Journal of Poverty, Investment and Development
ISSN 2422-846X An International Peer-reviewed Journal
Vol.21, 2016

Relationship between Major Developed Equity Markets and Major Frontier Equity Markets of World

Muhammad Mansoor Baig Muhammad Bilal Waheed Aslam
University of Sargodha Sub-campus Mianwali, Pakistan

Abstract
The core aim of this study is to compute the long run relationship between frontier equity markets Pakistan (KSE 100 Index), Argentina (MERVAL BUENOS AIRES) stock Exchange, NSE.20 (Kenya), MSM 30 (MSI) Oman and equity markets of developed world (OMXS30) Sweden, SMI (Switzerland), SSE Composite Index (China) and STI index (Singapore) by taking weekly values from stock return prices for the period 1st week of January-2000 to last week of March/2014. Descriptive statistic, Correlation, Augmented dickey fuller (ADF), Phillips Perron test, Johanson and Jelseluis test of co-integration, Granger causality test, Variance Decomposition Test and Impulse Response are used to find the relationship among frontier and developed markets. The results of this study reveal that frontier markets have no long run relationship with equity markets of developed world. Furthermore, this study is helpful for investors to enhance the returns by diversifying the unsystematic risk at given level of profit.
Keywords: Diversification, portfolio, frontier markets, unit root test, Co-integration test, markets of developed countries
JEL CLASSIFICATION*:* G10; G20

Introduction

There are different types of investment institutions available almost all over the world which offers investment opportunities for investors to make investment in them. Frontier equity markets are also part of investment institution for investors defined as the markets at early stage of growth as compared to other markets, while emerging markets defined as a country having or possessing some of the qualities to reach the level of those developed market which have already occupied their position in the world.

The word frontier equity market was first used by international finance corporation in 1996, represent a small number of liquid securities and offer excellent diversification benefits to investors. The word frontier defined as the small markets which impose restrictions on foreign ownership. The frontier equity markets are launched to achieve economic development and growth by diversifying risk. Before investing in frontier equity markets all shareholders, investors and portfolio managers make assure either their investment funds utilized efficiently or not, also they analyze that any sign of prosperity is visible or not and to how much extent their funds will give benefit to them. Further investors become more aware about safety of their funds saved and they already learn about amount of their risk and return, which may lead them for saving in frontier equity markets. Frontier markets are becoming important source of strong earnings in the form of return, so investors focus on these markets on the basis of following benefits which are offered to their policy owners, there is no ownership in frontier equity markets, creating potential earnings economy for all investors and shareholders in the form of return. No doubt, frontier markets are less liquid but trend of investments does not decrease. (Schroders)

To understand the relationship between frontier equity market and equity market of developed country, selected some major frontier equity market (Pakistan, Argentina, Kenya and Oman) with developed equity stock markets of Sweden, Switzerland China, Singapore for the period 1st week of January-2000 to last week of March/2014. If the markets of regional countries move together to invest in different equity markets would not gain any profit. Regional diversification suggests investing in those stock markets which are less correlated. To gain the benefit of diversifying, it is necessary that your portfolio assets should be invested in those markets which are negatively correlated as compared to developed markets which offer higher return to investors (Markowitz). Now a day's all investors are investing in frontier equity markets and developed equity markets. So individual, foreign and institutional investor began to diversify their risk by investing in different frontier and developed equity markets.

The terrorist's activities are the major obstacles in the growth of frontier markets so there is huge amount of risk involved in frontier markets, but no doubt the investors are more interested to get higher return as compared to other markets. Effective liberalization encourages the investors to make their investments in domestic and foreign equity markets but unfortunately there is absence of effective liberalization due to market integration, so on these reasons investors get back from investments (Bekaert et all 2003). The deregulation and liberalization affect directly investors behavior and consequently investment trend declines day by day, so investors feel hesitant in making investments mansoor at al(2014).

All business private organizations have a primary objective to maximize the shareholder wealth in a good way. The investor or portfolio managers can enhance the returns by diversifying the unsystematic risk at given

level of profit. The stock Investor by making investment in different stock of domestic country are unable to achieve optimum diversification (Mansoor et al.). This may be due to companies' face the same economic or political situation. So the Frontier equity markets have different economic environment as compared to developed equity market. This study will suggest the investors or portfolio managers to invest across the border in those equity markets which are different to each other economically and politically. In this way, the portfolio managers may be able to attain fully diversified portfolio and minimize the country risk.

