CO-INTEGRATION AMONG INDIAN EMERGING AND DEVELOPED STOCK MARKETS: IMPACT OF EMERGING AND DEVELOPED STOCK MARKETS ON INDIAN STOCK MARKETS

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Abstract:-

This research paper examined the cointegration among Indian emerging and developed stock markets such as India, China, Indonesia, Malaysia, South Korea, Japan, US and UK. The traditional test namely cross-correlation and the regression are employed to examine the co-integration among the markets. This empirical study is based on daily closing values of the stock markets from the period April 1, 2005 to March 31, 2015. The regression results proved that Indian Stock market is influenced by all the emerging and developed stock markets that are taken for study in short run. This study proves that Indian stock market is co-integrated with other stock markets in the short run.

Keywords: Cross correlation test, Regression, Stock index, India.

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1.   INTRODUCTION

The interrelationship between international stock markets is a key issue in international portfolio management and risk measurement. Trading and active portfolio management involve sophisticated brain functions such as logical reasoning, numerical computation, and short- and long-term planning which may often be tempered by emotional responses such as fear. Investors' preference for the avoidance of loss may imply that significant fluctuations in prices are not necessarily related to the arrival of information on economic or financial variables but may also correspond to collective phenomena such as crowd effects or herd behaviour. Behavioural finance incorporates these approaches into standard models of financial markets to explain the aggregate effects of decisions taken by individual traders. The existence of uncorrelated returns in international stock markets is fundamental in a context of global portfolio diversification. When high stock market volatility occurs, risk control is the main aim of portfolio managers and international diversification is a crucial issue for it. Portfolio managers, who follow a top-down approach, first look for the best international diversification and then choose the best-performing stocks in the local markets.

The dynamics of the world economy are changing. China and India happen to be the second and the fourth largest economies respectively in the world in terms of GDP at purchasing power parity (Euro monitor 2010, Appendix A). The equity markets in emerging economies are on a high since 2005. The Asian economies are advancing technology wise and are acting as an attraction for foreign capital. The increasing regionalization of economic activities and the liberalization of financial markets since the late 1980s resulted in regional economic integration, i.e., integration among the markets within the same region e.g. greater co-movement in the stock prices of South East Asian countries due to economic ties, lower geographical distance, and foreign investments or due to a common movement of fundamentals which is called the Contagion factor (Mukherjee and Mishra 2007). Due to the increasing interdependence of major financial markets all over the world, the transmission of stock return movements among major national markets has become a necessary research topic and is commonly termed as international stock market integration. The degree of a country's economic openness or capital control throws light on the degree of association with the financial markets in the world. Greater integration

would mean a free or relatively freer access to foreign financial markets. This better access would provide many firms a broader source for fund raising.

2. OBJECTIVES OF THE STUDY

❖ To investigate the cross correlation between the returns of Indian stock market and emerging and developed stock markets.

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❖ To examine the impact of emerging and developed stock markets on India.

3. PERIOD AND DATA OF THE STUDY

The current study is purely based on secondary data. This empirical study is based on daily closing values of the stock market indices of five important emerging stock market and three developed stock market. Daily closing prices of Nifty (India) Nikkei 225 index (Japan), Shanghai Composite (China), Kuala Lumpur Composite (Malaysia), Jakarta Composite (Indonesia), KS11 (South Korea), NASDAQ (US), FTSE 100 (UK) from the period April 1, 2005 to March 31, 2015 has been taken from Yahoo Finance.com.

4. METHODOLOGY

4.1.Cross correlation

The stationary series are also cross – correlated. The cross - correlation between the time series are tested by using the following formula:

$$\gamma_{x_y \; y_t}(k) = \frac{\sum_{t=1}^{T-K} (x_t - \bar{x})(y_{t+k} - \bar{y})}{\left[\sum_{t=1}^{T}(x_t - \bar{x})^2 \sum_{t=1}^{T}(y_t - \bar{y})^2\right]^{1/2}}$$

Where k is greater than, equal to, or less than zero.

