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Comparative analysis of Asian, European & American Markets With respect to Market Efficiency

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ABSTRACT

This study is the exploration of ten different markets from three different regions i.e. Asia, Europe & America. The main purpose behind the study was to discover any difference for EMH (Efficient Market Hypothesis) among various markets across different regions. In order, find it the price indices of ten markets have been used for the period from 2001-2014. Descriptive statistics and Augmented Dickey Fuller tests have been applied for normality tests. In addition to this Auto-correlation test have been applied to see that there is weak form efficiency in these markets or not. Results found reject the null hypothesis for weak form efficiency for all the markets and also confirms that no sample market prices follow the random walk model. This ultimately helps to understand that efficient market hypothesis is not followed in these markets including KSE, BSE, CSE, Nikie, Maxico, Nasdaq, New York, Swiss, London & Dowjones. As the historical prices are explaining the future prices which helps the people in the business to take timely decisions and get benefits from their investments. The investors in such a market can get the benefits from the mispricing and earn abnormal profits.

KEYWORDS: Weak Form Efficiency, Random walk, Historical Prices

INTRODUCTION

The cooperation for business and trade among various regions has given the investors a chance go globally and earn money. In order to get benefits and opportunities in the foreign markets there was a need to liberalize the economies of countries. The liberalization f borders have not only enhanced the business and earnings but also the regional cooperation among the countries. While the creation of SAARC (South Asian Association for Regional Cooperation), NAAFTA (North American Free Trade Agreement) and various European Association have led the people of these countries to capitalize their assets across the borders of their home country and ultimately earn profits higher than they can earn at their home. While doing so the risk faced by the investors is also high comparative to the risk at their home. The information available to all the people across the world do not give chance to all to earn high except the few ones. The main reason behind is the timings at which the investors receive the information and the ultimate decision. Therefore, they face difficulty in a wide market with huge number of competitive investors to get positive returns by using the right information at the right time.

The efficient market hypothesis helps to understand the availability of information to the investors and the way they avail the chance to earn higher returns. However, when the market efficiency is divided into sub categories of strong, semi strong and weak form efficient there is s difference in the return the investors are expected to earn from their investment. Taking into account the weak form market efficiency which states that 'price on traded assets (e.g., stocks, bonds, or property) already reflect all past publicly available information". History also shows that there is a close link between the random walk hypothesis and efficient market hypothesis.

Previously various researchers dig out the paths to guide the investors regarding the form of information that they have while going for investment decision.

De Bondt & Thaler, (1985) in this regard explore the efficiency of the market and argue that under the breach of Bayes rule most of the investor react to the events more than they should react according to the that time, where the information is already been absorbed by the stock prices. Such overreaction situation gives rise to the weak form market efficiency. The authors also use the situation of January returns gained by prior winners and losers. Where the people portfolio at losing position achieve higher returns (De Bondt & Thaler, 1985).

In order to check the existence of weak form efficiency the data for sale price was collected from the family homes on two dates.

The main objective of this paper is to find out the presence of weak form efficiency in different stock index markets after the elimination of borders and globalization of trade links. This comparative analysis will help the

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investors and future researcher to explore the markets further by focusing on other form market efficiency as well. The study have been designed as follows: after the main extract of the research the introductory section is started with brief overview of efficient market hypothesis. Following the introductory section is the chapter for literature review, hypothesis and theoretical framework. Next chapter consists of methodology and results and discussion of the tests applied for weak form efficiency. The research is then linked with conclusive remarks by the extension of future research guidance and limitations.

LITERATURE REVIEW

The openness of borders among the globally concentrated world has led to enhance the trade cooperation among various regions of the world. In this regard the origination of SAARC has led to create emergence of new ways to start business. Hassan et al in 2001 in this regard suggests that cooperative trades help to get some special consideration from the trading partner. (Hassan, et al ,2001). When such cooperation starts among the countries there is flow of capital as well as information across the boundaries. Such trade cooperation led the stock to respond to the information available. But in a globalized world such information is available among all the trading countries. Due to this reason the demand for the products changes and ultimately affects the prices. Kam et al in their research explored the eighteen markets and by working on stock markets found that there is an efficient behavior of stock prices when they are studied on individual basis. When they expand theory to check the integrated markets they come to results that such integration do not affect the various courtiers stocks to, move together (Kam et al, 1997).

Researchers had also explored the area of market liquidity and its ultimate impact on the efficiency of market. The main rational behind this coverage was to dig the truth regarding the ultimate impact of liquidity on the market efficiency. Chandra in 2002 found that liberalization of trade help to enhance the liquidity, various measures of liquidity were used o find its ultimate impact on the market efficiency. He suggested, after analyzing the ultimate outcome of liberalization as liquidity, that the liquidity results the enhancement of market efficiency. The ultimate findings arrived at by Chanadra were that market efficiency is the result of increased liquidity created by the market liberalization (Chandra 2002).