The study has objectives to recognize a long run relationship between developed equity markets and frontier equity market and secondly there exists lead lag relationship or not.

Literature Review

Shezad et al(2014), examined the relationship between co-integration of Pakistani stock markets whose selected Asian stock market for the period 2001 to 2013 by taking monthly values of stock market return. This study used descriptive statistics, correlation analysis, unit root test, VAR, Co-integration test and VECM test. Result shows that KSE is not co-integrated with Japan, Malaysia, Taiwan and China. All these tests and their results show that there is correlation between Chines markets and KSE 100. This study also concluded that for the Chinese investors have opportunities to make investment in these markets.

Khan & Aslam (2014), explored the study on co-integration of Karachi Stock Exchange index 100 with major Asian stock exchange markets Bombay Stock Exchange (BSE Index 30), Malaysian Stock Exchange (FTSE) and Japan Stock Exchange for the period 2007 to 2013 by selecting monthly values of stock markets. This study use data description and Augmented Fuller test (ADF) result shows that there is no co-integration of KSE 100 index with developed countries such as China and Japan. But Pakistani KSE 100 index co-integrated with India and Malaysia stock markets.

Prakhar Porwal (2014), explored the concept of diversification that how diversification will be achieved by focusing on frontier markets as well as developed markets. For this purpose, data was collected by MSCI and S&P Sri Lanka of the frontier and emerging markets. The data was analyzed by correlation and volatility of MSCI indices. The result shows that in frontier markets there is more risk involved but higher return will be gained with low volatility as compared to other emerging market.

Narayan @ al(2004) examined the dynamic linkage between the stock markets of developing countries such as Bangladesh, India, Pakistan and Sri Lanka by binding the relationship among the stock prices indices within a multivariate co integration framework for the period 1995-2001 by taking daily values of stock markets return. This study use co integration, causality testing, unit root test. Result shows that there exists a long run relationship between the Sri Lanka stock prices with Pakistan. It further used impulse response which concludes that Sri Lanka market has small impact on Pakistani market.

Aslam et al(2012) investigated the relationship between Karachi stock exchange with major developed equity market for the period 1999-212 by taking weekly values of stock prices. The stock data was analyzed by using VAR statistic, unit root test, unrestricted co-integration rank test (trace), unrestricted co-integration rank test (maximum Eigen value) granger causality. The result and finding shows that Karachi stock exchange is less or weakly correlated with developed equity markets and there is no co-integration exists among the stock markets.

Mansoor et al(2012) investigated a study on relationship between major Asian markets (kse 100,india BSE 500,srilanka CSE) with developed equity markets(cac40,ftse100,nikkie 225,s&p 500).the weekly data was collected for the period 2000-2012.the data was analyzed by applying descriptive statistic, augmented dickey fuller test, Phillips test, granger causality test, Johansen co-integration test, vector error correction model and variance decomposition test. The result shows that there is no long run relationship exists between south Asian equity markets while short run significant relationship exists. Further study help the investor or portfolio managers can enhance the returns by diversifying the unsystematic risk at given level of profit. The stock Investor by making investment in different stock of domestic country unable to achieve optimum diversification

Khalil jebran(2014) investigated a study on dynamic linkage between selected south Asian equity markets(India, Indonesia, China, Malaysia And Sri Lanka) with Pakistani stock market by using monthly data of stock prices was taken for the period 2003 to 2013.The correlation matrix, unit root test, Johansen and juselius co-integration, Granger Causality test and variance decomposition were applied to analyze data .The result shows that Indonesia stock market shows highest return among the selected Asian equity markets. India and Indonesia equity markets show high level of correlation and Johansen and Juselius result shows that long run relationship exist between selected stock markets. These all results show that there exists no confirmation of selected equity markets with Karachi stock exchange.

Hypothesis

H1: There is long run relationship exists between frontier equity markets and equity markets of Developed world.
H1: Emerging market of India (SENSEX) does not influence the frontier equity markets.
H01: There is no long run relationship exists between frontier equity markets and equity markets of Developed

world.