The significance of estimated cross – correlation is assessed by using approximate standard error, $T^{-\frac{1}{2}}$, (Bartlet, 1966), of the sample of cross – correlation. This helps to identify the causality

patterns associated with, $\gamma\, x_t\, y_t\, (k)$. This method was used, among others, by Ahmad (1989) in estimating the cross – correlations between two interest rate series.

4.2. Regression

The impact of emerging and developed stock markets on India is analysed with the help of simple regression. It is estimated by ordinary least squares under the following formula:

. $X_t = \beta_1 + \delta\, Y_t + \mu_t$

               X = India (Nifty) variable

               Y = Emerging and developed countries variable

The specific hypotheses are:

               $H_0 : \quad \delta = 0$

               $H_1 : \quad \delta \neq 0$

Null hypothesis is that there is no significant impact of emerging and developed countries on India. Variables namely the market return of all the emerging and developed countries are used.

5. HYPOTHESES

Following null hypotheses have been formulated for testing.

❖   India is not co integrated with emerging and developed stock markets.

❖   India is not influenced by emerging and developed stock markets.

6. REVIEW OF LITERATURE

This chapter concerns with review of important empirical works, concerning stock market volatility and return and stock market integration starting from 2005 to 2015. The review of literature is undertaken in two sections. The first section focuses on the review of empirical works related to market volatility and return. Similarly, the second section deals with the review of studies concerned with stock market integration. But studies from the year 1995 are taken for review.

Studies Related to Stock Market Integration

        Siklos, P.L, et.al. (2001) examined whether there is a common stochastic trends in the U.S., Japan, Hong Kong, Korea, Singapore, Taiwan and Thailand using stock market indices

from each countries spanning from January 1976 to August 1995. They employed Dickey Fuller and Philip-Perron to test the stationary property of the series and using Vector Error Correction Model (VECM) and co integration test to examine the relationship between the indices. They revealed that stock market integration is largely features post-1987 U.S. stock market crash, and intensified during 1990s. Before the 1987 crash, all seven stock market under study did not share the same common trend, which means that investor in Asia Pacific market did not exploit diversification opportunities. They found that Asia Pacific stock markets appear to behave as if trend in the U.S. and Japanese market did influence their stocks markets.

Fernández-Serrano and Sosvilla-Rivero (2002) investigated the long-run relationships between six major Latin American stock markets and the U.S. during the period of 1995 to 2002. They used daily closing prices of six major Latin American markets namely Argentina, Brazil, Chile, Mexico, Peru and Venezuela and the U.S. market. Besides conducting normal co integration test, they also employed co integration that allowed for structural shifts in the co integration vector. The result suggested that without structural breaks, they only found co integration in the cases of Brazil and Mexico with U.S market. In contrast, allowing for structural breaks, they found strong evidence in the relationship between the Argentine, Chilean and Venezuelan indices and the Dow Jones index which represent U.S. market after the 1998 financial turmoil and between the Brazilian and Mexican indices and the Dow Jones index before such turbulence.

Tan and Tse (2002) used daily data in local currencies over 1988-2000 to examine the linkages among U.S., Japan, and seven Asian stock markets including Malaysia, Philippines, Singapore, and Thailand. They found that Asian markets were most heavily influenced by the U.S. but that the influence of Japan was increasing. Another interesting result was that Malaysia was less affected by the U.S. and Japan after the crisis, which can be attributed to the success of its capital and currency controls, but Singapore and Malaysia still affect each other strongly, which can be attributed to geographic proximity, economic linkages, and structural symmetry.

Muhammad Naeem (2002) conducted a study on the interdependence of the major stock markets in South Asia and the linkages between the markets with U.S and U.K stock markets using monthly data from January 1994 to December 1999. Using both bivariate and multivariate co

integration analysis, he found no co integration between the South Asian stock markets indices for the entire period but found co integration for the prenuclear test period i.e. from January 1994 to April 1998.