The concept of market efficiency created in various regions is a very broad topic under discussion. In addition to the study of market efficiency in developed economies the market analysis of developing countries have achieved keen eyes of researchers after the elimination of barriers on trade and liberalization in different areas of business. The openness of border lines among SAARC countries help to promote the tradition of stock investments common in the developing countries including India and other nabhour countries. Poshakwale, 1996 in this regard targeted Indian economy for the study of stock market efficiency. The researcher works on the weak form efficiency of Bombay Stock exchange for a period of eight years and found that there do not exist weak form efficiency in the stock market. He further suggested that day of the week effect presence on the Bombay Stock Exchange. The existence of weak form efficiency show positive results for the developed countries in comparison with the developing countries where there has been taken an action on the elimination of trade barriers after the creation of SAARC (Poshakwale, 1996).

After the openness of borders for business among the SAARC countries few research works have been made to find the forms of market efficiency. In addition to this presence or absence of market efficiency has been rarely verified by experts in these regions although they have targeted the developed areas with keen focus. The reason behind this may be the vast trade activities going on in those economies. In order to overcome this gap Mobarek & Keasey, 2000 targeted the Dhaka Stock Exchange for the study of weak form efficiency. After working on the stock returns they concluded that weak form efficiency exists in the DSE. This evidence helps the markets analysts and experts to utilize the information for future investments and also give the researchers an idea about the new doors of knowledge to be opened by extending the work to some other countries which are member of SAARC (Mobarek & Keasey, 2000).

There has been another point discussed by the researchers that the size of the markets also affects the presence of efficiency in the market. In this regard study work done on the Nairobi stock exchange help to understand that there is presence of weak form of efficiency in the market. Dickinson & Muragu, 1994 consider the NSE as representative of developing economies and get positive link between stuck returns and market week form efficiency (Dickinson & Muragu, 1994).

In order to check verify that countries market follow random walk or not and whether the markets are weak form efficient researchers have applied various methodologies to arrive at the results. Noman & Ahmad in this regard worked on the Asian countries including the SAARC member countries. Where they have applied unit root test to check the random walk and further the weak form efficiency by applying auto correlation. They found that

these markets follow a random walk process; they further argue that these markets are not weak form efficient. (Noman & Ahmed, 2009). Few other people add to literature in this regard where they targeted some other markets to inform that those markets are weak form efficient or not. The authors have targeted Taiwan monthly stock index and concluded that Taiwan stock market is weak form efficient. In order to reach the findings and final arguments they have applied various tests including stationary tests and binominal distribution tests (Fawson, et al., 1996).

Few researchers also link the market efficiency with the liberalization of the market as the liberalization led the free trade and movement of information' this ultimately let the prices to adjust accordingly. Kawakatsu & Morey, 1999 added that although there is free trade in the markets due to liberalization but there is not any significant change in market efficiency due to liberalization. Because the markets are in their efficient form before they are exposed to the liberalization (Kawakatsu & Morey, 1999).

Another work was done by Cheung & Coutts,(2010) but their findings were different from most of the previous works done by scholars. The researchers in theory work targeted the Hong Kong stock exchange and found that market is weak form efficient and follow random walk (Cheung & Coutts, 2010).

In order to support the theories against the efficient market hypothesis the findings suggested by Buguk & Brorsen, (2003) are sufficient to quote they work on the Istanbul stock exchange and found that the three series i.e. composite, financial and industry index prices do not follow the random walk. Hence the prices can be used to forecast the future. (Buguk & Brorsen, 2003). In support of these researchers few others have extended the efforts to Eastern Europe where Guidi et al, (2010) use the stock markets for ten years and found that these markets do not follow the random walk. They further argue that this of market enable the investors to predict the future price changes and can the abnormal returns through investment (Guidi et al, 2010). The study works referred above helps to extend the study to the developing economies as well and also to make a comparison of developed & developing markets.

