studies.

RECOMMENDATIONS AND FUTURE DIRECTIONS:

The findings of the study suggest that the weak form hypothesis test is not only a good predictor for the market efficiency but other form like strong form efficient and semi weak form of efficient market hypotheses should also be checked in order to predict the overall aspect of the market.

The other side volume is also performing a significant role in trading, therefore it should also be assumed during future prediction of equity market efficiency.

There are various sophisticated models like artificial neural network may also be recommended for future prediction in Pakistan stock exchange.

There are a variety of indicators e.g. Average Directional Index (ADX) Adoptive Moving Average (AMA) can also be suggested in future studies in the realm of efficient market hypotheses.

Summary

This paper summarizesthat either Pakistan Stock Exchange (PSX) is efficient market or not. The sample includes the daily closing prices of PSX- 100 index for the period from7th march 2000 to 28thjune 2015. Wright Rank and Sign tests are used to test the certainty of the PSX market.Heteroscadastitcity based variance ratio test showed statistically significant results based on Joint test as well as the individual test. While the Wright Rank variance based ratio test having homoscedasticity also showed statistically significant result. All parametric methods tell us that both return series do not follow the random walk model and the significance autocorrelation reject the hypothesis of weak from efficiency. Generally, results from the observed analysis strongly recommend that the Pakistan Stock Market is efficient in weak from.