LITERATURE REVIEW

Although voluminous literature is available on the measurement of international financial integration and its determinants but not much attention has been paid in exploring the level of integration of Indian financial system with rest of the world. Also, there is no dearth of literature in the field of international finance on relationship of international financial integration or financial openness with long run growth of the country. With the present review of literature, an effort would be made to highlight the rationale of this study and to precisely define the problem, and ultimately to formulate the appropriate model for undertaking the task.

The literature reviewed in this chapter concentrates mainly on measurement criterion of international financial integration through different channels, its determinants, its long run growth effects on the economies, along with the models used by different studies at various point of times. For the coherent review of whole discussion, available research work has been divided broadly into two major sections which are further sub divided. In the first section (2.1), studies on the measurement of global financial integration of various countries in general and of India in particular, have been elaborated. This section is sub divided into two sections, covering the different horizons and different econometric techniques used for the measurement purpose. In the next section (2.2), various studies examining the impact of international financial integration on long run economic growth in general and India in particular have been analyzed. This section incorporates the studies that studied the direct and indirect role of international financial integration in growth.

3.1 Measurement of international Financial Integration

To know the optimum level of financial openness and hence integration in the world financial market, and to achieve a balance between benefits and costs of International financial integration it is necessary to measure it first. Below are the reviews of the studies concentrating on various methods and criteria to measure the integration of global financial markets.
Oxelheim (1990) made an attempt “to measure the level of international financial integration of national financial markets (Swedish). The author distinguished three form of financial integration: total, direct and indirect financial integration. Analysis performed in the study is linked to the direct financial integration and therefore, is based on the comparison (not links) of interest rates. After allowing for risk (both political and exchange) premium and exchange rate expectations, the study found that interest rate level in the Swedish credit market as a whole has differed significantly from international interest-rate levels. Moreover, gaps have increased during the recent sub periods 1979-1984 (74-84 whole period)”.

Lemmen and Eijffinger (1998) used “the role of saving-investment correlation to evaluate the degree of financial integration in the European Union (EU) i.e. Feldstein-Horioka Criterion. A link has been established between F-H criterion and three other criteria for international financial integration i.e. covered, uncovered and real interest parity condition. After performing both cross-sectional and time series (co integration) analysis, the study observed that the F-H criterion has quantified the degree of financial integration in EU. According to them, financial markets may be divided into two segments; one segment with low rated financial instruments in liquid wholesale markets and the other with low rated financial instruments with less liquid retail markets. F-H is more concerned with later segment whereas interest rate parity conditions are more concerned with the former segment”.

Park (1999) studied “the measurement indicator of international financial integration among developing countries. According to him, international financial integration occurs when exchange controls are demolished or reduced and capital account is rather free to allow financial resources in and out of the country. He pointed out that if there are no capital controls and exchange market interventions by the government, then interest rate differentials on comparable assets from different countries are related to the differentials between spot and forward exchange rates for

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1 Total, which embraces the direct and indirect means that expected real interest rates are same on the markets concerned (interest rate parity). Under direct financial integration law of one price for financial securities holds and an investor can expect the same risk-adjusted return on investments on different markets. Indirect on the other hand, refers to a situation in which return on the investment in one country is linked to the returns on the investments in other countries.
the currencies involved. He has given three indicators of international financial integration in developing countries, (i) Bank International Activities Ratio; (ii) Inward Foreign Direct Investments to GDP Ratio and; (iii) Private Capital Flows to GNP Ratio”.

In the pioneering work on international financial integration, *Lane and Milesi-Ferretti (2003)* attempted to empirically “identify the factors responsible for changing degree of international financial integration over time and across different countries. While constructing panel data set for 18 OECD member countries for the period 1978-2001, study found that trade openness, GDP per capita, and stock market capitalization are the main factors responsible in explaining the variation over time in the degree of international financial integration”.

*Tsoukis and Alyousha (2001)* “reviewed Felddstein-Horioka (1980) approach to measure the international capital mobility by the size of saving-investment correlation. While focusing on saving and investment ratio, the study followed a different measure of capital mobility, based on examining their causal ordering. This new approach given by Argimon and Roldan (1994) investigated causal ordering between saving and investment ratios. Sample in the study consisted of quarterly seasonally adjusted data for 7 industrial economies (Australia, Canada, Germany, Japan, Netherlands, United Kingdom, and United States) for the best part of post-war period era. Long run Granger causality was tested and there was considerable ambiguity about the co integration between saving and investment ratios when it was obtained for the whole of the sample. In case of Australia and U.K, test shows causality to run from saving to investment i.e. little capital mobility. There was some evidence of getting financial markets integrated in post Brettonwoods era”.

A study by *Phylaktis and Ravazzalo (2002)* examined “the real and financial links simultaneously at the regional and global (U.S) level for a group of Pacific basin countries. The study analysed the covariance of excess returns on national stock markets over the period 1980-1998. The study provided evidence that economic integration provides a channel for financial integration. Results revealed partly increase in financial integration even in the presence of foreign exchange
restrictions. Another connotation made from study is that regional and global financial integration became stronger during 1990s even prior to the Asian crisis. Some countries found to have close relationships with the U.S and others with the Japan”.

Using gravity model of bilateral financial asset holdings, Kim et. al. (2005) formally tested “if East Asian financial markets are relatively less integrated with each other than to global markets, particularly compared to the European ones. They also estimated the degree of regional and global risk sharing. The study found that East Asia tend to be relatively more integrated with the global market than with one another in the region, particularly compared to the Europe”.

