Inter-Linkage of Indian Stock Market with Foreign Economies:
An Illusion or not?

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Abstract

Stock market is the nerve of any country which explains the economic health of that country. Now a days, the interdependence of stock markets has so extreme that the happenings of any event in any country has its immediate effect on another. Emerging economies have a greater impact of external events as compared to developed economies, due to certain factors like psychology of investors, risk patterns, portfolio management etc. But the question arises whether the impact of developed economies is enhancing with the passage of time or it is on lower side. So, the present paper is an attempt to see the how the emerging economies and devloped economies are itegrated with each other. The emerging economies selected for this purpose were Brazil, South Korea, India and China. The developed economies selected for this purpose were Australia, Germany, USA, UK, Hong Kong, Japan and Singapore. The indices under study were SENSEX, BVSP, KOSPI, SCI, AORD, DAX, DJIA, FTSE, HANGSENG, NIKKEI and STI. The daily average return was used for the sample period from January 2003 to July 2014. EVIEWS 5 software was used to analyze the data. The statistical tools used for the study were Correlation Test, and Granger Causality Test. Emerging economies Brazil, South Korea and most of developed economies have an impact on Indian stock market but it has less impact on these markets. After sub-prime mortgage crisis, this linkage between foreign economies has improved and enhanced. It was found that the stock markets of Hong Kong, Indonesia and Malaysia have a long term significant relationship with USA and Philippines is linked to both markets USA and Japan. There are different reasons which are contributing towards low involvement of stock markets of foreign economies with Indian stock market. After liberalization, foreign capital was invited into different sectors resulted into market integration. But, even after this, lots of hurdles during investment in the stock market. Individual investors can not invest in the foreign markets. Some domestic corporate can raise funds through ADRs/GDRs in the foreign market. In the nutshell, with the growth of technical facilities in the capital market and removal of investment barriers, the integration of Indian stock market along with international stock markets will increase in future.

Keywords: Emerging Economies, Developed Economies, Foreign Investments, Interdependence, Indian stock market, etc.

Introduction

At the time of allocation of the funds in internationally diversified portfolio, an investor would like to compare returns and risk across different economies. The benefit of internationally diversified portfolio can be enjoyed only when there is less correlation between international stock markets. Further, while constructing internationally diversified portfolio of securities, the correlation in the returns of stocks from two different economies required to be examined. Some studies supported that there is less dependency between Asian markets themselves and between Asian and European markets. Booth & Koutmos (1998) found that in European stock markets, the dependence is high during calm time period and low during crisis. Peiro et al., (1998) examined New York is very influential market which is double than Tokyo and triple than Frankfurt. Tokyo is very sensitive more than double, of New York. It is believed that emerging markets and developed markets have long run correlations and hence less portfolio diversification investment opportunities available for international investors. Gilmore and McManus (2002) investigated the long run relationship between US equity market and other Central European stock markets. It was seen that these markets were not integrated in the long run. Syriopoulos and Roumpis (2009) examined whether some interdependence is found between South Eastern European economies stock markets and developed markets US and Germany. A long run relationship exist but still investors who want to take the benefit out of diversified portfolio can go for short term investment. The whole study is divided into four sections: section one includes Introduction, section two covers research methodology, section three has data analysis & interpretation and section four includes concluding remarks.

Review of Literature

There is extensive literature on the aspect that after the financial crisis there are changes in the dependence behavior of global stock markets. A group of studies is prevalent which emphasized that integration between Emerging economies and Developed economies has increased with the passage of time.

A Contemporary Concern: Relationship of Emerging and Developed Economies

Corhay et al., (1994) found that when Asian economies were considered as an different entity as compared to pacific, there did not seem much influence of each other. Significant relationship existed between Asian stock markets but less significant causal relationship existed between developed and emerging stock markets (Worthington et al. 2004). Narayan et al., (2004) consider that Pakistani stock market bears long-run relationship with stock markets of India, Bangladesh and Sri-Lanka. Tsouma (2007) investigated that

significant difference is found in stock returns behavior of developed and emerging stock markets and there was sign of interdependencies among mature and emerging stock markets. Bhaduri & Samuel (2009) suggested that very less correlation is present between the Indian markets and other world markets. Beine & Candelon (2011) discussed that post liberalization, the correlation between global markets has increased. Rejeb & Salha (2013) found that the integration between world stock market has increased and this even has positive aspects. But, some studies, documented that integration between Emerging and Developed economies is less significant and only short run correlation is prevalent. Kuo (2013) examined the integration between Asian developing economies but not in developed economies. Extensive researches are also done on the linkages of Emerging Asian economies. Das (2014) examined the trend of growth in Asian financial markets as Asian financial crisis affected their economy to a great extent.