Theoretical Framework

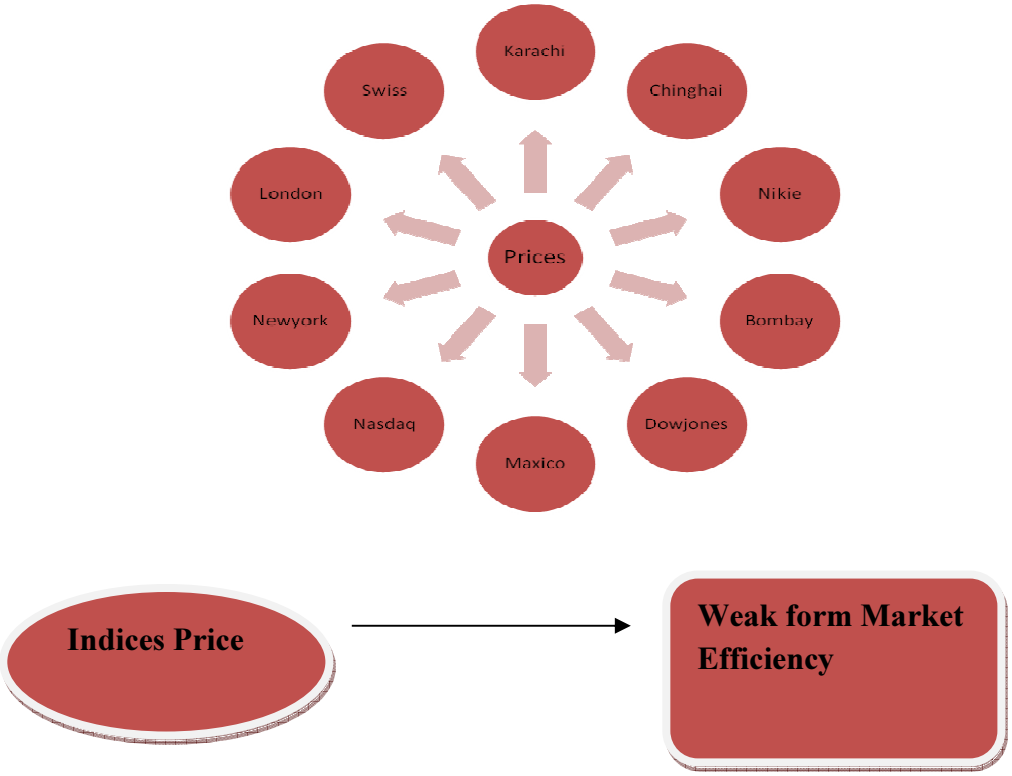


Fig:1 Comparative analysis of Asian, European & American Markets With respect to Market Efficiency

Hypothesis

H1: Karachi Stock Market follows Random Walk Model & is Weak form efficient.
H2: Bombay Stock Market follows Random Walk Model & is Weak form efficient
H3: Chinghai Stock Market follows Random Walk Model & is Weak form efficient
H4: Nikie Stock Market follows Random Walk Model & is Weak form efficient
H5: London Stock Market follows Random Walk Model & is Weak form efficient
H6: Swiss Stock Market follows Random Walk Model & is Weak form efficient
H7: Maxico Stock Market follows Random Walk Model & is Weak form efficient
H8: Nasdaq Stock Market follows Random Walk Model & is Weak form efficient
H9: New York Stock Market follows Random Walk Model & is Weak form efficient
H10: Dowjones Stock Market follows Random Walk Model &is Weak form efficient

METHODOLOGY

Data & Sample

In order to do the research through use various tests data have been collected from daily price indices of 10 countries including Pakistan, India, China, and Japan. Furthermore two European and Four American Markets have been also targeted. For this purpose the period from 2001-2010 have been used to make the sample.

Procedure:

The tests to be applied includes stationarity tests including Unit Root Test, Descriptive statistics have been also applied. In order to check the Random walk Model and Markets Weak form efficiency Auto-correlation test has been used.

Equation

Auto Correlation

$$LB = n(n+2)\sum m\ k = 1\ (P^{n^2}\ \ k/n - k \sim X^2$$

Where P^{n^2}k = Autocorrelation Coefficient at lag K

N= Sample Size

Autocorrelation test is used to check the dependence or interdependence of variables in a series. Test has been applied on the monthly prices over the period of ten years for ten markets including Asian, European & American Markets.

RESULTS AND DISCUSSION

After collection of data the descriptive statistics have been applied to confirm the normality of data. EMH has a condition for random walk model that the data should be normal. This phenomenon can be verified by applying the tests for normality of data. After application of tests the results found are shown in Table.1 the results display a clear picture of lack of data normality. With a high level of Kurtosis for all the ten markets i.e. China (2.541525), Dow(2.249571),India(1.536936),Japan(2.088055),London(2.135111),Maxico(1.494614),Nasdaq(2.934222),Newy ork(2.294008), Pakistan(2.279345), Swiss(2.354468) hence it is clear that data is not normal and prices do not walk randomly. In addition to this the results for skewness for China, Nasdaq and Pakistan are very high and supporting the above findings. To support the above results Augmented Dickey Fuller test has also been applied & results verify the above findings of descriptive statistics. Results show that data for no country was normal at Level. However, when the test range was extended to 1st difference the data was stationary. Hence, the results found at the Level for all the ten markets prove the above results of descriptive statistics that data is not normal and prices do not follow a random walk. This rejects the null hypothesis for all the ten markets that they do random walk.

After applying the above tests for data normality another test has been applied to check whether there is any autocorrelation among the prices or not. Which means that the previous or historical prices are explaining the future prices or not. If there is any significant result for presence autocorrelation in the test of autocorrelation, where the null hypothesis says that there is no autocorrelation then the null hypothesis for market random walk

and weak form efficiency will be prices will be rejected. This means there will be chances of rejection of rondom walk model and weak form efficiency.

After the application of autocorrelation test the results shown in Table. 3.1-3.10 shows that the probability of no autocorrelation for all the markets is equal to 0.000 & there is high autocorrelation in the prices. This clearly rejects the null hypothesis for all the markets targeted in this research work that stock markets do not random walk and they are weak form efficient.

After arriving the results hence it has been proved that china, Pakistan, India, Japan, Dowjones, Nasdaq, Newyork, Maxico, London & Swiss market prices do not follow random walk model and there is no weak form efficiency in these markets. Ultimately it can be argued that the historical prices help to forecast the prices for the following period.