Mishra and Daly (2006) focused “on the dynamics of international financial integration for a set of 13 industrial countries (U.S, U.K, Canada, Germany, France, Italy, Sweden, Switzerland, Spain, New Zealand and Netherlands) including Australia over the period 1990 to 2003 by analyzing data on foreign assets and liabilities. Several proxies have been constructed to measure international financial integration for a group of countries across a range of measures. In an attempt to compare Australia’s relative performance with a representative group of countries considered, it was found to be at similar stage. While taking growth in international cross-holdings of foreign assets and liabilities as dependent variable, the study observed that growth in goods trade and stock market capitalization are key determinants while taxes and capital controls do not appear as significant variables in explaining movements in international financial integration”.

Claessens and Schmukler (2007) studied “international financial integration focusing the firms from various countries raising capital trading equity, and/or cross listing in major world stock markets. They complemented the existing literature by studying international financial integration of analyzing firms’ activities in the world equity market. Using a large sample of 39,517 firms from 111 countries covering the period 1989-2000, the study found that although international financial integration has increased substantially over the period under consideration, but only relatively few countries and firms actively participated in international markets. Firms with higher income, better macroeconomic policies and worse institutional
environment are more likely to internationalize. The study suggested that international financial integration would likely to remain constrained by country and firms characteristics”.

Vo and Daly (2007) investigated “the structural determinants of international financial integration out of various potential drivers of it in vast existing literature. The study used a number of indicators\(^2\) to proxy international financial integration. The study aimed at highlighting some empirical features of increasing degree of international financial integration. Overall results provide strong evidence of international financial integration in the last decade. Even though some variables are unsuccessful in explaining variation in the degree of international financial integration, the analysis envisaged that some variables including the IMF capital control policy dummy variable, trade openness, domestic credit and economic growth are potential instruments for explaining variation in the degree of international financial integration”.

In a theoretical study, Sinha and pradhan (2008) analysed “trading and financial relation of India with Southeast Asian countries. Several issues focused in the study included (i) Does global experience suggest that trade liberalization/openness move in tandem with financial integration as well as higher growth (ii) links between international trade and financial openness. The study analyzed India’s domestic, regional and global openness with a special focus on Southeast Asian economies, including China”.

Bnn trix and N lti (2008) in their study found that “regional financial integration in Europe has increased particularly after introduction of Euro. However, a parallel process of financial integration at global level was also found”.

Kim and Lee (2008) examined “real and financial integration of East Asian countries. They compared the degree of real versus financial, degree of global versus regional, and extent of integration before versus after the 1997/98 financial crisis in these economies. The study made use of both price and quantity measures of integration such as size of intra and inter-regional trade, cross border financial

\(^2\) Details are given in chapter 4.
assets, correlation of stock returns, and interest rate differentials. It analysed VAR
based impulse response functions. World aggregate as aggregate of G-7 (excluding
Japan), and Asian aggregate of 10 countries (The People Republic of China (PRC)
Hong Kong, China, Indonesia, Japan, Republic of Korea, Malaysia, Philippine,
Singapore, and Thailand) were taken. Empirical investigation found that although
quantity and price measures showed some degree of increased financial integration
after crisis, the cross-country consumption relations did not match well. Secondly,
degree of regional financial integration within Asia is far smaller than the degree of
global financial integration, and financial integration lags behind real integration”.

Mukhopadhyay (2009) addressed “some key issues regarding international
financial market integration by considering regional indices, country indices as well
as sectoral indices for the period 1995-2008. Emerging Market index (EMI), All
Country World Index (ACWI) and G7 and BRIC countries’ indices from MSCI have
been used. All country world index consists of 46 countries comprising 23
developed and 23 emerging ones. EMI consists of 23 emerging economies. The
study investigated possible causes and effects of financial integration. With the use
of descriptive statistics and correlation matrix and simple plot of daily data on
sectoral indices of the countries concerned, it was found that financial market
integration across countries work at different two levels. One, it seems to be more
prominent among markets which are at comparable development stage and the
developed markets are more integrated with each other than less developed markets.
Two, market integration is mostly lead by developed markets. Thus, emerging
markets tend to suffer much more than the developed markets during times of
distress. In context of India, it was observed that the effect of individual market on
India increased during the study period”.

Pukthuanthong and Roll (2009) emphasized that “merely a correlation
between financial market indices from two countries can be a poor measure of
integration. Using used news-based measures in case of 81 countries for the period
of 34 years (1973-2006) they argued that if two countries were explained perfectly
by the same set of global factors only then it considered that markets are perfectly
integrated. Strong evidence of growing integration for most of the sample countries
was found, however, correlation gave different picture and failed to reveal the full extent of integration”.

**Pungu Lescu (2009)** reviewed “the process of financial integration achieved in European Union, both in the older member states (EU15) and the east-European countries (new member states) that joined in 2004 & 2007. Several segments and important aspects for financial market integration were taken into account like credit and bond market indicators, stock market indicators, indicators based on the household and firm decisions and indicators of institutional difference. It was found that integration was not complete in either the more advanced member countries or the East-European group. Different segments of the markets integrate at different speeds. The equity markets exhibits a rather low degree of integration. Moreover, the speed of convergence in the EU15 far surpassed the progress of ten new member states. No definite leader was observed after analysis, though Czech Republic, Hungary and Poland, followed by the Baltic states (most noticeably Estonia) were found the top performer in the region. Slovenia was observed an average candidate while Romania and Bulgaria were found almost always lagging behind”.

