

Dynamic Linkages among Selected South Asian Countries' Stock Markets

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Abstract

This study is about The Dynamic Linkages among Selected South Asian Countries Stock Markets for the period of five years from 2010-2014. This study aims to analyze the linkages among Pakistan, India, Bangladesh and Sri Lanka Stock Market by using Augmented Dickey Fuller unit root test, Co-integration, and Vector Errors Correction Model. For such purpose daily prices of indices were collected from selected South Asian countries' stock exchanges websites. The result of these tested model indicate that the model is valid and applicable in selected Stock Markets. The findings of this study show that all the variables are stationary at first difference. The result of Co-integration shows that Karachi Stock Exchange is Co-integrated. Error correction mechanism has been applied in this study to capture the short run dynamics among concerned variables within the context of long run relationship. Coefficients of Co-integrating equations show the speed of adjustment in case of short run disequilibrium.

Keywords: Co-integration; South Asia; ADF and VECM

Introduction

This study is about dynamic linkages among selected Stock Markets of South Asian countries such as Karachi Stock Exchange (KSE), Colombo Stock Exchange (CSE), Dhaka Stock Exchange (DSE) and Bombay Stock Exchange (BSE). Stock exchange is a place, where listed companies' stocks are traded. Listed company is a company which shares are available for trading in stock exchange. Stock exchange is a major source for companies to enhance capital. Stock exchanges play an important role in the nation's economy. In this research dynamic linkages means an investor is capable to buy a security from one stock exchange and sell in other stock exchange.

Dynamic economic means change the economic system over the time and changing the actions over the market (like demand and supply concept). During a dynamic economic situation, investors and portfolio managers must have the knowledge about international stock markets. Major theories of finance propose that institutions and institutional investors must have a grip on well diversified portfolio to minimize risk [1]. An international investor who is enthusiastic to make group investment in different markets should know about the effects of diversification. When stock markets of different countries move simultaneously, investors do not generate long run profit by portfolio diversification [2]. Due to globalization, stock markets integration leads to higher mobility of capital over the world and also provides an advantages and opportunities to investor to diversify their portfolio for better returns [3].

After the liberalization reforms, the concept of financial market integration became more important because globalization has permitted investors to invest in foreign countries with high returns. Financial market is well integrated because it allows a country to smooth its spending pattern and attract investment from out of the country to boost its productivity. Financial market integration helps developing nations to improve living standard and achieving high economic growth by opening international resource. Various factors that contributed in financial market integration; a) increase flow of information, b) free flow of capital, c) decrease transactions cost. The benefits of financial markets integration are effective on market

mechanisms, saving and economic growth, financial development and higher investment; but higher financial market integration indicates different risk i.e. higher dependency of international market cradle to loss the control on monetary and fiscal policy. However, policy maker recommended that to avoid the risk of market integration through market procedure of financial market integration should be kept monitoring [3]. Financial integrated markets assist investors and individual vary their portfolio risk by investing in all over the countries. The financial integration has two optimistic effects; diversify risk and increase the effectiveness of capital market.

Problem statement

After the financial integration, investors are liable to obtain high returns, domestic and foreign stock market investors have equal opportunity to avail and get financial benefit. It is difficult for the investor to select a portfolio diversification and making the investment decision. Investors have to select from a plenty of opportunities available in the market. However, benefit of this financial integration of different stock markets will lead to diversification of markets, high returns, easy access to capital market, and it may lead to high financial instability in different countries. Therefore, it is important to find out the dynamic linkages among stock markets of the countries.

Research objectives

- To study causal affect among Stock markets of KSE, BSE, CSE and DSE.

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- To investigate the long run relationship among stock markets of KSE, BSE, CSE and DSE.
- To investigate the short run relationship among stock markets of KSE, BSE, CSE and DSE.

Significance of study

Having a better understanding of association between well-established South Asian Stock markets (Karachi Stock Exchange, Bombay Stock Exchange, Dhaka Stock Exchange and Colombo Stock Exchange), the research will be beneficial for shareholders, management, all are stakeholders, investors, financial institutions and portfolio managers to utilize their capital across border in a better way.

Research hypotheses

- H1: Pakistan, India, Bangladesh and Sri Lanka Stock markets do have causal relationship.
- H2: Pakistan, India, Bangladesh and Sri Lanka Stock market do have significantly long run relationship.
- H3: Pakistan, India, Bangladesh and Sri Lanka Stock market do have significantly short run relationship.

Literature Review

Literature provides many studies for exploring the relation of different markets for providing the opportunities to worldwide investor for making healthy and successful diversified portfolio. However, the literature provides contradictory result about integration of market. Due to methodology difference and the difference in data use like weekly, daily and monthly. The last five years research studies will be appraised to establish the findings and inputs other researchers. The minority of studies of research are following.

Researcher studies to analyzing and investigating the Indian stock markets linkages with developed stock markets; such analysis have been done by several researchers in several countries like, research conducted in Chinese stock market by Sing [4] research conducted on Brazil, Russia, India and China (BRIC) stock markets by Dasgupta [5], in American stock market [6-8] and used exchange rate rupee and US Dollar in their studies by Jaya and Malarvizhi [9]. The objectives of these studies to check relationship on Indian Stock Market [4-8,10,11] and analyze the diversified portfolio [9,10,12]. Many econometrics and statistical techniques have been used by researchers such as Johansson Co-integration, Granger Causality, Error Correction Model (ECM), Augmented Dickey Fuller Test, Phillip Person, Correlation matrix and Descriptive statistics [4-8]. China and Indian stock markets are positively correlated and also found the bidirectional causality [4]. Short and long run relationship in both directions for Brazilian and Indian stock market and also show the positive correlation by Dasgupta [5]. Co-integration result shows that both stock markets are no Co integrated [7].

Various researcher emphases on similar studies Co-integration of Karachi Stock Exchange with major South Asian Stock [13], in East Asian Equity markets and KSE [14], in global stock market [3] and Asian countries stock markets [15]. These markets Sri Lanka, Pakistan, Indonesia, Singapore, Germany, United Kingdom, India, China and Malaysia have been selected and take monthly data for the period from 2007 to 2013; they employed Augmented Dickey Fuller (ADF), Correlation Matrix and Co-integration techniques for finding the relationship among those markets. Finding shows that there is no Co-integration of Karachi Stock Exchange with Japan and China stock

markets; so, the Co-integration of KSE-100 index with the market of Malaysia, India, Singapore and Indonesia [13]. India, China and United Kingdom have great opportunity to diversify their portfolios as compared to Karachi Stock Exchange [3]. Jebran [15] found that there is no long run relationship, the stock markets of Sri Lanka granger cause Indonesia, Malaysia and Indian stock markets and also fall in the unidirectional causality.

Similar researchers conduct studies to analyzing the Co-integration and international linkages between Romanian and Greek Stock Markets by Birau and Romania, in Baltic Stock Markets [16] and in United State of America [17]; aimed to analyze the relationship among stock markets and the behavior of financial markets; these emerging countries includes China (Shanghai Stock Exchange), Hong Kong, Philippines, Malaysia, Greek (Athens Stock Exchange), India (Bombay Stock Exchange), Japan, South Korea, Baltic countries like (Latvia (Riga Stock Exchange), Lithuania (Vilnius Stock Exchange) and Estonia (Tallinn Stock Exchange), Romanian (Bucharest Stock Exchange)], Singapore and United State of America; many econometric and statistical techniques have been used by the researcher to full fill the objectives of above studies through Augmented Dickey Fuller Test, Vector Error Correction Model. Johansson Co-integration approach, Granger Causality Test, Correlation Matrix and BDS Test are also used by Siminica and Birau [18]. Birau and Romania conclude that no causality between Romanian and Greek Stock Markets (GSM). Masood et al. found that long run bidirectional relationship between Riga, Tallinn and Baltic stock markets [16]. Sharma conclude that there is positive relationship between Asian market and United State of America [17].

