Dynamic Linkages between Asian Countries Stock Markets: Evidence from Karachi Stock Exchange

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Abstract

The prime aim of this study is to explore dynamic linkages between Stock market of Pakistan and selected Asian countries (India, Indonesia, China, Malaysia and Srilanka). For this study the most recent data of Monthly closing stock prices indices taken for the period November, 2003 to November, 2013. Correlation matrix was applied for finding associationship between stock markets which shows evidence of integration of India and Indonesia equity market. All the variables are found stationary at 1st Difference by applying unit root test. The Johansen and juselius co integration approach was applied for checking the long run relationship between variables which confirms only one cointegrating equation. Granger Causality test reveals that stock market of Srilanka is granger caused by India, Indonesia and Malaysia stock market. While there exist unidirectional causality from India, Malaysia and Indonesia to Srilanka stock market. This study found no long run relationship of Pakistan stock market with any other stock market. The variance decomposition implies that variances in stock markets of Pakistan and India are due to their own market innovation and other markets have no contribution to them.

Keywords: Granger causality, Johansen cointegration, correlation, unit root, diversification.

Introduction

Deregulation and trade liberalization opened the opportunities for foreign and domestic investors. International liberalizations removed the barriers for foreign inflows to domestic country. The removal of barrier has made the goods and services internationalized for foreign. Also the common stock markets have been opened for foreign investors for investments. This provided an opportunity for many investors to maximize their wealth by looking for different investments opportunities around the globe. So the individual and institutional investors began to diversify their risk by looking around the world wherever they can enhance their wealth. The investors were unable to invest in global well developed equity markets of the world before liberalization. Now a day's all around the globe the investors are able to gain advantage by investing in developing and well developed equity markets. The process of looking around the globe and diversifying the risk is called portfolio diversification. This concept was developed for the first time by Markowitz in 1952. He is known to be the pioneer researcher by introducing this concept. He gave the concept by investing in different assets rather than in a single asset investment. He said that the investors can diversify their risk by investing in different assets; that have either no relationship or either negative relationship. By no relationship means if there is any downturn and fluctuation in one economy so the loss of one asset can be compensated to other asset if they have no relationship. Later on Sharpe modify the concept of Markowitz by giving the concept of Capital Asset pricing model.

The concept of portfolio diversification provided the concept of investing in the assets having no relationship. So the risk of an investment can be minimized by investing in those assets having negative relationship. So than the investor can earn benefits from an investment. The investors first diversify their risk by investing in domestic assets. By having no benefits in the domestic level he began to move for foreign investments in the foreign equity markets. There are developed and emerging markets by which they can earn benefits and can diversify their risk. The huge investments in capital markets caused the international markets to lead and follow one another. Markets having associationship with each other can cause the investors to cannnot earn benefits from it. Liberalization opened opportunities for investors to invest in foreign markets but these also caused the foreign markets to lead and lag each other. This led the researchers to explore the linkages between the foreign markets to provide insights to investors for decisions making purpose. Literature provides the knowledge that countries which have trade relationships (imports, exports) are found to be integrated with each other. But many studies includes relationships of stock markets having no trade relationships in them. The knowledge about the integration of foreign markets have been a prime focus for many researchers and also investors. This gives the basis for decision making in investing in the foreign markets. The investors may always look for markets having no relationship because than there would be benefit of diversification. If the investors invest in two correlated markets so then they cannot enjoy the benefits of diversification.

Basis purpose of this study is to explore the dynamics of associationship between Asian countries stock markets. This study aims to provide insights about the relationships of selective Asian countries stock markets. For this purpose we have selected six equity markets of Asia. These equity markets includes: Pakistan, Srilanka, China, India, Malaysia and Indonesia. The novelty of this study is that I have undertaken this study on the diverse mix economies. This study will explore the integration of developed, developing and emerging markets. So the investors can gain benefit from this study by having knowledge of diverse mix economies.

Research Questions: i. Is there any long run associationship among Asian countries stock market? ii. Is there any diversification opportunity among selective Asian countries?

Research Objectives: i. To explore the long run and short run associationship among selected Asian countries. ii. To explore Unidirectional and Bidirectional causality. iii. To explore diversification opportunities for investors.

Significance of the study: This study aims to provide insights regarding decision making purpose to investors for making effective portfolio investments in Asian countries. This will be helpful for minimizing risk and earning benefits in international diverse mix economies. So this study will explore the dynamics of integration in Asian equity markets which will be helpful for both domestic and foreign investors.

Literature Review: Literature provides many studies for exploring interdependence of different equity markets for providing the opportunities to international investors for making well and effective diversified portfolios. But the literature provides inconsistent results regarding integration of markets. This is because of the methodological differences and also because of the difference in data use i.e. daily, weekly and monthly. Few of the studies of researchers are following

Wong et al. made an attempt to investigate the relationship of Asian emerging countries with the major established economies of the world. For this purpose they have employed weekly stock prices from Jan, 1981 to Dec, 2002. They used cointegration for this purpose to explore the integration in diverse mix countries. They found evidence of relationships in the emerging equity markets of Asia with those of the established countries. However they said that the emerging markets exhibits some short run integration in them. They said that their study will be helpful for investors in terms of decision making and foreign investments because they provided the associationship of emerging with the developed equity markets[1].

The integration of developing and emerging equity markets have been studied by Celayn and Dogan. They in their study included Pakistan, Lebanon, Morocco, Jordon, Oman, Kuwait and Egypt equity market. They found evidence of association of Lebanon with Kuwait. Their result also reveal that the market of turkey and Egypt. They concluded that other countries investors can enjoy benefits[2].

Islam et al. studied the markets of Malaysia Singapore and India for the purpose of exploring relationships in equity markets. In order to explore the dynamics of these equity markets they used the multivariate approach of cointegration. The causality was analyzed by using the granger causality test. Their study is based on the equity prices of daily data taken from July, 1997 to Feb, 2005. Their results pointed to unidirectional flow from Singapore equity market to Malaysian equity market. While the other market have been found bidirectional flow[3].

Lamba explore the dynamics of integration of south Asian with those established equity markets of the world by using the analyses of cointegration. He used the established equity markets of Japan, UK and US. He used the granger causality for examining the causal flow. He found that there is only response from the Indian equity markets to the developed markets while the other markets of Pakistan and Srilanka shows no such trends. So the investors of Pakistan may take advantage of this.

Glezakos et al. used a comprehensive study on exploring integration of different equity markets of the world in comparison with Athens stock market. In their analyses they included developed markets, USA, Japan, France and Germany and other markets in their study includes England, Spain, Italy, Holland and Belgium with the Athens market for the period 2000-2006. They confirmed integration of Athens market with different markets. They found evidence of multidirectional spillover in different markets using granger causality[5].

Ismail et al. made an attempt to explore the Asian equity markets with well established market of US. They have used four markets; Hong Kong, South Korea, Malaysia and India. Their study is undertaken by using monthly indices from 1996 to 2008. They found the evidence of relationship of US market with Asian by using the analyses of VAR model[6].

The Asia emerging equity markets was studied for integration with the equity market US by Sharma. She used the cointegration for exploring the associationship between these equity markets. Her analyses confirmed that the emerging markets are influenced by the US market. So the emerging market investors cannot earn benefit by investing in US market[7].

The integration of Pakistan market with the diverse mix economies was studied by Ali et al. They used the developed market of US, Japan, UK and China and other markets India, Indonesia, Singapore, Malaysia and Indonesia for this purpose. The monthly data taken from 1998 to 2008 have been analyzed by using the cointegration analyses. They found that the equity market of Pakistan is not integrated with the equity market of Singapore, UK, USA, Malaysia and Taiwan[8].

Hussain et al. empirically investigated association of Pakistan equity market with the East Asian Stock Markets. The monthly data from 2000 to 2010 of stock indices was analyzed using cointegration and error correction technique. Their analyses confirmed no relationship between the equity markets of East Asia. However they found unidirectional flow from Japan to equity market of Pakistan and to equity market of China[9].

Aslam et al. carried out a study for finding integration among developed equity markets and KSE for period 1999 to 2012. They have applied cointegration analyses for this purpose. They found that Pakistan equity market is weakly integrated with the developed stock markets. They also found that KSE have influence on France stock market, London stock market and US stock market[10].

Methodology

This study comprises of monthly closing stock prices indices from Nov, 2003 to Nov, 2013 for the following stock markets: Shanghai Stock Exchange (SSE), Bombay stock exchange (BSE), Jakarta stock exchange (JKSE), Kualalumpur stock exchange (KLSE), Karachi stock exchange (KSE), Colombo stock exchange (CSE). The ten years data will be enough to analyze the linkages among the selected stock markets. The return of each index is calculated by the following formula.
Return = $R_t = \ln(P_t / P_{t-1})$,

Where: R_t = Return for Given Period't'; P_t = Price at closing time. P_{t-1} = Price at the opening time. ln = Natural Log

Descriptive Statistics: Descriptive statistics is carried to analyze the behavior of the data of returns of the markets. It usually includes mean, median, maximum and minimum statistics of the data. It also provides the level of deviation in each variable.

Correlation matrix: It is used to know about the relationship between different variables. It also tells about positive or negative association ship. But the major defect is that it doesn't tells about long term or short term association ship between different series.

Unit root test: For cointegration test it is necessary that all the variables should be stationary of same order. Two test are used for this purpose Augmented Dickey fuller and Phillip Perron test.

Johansen Cointegration test: To know about long run association ship between different series johansen cointegration is used. This test will be used for finding long run relationship between this six equity markets.

Granger causality: It is a statistical hypothesis test which is used to determine whether one time series is useful in forecasting another series. If two series are cointegration there exists at least uni directional relationship.

Variance Decomposition: Variance decomposition is used to check that how much in percentage a market is innovative in itself and there is any contribution of other market or not. This shows the decomposition of variance in each market

Abbreviation used

Pakistan	KSE	Karachi Stock Exchange
Indonesia	JKSE	Jakarta stock Exchange
Srilanka	CSE	Colombo Stock Exchange
India	BSE	Bombay Stock Exchange
Malaysia	KLSE	Kualalumpur Stock Exchange
China	SSE	Shanghai Stock Exchange

Results and Discussion

Descriptive Statistics is carried out to examine the behavior of the stock returns of the selected stock markets. The table 1 represents analyses of six equity markets. Among the selected equity markets maximum monthly return of 24.88 % is shown by BSE with standard deviation of 7.3 % monthly. KSE represents minimum monthly return of about -44.87 % in selected equity markets. JKSE represents maximum mean monthly return of 1.64 %. The maximum monthly standard deviation of SSE is 8.78 % in these markets and mean monthly return is 0.3 %. The maximum monthly return shown by KSE in this particular period is 20.22% and shows average monthly return of 1.43 % with standard deviation of 7.76% for this period. The mean monthly return of CSE is 1.33% while KLSE represents 7% mean monthly return. All the markets data are found negatively skewed except CSE which is found positively skewed.

Table 2 represents the correlation matrix of selected equity markets. The analyses reveal the highest between the markets of BSE and JKSE. There results also found integration of KLSE and JKSE. The is also correlation between markets of BSE and KLSE and between BSE and SSE. Correlation results found moderate relationship between markets of: SSE and KLSE, SSE and JKSE. KSE is the only equity market which is not associated with any equity market.

Cointegration test is conducted on data to be stationary of same order at first difference or second difference. For this purpose all the data for various stock market indices are tested for stationarity. Unit root analyses is followed for this purpose. Two tests are used for analyzing stationarity. i. Augmented Dickey Fuller ii. Phillip Perron test. These tests have been applied to know about the stationary of different equity markets which confirms the stationarity of all the data of same order. Both test reveals same results and confirm the stationary of same order at first difference. So I can test cointegration between these equity markets.

Table-1
Descriptive Statistics

Statistics	BSE	CSE	JKSE	KLSE	KSE	SSE
Mean	0.011962	0.013305	0.016431	0.007024	0.014307	0.003590
Median	0.010887	0.011638	0.028251	0.011448	0.019601	0.007626
Maximum	0.248851	0.212441	0.183417	0.127032	0.202276	0.242526
Minimum	-0.272992	-0.176150	-0.377197	-0.165142	-0.448796	-0.282779
Std. Dev.	0.073851	0.070743	0.068877	0.038739	0.077680	0.087806

Table-2
Correlation Matrix

Variables	BSE	CSE	JKSE	KLSE	KSE	SSE
BSE	1.000000					
CSE	0.234683	1.000000				
JKSE	0.717390	0.282265	1.000000			
KLSE	0.590344	0.315001	0.685571	1.000000		
KSE	0.210998	0.072930	0.160913	0.189030	1.000000	
SSE	0.427883	0.133816	0.396888	0.510961	0.112803	1.000000

Table-3
Unit Root Test

Variables	ADF Level	ADF First Diff.	PP Level	PP First Diff.
BSE	-1.8790	-10.059	-1.8880	-10.121
CSE	-1.2223	-9.7709	-1.2949	-10.019
JKSE	-1.4601	-8.6407	-1.7056	-8.6935
KLSE	-0.9210	-9.0975	-1.1580	-9.2522
KSE	-1.5037	-9.3436	-1.5641	-9.3126
SSE	-1.4875	-10.054	-1.8835	-10.571
Critical Values				
1%	-3.4855	-3.4860	-3.4855	-3.4860
5%	-2.8856	-2.8858	-2.8856	-2.8858
10%	-2.5797	-2.5798	-2.5797	-2.5798

Tabel-4
VAR statistics

Lag	LogL	LR	FPE	AIC	SC	HQ
0	241.37	NA	6.25e-1	-4.1659	-4.0211	-4.1072
1	1026.7	1473.5	1.09e-1*	-17.430*	-16.416*	-17.018*
2	1044.1	30.747	1.52e-1	-17.100	-15.217	-16.336
3	1089.7	75.843	1.30e-1	-17.270	-14.518	-16.153
4	1111.5	33.948	1.71e-1	-17.018	-13.398	-15.549
* indicates lag order selected by the criterion						

The suitable Lag length is used estimation of cointegration test. VAR statistics is followed for this purpose. The significance of Schwarz value is the suitable lag value

The analyses confirms the Schwarz and also akaike information criterion significance at lag one which confirms that it is the suitable lag value to test the cointegration between the selected equity markets.

Table-5
Trace test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.374648	109.2926	107.3466	0.0370
At most 1	0.211542	53.42919	79.34145	0.8125
At most 2	0.103621	25.14572	55.24578	0.9898
Trace test show 1 cointegrating eqn(s) at 0.05				

Table-6
Maximum Eigenvalue Test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.374648	55.86345	43.41977	0.0014
At most 1	0.211542	28.28347	37.16359	0.3611
At most 2	0.103621	13.01764	30.81507	0.9684
Max-eigenvalue test show 1 cointegrating eqn(s) at 0.05				

Johansen Co integration Test: Johansen and juselius cointegration test was applied for the purpose of exploring long run associationship between the selected equity markets. Johansen and juselius cointegration is based on two test i.e. Trace test and Maximum Eigen value. Both tests are following the maximum likelihood procedure for evaluating the relation between variables

The Trace test confirms 1 cointegrating vector while Maximum Eigenvalue test also indicates 1 cointegrating equations. The result finds evidence of one long run associationship between the selected stock markets. In order to know about the unidirectional or bidirectional causal flow between equity markets Granger Causality test is applied.

Granger causality test is followed for determining and forecasting the one market to other market. Granger causality tells about the unidirectional or bidirectional flow between variables. Table 7 represents the analyses of Granger causality which confirms no evidence of any bidirectional lead lag relationship between the selected variables of the study. However the result indicates to unidirectional flow of causality in many markets. The unidirectional causality between equity markets are following. The results found evidence of causality from Indian equity market to Srilanka stock exchange. Also the Indonesia stock market is influence by Srilanka stock exchange. There also evidence of unidirectional flow from Malaysia stock market to Indonesia stock market.

The results found evidence of unidirectional associationship in the following markets.

From Kuala lumpur stock market to stock market of Colombo, from stock market of Bombay to Colombo stock market, From stock market of Jakarta to Colombo stock market and.
Table-7

Granger causality Test

Null Hypothesis	Obs	F-stat	Prob.
JKSE doesnot Granger Cause BSE	119	0.210	0.6471
BSE doesnot Granger Cause JKSE		1.361	0.2457
CSE doesnot Granger Cause BSE	119	0.432	0.5122
BSE doesnot Granger Cause CSE		7.323	0.0078
KLSE doesnot Granger Cause BSE	119	3.068	0.0825
BSE doesnot Granger Cause KLSE		2.330	0.1296
KSE doesnot Granger Cause BSE	119	1.003	0.3185
BSE doesnot Granger Cause KSE		1.076	0.3017
SSE doesnot Granger Cause BSE	119	0.044	0.8330
BSE doesnot Granger Cause SSE		0.845	0.3599
CSE doesnot Granger Cause JKSE	119	0.057	0.8110
JKSE doesnot Granger Cause CSE		8.531	0.0042
KLSE doesnot Grangr Cause JKSE	119	2.685	0.1040
JKSE doesnot Granger Cause KLSE		1.652	0.2012
KSE doesnot Granger Cause JKSE	119	2.595	0.11
JKSE doesnot Granger Cause KSE		0.590	0.44
SSE doesnot Granger Cause JKSE	119	0.890	0.34
JKSE doesnot Granger Cause SSE		0.548	0.46
KLSE doesnot Granger Cause CSE	119	5.394	0.02
CSE doesnot Granger Cause KLSE		1.605	0.20
KSE doesnot Granger Cause CSE	119	0.017	0.89
CSE doesnot Granger Cause KSE		0.114	0.73
SSE doesnot Granger Cause CSE	119	0.017	0.89
CSE doesnot Granger Cause SSE		0.875	0.35
KSE doesnot Granger Cause KLSE	119	2.096	0.15
KLSE doesnot Granger Cause KSE		0.190	0.66
SSE doesnot Granger Cause KLSE	119	0.897	0.34
KLSE doesnot Granger Cause SSE		0.590	0.44
SSE doesnot Granger Cause KSE	119	0.036	0.84
KSE doesnot Granger Cause SSE		0.005	0.94

Table-8
Variance Decomposition of BSE

Period	S.E.	BSE	CSE	JKSE	KLSE	KSE	SSE
1	0.071883	100.0000	0.000000	0.000000	0.00000	0.000000	0.000000
2	0.105931	97.13506	0.573177	0.154334	0.75085	1.382397	0.004175
3	0.129107	94.74480	1.005990	0.328409	0.50570	3.135745	0.279347
4	0.145548	92.95730	1.259276	0.462317	0.54251	4.212969	0.565621
5	0.158389	91.61468	1.488085	0.535522	0.71043	4.828480	0.822802
6	0.169114	90.59706	1.731237	0.570445	0.90500	5.166851	1.029407
7	0.178457	89.80275	1.992627	0.582719	1.09130	5.342592	1.188009
8	0.186790	89.15652	2.267936	0.582078	1.26505	5.420347	1.308058
9	0.194318	88.60813	2.551101	0.574411	1.43091	5.436682	1.398763
10	0.201173	88.12502	2.836577	0.563191	1.59446	5.413349	1.467399

Table-9
Variance Decomposition of CSE

Period	S.E.	BSE	CSE	JKSE	KLSE	KSE	SSE
1	0.07188	9.229637	90.77036	0.000000	0.000000	0.000000	0.000000
2	0.10593	17.96801	79.54930	0.851792	0.085992	0.338575	1.206325
3	0.12910	23.12266	73.00112	1.525874	0.226438	0.438565	1.685351
4	0.14554	25.55924	69.66202	2.269966	0.183241	0.528487	1.797049
5	0.15838	26.54018	67.73918	3.087500	0.161671	0.683872	1.787596
6	0.16911	26.74250	66.45127	3.930783	0.245945	0.909208	1.720292
7	0.17845	26.51144	65.45043	4.764403	0.453787	1.195551	1.624387
8	0.18679	26.03648	64.57784	5.561046	0.777771	1.530549	1.516322
9	0.19431	25.42737	63.76213	6.300865	1.202032	1.901613	1.405986
10	0.20117	24.75073	62.97224	6.970971	1.709206	2.297288	1.299564

Table-10
Variance Decomposition of JKSE

Period	S.E.	BSE	CSE	JKSE	KLSE	KSE	SSE
1	0.07188	51.1922	0.88550	47.9222	0.00000	0.00000	0.00000
2	0.10593	56.4315	1.32418	40.6929	0.59494	0.90038	0.05595
3	0.12910	57.3138	2.28374	37.8288	0.59375	1.63842	0.34136
4	0.14554	57.2225	3.37856	36.3636	0.51306	1.86103	0.66112
5	0.15838	56.9904	4.61760	35.1624	0.45204	1.81586	0.96157
6	0.16911	56.7487	5.98838	33.9570	0.40715	1.66854	1.23010
7	0.17845	56.5005	7.44528	32.7214	0.36978	1.49765	1.46522
8	0.18679	56.2320	8.94116	31.4828	0.33521	1.33835	1.67036
9	0.19431	55.9340	10.4367	30.2707	0.30313	1.20556	1.84982
10	0.20117	55.6040	11.9018	29.1055	0.27669	1.10458	2.00730

Table-11
Variance Decomposition of KLSE

Period	S.E.	BSE	CSE	JKSE	KLSE	KSE	SSE
1	0.07188	34.29863	2.622303	11.47994	51.59912	0.000000	0.000000
2	0.10593	41.26595	4.622807	11.03141	41.49648	1.180786	0.402565
3	0.12910	43.29593	5.970396	11.38054	36.90020	1.787506	0.665425
4	0.14554	44.07071	7.271148	11.70349	34.06526	1.966816	0.922575
5	0.15838	44.39841	8.622671	11.93374	31.97629	1.919395	1.149499
6	0.16911	44.54868	10.02167	12.06913	30.23720	1.779782	1.343550
7	0.17845	44.61306	11.44789	12.13071	28.68165	1.617108	1.509572
8	0.18679	44.62473	12.87954	12.14017	27.23776	1.464237	1.653566
9	0.19431	44.59651	14.29746	12.11361	25.87576	1.336245	1.780422
10	0.20117	44.53423	15.68580	12.06166	24.58518	1.239450	1.893677

Table-12
Variance Decomposition of KSE

Period	S.E.	BSE	CSE	JKSE	KLSE	KSE	SSE
1	0.07188	8.978427	0.716273	0.536988	1.591757	88.17656	0.000000
2	0.10593	13.57137	1.563513	1.078741	2.020799	81.28409	0.481479
3	0.12910	18.47816	1.605268	1.267680	4.862915	72.18676	1.599223
4	0.14554	22.83976	1.338751	1.159564	7.901817	64.26969	2.490422
5	0.15838	26.11465	1.090586	0.964313	10.31723	58.41305	3.100172
6	0.16911	28.44311	0.915533	0.809523	12.11877	54.21786	3.495206
7	0.17845	30.09640	0.810651	0.739715	13.47975	51.12474	3.748751
8	0.18679	31.29396	0.769690	0.765428	14.54198	48.71994	3.909000
9	0.19431	32.18126	0.790965	0.884599	15.39453	46.74409	4.004551
10	0.20117	32.84937	0.876138	1.090103	16.08901	45.04257	4.052816

Table-13
Variance Decomposition of SSE:

Period	S.E.	BSE	CSE	JKSE	KLSE	KSE	SSE
1	0.071883	20.76242	0.010197	1.049490	10.26167	0.261979	67.65425
2	0.105931	25.66912	0.159585	0.871611	10.66532	0.272038	62.36233
3	0.129107	29.86351	0.339825	0.585483	10.80568	0.195326	58.21017
4	0.145548	33.05443	0.532255	0.530788	10.60733	0.150112	55.12509
5	0.158389	35.60041	0.701849	0.709133	10.20414	0.141270	52.64319
6	0.169114	37.72459	0.837491	1.076377	9.705954	0.161864	50.49372
7	0.178457	39.54578	0.936979	1.585295	9.167859	0.208678	48.55541
8	0.186790	41.12834	1.001313	2.193712	8.623453	0.280483	46.77269
9	0.194318	42.51001	1.033882	2.866632	8.095391	0.376666	45.11742
10	0.201173	43.71555	1.039702	3.575863	7.599126	0.496654	43.57311

Variance decomposition tells about decomposition of variance for the various selected stock markets. The variance decomposition analyses for the stock markets are represented in table 8 to 13.

The variance decomposition analyses for Bombay stock market implies that major variances in its indices are brought by its innovation. There is no evidence of any impact and contribution of other market to it. The variance decomposition for Colombo equity market confirms that variances in its equity market is brought by its innovation while there is evidence of some contribution of Bombay stock market in variance of Colombo stock market. The analyses of variance decomposition for Jakarta equity market reveals its own market innovation but there is also some contribution in its changes due to stock market of Bombay. The test for stock market of Kualalumpur reveals that some changes in its market are brought by Bombay stock market and also due to Jakarta stock market while major variance in its market is due to its market innovation. The variance decomposition for stock market of Karachi implies that variance in its market is due to its own innovation but there is also some contribution of Bombay stock markets in its variances. While the analyses for stock market of shanghai reveals that changes in its market is due to its market innovation while some variances are brought by stock market of Bombay.

Discussion: The main aim of this study is to explore long and short run integration between the selected equity markets of Asian and to search out for any diversification opportunities for the foreign investors in these equity markets. Among the selected Asian countries the analyses shows that Indonesia stock market shows the highest average monthly return of 1.64%. China stock market represents 8.7% standard deviation shows higher riskier market in these markets. Correlation matrix points to high level of correlation India and Indonesian equity markets. The analyses found no evidence of association between stock market of China and stock market of Srilanka. Karachi Stock market shows no evidence of any association with any other selected equity markets. For long run relationship correlation test is considered to be weaker method. Johansen and juselius cointegration approach was applied for measuring long run relationship. The results of Johansen analyses reveal one long run equation. between the selected equity markets. The Granger causality analyses shows evidence of unidirectional flow of information from stock market of India to stock market of Srilanka, from stock market of Indonesia to Srilanka stock market and from stock market of Malaysia to Srilanka stock market. The analyses show no evidence of integration of Karachi stock exchange (KSE) with any other selected equity markets of Asia.

Conclusion

By evaluating results of cointegration and granger causality it is suggested that investors from India cannot enjoy benefits by investing in stock market of Srilanka because there will be no benefit to this market is found associated with Srilanka. It also suggested to Investors from Malsysia and Indonesia that the market is integrated with stock market of Srilanka. The analyses shows no evidences of Pakistan equity market with any other selected equity market. For investors in Pakistan they can diversify their risk by selecting in the equity market of selected countries and can enjoy benefits of diversification in regional equity markets rather than investing in other outside Asian region. Also the other five countries investors can maximize their wealth by investing in Pakistan equity market. Finally it is suggested that investors can invest in emerging equity markets like Indonesia stock market and Srilanka stock markets which gives highest average monthly returns of 1.64% and 1.33%.

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