Extent of Influence of US Stock Market on Indian Stock Market

Some other studies are of the view that US stock market has influence on Asian Emerging markets and any event or happening in the US stock market affects the Asian markets returns and hence portfolio diversification opportunities exist. Ahmad et al., (2005) revealed that no long-term relationship exist between Indian stock market with US and Japanese stock markets. Majid et al., (2008) found that ASEAN (Association of South East Asian Nations) stock markets i.e. Malaysia, Thailand, Philippine, Indonesia and Singapore are mostly influenced by the US stock market and less by Japanese stock market. Mariani et al., (2008) briefed that long-range power correlation is in existence between emerging economies i.e. India, China and Taiwan with developed country USA. Aktan et al., (2009) found that BRICA economies and their relation with the US stock market was identified and found that US stock market has sound effect on all BRICA economies. An unexpected shock was immediately responded by all markets and recovered themselves within a time period of five to six days. Kim (2010) examined US stock markets impacted almost all East Asian economies irrespective of financial crisis. Muthukumanan et al., (2011) examined the integration of Indian stock market with the US stock market and US stock market has an influence on Indian stock market so US financial crisis affect Indian equity market. Gangadharan & Yoonus (2012) considered that there is feedback effect from US stock market of Indian stock market means any crisis in the US has its influence on Indian stock market but there is no feedback from Indian stock market to US stock market i.e. Indian stock market has no impact on US stock market. On the other hand, there is literature supporting the view that USA stock market influence on other emerging stock markets is decreasing and no long term correlation of US stock market with other emerging stock markets is found.

Gupta & Guidi (2012) examined that there was less interdependence of Indian stock market with the US market and other developed Asian markets. It was also suggested that Indian stock market is not very much affected by the international events or happenings. With comparison to the developed Asian markets, Indian stock market volatility is more stable which give an opportunity to international investors for investment to improve returns. Guidi & Ugur (2014) investigated the integration of South-Eastern European (SSE) stock markets with their developed markets. SSE markets were integrated with the Germany and UK stock markets but not with the USA stock market. Diversification benefits also existed despite dynamic co-integration between the stock markets.

Contribution of Developed & Emerging Economies in Financial Crisis: A Controversial Issue

After Financial Crisis, whether the integration between emerging and developed economies has increased or not, this issue is always get attention from researchers and academicians. Few studies are in favor that integration between developed and emerging economies has increased after the financial crisis. Bahng (2003), who found that the influence of other Asian markets has increased on Indian stock market during and after the Asian Financial Crisis, this result gives an indication that Indian stock market, is moving closer towards other Asian stock markets integration. Wong et al., (2004) highlighted that there was a trend of increasing interdependence between most of developed markets and emerging markets after the 1987 market crash. After the 1997 financial crisis, the interdependence between these have gone more intensified resulted into international diversification benefits reduction.

Bose (2005), found whether there are any common forces which driving the stock index of all economies or there was some country specific factors which controlling the each individual country's economy. Indian stock market returns were highly correlated with the returns of rest of Asia and US during post Asian crisis and till mid 2004. Not only this, Indian stock markets influenced some major Asian stock market returns. Co-integration between India and other market in Asian region was not very high but sufficient

enough to design portfolio internationally. Huang (2013), supported that after Asian financial crisis from 1997-1999, the stock markets integration not getting weekend rather it improved and getting stronger. Chen et al., (2014) argues the integration between frontier and leading markets. Frontier markets have distinct relationship with the leading markets depending upon number of variables like interest rate, tax rate, population growth etc. After the financial crisis 2008, the level of integration between these markets changed and there are chances that in future integration get strengthen. Pan (2014) considered that dependence behavior between BRIC economies has changed significantly during and after the financial crisis. The dependence has increased with oil exporter Russia but weak for China. Yang et al., (2014) found that co-integration between developed and emerging economies increased after sub-prime mortgage crisis, while the degree of co-integration decreased after European Debt crisis. The developed stock markets were leading emerging markets before European debt crisis but their influence decreased after these crises.

Research Methodology

The objective of the study was to seek the impact of emerging and developed economies on Indian stock market. The developed economies selected for this purpose are Australia, Germany, USA, UK, Hong Kong, Japan and Singapore. Most of the studies are related to Asian Emerging economies like Hong Kong, Russia, Thailand or Malaysia. But there is dearth of studies on Indian stock market.

It is not clear whether Indian stock market is influenced by other emerging economies and developed economies, so the present study is an attempt to take this into consideration. The emerging economies selected for this purpose are Brazil, South Korea, China and India. The daily average return was used for the sample period from January 2003 to July 2014. The log of the closing price is taken to calculate the daily return of the indices. The data of India was taken from the official website of Bombay Stock Exchange i.e. www.bseindia.com and other countries data was taken from www.yahoofinance.com. The eview5 is used for the purpose of analysis the data. The stock indices under study are given below:

Stock Markets under Study and their Index

S. No	Country	Stock Market	Abbreviation
1	India	Bombay Stock Exchange	SENSEX
2	USA	Dow Jones	DJIA
3	UK	Financial Time Stock Exchange	FTSE
`4	Germany	DeutreherAktien Index	DAX
5	Hongkong	Hongkong Stock Index	HANGSENG

6	Singapore	Straits Time Index	STI
7	China	Shanghai Composite Index	SCI
8	Japan	Tokyo Stock Exchange	NIKKEI
9	Brazil	Sao Paulo Stock Exchange	BVSP
10	Australia	Australian Stock Exchange	AORD
11	South Korea	Korean Stock Price Index	KOSPI

Descriptive Statistics

The daily return is computed as follows:

$$Rt = (In\ Pt - In\ P\ (t-1))*100, \qquad (I)$$

Where Rt is the return in period t, Pt and Pt-1 are the monthly (daily) closing prices of the series at time t and t-1 respectively. Standard deviation is calculated to see the deviations of the actual returns as compared to expected to measure the volatility in the market. Skewness is a measurement of symmetrical or asymmetrical distribution.

Kurtosis was nothing but it characterizes the peak or flatness of a distribution compared with normal distribution, where positive kurtosis illustrates peak and negative kurtosis confirms flatness of a distribution. Jarqu-bera test is used to know whether series is normally distributed or not.

Correlation Test

The correlation coefficient of two variables in a data sample is their covariance divided by the product of their individual standard deviations. It is a normalized measurement of how the two are linearly related. Formally, the sample correlation coefficient is defined by the following formula, where sx and sy are the sample standard deviations, and sxy is the sample covariance, (Pearson; Francis Galton, 1980).

$$r_{xy} = \frac{s_{xy}}{s_x s_y} \qquad (II)$$

Co-integration Test

If 2 or more than 2 variables are integrated of the same order d where d > 0 and there exists a stationary linear combinations of these variables, the variables are said to be co-integrated (Johansen, 1988).

Engle-Granger Test for Co-integration in a Bivariate Process

Let x and y are I (1)

$$Y_t = \alpha + \beta x_t + \mu_t \qquad (III)$$

If u(t) is stationary, x and y are co-integrated, the regression is co-integration equation.

If u(t) is non-stationary, x and y are not co-integrated and regression is spurious.

Granger causality test

A technique for determining whether one time series is useful in forecasting another (Granger, 1969). If two variables, x and y are correlated, it is possible that: X is caused by y, Y is caused by x, Both x and y are caused by some other variable z. Let y and x be a stationary time series. The null hypothesis that x does not Granger-cause y is tested but first, one finds the lagged values of y to include in a univariate autoregression of y:

$$Y_t = \alpha + \sum_{i=1}^{i} \alpha_i y_{t-1} + \sum_{j=1}^{j} \beta_j x_{t-j} + \epsilon_t \qquad (IV)$$

The Granger Causality test (Granger, 1969) is used to see the causal impact of different economies. This test earlier is used by Bahng, 2013; Gupta & Guidi, 2012; Chen et al., 2014: Jang & Sul, 2002.

Impulse Response

Impulse responses trace out the responsiveness of the dependent variables in the VAR to shocks to each of the variables. So, for each variable from each equation separately, a unit shock is applied to the error, and the effects upon the VAR system over time are noted. Thus, if there are g variables in a system, a total of g2 impulse responses could be generated. The way that this is achieved in practice is by expressing the VAR model as a VMA that is, the vector autoregressive model is written as a vector moving average. Provided that the system is stable, the shock should gradually die away. To illustrate how impulse responses operate, consider the following bivariate VAR (1).

$$y_t = A_1 y_{t-1} + \mu$$

Data Analysis and Interpretation

The data was analyzed by for returns series of eleven stock markets of developed and emerging markets for the entire sample period from January 2003 to July 2014.