Gleghorn et al. [19] investigate the relationship between India and its trading partner Switzerland, Hong Kong, United States, Singapore and Malaysia; data were taken from 2000 to 2011; researcher employed Augmented Dickey Fuller test, Co-integration and Vector Error Correction Model; finding shows that long run relationship between India and its major trading partner; all stock markets are similar stochastic trend.

Researchers Siddiqui [20] focus on exploring integration between European market indices and SENSEX, the European stock markets are France, Austria, Italy, UK, Netherland, Switzerland, Germany and Belgium; researcher used daily closing price from 1999 to 2008 and employed Pearson Correlation, Unit Root Test, Johansen Co-integration and Granger Causality Test (GCT); the finding of this study have positive correlation between SENSEX and other European market and the return of all stock market are not normally distributed and show the stochastic trend in data.

Deo investigate the Co-integration between some Indian stock market indices such as CNX Mid Cap, CNX Small Cap, CNX Nifty 500 and CNX Nifty; researcher applied Unit Root Test, Engle-Granger Co-integration test and Johansen Co-integration techniques for analysis; finding shows that long run relationship between all Indian stock indices. Mohsin and Rivers looked financial market integration of South Asian countries like Nepal, Bangladesh, Pakistan, India and Sri Lanka; data was taken from 1970-2006 for utilizing the econometric techniques and real interest rate differentials (RIDs); the data was stationary by using RIDs techniques and it also provides the strong suggestion of integration, correlation between investment and saving quiet significance.

Similar studies were conducted by various researcher [18,21] emerging stock market integration and contagion in the context of

global financial crisis, Sugimoto and Yoshida in African and Khan [22] in equity market of India and Pakistan's Financial Crisis; econometric techniques were used [21,23] as Multiple Generalized Autoregressive Conditional Heteroskedasticity (MGARCH), Autoregressive Conditional Heteroskedasticity (ARCH), Generalized Autoregressive Conditional Heteroskedasticity (GARCH) and Vector Auto Regression (VAR) Model and Granger Causality Test. Ullah et al. [24] used these models Unit Root Test, Co-integration and correlation; Siminica and Birau [18] used previous model but these test are also used HP and BDS test. Trivedi and Birau [21] suggested that emerging stock markets are highly depended on moment index. Ullah et al. found that develop and developing countries have dynamic equity relationship [24].

Iqbal and Rafiq [25] focus to analyze the interrelationship among stock markets; the objective of this paper to find out the dynamic relationship among equity market and used daily data for the period of January 2003 to December 2009; the study utilizes the Johansen and Juselius Co-integration and Granger Causality Test; researcher found that there is no co integration between Pakistan, India and United States but all the market shows the unidirectional causality.

Qadeer and Ahmad [26] discover the Co-integration of equity markets of developed and developing countries; developing countries include Pakistan and India and developed countries included France, China, United States, United Kingdom, Hong Kong, Canada, Germany, Japan and Australia; weekly data have been used from the period of 2001 to 2011; these econometric techniques were applied to explore the Co-integration of equity markets such as Descriptive analysis, Unit Root Test, Multivariate Co-integration, Granger Causality and Variance Decomposition analysis; the result of Multivariate Co-integration analysis explain that KSE only cointegrated with Toronto Stock Exchange (TSE) market and bidirectional causality shows that Bombay cause AORD.

Patel and Ritesh investigate the interdependency of Bombay Stock Market with foreign markets, to understand the shocks in one market are change with the effect of other market; data was collected from Jan 2001 to Dec 2011 closing stock price of JKSE, TSEC, CSE, FTSE, BSE and NIKKEI; researcher used these techniques Descriptive Analysis, Correlation Analysis, Unit Root Test and Breviate Granger causality Test; author find that BSE positive correlated with foreign markets and BSE also granger cause to JKSE, TSEC, FTSE and CSE.

Chen et al. [27] conducted the study on stock market linkages between leading and frontier market from 2000 to 2011 by using time series analysis and Granger Causality Test; these markets explain that relationship between frontier and leading markets. Berger et al. examined the financial integration and globalization with the sample of 48 emerging markets from the period of 1985-2008; in this study researcher found that no evidence of tradeoff between globalization and financial integration. Berger et al. frontier market showed the low integration with other markets, but they offer the diversification benefits [28].

Various searchers explored the integration and dynamic linkages between BRIC and United States [29] and An and Brown [30], in developed market by Fahami [31] and investigating between stock exchange [4]. The objectives of various studies were similar to investigate the interlink ages of Brazil, Russia, India and China nations [4,29-31]. Econometric techniques were applied Unit Root test, Granger Causality Model, Johansson Co-integration test, Variance Decomposition Analysis and Vector Auto regression. All the BRIC nations' have perceptible effects of stock market [4]. Correlation result

show positive correlation between BRIC and these stock markets are favourable for global investor in future [29]. An and Brown [30] found that one co-integration equation between United States and china but no Co-integration between other Brazil, Russia and India.

Research studies on exploring the Co-integration and linkages of stock exchange have been done by many researchers such as research conducted on Hungarian and Romanian by Birau and Antonescu in South Asian equity markets [32], in India and its major Asian counterparts by Mukherjee and Mishra [33], long run relationship in Karachi Stock Exchange by Khalid and Hussain [34], emerging equity markets are integrated [35] integration of emerging Asian economics by Narayan and Islam and stock market of GCC nation [36]. Many econometric techniques have been used by the researcher to found the linkages of stock markets; Correlation analysis, Return analysis, Descriptive analysis, Unit Root Analysis, Johnson Co-integration, Co-integration, Multivariate Co-integration, Granger Causality, Bidirectional Causality, Unidirectional Causality and Variance Decomposition Analysis are used to compute the relationship [32,35,37-41]. Gupta and Guidi [39] found that no long run relationship between India and Asian developed market. Dimpfl [40] explained that international financial markets are no cointegrated. Chaudhry et al. [35] found that South Asian equity markets are highly integrated. Khalid and Hussain [34] bi-variate integration between KSE and Dhaka Stock Exchange.

Research Design and Methodology

In this research study, research design is quantitative in nature that are particularly following head. The primary theme is to detecting the econometric techniques and methodology.

Time period

The population for this study is the daily closing index of KSE, DSE, CSE and BSE. In this research, purposive sampling technique is used, and four major countries were selected for analyses. The study used five years data and sample period span from January 2010 to December 2014. The reasons for selecting this period are the researcher's wants to check the relationship of South Asian Stock Exchanges.

Nature and source of data

To explore the association among South Asian Stock markets of this study quantitative, time series and secondary data is used. The research is based on secondary data of South Asian Stock markets that are selected in the sample. The researcher used daily closing prices of the stock exchanges. Data are collected from the official website of KSE, CSE, DSE and BSE for the period of January 2010 to December 2014.

Methodology

This area holds the essential approaches and whole methodology to fulfil the objective of exploration study. Time series data is analyzed by using E-Views. Unit Root Test used to check the stationary of data. Two tests are used for stationary of data Augmented Dickey Fuller Test (ADFT) by Fuller and Phillip Peron Test by Perron. ADFT is the edition of the Dickey Fuller test. When data is stationary at same order, than check the Co-integration technique that causes the direction of long run relationship between variables. The next step is to check the Granger Causality test by Granger to resolve the causality with references to variables in the internal relation. Therefor this technique will be used to detect the actual causal relationship between variables. If the data is not stationary on same level then Auto Regressive Detributive Lag (ARDL) model is applied to analyze the short and long term relation.

Results and Interpretations

Check unit root problem with time series data

To check the data problem, formal examination is done through application of Phillip Person Test as well as Augmented Dickey Fuller Test. Both the test, T-Statistic is compared to critical value. If the values of PP or ADF statistics exceed critical value then null hypothesis of unit root test cannot be accepted. If T-Statistic does not exceed critical value then null hypothesis cannot be rejected. It means the data is non-stationary. The result of ADF as well as PP test of unit root shown in Table 1. These tests have been applying on stock indices among South Asian stock exchanges. This test is applied at level and first difference. The first column of Table 1 shows country second is variable, third is Unit Root Test, fourth is test statistics and fifth column is critical value that consists of 1%, 5% and 10% respectively.

The above Table 1 Unit Root Test reports that the stock indices of four South Asian countries such as Pakistan (KSE-100 index), India (BSE-100 index), Sri Lanka (CSE-100 index) and Bangladesh (DSE-20 index). It contains Unit Root test at level as Augmented Dickey Fuller Test and PP test statistic of KSE-100, CSE-100, DSE20 and BSE-100 exceed 1%, 5% and 10% critical value. It means series is non-stationary. To check the long run relationship data must be stationary at same level. For this purpose, researcher apply unit root test at first difference. At first difference all the stock exchange indices test statistic value exceeds critical value. It means series is integrated of order 1 and become stationary at first difference.

Result of Johansen co-integration test

Long run relationship among variables has been explored by employing Johansen's co integration technique. Table reports the results of Johansen's co integration test for KSE, BSE, CSE, and DSE.

Table 2 unrestricted Co-integration rank test are consisting of these column country, hypothesized number of CE, Eigen-value, trace statistic, critical value and probability respectively. Above-mentioned Table reports the results of Johansen's co integration test for KSE, BSE, CSE, and DSE. Results indicate that at 5% significance level, there is one cointegrating equation among said variables.

Above Table 3 Unrestricted Co-integration rank test (Maximum Eigen Value) are consist of these columns hypothesized number of CE, Eigen-value, Max-Eigen statistic, critical value and probability respectively. Above-mentioned Table reports the results of Johansen's co integration test for KSE, BSE, CSE, and DSE. Results indicate that at 5% significance level, there is one co-integrating equation among said variables (Table 4).

Error Correction Mechanism has been applied in this study to capture the short run dynamics among concerned variables within the context of long run relationship. Coefficients of co integrating equations show the speed of adjustment in case of short run disequilibrium. In case of KSE, coefficient of co integrating equation is significant indicating that adjustment of disequilibrium is due to first error correction term. Column 1 indicates that KSE adjusted by almost 0.34% in one day and it takes almost 294 days ($1/0.003406=293.6$) to eliminate completely the disequilibrium.

Country	Variable	Unit Root Tests		Test-Statistic	Critical Value		
					1%	5%	10%
Pakistan	KSE-100	ADF Test	At Level	2.775601	-3.8635	2.86367	2.56796
			First Diff.	2.819152	-3.8192	2.86367	2.56796
		PP Test	At Level	34.4945	-3.4354	2.86367	2.56796
			First Diff.	34.48921	-3.4354	2.86367	2.56796
India	BSE-100	ADF Test	At Level	-1.2787	-3.4355	2.86637	2.56796
			First Diff.	1.256092	-3.4355	2.86368	2.56796
		PP Test	At Level	33.82086	-3.4355	2.86368	2.56796
			First Diff.	33.80383	-3.4355	2.86368	2.56796
Sir Lanka	CSE-100	ADF Test	At Level	0.129331	-3.4354	2.86367	2.56796
			First Diff.	2.810468	-3.4354	2.86367	2.56796
		PP Test	At Level	139.4651	-3.4354	2.86367	2.56796
			First Diff.	110.8656	-3.4354	2.86367	2.56796
Bangladesh	DSE-20	ADF Test	At Level	2.185235	-3.4355	2.86371	2.56797
			First Diff.	2.255234	-3.4354	2.86168	2.56796
		PP Test	At Level	22.52249	-3.4356	2.86371	2.56797
			First Diff.	154.2576	-3.4354	2.86368	2.56796

Table 1: Result of unit root test.

Hypothesized	Eigen-value	Trace	0.05	Prob.**
No. of CE(s)		Statistic	Critical Value	
None *	0.036549	57.41945	47.85613	0.0049
At most 1	0.005946	11.88241	29.79707	0.9359
At most 2	0.00368	4.588371	15.49471	0.8509
At most 3	6.47E-05	0.079077	3.841466	0.7785

Trace test indicates 1 co-integratingeqn(s) at the 0.05 level.

*Denotes rejection of the hypothesis at the 0.05 level.

**MacKinnon- Hug-Michele's (1999) p-values.

Table 2: Unrestricted Co-integration rank test (Trace).

Hypothesized	Eigen-value	Max-Eigen	0.05	Prob.**
No. of CE(s)		Statistic	Critical Value	
None *	0.036549	45.53704	27.58434	0.0001
At most 1	0.005946	7.294038	21.13162	0.9414
At most 2	0.00368	4.509294	14.2646	0.8021
At most 3	6.47E-05	0.079077	3.841466	0.7785

Max-Eigen-value test indicates 1 Co-integrating eon(s) at the 0.05 level.

*Denotes rejection of the hypothesis at the 0.05 level.

**MacKinnon-Hug-Michele's (1999) p-values.

Table 3: Unrestricted Co-integration rank test (Maximum Eigen-value).

Error Correction	D (KSE100)	D (BSE100)	D (CSE100)	D (DSE20)
CointEq1	-0.003406	0.002441	-0.000345	-0.021392
	[-2.41107]	[2.08134]	[-0.73764]	[-9.31990]
D (KSE100(-1))	0.039175	0.029473	-0.003794	0.032536
	[2.15812]	[1.95577]	[-0.63205]	[1.10322]
D (KSE100(-2))	-0.007056	-0.000498	-0.000224	0.000294
	[-1.39315]	[-0.11848]	[-0.13385]	[0.03579]
D (BSE100(-1))	0.005951	0.031299	0.030738	0.053683
	[0.17222]	[1.09098]	[2.69008]	[0.95617]
D (BSE100(-2))	3.15E-05	-0.016522	-0.01488	-0.000208
	[0.00094]	[-0.59322]	[-1.34135]	[-0.00381]
D (CSE100(-1))	0.159993	0.025051	0.111831	0.380345
	[1.84757]	[0.34845]	[3.90561]	[2.70336]
D (CSE100(-2))	-0.18424	-0.107892	0.033781	-0.153363
	[-2.49006]	[-1.75646]	[1.38076]	[-1.27577]
D (DSE20(-1))	0.010137	0.000861	0.006859	-0.298053
	[0.53237]	[0.05446]	[1.08942]	[-9.63417]
D (DSE20(-2))	-0.006363	-0.001954	-0.001631	-0.163319
	[-0.36541]	[-0.13514]	[-0.28333]	[-5.77274]
C	-17.04726	1.149194	-2.85089	2.250927
	[-3.69002]	[0.29964]	[-1.86630]	[0.29989]

Standard errors in () & t-statistics in []

Table 4: Result vector error correction models.

In case of BSE, coefficient of co integrating equation is significant indicating that adjustment of disequilibrium is due to first error correction term. Coefficient of first error correction term indicates that almost 0.24% of disequilibrium is adjusted in one day and it takes almost 410 days (1 year and 45 days) to completely eliminate short run disequilibrium.

In case of DSE, coefficient of co integrating equation is significant indicating that adjustment of disequilibrium is due to first error correction term. Column 1 indicates that D\SE adjusted by almost 2.14% in one day and it takes almost 47 days to completely eliminate the disequilibrium. However, in case of CSE, coefficient of error correction term is insignificant indicating that error correction term fails to make adjustments significantly.

Conclusions

The main purpose of this study is to measure the Dynamic Linkages among selected South Asian Stock Exchange. The objective of this study to investigate the short and long run relationship among stock markets of KSE, BSE, CSE and DSE. The data were collected from January 2010 to December 2014. Following the tools were used to find out the objective through Co-integration, and Vector Error Correction Model.

The findings of this study are contributing the existing literature.

All the variables are stationary at first difference. The result of Co-integration shows that Karachi Stock Exchange is Co- integrated. Error correction mechanism has been applied in this study to capture the short run dynamics among concerned variables within the context of long run relationship. Coefficients of co integrating equations show the speed of adjustment in case of short run disequilibrium. In case of KSE, adjusted by almost 0.34% in one day and it takes almost 294 days to completely eliminate the disequilibrium. In case of BSE, it indicates that almost 0.24% of disequilibrium is adjusted in one day and it takes almost 410 days (1 year and 45 days) to completely eliminate short run disequilibrium. In case of DSE, adjusted by almost 2.14% in one day and it takes almost 47 days to eliminate the disequilibrium. However, in case of CSE, coefficient of error correction term is insignificant indicating that error correction term fails to make adjustments significantly.

References

- Siddiqui DS (2009) Examining Associations between S&P CNX Nifty and selected Asian & US Stock Markets. pp: 1-36.
- Aslam N, Altaf HH (2012) Long run relationship between Karachi Stock Exchange and major developed countries market. International Journal of Management and Strategy.
- Hussain SD, Adnan H (2011) The Dynamic Linkages of Pakistani and Global Stock Markets: Evidence from Karachi Stock Exchange. Pakistan Journal of Commerce and Social Sciences 5: 233-242.
- Sing GA (2010) Chinese and Indian stock market linkages with developed stock markets. Asian Journal of Finance and Accounting 2: 21-39.
- Dasgupta R (2014) Integration and dynamic linkages of the Indian stock market with BRIC: An empirical study. Asian Economic and Financial Review 4: 715-731.
- Subha MV, Nambi ST (2010) A study on Co-integration between Indian and American stock market. Journal of Contemporary Research in Management, pp: 105-113.
- Sriram M (2011) Co-integration of NIFTY and NASDAQ composite: An empirical investigation. Proceedings of Third International Conference on Global Business, Economics, Finance and Social Sciences, Mumbai, pp. 1-11.
- Subha MV, Nambi ST (2013) Investigating causal relationship between Indian and American markets. Life Sciences Journal.
- Jaya M, Malarvizhi (2012) An analytical study on the movement of NIFTY index and exchange rate. International Journal of Marketing and Technology 2: 274-282.
- Assidenou KE (2011) Co-integration of major stock market indices during the 2008 global financial crisis. International Journal of Economic and Finance.
- Krishnankutty R, Tiwari AK (2011) Are the Bombay stock exchange sectorial indices of Indian stock market cointegrated? Evidence using fractional Cointegration test. Journal Emerging Financial Market 2: 37-45.
- Alagided P, Panagiotidis T, Zhang X (2010) Why Diversified portfolio should include African.
- Khan SN, Aslam MS (2014) Co-integration of Karachi Stock Exchange with major South Asian Stock Exchanges. International Journal of Accounting and Finance Reporting 4: 106-117.
- Hussain RY, Hussain H, Hassan GA (2012) Long run relationship among East Asian equity markets and KSE. Management Science Letter 2: 1167-1174.
- Jebran K (2014) Dynamic linkages between Asian countries stock markets: Evidence from Karachi Stock Exchange. Research Journal of Management Sciences 3: 6-13.
- Masood O, Bellalah SC, Teulon WM (2010) Cointegration of Baltic stock markets in the financial Tsunami: Empirical evidence. International Journal of Business 15: 119-131.
- Sharma P (2011) Asian emerging economics and United State of America: Do they offer a Diversification benefits. Australian Journal of Business and Management Research 1: 85-92.

18. Siminica M, Birau R (2014) Investing international causal linkages between Latin European markets in term of global financial crises: A case study of Romania, Spain and Italy. *International Journal of Business Quantitative Economic and Applied Management Research* 1: 12-36.
19. Gleghorn G, Jin Z, Harper A (2011) Do these stock markets move together? An empirical study of India and its major trading partner. *Academia*, pp: 1-9.
20. Siddiqui S (2010) Exploring integration between European market indexes and SENSEX. *Journal of India*, pp: 79-95.
21. Trivedi J, Birau R (2012) Analysis of international contagion in emerging stock markets in term of global financial crisis. *Advances in Accounting, Auditing and Risk Management*, pp: 120-124.
22. Khan TA (2011) Co-integration of international stock markets: An investigation of diversification opportunities. *Undergraduate Economic Review* 8: 1-51.
23. Tavakoli A, Dadashi M (2013) Dynamic linkages between exchange rates and stock prices: Evidence from Iran and South Korea. *International Economic Studies* 42: 23-30.
24. Ullah I, Khan R, Khan M, Rehman S (2013) Correlation dynamic of equity markets in Pakistan and India: A comparative study in the context of financial crisis. *City University Research Journal* 3: 76-84.
25. Iqbal A, Rafiq NK (2011) Dynamic interrelationship among the stock markets of India, Pakistan and United States. *World Academy of Science, Engineering and Technology* 5: 98-104.
26. Qadeer A, Ahmad MM (2014) Testing of financial cointegration of equity markets of developed and developing economics. *International Journal of Research in IT, Management and Engineering* 3: 1-15.
27. Chen M, Lee F, Chen P (2014) Frontier stock market integration and the global financial crisis. *North American Journal of Economic and Finance* 29: 84-103.
28. Berger D, Pukthuanthong K, Yang JJ (2011) International diversification with frontier markets. *Journal of Financial Economics*, pp: 227-242.
29. Dasgupta R (2013) BRIC and US integration and dynamic linkages: An empirical study for international diversification strategy. *Interdisciplinary Journal of Contemporary Research in Business* 5: 536-563.
30. An L, Brown B (2010) Equity market integration between US and BRIC countries: Evidence from unit root and cointegration test. *Research Journal of International Studies* 16: 15-25.
31. Fahami NA (2011) The structure of linkages and causal relationship between BRIC and developed equity nation. *International Conference of Information and Finance* 21: 72-77.
32. Subhani MI, Hassan A, Osman AM (2011) Are the major South Asian equity markets Co-integrated? *International Journal of Humanities and Social Sciences* 1: 117-121.
33. Mukherjee KN, Mishra RK (2010) Stock market integration and volatility spillover: India and its major Asian counterparts. *Research in International Business and Finance* 24: 235-251.
34. Khalid M, Hussain MM (2011) Long run relationship of macroeconomic variables and stock returns: Evidence from KSE. *The Journal of Commerce* 4: 45-59.
35. Chaudhry M, Boldin RJ, Khan IA (2012) Seven Asian emerging equity markets; Are they integrated? *Asia Pacific Journal of Finance and Banking Research* 6: 26-36.
36. Salem AY, Saki K (2014) Cointegration of stock markets of GCC nations in the wake of Arab spring of 2010: Analysis of the relationship between Oil and stock market prices. *The International Journal of Business and Management* 2: 91-100.
37. Huyghebaert N, Wang L (2010) The Co-movement of stock markets in East Asia Did the 1997-1998 Asian Financial Crisis really strengthen stock market integration. *China Economic Review*, pp: 98-112.
38. Guisi F, Ugur M (2014) An analysis of South Eastern European stock markets: Evidence on Co-integration and portfolio diversification benefits. *Journal of International Financial Markets, Institutions and Money* 30: 119-136.
39. Gupta R, Guidi F (2012) Co-integration relationship and time varying co-movements among Indian and Asian developed stock markets. *International Review of Financial Analysis* 21: 10-22.
40. Dimpfi T (2014) A note on Co-integration of international stock market indices. *International Review of Financial Analysis* 33: 10-16.
41. Moore T, Wang P (2014) Dynamic linkages between real exchange rates and stock prices: Evidence from developed and emerging Asian markets. *International Review of Economic and Finance* 29: 1-11.