H2: There is Lead Lag relationship exists between the frontier equity markets and equity markets of Developed world.

H02: There is no Lead Lag relationship exists between the frontier equity markets and equity markets of Developed world.

Methodology

In this study weekly data of frontier equity markets and developed markets was collected by using Investing.com and Yahoo finance for the period 1st week of January-2000 to last week of March/2014. To explore the relationship, we selected some frontier equity market such as KSE 100 Index (Pakistan), Argentina (MERVAL BUENOS AIRES) stock Exchange, NSE.20 (Kenya), MSM 30 (MSI) Oman and major developed equity stock markets of (OMXS30) Sweden, SMI (Switzerland), SSE Composite Index (China), and STI index (Singapore). This study assists the portfolio manager and decision makers to calculate the return rate by applying the equation of Rtn=logn (Prt./Prt-1)

Where Rtn =shows the return in a given period t
Prt =shows the price at the time of closing
Prt-1=shows the price at the time of opening
Logn=represent the natural logarithm

In this study the techniques of Correlation, unit root test, co- integration, variance decomposition, granger causality and impulse response are used to measure the nature of relationship.

Results:

Table 5.1 Descriptive statistics:

	India	Pakistan	Sri Lanka
Mean	0.0002	0.000479	-0.00044
Median	0.000516	0.000813	-0.00013
Maximum	0.014541	0.014018	0.014867
Minimum	-0.01859	-0.02227	-0.02827
Std. Dev.	0.003805	0.003817	0.003915
Skewness	-0.59589	-1.08995	-0.95366
Kurtosis	5.965785	7.918217	10.65743
Jarque-Bera	310.7432	880.2829	1894.169
Probability	0	0	0

The table 3.1 shows the description of markets. The table represents the value of mean, median, maximum, minimum Standard deviation, Skewness and kurtosis. The results reveal that Pakistan stock exchange 100 and India (SENSEX) show high return while Colombo stock show negative return. On the other hand, in terms of standard deviation KSE 100 stock market shows the highest value of standard deviation (0.003817), which differentiate it from all SENSEX and CSE markets at given period of time.SO we can conclude that KSE100 stock market is one of the riskier or higher return stock market because it gives the highest value of return in a given time study.

Table 5.2 Correlation technique:

	SENSEX	KSE	CSE
SENSEX	1		
KSE	0.043486	1	
CSE	-0.04677	-0.0296	1

Table (5.2) explores the correlation among the different selected stock markets. It indicates that emerging market of India (SENSEX) weekly correlated with frontier market of KSE and negatively with frontier market of CSE. The frontier equity market of KSE is negatively correlated with CSE.

Table 5.3 Unit root test:

	ADF LEVEL	ADF 1st DIF	PP LEVEL	PP 1st DIF
India	-0.36066	-16.7078	-0.3793	-25.9705
Pakistan	-1.05841	-16.582	-1.01088	-23.0001
Sri Lanka	-0.2557	-16.6498	-0.20493	-22.7762
Critical values				
1%	-3.43909	-3.43911	-3.43908	-3.43909
5%	-2.86529	-2.86529	-2.86528	-2.86529
10%	-2.56882	-2.56883	-2.56882	-2.56882

The table 5.3 shows both augmented and Philips- Perron test confirmed that data is not stationary at level but it is stationary at first difference.

Table 5.4 Multivariate co integration:

		Eigen value	Trace statistic	Critical value 5%	Remarks
India	**At most 1**	0.019117	22.98304	29.79707	NO-COINTEGRATION
Pakistan	**At most 2**	0.011977	8.912032	15.49471	NO-COINTEGRATION
Sri Lanka	**At most 7**	0.000176	0.127963	3.841466	NO-COINTEGRATION

Table 5.4 shows the values of multivariate co integration. Result indicates that there is no co-integration equations at the 0.05 level.

Table 5.5 Bivariate co-integration KSE:

	Eigenvalue	Statistic	Critical Value	Prob.**	Remarks
Pakistan-India	0.018995	16.32356	15.49471	0.0374	Co-integrated
	0.003209	2.342893	3.841466	0.1259	

The results of above table reveal that Karachi stock exchange is Co-integrated with India (SENSEX) market, which discourage all shareholders, portfolio managers and investors to invest their funds.