Table.1: Descriptive Statistics

	CHINA	DOWJONES	INDIA	JAPAN	LONDON	MAXICO	NASDAQ	NEWYORK	PK	SWISS
Mean	7.604356	8.106497	8.988336	9.364752	8.535814	9.617809	7.607139	8.845815	8.665372	8.77089
Median	7.467487	8.103701	9.104046	9.313426	8.554412	9.785685	7.64572	8.83018	8.933838	8.751142
Std.Dev	0.418718	0.188101	0.656349	0.229535	0.157315	0.643226	0.192978	0.198544	0.761675	0.196476
Skewness	0.615071	-0.1428	-0.17757	0.312523	-0.2876	-0.22076	-0.71011	0.032894	-0.77754	0.039853
Kurtosis	2.541525	2.249571	1.536936	2.088055	2.135111	1.494614	2.934222	2.294008	2.279345	2.354468
Observations	120	120	120	120	120	120	120	120	120	120

Table. 2 Augmented Dickey Fuller Test

Country	Level	Ist Difference	Critical Value	
China	-1.98784	-3.147146	1%	-3.488
			5%	-2.8868
			10%	-2.5801
Dowjones	-1.74218	-3.967437	1%	-3.488
			5%	-2.8868
			10%	-2.5801
India	-0.82919	-4.414822	1%	-3.488
			5%	-2.8868
			10%	-2.5801
Japan	-2.08389	-4.972166	1%	-3.488
			5%	-2.8868
			10%	-2.5801
Pakistan	-1.88819	-4.075111	1%	-3.488
			5%	-2.8868
			10%	-2.5801
London	-2.04173	-3.748405	1%	-3.488
			5%	-2.8868
			10%	-2.5801
Swiss	-1.86554	-3.733254	1%	-3.488
			5%	-2.8868
			10%	-2.5801
Maxico	-0.51216	-4.289178	1%	-3.488
			5%	-2.8868
			10%	-2.5801
Nasdaq	-1.76696	-4.378293	1%	-3.488
			5%	-2.8868
			10%	-2.5801
Newyork	-2.05185	-3.835487	1%	-3.488
			5%	-2.8868
			10%	-2.5801

Table.3.1 Autocorrelation China

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******|	.|*******|	1	0.974	0.974	116.80	0.000
.|*******|	*|. |	2	0.946	-0.074	227.75	0.000
.|*******|	**|. |	3	0.906	-0.237	330.35	0.000
.|*******|	.|. |	4	0.864	-0.019	424.66	0.000
.|****** |	**|. |	5	0.812	-0.219	508.51	0.000
.|****** |	*|. |	6	0.755	-0.100	581.65	0.000
.|***** |	.|* |	7	0.702	0.161	645.55	0.000
.|***** |	*|. |	8	0.644	-0.164	699.69	0.000
.|**** |	.|. |	9	0.585	-0.042	744.75	0.000
.|**** |	.|. |	10	0.521	-0.037	780.94	0.000
.|**** |	*|. |	11	0.459	-0.096	809.28	0.000
.|*** |	.|. |	12	0.398	0.034	830.75	0.000
.|*** |	.|* |	13	0.341	0.096	846.65	0.000
.|** |	.|* |	14	0.294	0.145	858.60	0.000
.|** |	.|* |	15	0.258	0.186	867.86	0.000
.|** |	*|. |	16	0.225	-0.070	874.97	0.000
.|** |	.|. |	17	0.198	-0.017	880.52	0.000
.|* |	*|. |	18	0.169	-0.162	884.62	0.000

Table.3.2: Autocorrelation Dowjones

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******|	.|*******|	1	0.966	0.966	114.78	0.000
.|*******|	*|. |	2	0.922	-0.159	220.30	0.000
.|*******|	.|. |	3	0.882	0.046	317.60	0.000
.|****** |	*|. |	4	0.836	-0.127	405.73	0.000
.|****** |	*|. |	5	0.784	-0.083	483.89	0.000
.|****** |	.|. |	6	0.730	-0.042	552.37	0.000
.|***** |	.|* |	7	0.690	0.174	614.01	0.000
.|***** |	*|. |	8	0.644	-0.159	668.21	0.000
.|***** |	*|. |	9	0.591	-0.080	714.23	0.000
.|**** |	.|* |	10	0.549	0.135	754.32	0.000
.|**** |	.|* |	11	0.518	0.078	790.30	0.000
.|**** |	*|. |	12	0.481	-0.126	821.68	0.000
.|*** |	*|. |	13	0.433	-0.148	847.39	0.000
.|*** |	.|* |	14	0.394	0.081	868.82	0.000
.|*** |	.|. |	15	0.364	0.056	887.28	0.000
.|** |	*|. |	16	0.328	-0.065	902.41	0.000
.|** |	*|. |	17	0.286	-0.079	914.04	0.000
.|** |	.|. |	18	0.252	0.015	923.13	0.000
.|** |	*|. |	19	0.219	-0.067	930.06	0.000
.|* |	.|. |	20	0.180	0.003	934.79	0.000
.|* |	.|* |	21	0.147	0.126	937.99	0.000
.|* |	.|. |	22	0.128	0.035	940.44	0.000
.|* |	.|. |	23	0.118	0.049	942.53	0.000
.|* |	*|. |	24	0.100	-0.077	944.05	0.000