Golaka C Nath and Sunil Verma (2003) examined the interdependence of the three major stock markets in South Asia. Using daily stock market indices of India (NSE-Nifty), Singapore (STI) and Taiwan (Taiex) from January 1994 to November 2002, they employed bivariate and multivariate co-integration test. The result showed that no co integration was found for the entire period thus concluded that there was no long run equilibrium between India, Singapore and Taiwan.

Aggarwal, Lucey and Muckley (2003) have examined time-varying integration of European equity markets over the 1985 to 2002 period using daily data for the main EU countries. They used estimates of traditional co-integration, the Haldane and Hall Kalman filter technique, and dynamic analysis in their study. The result showed the evidence of integration in European countries only after the establishment of EMU and the ECB during 1997-98 periods. Result also indicated that Frankfurt was the dominant market for equities in Europe.

Nath and Verma (2003) examined the interdependence of the three major stock markets in south Asia stock market indices namely India (NSE-Nifty) Taiwan (Taiex) and Singapore (STI) by employing bivariate and multivariate co integration analysis to model the linkages among the stock markets, No co -integration was found for the entire period (daily data from January 1994 to November 2002).They concluded that there is no long run equilibrium.

Shamsuddin and Kim (2003) investigated the integration of the Australian stock market with its two leading trading partners, the US and Japan. In investigating the extent of integration, the study considered the interdependence between foreign exchange rates and stock prices, since exchange rates influence international competitiveness of firms, and, via interest rates, the cost of capital. The results indicated that there was a stable long-run relationship among the Australian, US and Japanese markets prior to the Asian crisis but that this relationship disappeared in the post-Asian crisis period.

Click R.,and Plummer M.G., (2003) examined whetherthe ASEAN-5 markets were integrated or segmented using the time series technique of co-integrationto extract a long-run relation. The empirical results suggested that the ASEAN-5 stock markets wereco-integrated and were thus not completely segmented by national borders. They concluded that ASEAN-5 stock markets were integrated in the economic sense, but that integration wasnot complete. From the perspective of the international portfolio investor, benefits ofinternational portfolio diversification across the five markets were reduced but not eliminated.

Narayan et al. (2004) examined the dynamic linkages between the stock markets of Bangladesh, India, Pakistan and Sri Lanka using Granger causality approach, using daily stock price indices over the period 1995–2000. They found that in the short run there is unidirectional Granger causality running from stock prices in Pakistan to India, stock prices in Sri Lanka to India and from stock prices in Pakistan to Sri Lanka. Bangladesh is the most exogenous of the four markets.

Chaitanya, (2005) focused on trend movements of Global and Asian Stock Market indices, including the correlation with each other markets, descriptive statistics, Kurtosis, and skewness during the period of 2005-2014. They found from the study results that the BSE Sensex is highly correlated with the Hang Seng (89%) followed by Shanghai Composite (56%), S&P (55%) and Nikkie (33%). It depicts that the stock markets do impact each other.

Maghyereh (2006) investigated the interdependence among the daily equity market returns for four major Middle Eastern and North African (MENA) emerging markets, Jordanian, Egyptian, Moroccan and Turkish markets. Evidence indicated that none of the MENA markets is completely isolated and independent.

Debjban Mukharjee (2007) evidenced that the markets in general and Indian market in particular is more integrated with other global exchanges from 2002-03 onwards. This can very well be seen since the South Asian crisis of the mid- late nineties barely affected US particularly because India was insulated due to government policies and was just making the transition. However, in

the later time periods, the influence of other stock markets increased on BSE or NSE, but at a very low almost insignificant level.