Table 5.5 Bivariate co-integration CSE:

	Eigenvalue	Statistic	Critical Value	Prob.**	Remarks
India-Sri lanla	0.00414	3.027193	15.49471	0.9657	NO-COINTEGRATION
	4.03E-06	0.002941	3.841466	0.9552	

The results of above table reveal that Colombo stock exchange is not Cointegrated with India (SENSEX) market, which encourage all shareholders, portfolio managers and investors to get the benefit of diversification.

GRANGER CASUALITY:

Pairwise Granger Causality Tests
Date: 11/20/15 Time: 10:23
Sample: 1 731
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
KSE does not Granger Cause SENSEX	728	4.26269	0.0054
SENSEX does not Granger Cause KSE		1.71493	0.1625
CSE does not Granger Cause SENSEX	728	1.50814	0.2111
SENSEX does not Granger Cause CSE		0.55639	0.6440
CSE does not Granger Cause KSE	728	0.87420	0.4541
KSE does not Granger Cause CSE		1.03562	0.3761

The above table shows the result of Granger causality technique, which explore that frontier market KSE 100 does not granger cause the stock return in SENSEX and CSE. The emerging market of India (Sensex) does not granger cause the stock return in both frontier equity markets (KSE & CSE).

Table 5.9 Variance Decomposition of SENSEX:

Period	S.E.	SENSEX	KSE	CSE
1	0.003812	100	0	0
2	0.003815	99.99521	0.003313	0.001476
3	0.003815	99.99493	0.003505	0.001565
4	0.003815	99.99492	0.003513	0.001569
5	0.003815	99.99492	0.003513	0.001569
6	0.003815	99.99492	0.003513	0.001569
7	0.003815	99.99492	0.003513	0.001569
8	0.003815	99.99492	0.003513	0.001569
9	0.003815	99.99492	0.003513	0.001569
10	0.003815	99.99492	0.003513	0.001569

Above table show change in SENSEX stock exchange explained by due to its own innovation and also tells that other frontier stock exchanges have no effect on it if any change or fluctuation occurs in these frontier markets.

Table 5.10 Variance Decomposition of KSE:

Period	S.E.	SENSEX	KSE	CSE
1	0.003763	0.211063	99.78894	0
2	0.003825	0.614898	99.2389	0.1462
3	0.003827	0.6322	99.20808	0.159724
4	0.003827	0.632766	99.20674	0.160491
5	0.003827	0.632785	99.20669	0.160528
6	0.003827	0.632786	99.20669	0.160529
7	0.003827	0.632786	99.20669	0.160529
8	0.003827	0.632786	99.20669	0.160529
9	0.003827	0.632786	99.20669	0.160529
10	0.003827	0.632786	99.20669	0.160529