While measuring financial integration of money market, stock market, foreign exchange market and bond market of India on domestic front, **Sanati (2010)** also focused on “international financial integration of the country with various developed and developing countries (Canada, Japan, U.K, Germany, and South Korea) in post liberalisation period. Using Johansen-Jusellius approach of cointegration, she examined the integration of financial markets on international fronts. The variables used to measure co-integration among the countries were short term rates like call money rate and 91 days Treasury bill rates along with 10-year bonds yield rate which represents the long run market. However, while studying long run relationship among international markets, stock market is ignored in the study. Although, call money market is found to be integrated with all the countries in the sample, but, treasury-bill rates and bond market shows evidence of weak relationship of India’s global financial integration”.

So far, studies on traditional and commonly used measures of global financial integration such as simple correlation among interest rates, plot in graphs,
interest rate differentials, covariance and correlation matrix of equity returns and stock prices, correlation between exchange rates, saving-investment correlation given by Feldstein-Horioka (1980), causal relation between saving and investment ratios, cross-border financial transactions or composition of foreign assets and liabilities, cross listing in major world stock markets, news based measures etc along with the proxies and determinants of international financial integration have been discussed. While analyzing the different measures of international financial integration in the empirical studies, it was observed that financial integration has been measured over different dimensions (using different methodologies in different markets like money market, bond market, exchange rate market, stock market). On this basis we have concentrated on the measurement of financial integration in broadly two markets, namely money market that deals with the securities having short period maturity and capital (Equity) market that covers long run securities. Accordingly we have segregated the existing literature into two parts: international integration of Indian capital market focusing on stock market and integration of Indian money market with global market.

3.1.1 Capital (Equity) Market Integration

In an early attempt of equity market integration in international finance, researchers relied upon simple correlation among the stock price or equity returns. Later, co-integration analysis was used to find long run co-movement among the stock markets of different countries. With the help of VAR (Vector Autoregressive) based co-integration analysis and corresponding error correction model, if long run relationship existed, it was considered that there exists financial integration among the nations. Many studies (Chan et. al. (1996), Yang et.al (2002), Wong et.al (2004), Hasan et.al (2008), and Joshi (2008) Anaraki (2009) etc) have used co-integration and error correction mechanism to examine long term as well as short term relationships among the stock markets. These studies have used two variables Engle-Granger and Johansen multivariate approaches to study co-integration relationships.

“Since integration is a time varying (Hanhardt and Ansotegui (2009), and Rua (2009) and a frequency varying (Rua, 2009) phenomenon, simple co-integration analysis is not able to capture these variations. According to Arouiri and Jawadi
(2010), there are information barriers, and asymmetries in financial time series. Therefore, they used non-linear co-integration and non-linear error correction models to characterize the stock integration dynamics” (Verma and Mahajan, 2013). The more recent research on financial market integration has been conducted in a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) framework in order to take into account the existence of ARCH effects in data (e. g. Karolyi (1995), Prasarnsith (2000), Fratzscher (2001), Bhar & Nikolova (2007), Mukherjee & Mishra (2008) etc). GARCH based volatility spillover models are able to capture time variation in the integration process as well as source of volatility in domestic market. Studies pertaining to measurement of international financial integration through spillover effects in both return and volatility are given below.

**Eun and Shim (1989)** investigated “international transmission mechanism of stock market movements by estimating a nine-market VAR framework for European and Asian-Pacific economies. Using daily stock indices from December 31, 1979 to December 20, 1985 (1560 observations) and simulated responses of the estimated VAR system, main channels of interactions among national stock markets along with dynamic responses of one market to innovations in another have been examined. A substantial amount of multi-lateral interactions have been detected among national stock markets. The study found that the innovations in the U.S are rapidly transmitted to other markets, whereas no single foreign market can significantly explain the U.S market movements. Also, the dynamic response pattern has found to be generally consistent with these results”.

A study made by **Karolyi (1995)** examined “the structure of short run dynamics of returns and volatility for the stocks traded on Toronto Stock Exchange (TSE) and New York stock exchange (NYSE) for the period 1981-89. Using time series of closing daily stock market indices and impulse response function in VAR and GARCH framework, the study found that how the stock returns innovation in one market has impacted not only market returns of home country but also the volatility of other market”.

**Prasarnsith (2000)** investigated “international financial markets interdependence in the form of stock return and volatility transmission using non-
linear approaches (Multivariate adaptive Regression Splines (MARS) and Generalized Additive Model (GAM)). Results from MARS estimation indicate bidirectional effect of return transmission between Asian emerging markets and developed ones which prevailed before crisis period. It appeared that international financial markets are not fully integrated but globalization strengthens market interdependence within specific country blocks (in this case Pacific Basin region). “

Fratzscher (2001) analysed “the process (nature and changes) of integration of European stock market since mid 1980s. Two questions have been addressed in the study (i) how strongly integrated are European stock markets and has the degree of integration intensified over time? (ii) the role that EMU (European Monetary Union) has played in the process of European financial market integration. Study build on an uncovered interest parity condition applied to asset prices to define financial market integration and employed a trivariate GARCH for 16 OECD countries to test the hypotheses empirically. The main contribution he made in the literature was to make comparison of relative importance of three EMU pillars that of exchange rate stability, real convergence and monetary policy convergence in explaining the time variations of equity market integration in Europe. He developed GARCH methodology with time varying coefficient to analyze and compare the role of these three factors. The key results of the study were that (i) European equity markets have become highly integrated only since 1996 (ii) the Euro area market gained considerable importance in world financial markets and has been taken over from the U.S (iii) integration of European equity markets in large part explained by EMU, and found that Euro area equity market has gained importance in world (U.S) financial markets since the mid-1990. It was in particular the reduction of exchange rate uncertainty that explained high degree of volatility in financial integration in 90s”.