Risk Parameters in Various Horizons in International Context

Table 1 showed that SENSEX provided the highest mean return which was (7.07%), BVSP (5.4%), KOSPI (4.1%), DAX (4.0%), HANGSENG (3.09%), STI (2.99%). SCI has the lowest return (1.47%), second lowest returns are in Japan NIKKEI (01.97%) and thereafter, a little higher FTSE

(1.93%). The returns of developed economies range from 3% to 4%. Emerging economies returns were also range at the same level so it can be concluded that there was not much difference between the returns of developed and developing economies. This result represents contrary to some earlier observations. Lucey and Muckley (2010) found that as regards diversification opportunities were concerned European stock markets provided better long-term diversification opportunities as compare to the Asian stock markets.

Table 1: Descriptive Statistics of Daily Returns of Selected Indices

	AORD	BVSP	DAX	DJIA	FTSE	HANGS	KOSPI	NIKKEI	SCI	SENSEX	STI
Mean	0.021	0.054	0.041	0.024	0.019	0.031	0.041	0.020	0.015	0.071	0.030
Median	0.061	0.106	0.093	0.054	0.019	0.051	0.090	0.051	0.003	0.112	0.056
Maximum	5.36	13.68	10.80	10.51	9.38	13.41	11.28	13.23	9.03	15.99	7.53
Minimum	-8.55	-12.10	-7.43	-8.20	-9.26	-13.58	-11.17	-12.11	-9.26	-11.81	-8.70
Std. Dev.	1.03	1.79	1.45	1.16	1.20	1.54	1.43	1.55	1.61	1.59	1.17
Skewness	-0.60	-0.08	0.09	-0.09	-0.12	0.03	-0.49	-0.57	-0.24	-0.02	-0.22
Kurtosis	9.32	8.30	9.24	13.64	11.26	12.69	9.08	10.81	6.85	11.27	8.90
Jarque-Bera	4853.75	3306.12	4579.04	13286.30	8023.11	11033.91	4448.73	7310.98	1764.34	8034.18	4109.12
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum	59.34	152.22	115.27	66.37	54.27	87.1	115.56	55.39	41.3586	199.27	84.36
Sum Sq. Dev.	3007.23	8998.96	5913.34	3801.19	4086	6711.49	5783.08	6756.37	7274.515	7078.72	3861.44
Observations	2818	2818	2818	2818	2818	2818	2818	2818	2818	2818	2818

Other issue which is discussed in Table 1 is variance of returns of different indices. Brazil stock market has the highest volatility (1.79%), China stock market (1.61%) and India stock market (1.59%). Whereas the Australian stock market was less (1.03%), USA stock market (1.16%) and Singapore stock market (1.17%). So, it was seen that emerging economies have more fluctuations as compared to the developed economies. The changes in markets in terms of emergence of new technology, new commodity markets and derivatives have resulted into increased integration between markets and different volatility and risk patterns emerged. Skewness of all the indices except DAX was negative. It mean that mean returns were influenced by low frequencies of high daily returns; Where Skewness of SCI was zero indicating symmetrical frequency distribution. It was seen that positive kurtosis of all the indices indicating peak charts of all the indices. Jarque-bera test suggested that series is normally distributed. Overall, there was not much difference between the variations of developed and emerging economies.

How correlated and integrated Indian stock market is with International Stock Markets?

The results of correlation test for eleven stock markets are presented in Table 2. It shows that during sample period, Indian stock markets are closely related with South Korean index, Table 2 shows that during sample period, Indian stock markets are closely related with Korean stock index, KOSPI (0.96), followed by Hong Kong stock market, HANGSENG (0.92), then Brazil index, BVSP with correlation (0.91), Singapore stock market, STI (0.877) and Germany stock market (0.87).

Table 2: Correlation Analysis of Selected Indices

	AORD	BVSP	DAX	DJIA	FTSE	HANGS	KOSPI	NIKKEI	SCI	SENSEX	STI
AORD	1	0.606	0.819	0.681	0.867	0.805	0.657	0.67	0.655	0.65	0.862
BVSP	0.606	1	0.701	0.453	0.55	0.885	0.909	0.016	0.712	0.912	0.81
DAX	0.819	0.701	1	0.883	0.885	0.864	0.862	0.435	0.533	0.871	0.91
DJIA	0.681	0.453	0.883	1	0.829	0.696	0.707	0.51	0.316	0.695	0.799
FTSE	0.867	0.55	0.885	0.829	1	0.737	0.715	0.588	0.46	0.688	0.843
HANGSENG	0.805	0.885	0.864	0.696	0.737	1	0.909	0.3	0.754	0.918	0.936
KOSPI	0.657	0.909	0.862	0.707	0.715	0.909	1	0.161	0.586	0.964	0.895
NIKKEI	0.67	0.016	0.435	0.51	0.588	0.3	0.161	1	0.083	0.146	0.417
SCI	0.655	0.712	0.533	0.316	0.46	0.754	0.586	0.083	1	0.605	0.655
SENSEX	0.65	0.912	0.871	0.695	0.688	0.918	0.964	0.146	0.605	1	0.877
STI	0.862	0.81	0.91	0.799	0.843	0.936	0.895	0.417	0.655	0.877	1

It is least correlated with Japanese stock index (0.146%).Ding (2010) proposed that Chinese Asian market has very less correlation with other Asian markets and US market. Other Asian markets viz Hong Kong, Taiwan, Singapore, Indonesia and Korea were strongly correlated with each other. Yang (2002) explored that East Asian stock markets were not showing any sign of long term correlations, the only short term correlations were found prevalent.

Table 3: Co-Integration Test Results for Selected Indices

	Hypothesized No. of CE(s)	Trace Statistic	0.05 critical value	Prob.	Max-Eigen stats	0.05 critical value	Prob.
AORD	None	7.544	15.495	0.515	6.772	14.265	0.516
	At most 1 *	0.772	3.841	0.38	6.772	14.265	0.516
BVSP	None *	6.483	15.495	0.638	5.146	14.265	0.723
	At most 1	1.337	3.841	0.248	1.337	3.841	0.248
DAX	None *	13.544	15.495	0.096	13.2	14.265	0.073
	At most 1	0.344	3.841	0.558	0.344	3.841	0.558
DJIA	None	6.55	15.495	0.63	6.138	14.265	0.596
	At most 1	0.412	3.841	0.521	0.412	3.841	0.521
FTSE	None	8.598	15.495	0.404	7.96	14.265	0.383
	At most 1	0.638	3.841	0.424	0.638	3.841	0.424
HANGSENG	None *	15.116	15.495	0.057*	14.414	14.265	0.047*
	At most 1	0.702	3.841	0.402	0.702	3.841	0.402
KOSPI	None *	22.907	15.495	0.003*	21.6	14.265	0.003*
	At most 1	1.307	3.841	0.253	1.307	3.841	0.253
NIKKEI	None	7.437	15.495	0.527	5.455	14.265	0.684
	At most 1	1.983	3.841	0.159	1.983	3.841	0.159
SCI	None	4.422	15.495	0.867	3.983	14.265	0.861
	At most 1	0.439	3.841	0.507	0.439	3.841	0.507
STI	None *	13.668	15.495	0.093	13.013	14.265	0.078
	At most 1 *	0.654	3.841	0.419	0.654	3.841	0.419

Table 3 reports that India Co-integration was found with Australia, Brazil, Germany, Hongkong, Singapore and South Korea by both trace value and Eigen value. In recent years, the trading relationship between India and Australia has remarkably increased. Both the economies have trade value increased from $5.1 b in year 2003 to $15.2 b in 2013. India is a huge market of 1.2 b people. It has diversified economy with growth opportunities for Australian business. Australia is providing India, Gold, Coal, Ores and Lead. It is also a source of educational training. Australia is a collaborative partner in research & innovation in different sectors like automobile, agricultural and manufacturing. Australia and India signed a comprehensive Economic Cooperation Agreement on 12th May, 2011. Trade Minister, Australia, Craig Emerson and Indian Commerce & Industry Minister, Anand Sharma understood the importance of an agreement which can further enhance trade relations of both economies. This agreement covers investment and trade in goods and services. Narayan et al., (2014) examined the integration between emerging Asian stock markets and US, Australia, China and India. As compared to US stock markets, Australian stock market is more integrated with the Asian stock market. Asian markets i.e. Korea, Malaysia, Singapore and Thailand were more correlated with Chinese stock market than US, Australian and Indian stock market.

Table 4: Granger Causality Test for Selected Indices

Null Hypothesis:	Obs	F-Statistic	Prob	Results	Direction
SENSEX does not Granger Cause AORD	2816	9.3222	9.20E-05	Accepted	Unidirectional
AORD does not Granger Cause SENSEX		5.7410	0.00325*	Rejected	
SENSEX does not Granger Cause BVSP	2816	7.0046	0.00092	Accepted	
BVSP does not Granger Cause SENSEX		7.5249	5.50E-04	Accepted	
SENSEX does not Granger Cause DAX	2816	0.3758	6.87E-01	Accepted	
DAX does not Granger Cause SENSEX		0.0801	0.92301	Accepted	
SENSEX does not Granger Cause DJIA	2816	2.1517	0.11647	Accepted	
DJIA does not Granger Cause SENSEX		4.9178	0.00738*	Rejected	Unidirectional
SENSEX does not Granger Cause FTSE	2816	0.5267	5.91E-01	Accepted	
FTSE does not Granger Cause SENSEX		0.6342	0.53045	Accepted	
SENSEX does not Granger Cause HANGSENG	2816	3.4959	3.05E-02	Accepted	
HANGSENG does not Granger Cause SENSEX		13.233	1.90E-06	Accepted	
SENSEX does not Granger Cause KOSPI	2816	6.2133	0.00203*	Rejected	Unidirectional
KOSPI does not Granger Cause SENSEX		1.0634	3.45E-01	Accepted	
SENSEX does not Granger Cause NIKKEI	2816	2.2195	0.10886	Accepted	
NIKKEI does not Granger Cause SENSEX		1.7190	0.17944	Accepted	
SENSEX does not Granger Cause SCI	2816	2.2195	0.10886	Accepted	
SCI does not Granger Cause SENSEX		1.71895	0.17944	Accepted	
STI does not Granger Cause SENSEX	2816	5.9349	0.00268*	Rejected	Unidirectional
SENSEX does not Granger Cause STI		2.8893	5.58E-02	Accepted	

Table 4 reports that null hypothesis of SENSEX does not have impact on Australian stock market AORD but Australian stock mark does not have impact on Indian stock market as it was rejected at 0.5% level. Indian stock market does not have impact on USA stock market but USA stock market has an impact on Indian stock market. Indian stock market has an impact on South Korean stock market but South Korean stock market does not have impact on Indian stock market. Singapore stock market has impact on Indian stock market but Indian stock market does not have any impact on Singaporean stock market.
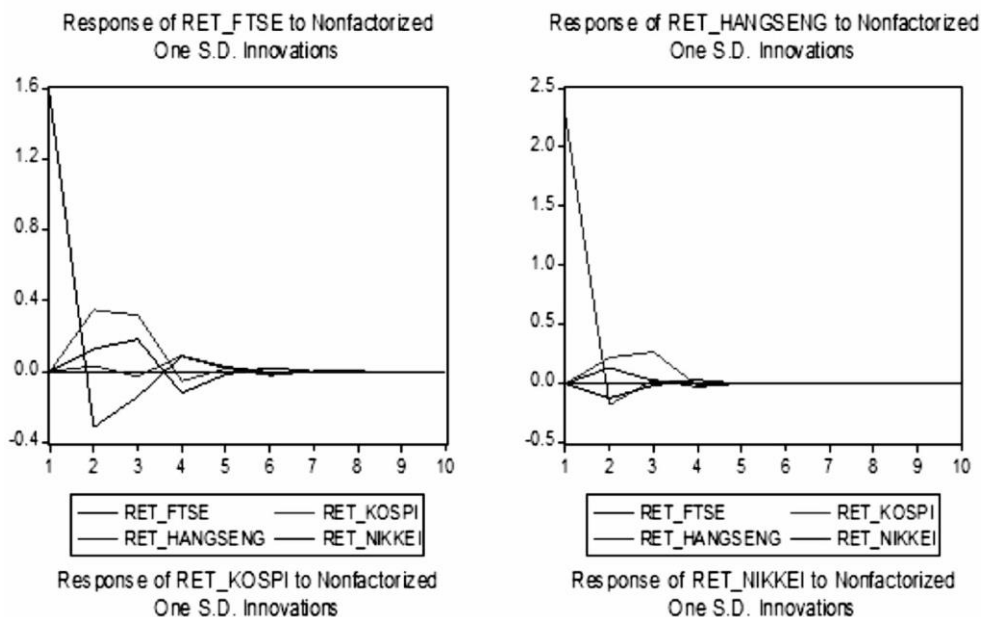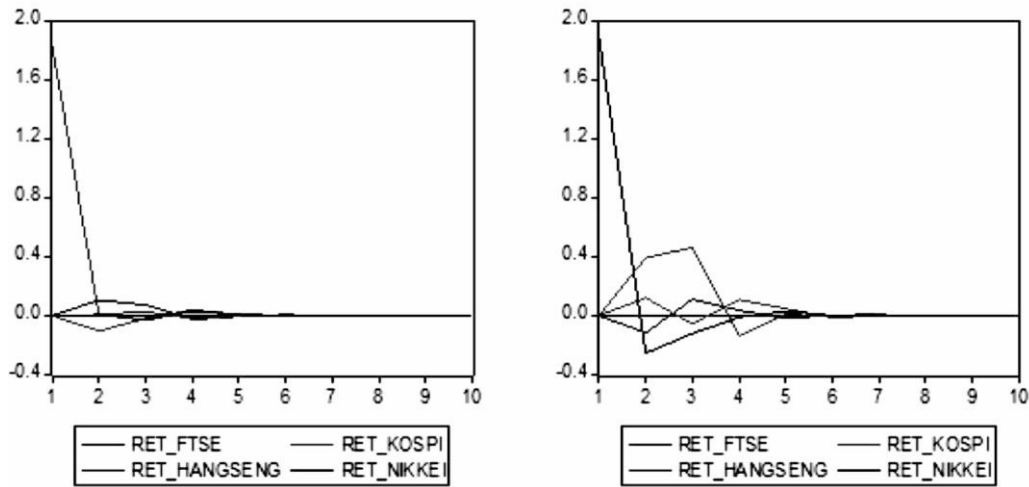
Figure 1: Impulse Response Functions of AORD, BVSP, DAX & DJIA

Shock in a Market always has its Signs on Other Markets as Well.

The impulse response estimates, provides normalized responses for the UK, Hong Kong, Japan and South Korea for a typical shock to and from the markets is depicted in figure 1. These responses represent unit shocks. As can be seen from the results, the shock in any market does not have much impact on the other stock market. The impulse response results of Australia, Germany, USA and Brazil and again it was found that there is very little impact of shock

from one market to another market is depicted in Figure 2. The stock markets of China, India and Singapore are less affected from the shocks from one another is depicted in Figure 3. Tokic (2003) discussed that the interrelationship between Asian Pacific equity markets and some other major stock exchanges of USA and Japan was investigated to see the impact of 1997 Asia Pacific Financial Crisis. It was found that the stock markets of Hong Kong, Indonesia and Malaysia have a long term significant relationship with USA and Philippines is linked to both markets USA and Japan.
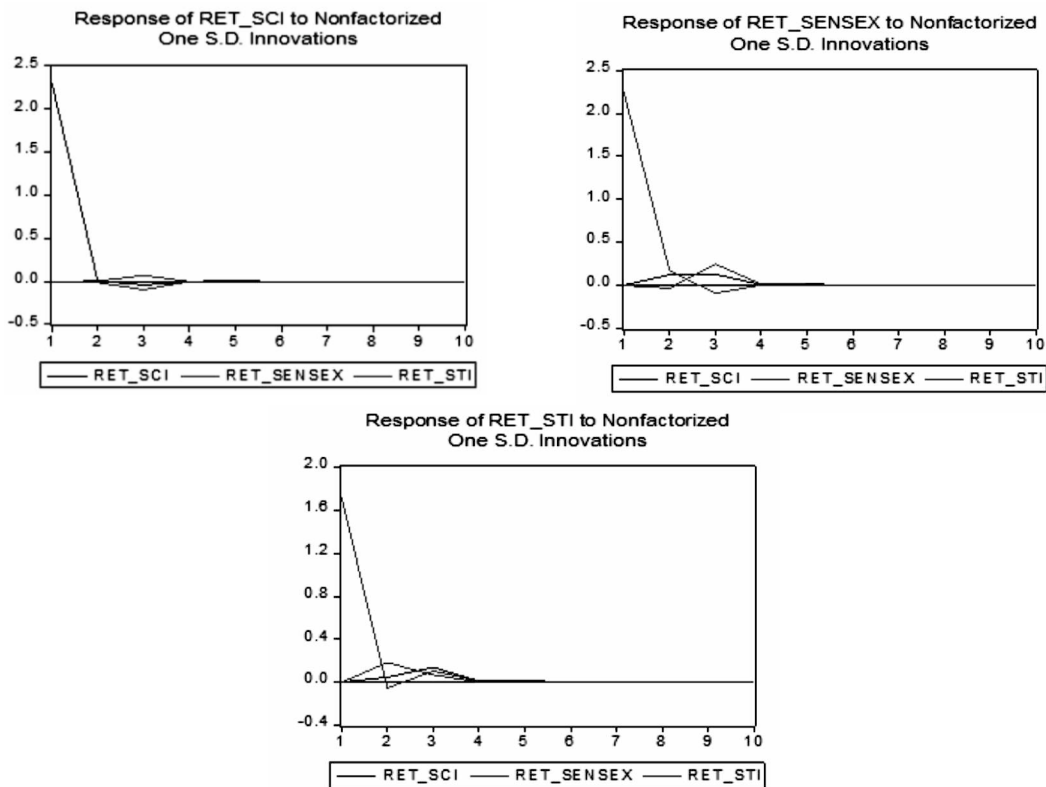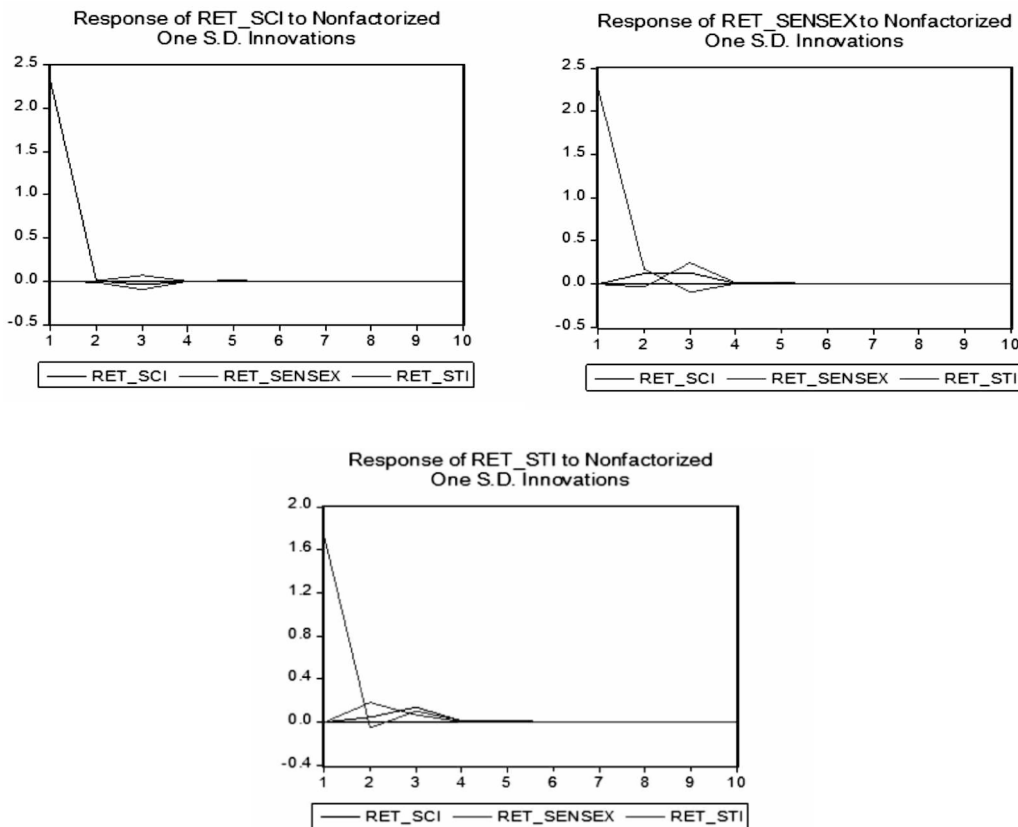