Table.3.3: Autocorrelation India

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|********	.|********	1	0.981	0.981	118.28	0.000
.|*******|	.|. |	2	0.959	-0.052	232.48	0.000
.|*******|	*|. |	3	0.935	-0.105	341.78	0.000
.|*******|	.|. |	4	0.908	-0.050	445.85	0.000
.|*******|	.|. |	5	0.882	-0.003	544.80	0.000
.|*******|	.|. |	6	0.855	-0.006	638.71	0.000
.|****** |	.|. |	7	0.829	-0.001	727.79	0.000
.|****** |	.|. |	8	0.804	0.003	812.28	0.000
.|****** |	.|. |	9	0.777	-0.055	891.97	0.000
.|****** |	.|. |	10	0.751	-0.021	966.94	0.000
.|****** |	.|. |	11	0.725	0.037	1037.6	0.000
.|***** |	.|. |	12	0.702	0.023	1104.4	0.000
.|***** |	*|. |	13	0.677	-0.065	1167.1	0.000
.|***** |	.|. |	14	0.652	0.000	1225.8	0.000
.|***** |	.|. |	15	0.629	0.020	1281.0	0.000
.|***** |	*|. |	16	0.604	-0.064	1332.5	0.000
.|**** |	.|. |	17	0.580	-0.014	1380.2	0.000
.|**** |	.|. |	18	0.556	0.024	1424.6	0.000
.|**** |	.|. |	19	0.533	-0.001	1465.7	0.000
.|**** |	*|. |	20	0.508	-0.075	1503.5	0.000
.|**** |	.|. |	21	0.486	0.053	1538.4	0.000
.|**** |	.|. |	22	0.466	0.061	1570.9	0.000

Table.3.4: Autocorrelation Japan

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******|	.|*******|	1	0.962	0.962	113.94	0.000
.|*******|	*|. |	2	0.913	-0.183	217.28	0.000
.|*******|	*|. |	3	0.858	-0.071	309.37	0.000
.|****** |	*|. |	4	0.794	-0.138	388.97	0.000
.|****** |	*|. |	5	0.726	-0.061	456.11	0.000
.|***** |	.|* |	6	0.672	0.180	514.13	0.000
.|***** |	.|. |	7	0.625	0.026	564.73	0.000
.|**** |	.|. |	8	0.582	-0.002	608.98	0.000
.|**** |	.|. |	9	0.548	0.039	648.52	0.000
.|**** |	*|. |	10	0.508	-0.173	682.89	0.000
.|**** |	.|. |	11	0.467	-0.013	712.19	0.000
.|*** |	*|. |	12	0.421	-0.095	736.17	0.000
.|*** |	.|. |	13	0.376	0.041	755.47	0.000
.|** |	*|. |	14	0.324	-0.080	769.94	0.000
.|** |	.|* |	15	0.279	0.080	780.78	0.000
.|** |	*|. |	16	0.231	-0.112	788.32	0.000
.|* |	*|. |	17	0.183	-0.066	793.07	0.000
.|* |	.|. |	18	0.141	0.044	795.93	0.000

Table.3.5 Autocorrelation London

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******|	.|*******|	1	0.949	0.949	110.68	0.000
.|*******|	.|. |	2	0.897	-0.027	210.49	0.000
.|*******|	.|. |	3	0.852	0.038	301.30	0.000
.|****** |	*|. |	4	0.800	-0.095	382.03	0.000
.|****** |	*|. |	5	0.735	-0.149	450.87	0.000
.|***** |	.|. |	6	0.671	-0.050	508.61	0.000
.|***** |	.|. |	7	0.609	-0.015	556.69	0.000
.|**** |	*|. |	8	0.542	-0.081	595.14	0.000
.|**** |	.|. |	9	0.473	-0.051	624.65	0.000
.|*** |	.|. |	10	0.408	-0.009	646.83	0.000
.|*** |	.|* |	11	0.356	0.085	663.88	0.000
.|** |	.|. |	12	0.306	-0.005	676.53	0.000

.|** |	*|. |	13	0.241	-0.168	684.48	0.000
.|* |	.|. |	14	0.187	0.037	689.33	0.000
.|* |	.|. |	15	0.137	-0.055	691.95	0.000
.|* |	.|. |	16	0.084	-0.053	692.93	0.000
.|. |	*|. |	17	0.024	-0.105	693.02	0.000
.|. |	.|* |	18	-0.020	0.088	693.07	0.000
.|. |	.|. |	19	-0.052	0.061	693.46	0.000
*|. |	*|. |	20	-0.095	-0.101	694.77	0.000

Table.3.6: Autocorrelation Swiss

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******|	.|*******|	1	0.970	0.970	115.72	0.000
.|*******|	**|. |	2	0.928	-0.217	222.49	0.000
.|*******|	.|. |	3	0.883	-0.024	320.08	0.000
.|****** |	*|. |	4	0.830	-0.162	407.08	0.000
.|****** |	.|. |	5	0.777	0.021	483.96	0.000
.|****** |	*|. |	6	0.720	-0.105	550.60	0.000
.|***** |	.|. |	7	0.663	0.002	607.56	0.000
.|***** |	.|. |	8	0.608	-0.010	655.85	0.000
.|**** |	.|. |	9	0.552	-0.033	696.09	0.000
.|**** |	.|. |	10	0.500	0.018	729.37	0.000
.|*** |	.|. |	11	0.452	0.012	756.78	0.000
.|*** |	*|. |	12	0.401	-0.101	778.57	0.000
.|*** |	.|. |	13	0.350	-0.024	795.37	0.000
.|** |	.|. |	14	0.300	-0.049	807.83	0.000
.|** |	.|. |	15	0.250	-0.030	816.53	0.000
.|** |	*|. |	16	0.198	-0.080	822.05	0.000
.|* |	.|. |	17	0.144	-0.057	825.00	0.000
.|* |	.|. |	18	0.093	0.013	826.24	0.000
.|. |	.|. |	19	0.048	0.055	826.58	0.000
.|. |	*|. |	20	0.000	-0.131	826.58	0.000

Table.3.7: Autocorrelation Pakistan

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******|	.|*******|	1	0.975	0.975	117.04	0.000
.|*******|	.|. |	2	0.949	-0.050	228.74	0.000
.|*******|	.|. |	3	0.922	-0.026	335.05	0.000
.|*******|	.|. |	4	0.896	0.010	436.32	0.000
.|*******|	.|. |	5	0.869	-0.033	532.42	0.000
.|****** |	*|. |	6	0.839	-0.076	622.82	0.000
.|****** |	.|. |	7	0.807	-0.055	707.19	0.000
.|****** |	.|. |	8	0.775	-0.004	785.79	0.000
.|****** |	*|. |	9	0.740	-0.105	857.99	0.000
.|***** |	.|. |	10	0.707	0.051	924.59	0.000
.|***** |	.|. |	11	0.675	-0.017	985.78	0.000
.|***** |	*|. |	12	0.641	-0.058	1041.4	0.000
.|***** |	.|* |	13	0.611	0.079	1092.5	0.000
.|**** |	.|. |	14	0.583	0.022	1139.4	0.000
.|**** |	.|. |	15	0.555	-0.014	1182.4	0.000
.|**** |	.|. |	16	0.530	0.023	1222.0	0.000
.|**** |	*|. |	17	0.502	-0.066	1257.7	0.000
.|**** |	.|. |	18	0.473	-0.042	1289.9	0.000
.|*** |	.|. |	19	0.445	-0.012	1318.7	0.000
.|*** |	.|. |	20	0.419	0.010	1344.3	0.000

Table.3.8: Autocorrelation Maxico

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|********	.|********	1	0.980	0.980	118.04	0.000
.|*******|	*|. |	2	0.957	-0.067	231.61	0.000
.|*******|	.|. |	3	0.933	-0.036	340.50	0.000
.|*******|	.|. |	4	0.910	0.014	445.00	0.000
.|*******|	.|. |	5	0.888	0.020	545.46	0.000
.|*******|	.|. |	6	0.867	-0.023	641.88	0.000
.|*******|	.|. |	7	0.846	0.013	734.54	0.000
.|****** |	*|. |	8	0.822	-0.076	822.92	0.000
.|****** |	*|. |	9	0.795	-0.094	906.37	0.000
.|****** |	.|. |	10	0.768	-0.010	984.92	0.000
.|****** |	.|. |	11	0.743	0.037	1059.1	0.000
.|****** |	.|. |	12	0.719	0.007	1129.2	0.000
.|***** |	.|. |	13	0.695	-0.034	1195.2	0.000
.|***** |	.|. |	14	0.672	0.013	1257.5	0.000
.|***** |	.|. |	15	0.651	0.044	1316.6	0.000
.|***** |	.|. |	16	0.628	-0.041	1372.1	0.000
.|***** |	.|. |	17	0.605	-0.041	1424.1	0.000
.|**** |	.|. |	18	0.581	-0.024	1472.5	0.000
.|**** |	.|. |	19	0.556	-0.040	1517.3	0.000
.|**** |	.|. |	20	0.531	-0.014	1558.5	0.000

Table.3.9: Autocorrelation Nasdaq

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******|	.|*******|	1	0.914	0.914	102.81	0.000
.|****** |	.|. |	2	0.827	-0.052	187.67	0.000
.|****** |	.|* |	3	0.761	0.084	260.22	0.000
.|***** |	*|. |	4	0.691	-0.073	320.41	0.000
.|***** |	.|. |	5	0.634	0.061	371.56	0.000
.|**** |	*|. |	6	0.565	-0.125	412.49	0.000
.|**** |	.|. |	7	0.502	0.029	445.19	0.000
.|*** |	*|. |	8	0.429	-0.146	469.22	0.000
.|*** |	.|* |	9	0.372	0.098	487.51	0.000
.|** |	*|. |	10	0.321	-0.074	501.19	0.000
.|** |	.|. |	11	0.272	0.050	511.14	0.000
.|** |	*|. |	12	0.213	-0.167	517.28	0.000
.|* |	*|. |	13	0.135	-0.086	519.79	0.000
.|* |	.|. |	14	0.086	0.054	520.81	0.000
.|. |	.|. |	15	0.051	0.058	521.17	0.000
.|. |	.|. |	16	0.025	0.013	521.27	0.000
.|. |	.|. |	17	-0.003	-0.036	521.27	0.000
.|. |	.|* |	18	-0.017	0.102	521.31	0.000
.|. |	.|. |	19	-0.029	-0.045	521.43	0.000
*|. |	*|. |	20	-0.060	-0.093	521.95	0.000
*|. |	.|* |	21	-0.059	0.117	522.46	0.000
.|. |	.|. |	22	-0.052	0.020	522.86	0.000