Using daily returns from 1992 to 2002, Bala and Premaratte (2003) studied “volatility transmission between Singapore stock market and the markets of U.S, U.K, H.K and Japan. For the purpose (i) univariate GARCH (ii) VAR (iii) multivariate and asymmetric GARCH model with GJR extensions have been used. Results indicated high degree of volatility co-movements among the considered
markets. The study revealed the volatility spillover from smaller to the dominant market which is contradictory to previous studies”.

Christiansen (2007) evaluated “how the volatility in a number of European bond markets was affected by the volatility in U.S bond market. GARCH models have been applied that allow for both mean and volatility spillover. From both, U.S as well as aggregate European bond markets, spillover to individual markets has been studied. Mean-spillover effects have appeared to be almost negligible whereas volatility spillover effects have found significant. For EMU countries regional effects were more prominent followed by local effects. For non-EMU countries own country effects have been found to be stronger, European effects smaller and U.S effects larger. Overall, results are inconclusive”.

Wang et. al. (2005) examined “volatility spillover from U.S and Japan to three South Asian: Bombay, Karachi, and the Colombo stock exchange. Based on univariate EGARCH model they considered unexpected return of particular South Asian market and a regional shock from Japanese market and a global shock from the U.S.A. have been analyzed with the help of bivariate GARCH model. Study found return spillover in all three markets, and volatility spillover from U.S to India & Sri Lanka and from Japan to Pakistan. Regional factors seemed to exert an influence on these markets before Asian financial crisis but global factors became more prominent in the post crisis period”.

In order to gauge increased equity market interdependence, Baele (2005) focused on “the Western Europe for measuring time varying nature of volatility spillover from the aggregate EU to U.S market and vice versa. A regime switching model that allow for shock sensitivities to change over time have been used to account for time-varying integration from January 1980 to August 2001 (weekly, 1130 observations). From both U.S and EU shock spillover intensity increased substantially over 1980s & 1990s and this rise was found more pronounced from EU spillovers. However, the study also found evidence for contagion from U.S market to number of local EUs equity markets during periods of high volatility”.

Chancharoenchai and Dibooglu (2006) analyzed the “volatility spillover in six Southeast Asian stock markets with U.S markets as a world financial market and
with the Japanese market as a regional financial market using GARCH-M model during the time of 1997 Asian crisis (January 1996 to December 1999). The behavior of individual markets and their interactions with other markets in the region have been seen. Study supported the Asian contagion which insulated from Thailand and scattered to other markets”.

Using the concept of stochastic volatility and structural time-series modeling, Al-Deehani and Moosa (2006) examined “the volatility spillover among the stock markets of Bahrain, Kuwait, and Saudi Arabia. The study used structural time series modeling which allows to account for the effect of missing variables encompassing stochastic trend. Daily observations of the stock prices (688) covering January 1, 2000 to April 15, 2003 have been used and study concluded that volatility in each of these markets cannot be explained totally by volatility in the other two markets”.

Bhar and Nikolova (2007) analyzed “the degree of integration of BRIC countries on a regional and global basis by using daily equity index level data. The mean and volatility spillover effects for all the BRIC countries from the world and respective regional equity index returns over the period January 95 to December 2004 have been analyzed. Two stage GARCH-in-mean approach (GARCH-M) has been used to examine the international transmission of equity index returns and volatility in BRIC countries. The results suggested that conditional mean returns and the volatility of BRIC are more influenced by the global markets than regional. However, regional markets have greater influence upon equity price creation process in all BRIC as opposed to world. The results for volatility spillover effects came out more versatile. Regional rather than global influences seen to leave greater effect on return volatility in Brazil. Volatility spillover effects for both Russia & India found to be greater on global as opposed to regional basis. China found to the only country for which the volatility of return was negatively related to both world and regional equity index returns, and regional influence came greater than any broader international influences”.

Mukherjee and Mishra (2008) in their study examined “return and volatility spillover among Indian stock market with that of 12 other developed and emerging Asian countries over a period from November 1997 to April, 2008. The
study attempted to investigate first and second moment interactions among Indian equity market with that of Asian counterparts. They argued that volatility of stock return is time varying, both intra-day and across the day. Therefore, GARCH model has been used to account for time-variant conditional variances. Results based on daily price observations ensured the different degree of correlations. The contemporaneous intraday return spillover among India and almost all the others are found to be positive significant and bidirectional whereas same in terms of volatility it is basically unidirectional i.e. either from other Asian to India or vice versa. As far as lagged spillover of market information is concerned, most of the information transmitted among the markets without much delay”.

**Johansson (2009)** analyzed “China’s integration with the major financial markets (U.S, Japan, Hong Kong, Asia (MSCI Asia excluding Japan has been used), Europe (MSCI Europe has been used)). Also MSCI world index was used for world market. He made use of copulas for measuring financial integration with the help of three models; (i) GARCH (ii) TGARCH (iii) EGARCH to capture interdependence. Using both unconditional and conditional copulas, study evaluated that China’s financial market is becoming increasingly integrated with number of international financial markets and 2008 crisis, originating in U.S also seemed to augment this increasing integration during the last decade. Study has given plausible explanation for China becoming more financially integrated with world”.