Choudhry.et.al. (2007) studied the changes in the long run relationship between eight East countries namely Thailand, Malaysia, Indonesia, Hong Kong, Singapore, the Philippines, South Korea and Taiwan around the Asian financial crisis of 1997-98. They also examined the change in the influence of the U.S. and Japanese stock markets in the East region before, during and after the Asian financial crisis using daily stock price indices from January 1, 1998 to January 1, 2003. Correlation coefficients, multivariate co integration, causality test and regression are conducted and results showed significant long-run relationship and linkages between the Far East stock markets before, during and after the crisis. They also found larger U.S. influence in all periods and some evidence of increasing Japanese influence to the eight Far East countries.

Royfaizal, et.al., (2007) analysed the stock markets interdependencies between the Asean-5+3 and U.S. stock markets before, during and after ASEAN 5+3 financial crisis by using weekly stock indices expressed in local currencies from July1997 to June 1998. They employed Granger-causality test based on VECM to test the long run relationship among the stock markets. The study showed that the long run relationships between ASEAN 5+3 stock markets occurred only for during- and post crisis period. They also found that US became dominant compared to other countries after the crisis.

Lim L.K. (2007) conducted a study to examine the dynamic interdependencies of five ASEAN stock markets i.e. Indonesia, Malaysia, Philippines, Singapore and Thailand with US stock market over the period of April 1990 to July 1997 using daily total market-return indices for each stock market. The result indicated higher average returns and correlations over the post crisis period. The result also indicated an increase in the integration between the ASEAN-5 markets after the financial crisis and US market returns have significant influence on the returns of all ASEAN-5 markets.

Abbas Valadkhani and Surachai Chancharat (2008) have investigated the existence of co-integration and causality between the stock market price indices of Thailand and its major

trading partners (Australia, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, the UK and the USA), using monthly data spanning from December 1987 to December 2005. They used both the Engle-Granger two-step procedure (assuming no structural breaks) and the Gregory and Hansen test (allowing for one structural break). They found evidence of potential long run benefits from diversifying the investment portfolios internationally. They also found that the stock returns of Thailand and three of its neighbouring countries (Malaysia, Singapore and Taiwan) are interrelated.

Canarella, Miller and Pollard (2008), explored the dynamic linkages between stocks market returns in NAFTA (i.e., Canada, Mexico and the U.S.). They employed daily closing price of S&P TSX Composite Index in Canada, the IPC index in Mexico and the S&P500 index in U.S for the period of January 1, 1992 to December 31, 2007. They used co-integration techniques of Johansen and Juselius to examine the long-run relationship between the three markets and impulse-response analysis to evaluate the dynamic relationship between the three markets. They fail to discover evidence that the NAFTA stock indices share long-run equilibrium relationship since there is no evidence of a common long-term trend between the three indices. They also found that the response of each market to shocks in its own market always exceeds the response to shocks in other markets with U.S. holds a leading role.

Mukherjee and Bose (2008) investigated the level of market integration of India with the developed countries of US, Japan and five other Asia Pacific markets for the period from 1999 to 2005. They found that stock returns in India were led by major stock index returns in US, Japan, Hong Kong, South Korea and Singapore. They also found that Indian markets exerted considerable influence on stock returns in Japan and South Korea along with Taiwan and Malaysia.

Kumar and Dhankar (2009) examined the cross correlations in stock returns of India with Pakistan and Bangladesh for a period between 1997 and 2007. They tested the asymmetric volatility and relationship of stock returns with expected and unexpected volatility. They found weak correlation between the stock returns and significant relationship between stock returns and unexpected volatility, suggesting that investors realize extra risk premium for taking advantage

of unexpected variations in stock returns. With such mixed results, the literature tends to conclude that financial markets in the Asia-Pacific region have been neither well integrated nor completely segmented in the recent past.