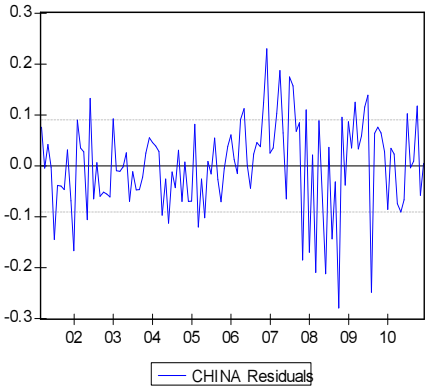
Table.3.10: Autocorrelation New York

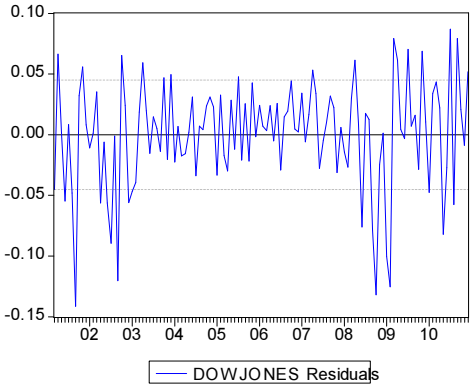
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******|	.|*******|	1	0.967	0.967	115.14	0.000
.|*******|	**|. |	2	0.922	-0.219	220.56	0.000
.|*******|	.|. |	3	0.877	0.036	316.87	0.000
.|****** |	*|. |	4	0.825	-0.168	402.77	0.000
.|****** |	*|. |	5	0.765	-0.097	477.31	0.000
.|***** |	.|. |	6	0.704	-0.034	540.96	0.000
.|***** |	.|* |	7	0.653	0.153	596.28	0.000
.|***** |	*|. |	8	0.600	-0.132	643.38	0.000
.|**** |	*|. |	9	0.541	-0.067	682.03	0.000
.|**** |	.|* |	10	0.491	0.089	714.13	0.000
.|*** |	.|. |	11	0.450	0.047	741.31	0.000

.|*** |	*|. |	12	0.406	-0.101	763.61	0.000
.|*** |	*|. |	13	0.356	-0.079	780.94	0.000
.|** |	.|* |	14	0.315	0.084	794.65	0.000
.|** |	.|. |	15	0.280	-0.023	805.58	0.000
.|** |	.|. |	16	0.242	-0.037	813.79	0.000
.|** |	.|. |	17	0.201	-0.044	819.53	0.000
.|* |	.|. |	18	0.168	0.046	823.59	0.000
.|* |	*|. |	19	0.138	-0.071	826.33	0.000
.|* |	*|. |	20	0.096	-0.134	827.68	0.000

Table 4: Results for ARMA (Auto Regressive Moving Average)

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
China	C	0.184695	0.154444	1.195864	0.2342
	CHINA(-1)	0.976103	0.020289	48.11041	0
	RESIDCHINA(-1)	0.080956	0.095	0.852166	0.3959
Dowjones	C	0.307911	0.184085	1.672661	0.0971
	DOWJONES(-1)	0.962259	0.022706	42.37929	0
	RESIDDOW(-1)	0.221906	0.094007	2.360518	0.0199
	C	0.052554	0.099906	0.52604	0.5999
India	INDIA(-1)	0.995641	0.011089	89.78319	0
	RESIDINDIA(-1)	0.142259	0.09294	1.530657	0.1286
Japan	C	0.451088	0.227502	1.982789	0.0498
	JAPAN(-1)	0.951626	0.024287	39.18268	0
	RESIDJAPAN(-1)	0.225019	0.093893	2.396548	0.0182
London	C	0.427131	0.23132	1.846495	0.0674
	LONDON(-1)	0.949948	0.027104	35.04881	0
	RESIDLONDON(-1)	0.123116	0.096705	1.273107	0.2055
Maxico	C	0.614916	0.25491	2.412289	0.0174
	NASDAQ(-1)	0.919364	0.03352	27.42761	0
	RESIDNASDAQ(-1)	0.22395	0.09276	2.414292	0.0173
Newyork	C	0.398203	0.200215	1.988882	0.0491
	NEWYORK(-1)	0.955172	0.02263	42.208	0
	RESIDNEWYORK(-1)	0.278387	0.092769	3.000879	0.0033
Nasdaq	C	0.614916	0.25491	2.412289	0.0174
	NASDAQ(-1)	0.919364	0.03352	27.42761	0
	RESIDNASDAQ(-1)	0.22395	0.09276	2.414292	0.0173
Pakistan	C	0.188787	0.094985	1.987549	0.0492
	PK(-1)	0.980319	0.010913	89.82635	0
	RESIDPAKISTAN(-1)	0.105988	0.093268	1.136373	0.2582
Swiss	C	0.379761	0.176409	2.152731	0.0334
	SWISS(-1)	0.956525	0.020112	47.55959	0
	RESIDSWISS(-1)	0.309017	0.090971	3.396889	0.0009


CHINA Residuals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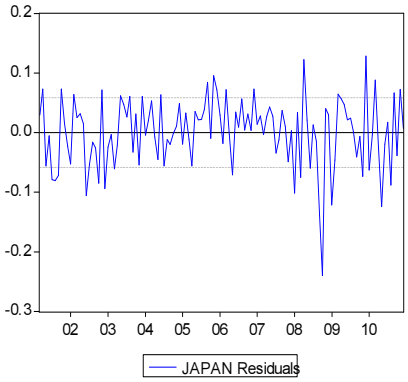
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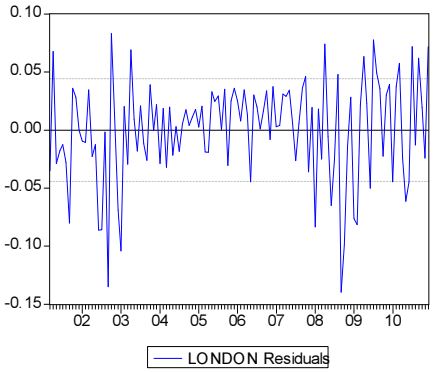
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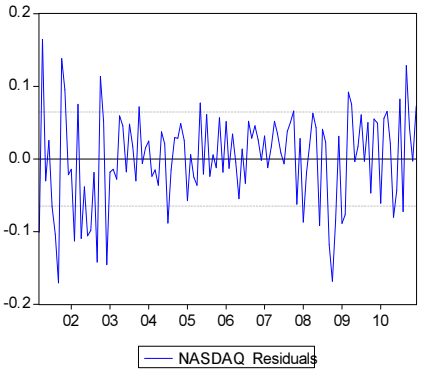
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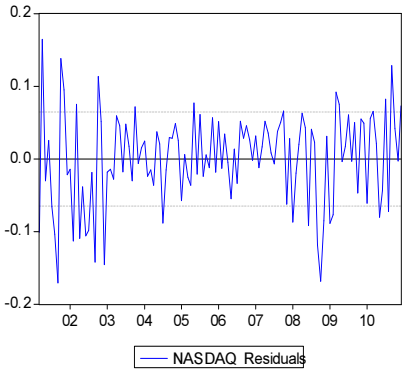
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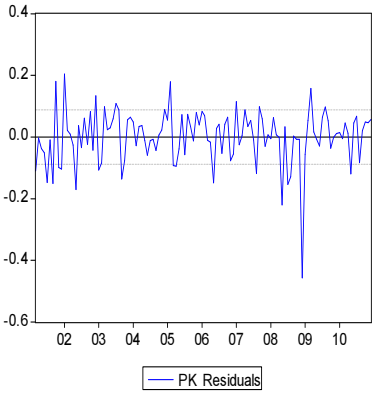
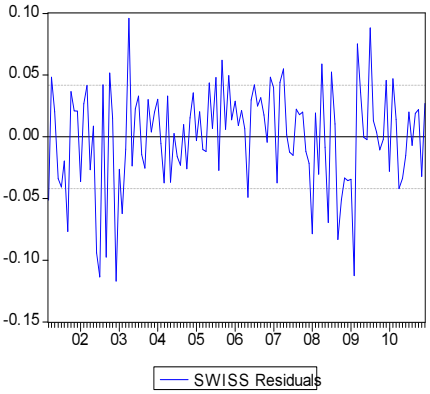
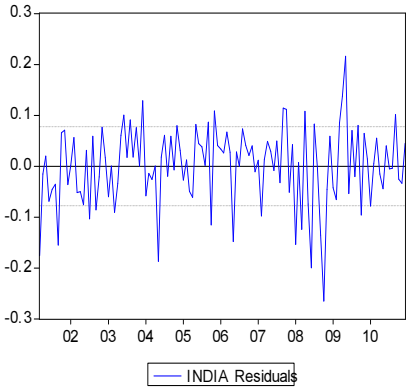
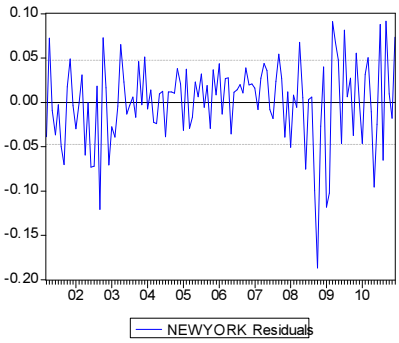

PK Residuals


SWISS Residuals


INDIA Residuals


NEWYORK Residuals

CONCLUSION

Efficient market hypothesis is a very important concept concerning the price movements in the market & is based upon the random walk theory. Current study has targeted the markets from three different regions to find out what outcomes are for various market prices from different regions. In order to check whether these three regional markets follow random walk and weak form efficiency data have been collected for ten markets including Pakistan, China, Japan, India, Europe and America.

Study found that these markets do not follow random walk and also do not have weak form efficiency. Extracting the meanings from these findings theory suggests that prices of these markets explain the future price movements. This can help the investors to take important investment decisions in the market. By using the information the investors can avail the chance of profitable investment which has left or overlooked by others. Such situation has the mispricing behavior of the prices and the investor can earn the profits until the prices move back to their fundamental values.

Study has been completed by using the data from major markets from different regions. This can be extended to some other Asian markets which are not larger one. In addition to this, future researchers can extent the study to the other forms of market efficiencies as well.

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