**Diebold and Yilmaz (2009)** have examined “the return and volatility spillover for measuring the linkages in assets return of 19 global equity markets with the use of variance decomposition in VAR. Both crisis and non crisis periods were incorporated so as to study bursts in spillovers. Based on weekly data (underlying daily) from January 1992 to November 2007, there was evidence of divergent behavior in the dynamics of return versus volatility spillover. Return spillovers displayed no bursts but gently increasing trend was found which was associated with gradually increasing financial market integration in last fifteen years. However, Volatility spillovers in contrast to that did not display any trend but clear bursts associated with readily identified crisis were observed”.
Savva et. al. (2009) examined “the transmission mechanism of price and volatility spillover across the New York, London, Frankfurt and Paris stock markets under the framework of multivariate EGARCH model. Also, the correlations between these markets are investigated for the periods before and after the introduction EURO under constant and dynamic conditional correlation frameworks. By using daily closing prices from December 3, 1990 to August 6, 2004, study investigated first and second moment interdependencies among various markets. For the pre-EURO period, New York market remains the most influencing market as far as volatility spillovers are concerned, after EURO introduction, France is having larger spillover effects on other three. For whole period volatility is found to respond asymmetrically to news/innovations in other markets with stronger response in case of bad news than in case of good news. DCC model shows increase in correlations among most of the markets”.

Dimpfle and Jung (2011) investigated “the linkages of international financial markets through the transmission of return and volatility spillover around globe. They employed structural VAR models for three representative market of globe (Europe, U.S.A, and Japan) and modeled mean (return) and volatility separately for the period July 1, 2002 to May 31, 2006. Within this framework, they tested the hypothesis in the light of Granger type causality tests and investigated short-run dynamics in the three markets using impulse response functions, and identifying leadership effects through variance decomposition analysis. Stock index future returns have been used instead of simple returns. Results found have shown weak and short-lived return spillover, in particular from U.S.A to Japan. Also volatility spillovers are more pronounced and persistent. The volatility effect originating in foreign markets dies out within 2-3 trading days; however, the influence of home market is persistent for 10 days”.

Ehrmann et. al. (2011) estimated “the financial transmission between money, bond and equity markets and exchange rate within and between the U.S.A and the Euro Area. The empirical model concentrated on daily returns over a 20 year period of 1989-2008 for the seven asset prices for short-term interest rates, bond yields and equity market returns, as well as exchange rate. The study underlined the importance of international spillovers, both within asset classes as well as across
financial markets. Although, the strong international transmission of shocks take place within asset class, evidence has been found that international cross market spillovers are significant. Overall, U.S financial markets were observed to explain on average around 30% of euro area financial market movements in the period 1989-2004, whereas euro area markets found to explain about 6% of the variance of U.S asset prices”.

**Abou-Zaid (2011)** evaluated “volatility spillover in emerging MENA (Egypt, Israel and Turkey) countries from both New York stock market and London stock exchange. By using daily close to close data during the period January 2, 1997 to September 25, 2007, study found significant unidirectional return spillover from U.S to both Egypt and Israel but insignificant for Turkey. British market has no influence on any three MENA markets. Study found that own lag return effects dominate the spillover effects from other markets in case of both Egypt and Israel but it is reverse in case of Turkey”.

**Grosvenor and Greenidge (2012)** made an attempt “to find international financial integration between the stock markets of Caribbean, namely the JSE, the TTSE and the BSE through volatility spillover and determined the extent of spillover from the developed NYSE to these regional markets. Using daily data from 2005 till 2008 in the composite stock market indices, both univariate and multivariate GARCH techniques have been employed to evaluate the extent of transmission of both return and volatility. Univariate results suggested the presence of ARCH and GARCH effects in all the series. The presence of bidirectional mean spillover among carribbean and between NYSE and these regional countries was found. However, degree of integration is lesser in intra regional. But volatility spillover is more significant. Significant GARCH effects suggest highest level of volatility spillover intra regional as well as global”.

**Padhi and Lagesh (2012)** in order “to examine interdependence across international financial markets, aimed at investigating volatility transmission between emerging markets (5 Asian +India) and U.S market. Taking daily stock-price indices from July 1, 1994 through September 30, 2009 as base they have used bivariate BEKK and DCM-GARCH model for empirical analysis. Study found the presence of volatility spillover, bidirectional shocks spillover and dynamic conditional correlation between India/U.S, India/Malaysia, India/Taiwan,
India/Thailand and India/Indonesia. Indonesia is found the main transmitter within Asian markets. Asian-U.S stock markets are found to be highly dynamic and time varying”.

**Li and Giles (2013)** in the most recent research “examined the linkages of stock market across U.S, Japan & six Asian developing : China, India, Indonesia, Malaysia, The Philippines and Thailand over the period January 1, 1993 to December 31, 2012 (5217 observations). Asymmetric GARCH model has been used to model volatility spillover. Along with volatility performance over the long run, short run dynamics have also been investigated. The whole sample is again divided into sub-samples. In both long and short run, the emerging markets are found to be more affected by their own past shocks as compared to developed markets. The U.S stock market has been greatest affected by own negative shock among all. Also U.S stock market, as the central one in the world, has unidirectional shock spillover to both Japan and other emerging markets in both long and short periods. No shock spillover from Japan to Asian markets in long run was found but significant volatility spillover between them in long and short run was there. During recent five years, the linkage between Japanese market and Asian emerging markets has become stronger”.