Figure2: Impulse Response Functions of FTSE, KOSPI, HANGSENG & NIKKEI

Figure3: Impulse Response Functions of SCI, SENSEX and STI

Conclusions

The purpose of present study is to investigate the nature of long-run relationship between Indian stock market and the stock markets of three other Asian economies and seven developed economies. The stock markets of emerging economies Brazil and South Korea have influence on Indian stock market and Indian stock market is also influencing these economies but there is no causal relationship between Indian stock market and Chinese stock market. The stock markets of developed economies of Australia, Hongkong, Germany, USA, Japan and Singapore have a causal relationship with Indian stock market but Indian stock market does not have much influence on the stock markets of any developed economy. There is long term relationship between stock markets of developed economies like Germany and Hongkong and Indian stock market. So, among developed economies which are significantly in relationship with Indian stock market are USA stock market, UK stock market, Singapore stock market and Japanese stock market. As far as, emerging economies are concerned South Korean stock market and Brazilian stock market playing an important role for Indian stock market. Although there is no stable lead-lag relationship of Indian stock market with the stock markets of developed and emerging economies. (Tsouma, 2007; Rejeb&Salha, 2013; and Beine

& Candelon, 2011;) There is no consistency in any particular country which is influencing India throughout. Indian stock market has a short-run relationship with the developed and emerging economies but no long-run relationship exits. There are different reasons which are contributing towards low involvement of stock markets of foreign economies with Indian stock market. After liberalization, foreign capital was invited into different sectors resulted into market integration. But, even after this, lots of hurdles during investment in the stock market. Individual investors can not invest in the foreign markets. Some domestic corporate can raise funds through ADRs/GDRs in the foreign market. In the nutshell, with the growth of technical facilities in the capital market and removal of investment barriers, the integration of Indian stock market along with international stock markets will increase in future. Chattopadhyay and Beherat (2008) was in favor of these results.

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