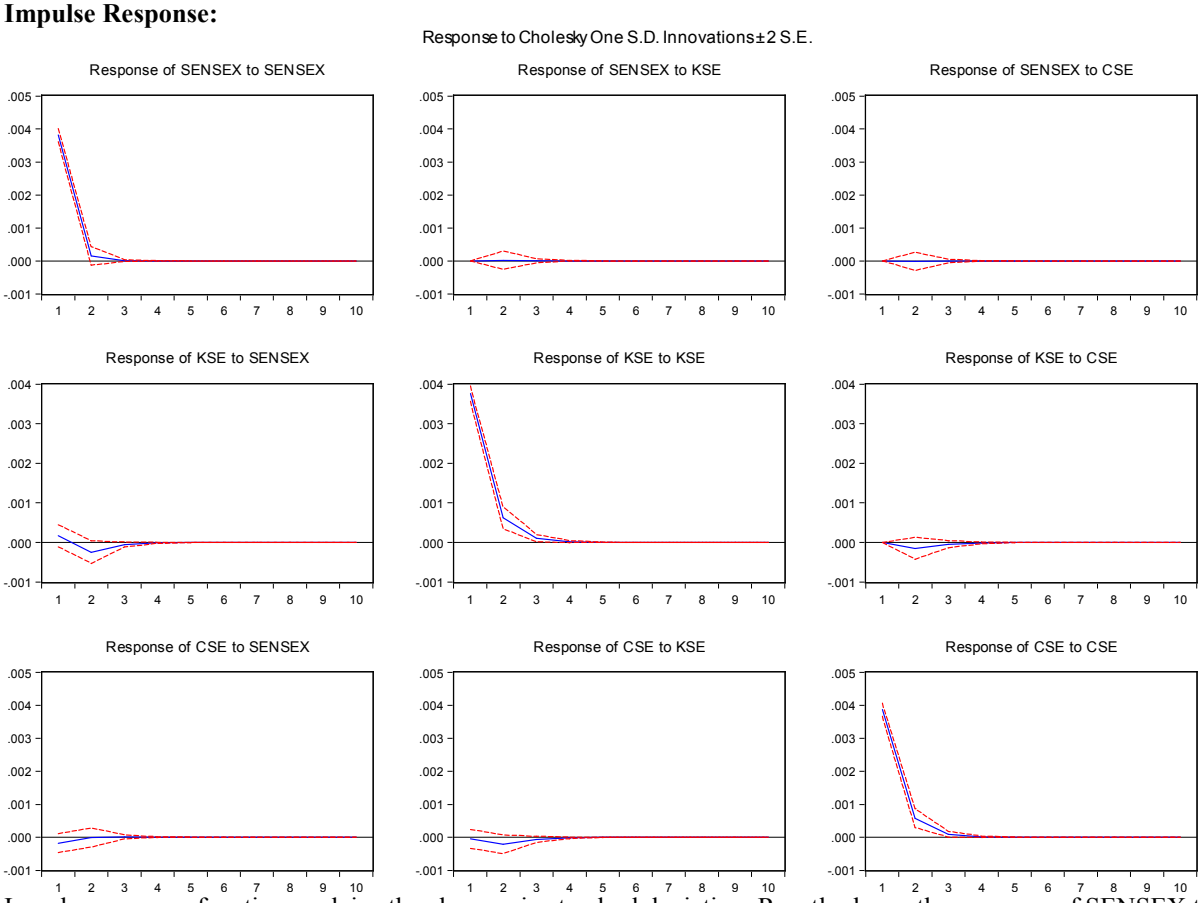
Above Table shows, change in Karachi stock exchange explained by due to its own innovation and tells that SENSEN and CSE exchanges have no effect on it if any change or fluctuation occurs in these markets.

Table 5.11 Variance decomposition of CSE:

Period	S.E.	SENSEX	KSE	CSE
1	0.003876	0.213888	0.017183	99.76893
2	0.003924	0.209311	0.311638	99.47905
3	0.003926	0.210225	0.339227	99.45055
4	0.003926	0.210365	0.340806	99.44883
5	0.003926	0.210374	0.340882	99.44874
6	0.003926	0.210375	0.340885	99.44874
7	0.003926	0.210375	0.340885	99.44874
8	0.003926	0.210375	0.340885	99.44874
9	0.003926	0.210375	0.340885	99.44874
10	0.003926	0.210375	0.340885	99.44874

Above Table shows change in CSE stock exchange explained by due to its own innovation and also tells that KSE and SENSEX stock exchanges have no effect on it if any change or fluctuation occurs in these markets.

Impulse Response:



Impulse response function explains the changes in standard deviation. Resutls shows the response of SENSEX to the changes in the Frontier equity markets. However, results of Impulse Response Function shows that SENSEX returns are not influnced by the shocks in the other marekts.

Conclusion

The main objective of every study is to give direction to the readers. This study is conducted between Emerging market of India (SENSEX) and frontier equity markets of Pakistan and SRI LANKA. Both the types of stock markets have different economic, social and geographic conditions.so it may be possible that the economic environment for the investors of these countries is different and same is the case political conditions.