**Louzis and Greece (2013)** in their study examined “the return and volatility spillovers among the money, stock, foreign exchange and bond markets of the euro area, utilizing the forecast-error variance decomposition framework of a generalized VAR model proposed by Diebold and Yilmaz (2012). Empirical results, based on a data set covering a twelve-year period (2000-2012), suggested a significant amount of total return and volatility spillover effects throughout the sample, indicating that, on average, more than the 50% of the forecast-error variance of the respective VAR model is explained by spillover effects. Moreover, the stock market is identified as the main transmitter of both return and volatility spillovers even during the current sovereign debt crisis. The study has established the key role of money market in volatility transmission in the euro area during the outbreak of the global financial crisis”.

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3.1.2 Money Market Integration

Studies pertaining to money market integration are given below.

**Eagly and Smith (1976)** undertook research “to utilize monthly interest rates for the period 1731-1789 for describing the development and integration of eighteenth-century London money market. It was found that Amsterdam retained its dominating position among European money markets even with the rapid expansion of London money market and highly influenced the London money market”.

**Kugler and Neusser (1993)** analyzed “the long run international equalization of real interest rates using monthly data over the period 1980 to 1991 for U.S.A, Japan, the U.K, France and Switzerland. In a preliminary investigation, unit root of real interest rates have been examined and it was rejected for the sample. Then, a hypothesis of real interest rate parity has been analyzed in a stationary multivariate time-series approach based on the concept of co-dependence proposed by Gourioueroux and Peaucelle (1989). A strong relation between real interest rates has been observed in the short-run. Deviations from real interest parity which are substantial in the short-run, disappear in long-run”.

**Bhoi and Dhal (1998)** empirically evaluated “the extent of integration of India’s financial markets in the post-liberalized period. While there exists a fair degree of convergence of interest rates among the short term markets (money market, gilt market, credit market), capital markets exhibited divergent behaviour. In case of integration with overseas market, there was some evidence of covered interest rate parity in case of India but uncovered interest parity condition did not hold. Thus, domestic and international markets showed different behavior”.

**Wu and Chen (1998)** re-examined the hypothesis of real interest rate parity with the CPI-based real interest rate. Study employed “the panel unit-root tests provided by Levin and Lin (1992), and Pesaran and Shin (1995) which have important implications for the hypothesis of real interest rate parity. Data is pooled in real interest rate differentials between the U.S and major industrial countries as a panel. Empirical evidence supported the view of real-interest rate parity to exist”.
Goldberg et. al. (2003) examined “the behavior of cross-country real interest rate differential for U.S and five others (Canada, France, Germany, Japan, and U.K) by using quarterly short-term domestic money market interest rates over the period 1957Q1 to 2000Q2. They compared the behavior of real interest rate differentials across major countries under Bretton woods regime and the regime of floating exchange rate. For the purpose, criterion of real interest rate parity has been used. The study found an evidence of considerable long-run financial integration across six major countries and speed of convergence has observed to be increased over time. After allowing for structural break, real interest rate differentials between pairs of countries appeared mean reverting”.

Bhatt and Virmani (2005) estimated “the degree of financial integration of India with rest of the rest of the world by focusing on the degree of integration of the Indian money market with global markets for the period 1993-2003. While considering three interest rate parities namely (i) real interest parity (ii) uncovered interest parity (iii) covered interest parity, they have tried to find co-integrated relationship between money markets in India and U.S.A. The study found that short term markets in India are gradually getting integrated with money markets in U.S.A, although the degree is far from perfect. Covered interest parity held but uncovered failed to hold”.

Jain and Bhanumurthy (2005) examined “the financial integration of domestic money market with international markets in the post 1991 period by using monthly data on call money rates, 91 day Treasury Bill rates, Indian Rupees/U.S dollar exchange rates, and the London Inter Bank Offered Rate (LIBOR). Co-integration has been used in order to find long run relationship between Indian and international markets. The study found that there is increasing integration between the domestic and international financial markets”.

Bartolini et. al. (2006) provided evidence of “integration between the federal funds and Eurodollar markets; the two core components of the dollar money market. Using transition-level high frequency data, results have shown that these markets are well integrated. Federal fund market has found to dominate the whole
term structure of U.S. interest rate. And, Eurodollar market has been a source of funds for banks in U.S”.

A study by **Grencide and Moore (2007)** empirically investigated “the sensitivity of interest rates in the Eastern Caribbean Currency Union (ECCU) to the changes in U.S rates (to which currency is pegged). They exploited uni-variate and multivariate tests of the unit root and stationary hypothesis of the interest rate differentials as the tests of the interest rate parity hypothesis. By employing quarterly data from March, 1980 to December, 2005, all the tests accepted the interest rate parity hypothesis for Grenade, Montserrat, St Kitts-Nevis, Sain Lucia and St Vincent and the Grenadines. However, in the case of Antigua and Barbuda, Anguilla and Dominica, some of the tests rejected the interest rate parity hypothesis i.e. absence of long-run convergence. However, short-run responses calculated by impulse response function showed that in short run a shock to either the Fed funds rate or U.S Treasury bill rate has an almost immediate impact on the rates of ECCU. The lending rates of these economies tend to have a much longer response to Fed rate shocks than to Treasury-bill shocks”.

### 3.2 International Financial Integration and Economic growth

“There are significant incentives for better understanding the economic effects of financial openness or integration because financial openness and integration create a ground for policymakers to frame macroeconomic policies” (Quinn et. al., 2011). This section explores literature regarding the impact of open capital account or international financial integration on economic growth and performance of the countries.

**Kraay (1998)** attempted research “on the two hypotheses (i) that benefits of capital account liberalization are offset by greater volatility it brings and (ii) these benefits can only be realized in countries with sound institutions and policies. He used a combination of cross sectional and event-study analysis covering a large number of developed and developing countries. The study aimed at studying medium to long run macro economic benefits of capital account liberalization and its effects on growth, investment and inflation. The weak relation between measures of financial openness and key macroeconomic indicators was found. The study
concluded with the evidence of lack of statistical significant impact of capital account liberalization on growth even in countries with good policies and institutions in the form of strengthen financial system”.

In the early literature on relationship between international financial integration and economic growth, Gregorio (1999) focused “on long run growth effects of international financial integration on economic growth in a sample of 24 countries during 1976-1993. After studying the individual relationship namely (i) financial development and economic growth (ii) financial integration and financial development (iii) financial integration and economic growth, he found no evidence of direct effect of financial integration on economic growth. In an exercise of assessing the interaction among financial deepening, integration and growth, he concluded that beneficial effects of financial integration on growth come mainly through fostering the development of domestic financial system. He confirmed that international financial integration has no additional effect on economic growth beyond the effect that it may have on financial deepening”.

Arteta et. al. (2001) considered “the issue of relation between capital account liberalization and growth in case of 61 countries. Although the positive association was found, but effects were found varying with time, with the methods used to measure capital account liberalization and with how the relationship is measured. By taking rate of real GDP per capita, as dependent variable, study explored that effects of capital account liberalization on growth are stronger since 70s in countries with strong institutions as measured by standard indicators of rule of law, but weak evidence was found that benefits grow with countries’ financial depth and development”.

Edison et. al. (2002) also investigated “the impact of international financial integration on growth during the period 1980-2000 depending on the level of economic development, financial development, government corruption, and macroeconomic policies by using wide array of indicators and various econometrics methodologies for 57 countries. The study was unable to reject the null hypothesis that international financial integration does not accelerate economic growth even when controlling for particular economic, financial, institutional, and policy
characters. They found that international financial integration does not exert positive influence on growth in countries with high levels of bank or stock market development i.e. financial development”.

The objective of the study by Fratzcher and Bussiere (2004) was “to analyze financial liberalization-growth nexus. They investigated whether capital account liberalization creates inter temporal trade-off in a set of 45 emerging and industrialized countries for the period 1980-2002. The study presented results favoring that countries experience short run gain at the expense of medium to long run pains due to opening of their capital account and suggested that there was strong time varying relation between openness and economic growth among sample countries. Sample of the study includes relatively homogeneous countries and exclude least developed and many of these opened their capital account between 1985 and 1995. Study concluded that the acceleration of growth immediately after liberalization is found to be often driven by investment boom and a surge in portfolio and debt inflows. And, the quality of domestic institution, the size of FDI inflows and the sequencing of the liberalization process are found to be important driving forces for growth in medium to longer term”.

Edwards (2001) attempted “to find evidence, in a cross country analysis, for the association of higher capital mobility with higher growth and to check if this relationship is different for advanced and developing countries. He considered six groups of countries namely (i) industrial (ii) African (iii) Asian (iv) Non industrial European (v) Middle east and (vi) Western hemisphere or Latin America and the Caribbean with three type of capital flows. The study suggested that strong positive relation exists between capital account openness and productivity performance. The study also confirmed that countries with greater degree of integration with rest of the world performed better than others. He argued that countries can only take advantage of greater capital mobility, once they have achieved somewhat advanced domestic financial markets. This was explored by interacting CAPOP index (measurement index) with standard measures of domestic financial development. Thus, results supported the view that for financially sophisticated countries, an open

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3 Partly because of data availability and also because of trade-off issue analyzed in the study arises only for the countries with more mature financial systems.
capital account is a boon, while at low level of financial development it may have negative effect on performance of the economy”.

Levine (2001) examined “existing theory and evidence to evaluate whether international financial liberalization, by improving the functioning of domestic markets and banks, accelerate economic growth and found favoring results. He analyzed that by liberalizing restrictions on portfolio flows, there is enhancement in stock market liquidity which in turns accelerate economic growth, primarily by boosting productivity growth. On the other hand, by allowing foreign banks in the domestic market, there is increase in the efficiency of domestic banking system, he suggested. Thus, developed banks tend to enhance economic growth by accelerating economic growth”.

Prasad et. al. (2003) found “no empirical evidence of growth enhancing feature of international financial integration in case of developing countries. They observed rather, it may be associated with higher consumption volatility. They also supported the view that it might not be essential for a country to develop a full set of sound institutions that match with best practices in world, before embarking for financial integration. It may strain the capacity of the country. In case of 22 more financially integrated and 33 less financially integrated economies, for the period 1970-1999, they suggested that focusing on making progress in core indicators namely, transparency, control of corruption, the rule of law and financial supervisory capacity is more beneficial for less developed countries. Moreover, macroeconomic stability is the prerequisite for ensuring financial globalization is beneficial for developing countries”.

Guiso et. al. (2004) argued “financial integration is growth enhancing in European Union (E.U). Based on industry level data, the study confirmed the positive effects of financial development and that of international financial integration on growth in E.U. Overall estimates are that impact of financial integration on growth of European manufacturing industries ranges from 0.6 to 0.7 points (implying 0.1 to 0.2 points of GDP growth) and effects would have been smaller if financial integration were to occur at a lower level of financial development”.

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Lee (2004) examined “the effects of capital account liberalization on growth and provided evidence of no impact of capital account liberalization on long-term economic growth in the cross-country regression for the period 1976-1995. On the contrary, capital controls do have positive effect on growth in countries with more institutional development, more ethnic homogeneity and higher corporate debt ratio”.

Klein (2005) in his study has shown that “the effect of capital account liberalization on economic growth depends upon the environment in which policies occur. In a panel of 71 countries for the period 1976-1995, estimates of several specifications consistent with the models used in the study revealed that there is significant but non-monotonic and inverted-U shaped relationship between responsiveness of growth to capital account liberalization and institutional quality. And relation varies with institutional quality. The relation was found significant for about one quarter of the countries in the sample which were having better institutional setup. The study found strong relationship between institutional quality and per capita income and countries tend to be benefited significantly from capital account liberalization were mostly upper-middle-income countries”.

Chanda (2005) challenged the notion of “no effect of capital controls on economic growth that exists in existing empirical research. For the sample of 57 non-OECD and 52 OECD countries that did implement capital controls for the period 1975-95, he found that 39 out of 57 and 32 out of 52 (total 71 out of 99) had experienced reduction in their growth rates and 18 had net positive effect. He claimed that the degree of heterogeneity in any country plays significant role in explaining the effects of capital account liberalization or controls on economic growth. For countries with high degree of ethnic heterogeneity, capital controls lead to high inefficiencies and lower economic growth. At the same time, countries with high degrees of homogeneity have shown that capital controls worked as augmenting economic growth. He emphasized the need to analyse the way policies work rather than to find direct positive or negative relation”.

Epaulard and Pommeret (2005), found that “compared to autarky, international financial integration is slightly higher growth enhancing (0.4% per
year) in case of 32 developing and emerging countries over the period 1980-1998. They measured the theoretical model in order to evaluate welfare gains from financial integration using two measures of actual financial integration. First is Index1 which is ratio of the sum of all claims and liabilities of a country to its GDP and second is Index2 that exclude government and monetary authority claims and liabilities is the ratio of claims on foreign assets (excluding foreign exchange reserves) & liabilities (excluding public & publically-guaranteed debt) of a country to its GDP”.

**Schularick and Steger (2006)** empirically investigated “the relation between international financial integration and economic growth for pre World War I period and compared it with the present world. Using same empirical models and econometric techniques, results suggest that international capital market integration fostered economic growth significantly in historical period but no longer does so today i.e. international financial integration promoted economic growth in the first era of globalization but fails to do so in modern times”.

**Evans and Hnatkovska (2006)** evaluated “the effects of international financial integration on macroeconomic volatility and welfare. They focused on how greater access to foreign capital markets affects the volatility of key macroeconomic variables like consumption and output and welfare of the households with the help of two-sector, two-country world economy. They compare the greater financial integration with gradual removal of restrictions on the access to foreign financial markets. The study found that at initial stages of greater integration leads to more volatile consumption and output but as integration proceeds or intensified volatility declines. Also with the greater and increased integration, there is greater and significant risk sharing between countries, therefore, improvement in welfare”.

**Mendoza et. al. (2007)** in case of U.S. showed that “international financial integration can lead to greater global imbalances in the countries with deeper financial markets because these countries borrow heavily from abroad and invest in high-return foreign risky assets. But on the other side, it has also been found that international financial integration can be undesirable for the countries having poorly developed financial system because welfare costs for these countries are large from
international financial integration. However if international financial integration promotes financial development and allow for the benefits such as technological diffusion, risk sharing, resource allocation etc, then it can be beneficial for participating countries”.

In a survey by Obstfeld (2008), “a policy framework is discussed in which financial globalization is more likely to prove beneficial for developing countries. It was found that at macro level it is hard to say that financial opening yield improvement in economic growth for emerging countries. He argued that domestic financial market imperfection and institutional weakness, not the financial openness, is the primary problem in the present setup and financial development associated economic growth”.

Quinn and Toyoda (2008) checked “whether capital account liberalization is a way toward higher economic growth using de jure measures of capital account and financial current account openness for 94 countries from 1950 to 1999. While giving various measures of financial globalization, study concluded that capital account liberalization had positive association with growth in both developed and emerging markets and confirmed that equity market liberalization had an independent effect on growth”.

Masten et. al. (2008) “using both macro and industry-level data analyzed non-linear effects of financial development and international financial integration on economic growth in Europe. In case of 31 European countries, results revealed the evidence of significant non-linear effects with less developed countries gaining more from financial development during the period 1996-2004. However, benefits of international financial integration become significant at higher level of financial development. Finally study concluded that international financial integration, both directly as well as indirectly through the development of national financial markets is growth enhancing”.

Non-linear in the sense that “positive effect of development of domestic financial markets on growth is higher in less developed countries, represented by group of transition countries in this case. The effects vanish as financial development approaches the level of characterizing the EU15. In addition, financial integration may not have positive effect on growth itself, as it depends on development of national markets, macroeconomic stability and quality of institutions”.

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While discussing channels through which international financial integration is growth enhancing, Klein and Olivei (2008) made a study “by taking sample of 21 OECD and 74 non OECD countries for the period 1976-95 and confirmed that countries having open capital accounts have significantly greater increase in financial depth and over the 20 years, greater economic growth. They examined that whether there is evidence of causal link from capital account liberalization to financial depth and through this channel, to overall economic growth. