Do Stock Markets Provide Diversification? A Case Study of South Asian Countries

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Abstract
The essential goal of this study is to compute the long run relationship between emerging market of India (SENSEX) with frontier markets of KSE 100 and Colombo stock exchange by taking weekly values from stock return prices for 2000-2014. The technique of Johanson co-integration, Granger causality test, and Variance Decomposition Test are applied. The results of this study reveal that emerging market of India (SENSEX) has no long run relationship with frontier markets (KSE, CSE). This study is helpful for investors to enhance their returns by diversifying the unsystematic risk at given level of profit.
Key words: Diversification, Emerging and frontier markets, unit root test, Co-integration test
JEL CLASSIFICATION*:* G10; G20

Introduction

A major difference of economies differentiates or classified the emerging and frontier markets i.e. emerging market show higher scale of economies while frontier markets are lies on the initial stage of development having slow economies. 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 trend of globalization dominating in today world. Countries are diminishing the trade barriers across the borders to achieve high return and optimize the wealth of the owners. Global companies promoting globalization via markets globalization, Production globalization and financial markets globalization. The purpose of globalization, in terms of equity markets to minimize unsystematic risk. In the current era recent years' interdependence and relationships among the stock markets is increases unexpectedly. The portfolio manager may diversify their investment by investing in different industries of one country but this type of diversification is limited. International Diversification suggests investing in those stock markets, which shows low level of interdependence or not show co-movements.

This study aims to examine or investigate the relationship between emerging market of India (SENSEX) and frontier equity market of Pakistan (KSE100) and Sri Lanka(CSE). This study purpose to helps investors and portfolio managers whether the investment in Sensex stock market or frontier markets (KSE 100 and Colombo stock exchange) provide diversification to their portfolio or not. 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 invested in those markets, which are negatively correlated' as compared to developed markets, which offer higher return to investors (Markowitz). 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, due to these reasons investors get back from investments (Bekaert et all 2003).

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. 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 emerging market of India (SENSEX) and frontier markets (KSE100, CSE) and secondly there exists lead lag relationship or not.

Literature Review

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 all (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

Yuli Su & Yewmun Yip (2007), investigated the long run relationship between US and some emerging stock market and analyzes the contagion fact of financial crises on emerging and equity markets. The data was collected stock index prices of 32 countries from (MSCI) for the period 2002 to 2013. This study use unit root test, co-integration analysis, Recursive co-integration analysis and descriptive statistics. The result shows that there is no co-integrated between US markets and foreign stock markets. Although in 2007 financial degree of co-integration increases due to this reasons benefits of international diversification effected which conclude that short term relationship exist between US stock markets and emerging stock markets.

Raj et al(2008) explore the relationship between the Indian stock market with Hong Kong, Singapore, UK, USA and Japan by applying Augmented Dickey-Fuller unit root test and johansen multivariate Vector error correction model for the period 1993-2008.The result shows the Indian Stock markets are integrated with other stock markets in terms of stock prices measured in Us dollar.

Amalendu bhunia (2012) investigated a study on the relationship of stock market in India and south Asian countries. The data was collected for the period of august2002 to august 2011 by the taking daily values of stock market return. The data was analyzed by using applying bivariate and multivariate co-integration tests and the granger causality test. This study concluded that both short run and long run relationship exist. This study provides the opportunities for investors to enlarge their investments in both Indian and selected south Asian markets.

Francesco Guidi et all (2010) investigated a study on co-movements among Indian stock market and three selected developed Asian markets for the period of 1999-2009 by taking the daily stock prices. The data was analyzed by applying co-integration and 7ddin7es test. The result shows that the trend in investing in India is limited and correlation rise during periods of crises.

Lorde et all (2009) investigated a study on long run co movements, and efficiencies in Emerging stock markets of Barbados, Jamaica, Trinidad and Tobago. For this purpose, data was collected for the period of 1999-2006 by taken values of stock markets. The data was analyzed by applying techniques of co integration and common feature testing. The study concluded that there is no long run or short run relationship exists in these markets. However, the Barbados stock market(BSE), Jamaica stock market (JSE), Trinidad and Tobago stock market(TTSE) are weakly efficient, segmented and these markets give the benefits to portfolio managers by making investing from regional diversification.

Yang et all (2003) conducted a study on both short and long run causal linkage among ten Asian emerging and U.S, Japanese stock market integration and financial crises for the period 1997 to 1998 to judge at what extent financial crises effect prices of stock market. This study used comparative analyses of pre-crises and post crises period to evaluate the effect of crises. The result shows that there exist a strong long run and short run causal linkage with Asia market and becomes more integrated after the crises.so study further help to differentiate on the basis of change of integration as compared to other studies.

Hypothesis

H1: There is long run relationship exists between emerging market of India (SENSEX) and frontier markets (KSE100, CSE).

H01: There is no long run relationship exists emerging market of India (SENSEX) and frontier markets (KSE100, CSE).

H2: There is Lead Lag relationship exists between emerging market of India (SENSEX) and frontier markets (KSE100, CSE).
H02: There is no Lead Lag relationship exists between emerging market of India (SENSEX) and frontier markets (KSE100, CSE).

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), Colombo stock exchange(CSE) and SENSEX market of India. 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 1.1 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 1.1 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 1.2 Correlation technique:

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

Table 1.2 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 1.3 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 1.3 shows both augmented and Philips- Perron test confirmed that data is not stationary at level but it is stationary at first difference.

Table 1.4 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 1.4 shows the values of multivariate co integration. Result indicates that there are no co-integration equations at the 0.05 level.

Table 1.5 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 1.6 Bivariate co-integration CSE:

	Eigenvalue	Statistic	Critical Value	Prob.**	Remarks
India-Sri Lanka	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 co-integrated with India (SENSEX) market, which encourage all shareholders, portfolio managers and investors to get the benefit of diversification.

GRANGER CASUALITY:

Null Hypothesis:	**F-Statistic**	**Prob.**
KSE does not Granger Cause SENSEX	4.26269	0.0054
SENSEX does not Granger Cause KSE	1.71493	0.1625
CSE does not Granger Cause SENSEX	1.50814	0.2111
SENSEX does not Granger Cause CSE	0.55639	0.6440
CSE does not Granger Cause KSE	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 1.7 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 1.8 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

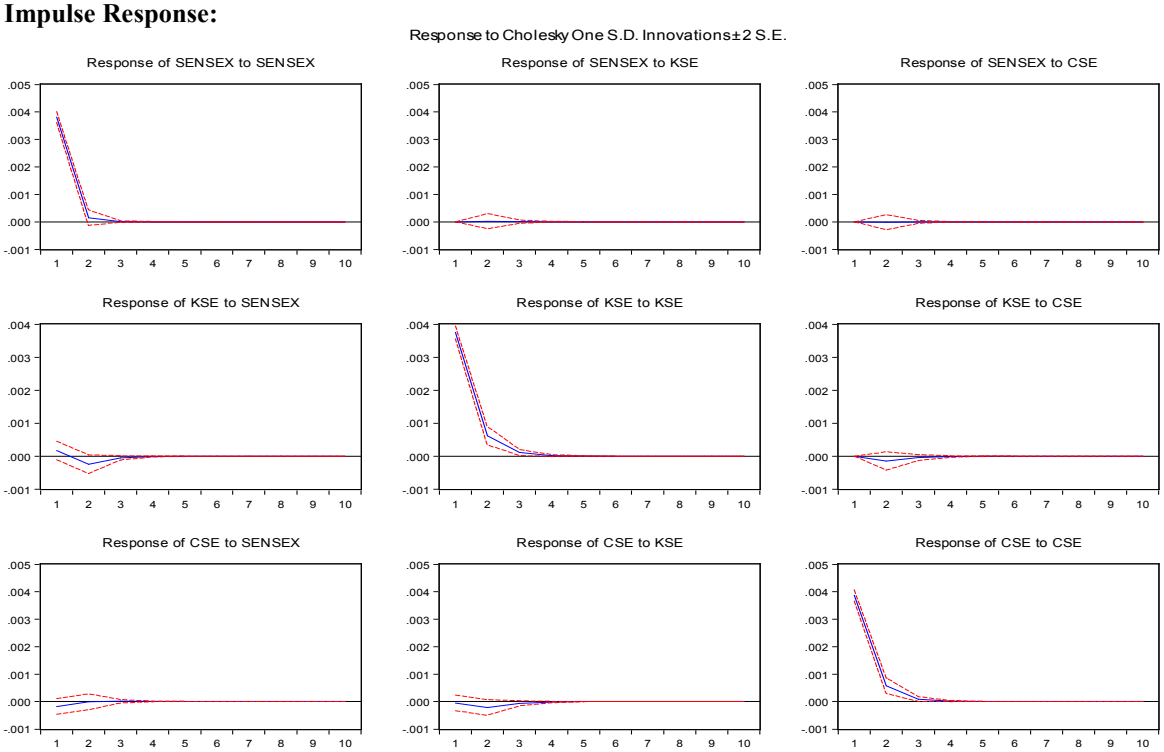
Above Table shows, change in Karachi stock exchange explained by due to its own innovation and tells that SENSEN and CSE exchanges have no effect on it if any change or fluctuation occurs in these markets.

Table 1.9 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 tell's 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.

This study aims to examine or investigate the relationship between emerging market of India (SENSEX) and frontier equity market of Pakistan (KSE100) and Sri Lanka(CSE). 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 this 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 explores that frontier equity market of KSE does not granger cause the stock return in SENSEX and CSE.

This study is productive for the portfolio managers who make investments in the Sensex and frontier markets (KSE100, CSE) with the aim to attain the high rate of profit. The portfolio managers assume that by making investments in different countries they diversify their portfolio and minimizing their unsystematic risk but if the co-movements exist among the equity markets it leads to undiversified portfolio. Surely this types of studies helpful the investors for decision making in the creation of diversified portfolios. 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. Furthermore, this study expected to help the portfolio managers making right decisions about the investments. This study provides guidance to portfolio managers that they can get the advantage of diversification and reduce the unsystematic risk by investing in the Sensex market and frontier markets. By making investment in Foreign countries the investor manages systematic risk like country risk, political risk etc.

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