The purpose of this study to relationship between emerging market of India (SENSEX) and Frontier markets of Pakistan and Sri Lanka for the period 1st week of January-2000 to last week of March/2014. The aim of this study is to investigate whether the co movement or integration exists among these stock markets or not because co movement is very important for the investors. The results of this study reveals that frontier market of Pakistan (KSE100) is riskier and high return market, showing a behavior of more volatile market as compared to all other selected markets in the study, which is a best opportunity for local and foreign investors to earn more profit. The correlation analysis indicates emerging market of India (SENSEX) weekly correlated with frontier market of KSE and negatively with frontier market of CSE. This study assists the investor or portfolio managers to enhance the returns by diversifying the unsystematic risk at given level of profit. For this purpose, augmented fuller (ADF) and Phillips-Perron techniques are used for stationary of data at similar order by applying on log prices of stock return. Multivariate co integration is applied which indication of no co integration equation among stock markets. The finding of granger cause explore that frontier equity market of KSE does not granger cause the stock return in SENSEX and CSE. The results of vector decomposition designate that change in frontier markets (Pakistan, Sri Lanka) explained by due to its own innovation and SENSEX stock exchange have no effect on it if any change or fluctuation occurs in India market.

This study will suggest the investors or portfolio managers to invest across the border in those equity markets which are different to each other economically and politically. In this way the portfolio managers may be able to attain optimum diversified portfolio and also minimize the country risk.

References

Khan, S. N., & Aslam, M. S. (2014). Co-integration of Karachi Stock Exchange with Major South Asian Stock

Exchanges. International Journal of Accounting and Financial Reporting.
Porwal, P. (2014). ACHIEVING DIVERSIFICATION IN GLOBAL. Int. J. Mgmt Res. & Bus. Strat. 2014.
Narayan, P., Smyth, R., & Nandha, M. (2004). Interdependence and dynamic linkages between the emerging stock markets of South Asia. Accounting and Finance, 419-439.
Su, Y., & Yip, Y. (2014). Contagion Effect of 2007 Financial Crisis on Emerging and Frontier Stock Markets. Journal of Accounting and Finance, 97-113.
Shezada, A., Jana, F. A., Gulzara, S., & Ansarid, M. A. (2014). A Study on Co-integration of Pakistani Stock Market with Selected Asian Stock Markets. Journal of Management Info, 52-74.
Sarfraz, A., Shehzadi, S., Hussain, H., & Altaf, M. (2012). Co-integration of Karachi Stock Exchange With Major Asian Markets. ACTA UNIVERSITATIS DANUBIUS Vol 8, no 5, , 118-129.
Shahzad, S. H., Ahmed, T., Rehman, M. U., & Zakaria, M. (2014). Relationship between Developed,Emerging and South Asian Equity Markets: Empirical Evidence with a Multivariate Framework Analysis. Munich Personal RePEc Archive, 1-27.
Kisaka, S. E., & Mwasaru, A. (2012). The Causal Relationship between Exchange Rates and StockPrices in Kenya. Research Journal of Finance and Accounting, 121-130.
Mansoor, M., Hassan,, A., & Hussain, R. H. (2014). Long Run Relationship between South Asian Equity Markets and Equity Markets of Developed World. International Journal of Management and Strategy, 1-22.
Tahir, S. H., Sabir, H. M., ALI, Y., Ali, S. J., & Ismail, A. (2013). INTERDEPENDENCE OF SOUTH ASIAN & DEVELOPED STOCK MARKETS AND THEIR IMPACT ON KSE (PAKISTAN). Asian Economic and Financial Review, 16-27
YANG, J., KOLARI2, J. W., & MIN, I. (2002). Stock market integration and financial crises:the case of Asia. Applied Financial Economics, 1-30.
Zeren, F., & Koç, M. (2013). Analyzing Integration between Stock Market of Turkey and G8 Nations with Maki Cointegration Test. Journal of Applied Finance & Banking, vol. 3, no. 6, 135-142.
Nath, G. c., & Verma, S. (2003). Study of Common Stochastic Trend and Co-Integration in the Emerging Markets. Applied Financial Economics, 1-34.
Palamalai, S., M., K., & Devakumar, C. (2013). Stock Market Linkages in Emerging Asia-Pacific Markets. SAGE Open, 1-15
Aslam, N., HUSSAIN, H., & Altaf, M. (2012). LONG-RUN RELATIONSHIP BETWEEN KARACHI STOCK EXCHANGE AND MAJOR DEVELOPED EQUITY MARKETS. International Journal of Management and Strategy.