Saif siddiigui (2009) examined associations between S&P CNX Nifty and selected Asian & US stock markets. They used daily closing figure from June 1st, 1999 to June 1st 2009, time period was divided into two equal parts, period I: starts from 1st June 2009 and period II is ranged from 1st June, 2004 to 1st June, 1999. They used test correlation, stationarity of time series, co-integration and causalities between the stock markets. It was found that the returns are not normally distributed. It was also concluded that volatility has gone down in Period-II. Change in correlation between the indices was also widespread in Period-II. It can further be derived that the interdependencies among the indices has increased in Period II. No very clear direction of relationships existed in the sense of Granger Causality indicating the fact that influence of few markets, especially that of the US, has eroded over a period of time.

Vijay Agarwal, (2011) examined that the correlation of stock returns of India with five other Asian countries. There existed a very weak correlation between the Indian markets and Hong Kong, Indonesia, Malaysia and Japan. Comparatively higher correlation was found between the Indian and the Korean markets, which have weakened in the short run. Indian markets offer diversification benefits to international investors looking for investment in the Asia Pacific region. Indian markets also delivered the highest compounded annual growth rate in stock market returns, both in the short as well as long run.

Komlavi Elubueni Assidenou (2011) investigated the co-integration properties of major capital markets indices during September, 2008 / August, 2009 episode of the financial and banking crises originated in U.S markets. Based on daily closing prices of international stock markets indices, the analysis showed that three set of indices of economies (OECD group, Pacific group and Asia group) had at least one co-integrating vector. They concluded on the independencies of Asian markets, they revealed that during the deeper financial crisis period, Asian major markets indices were co-integrated.

Amitabh Joshi and Shanul Gawshinde (2012) investigated cross sectional study of various developed and developing countries for the year 2006, 2007 and 2008. Eight developed countries viz. USA, UK, Australia, France, Germany, Hongkong, Japan, Singapore and Nine developing countries viz. India, Russia, Brazil, Indonesia, Korea, Malaysia, Taiwan and Mexico. Two-way ANOVA have been used for analysis. They concluded that there was no significance relationship between the Market Capitalization of Stock Market of Developed and Developing countries.

Safdar Hussain Tahir, et.al. (2013) investigated the interdependence among the South Asian and developed markets and their impact on Karachi Stock Exchange. They data were collected from eight stock exchanges, four from each South Asia and developed countries for the period from July, 1999 to June, 2011. They used the techniques like Correlation Matrix, Unit root Co-integration test and Granger Causality were applied. They found the Equity markets of South Asia and developed countries are not co-integrated with each other.

Ahmet sensoy (2013) investigated the presence of long-range dependence in the stock markets and exchange rates (vis-a-vis US dollar) of all inflation targeting countries having floating currencies. He considers daily prices of stock markets and exchange rates of all inflation targeting countries with floating currencies throughout the time period from January, 2003 to December, 2013. This condition gives us 17 countries to consider, namely; Australia, Canada, England, New Zealand, Norway, Sweden and Switzerland as developed markets and Brazil, Chile, Czech Republic, Is rael, Mexico, Philippines, Poland, South Africa, South Korea and Turkey as emerging markets. He used Hurst exponent, exchange rate, stock market, efficiency, emerging countries, inflation targeting. We conclude that efficiency rankings for both stock markets and exchange rates under several approaches. We believe the results of this study will provide guidance for both policy makers and investors.

Voluminous literature on stock market co-integration are available. Researchers have examined the linkages among various equity markets in the Pacific Region, Europe and North America but Indian markets have received little research interest. Hence, this study has been undertaken.

7. CROSS - CORRELATION AMONG INDIA EMERGING AND DEVELOPED STOCK MARKETS

A group of markets are said to be integrated when shocks arising in one market gets quickly transmitted to other interrelated markets. If the stock prices in countries i and j are co-integrated, stock price changes in country i (country j) are predictable. If the stock prices in countries i and j are determined independently, then stock prices in country i (country j) incorporate all available information. Hence, from the past stock prices in country i (country j), no other information will be useful to explain changes in its stock prices.

Cross correlation is a measure of similarity of two series as a function of the lag of one relative to the other Cross correlation is generally used when measuring information between two different time series. The range of the data is -1 to 1 such that the closer the cross-correlation value is to 1, the more closely the information sets are. The stationary series are also cross – correlated. The cross - correlation between the time series are tested by using the following formula:

$$\gamma_{x_y y_t}(k) = \frac{\sum_{t=1}^{T-K} (\ x_t - \bar{x})(y_{t+k} - \bar{y})}{\left[\sum_{t=1}^{T}(x_t - \bar{x})^2 \sum_{t=1}^{T}(y_t - \bar{y})^2 \right]^{1/2}} \qquad (6)$$

Where k is greater than, equal to, or less than zero.

The significance of estimated cross – correlation is assessed by using approximate standard error, $T^{-1/2}$, (Bartlet, 1966), of the sample of cross – correlation. This helps to identify the causality patterns associated with, $\gamma \ x_t \ y_t \ (k)$. This method was used, among others, by Ahmad (1989) in estimating the cross – correlations between two interest rate series. The test results of cross-correlation are presented in Tables from 5.1 to 5.4.

The null and alternative hypotheses are

$$H_0 : \ \delta = 0$$
$$H_1 : \ \delta \neq 0$$

H_0 : There is no co-integration among the stock indices.

H_1 : There is co-integration among the stock indices

Table – 1

Cross-correlations on Daily Returns

(India on Indonesia, Malaysia) (2005-2015)

Table 2: Cross-correlations on Daily Returns (2005 April -2015 March)		
Lags	**India on Indonesia**	**India on Malaysia**
-5	-.006	.009
-4	-.035	.003
-3	.007	-.017
-2	.122 *	-.028
-1	.065 *	.031
0	.395 *	.257 *
1	.145 *	.150 *
2	.010	.018
3	.006	.036
4	.016	-.004
5	.001	.034

* Significant at 1% level.

TABLE 2

Cross-correlations on Daily Returns

(India on China, South Korea) (2005-2015)

Table 2: Cross-correlations on Daily Returns (2005 April -2015 March)

Lags	India on China	India on South Korea
-5	-.058 *	.013
-4	-.027	.000
-3	.002	-.012
-2	.006	-.010
-1	-.024	.023
0	.249 *	.098 *
1	.092 *	.040 *
2	-.013	.011
3	.025	.007
4	.017	-.001
5	.020	.008

* Significant at 1% level.

TABLE 3

Cross-correlations on Daily Returns

(India on Japan, UK) (2005-2015)

Table 2: Cross-correlations on Daily Returns (2005 April -2015 March)		
Lags	India on Japan	India on UK
-5	.002	-.029
-4	-.024	-.007
-3	-.006	.025
-2	.018	.038
-1	.037	.137 *
0	.391 *	.436 *
1	.173 *	.027

2	-.062 *	-.033
3	-.005	-.039
4	-.010	.012
5	-.025	-.022

* Significant at 1% level.

TABLE 4

Cross-correlations on Daily Returns

(India on US) (2005-2015)

Table 2: Cross-correlations on Daily Returns (2005 April -2015 March)	
Lags	India on US
-5	-.013
-4	-.012
-3	.015
-2	-.023
-1	.040 *
0	-.004
1	-.009
2	.030
3	.012
4	-.001
5	-.005

* Significant at 1% level.

Cross correlation coefficients of Indian stock market returns (first difference in the log level) with those of the other emerging and developed stock markets are examined. The cross correlation coefficients for the log of the market return series show significant cross correlation at different lags for the sample period. In respect of India on Indonesia 4 lags are significant. In the case of India on Japan and India on China 3 lags are significant. Two lags are significant in

India on UK, India on Malaysia and India on South Korea. The presence of non-zero cross correlation coefficients in the log of the market returns series clearly suggest that there is a serial dependence between the values. Therefore, null hypothesis of no co integration among Indian stock markets and other emerging and developed stock markets is rejected at 1 per cent level. The test fails to support no co-integration among Indian stock markets and other emerging and developed stock markets in the short run.

IMPACT OF EMERGING AND DEVELOPED STOCK MARKETS ON INDIAN STOCK MARKETS

The impact of emerging and developed stock markets on India is analyzed with the help of simple regression. It is estimated by ordinary least squares under the following formula:

. $\quad X_t = \beta_1 + \delta Y_t + \mu_t$

$\qquad$ X = India (Nifty) variable

$\qquad$ Y= Emerging and developed countries variable

The specific hypotheses are:

$\qquad$ H_0 : $\quad \delta = 0$

$\qquad$ H_1 : $\quad \delta \neq 0$

Null hypothesis is that there is no significant impact of emerging and developed countries on India. Variables namely the market return of all the emerging and developed countries are used Tables 5.5 to 5.11 portray the results of regression.

TABLE 5

Impact of China Stock Market on Indian Stock Market

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.147	.119		34.983	.000[*]
	CHINA	.556	.015	.595	36.659	.000[*]
a. Dependent Variable: INDIA						

* Significant at 1% level.

TABLE 6

Impact of Indonesia Stock Market

on Indian Stock Market

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.580	.038		95.015	.000*
	INDONESIA	.618	.005	.936	129.727	.000*
a. Dependent Variable: INDIA						

* Significant at 1% level.

TABLE 7

Impact of South Korea Stock Market

on Indian Stock Market

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.720	.040		168.302	.000*
	SOUTHKOREA	.225	.005	.669	43.907	.000*
a. Dependent Variable: INDIA						

* Significant at 1% level.

TABLE 8

Impact of Malaysia Stock Market on Indian Stock Market

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.424	.078		-5.428	.000[*]
	MALAYSIA	1.235	.011	.919	113.811	.000[*]
a. Dependent Variable: INDIA						

* Significant at 1% level.

TABLE 9

Impact of Japan Stock Market On Indian Stock Market

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.283	.250		29.164	.000[*]
	JAPAN	.125	.027	.097	4.723	.000[*]
a. Dependent Variable: INDIA						

* Significant at 1% level.

TABLE 10

Impact of UK Stock Market on Indian Stock Market

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		

1	(Constant)	-4.695	.359		-13.090	.000*
	UK	1.520	.041	.597	36.679	.000*
a. Dependent Variable: INDIA						

* Significant at 1% level.

TABLE 11

Impact of US Stock Market On Indian Stock Market

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.184	.094		33.939	.000*
	US	.688	.012	.753	56.300	.000*
a. Dependent Variable: INDIA						

* Significant at 1% level.

The regression results proved that Indian Market is influenced by all the emerging and developed stock markets that are taken for study.

8. SUMMARY, FINDINGS AND CONCLUSION

8.1.Dynamic linkages between India and emerging and developed stock markets.

The presence of non-zero cross correlation coefficients in the log of the market returns series clearly suggest that there is a serial dependence between the values. Therefore, null hypothesis of no co integration among Indian stock markets and other emerging and developed stock markets is rejected at 1 per cent level. The test fails to support no co-integration among Indian stock markets and other emerging and developed stock markets.

8.2.Impact of Emerging and Developed Stock Markets on Indian Stock Markets.

The regression results proved that Indian Market is influenced by all the emerging and developed stock markets that are taken for study in the short run.

9. CONCLUSION

Dynamic linkages among India and emerging and developed stock markets are examined. The cross- correlation and regression tests are employed to examine co-integration among the markets. The hypothesis of no co-integration between India and emerging and developed stock markets is rejected for all the stock price index. Regression result also confirmed the cross-correlation test result. Co-integration existed among the stock markets only for a short run.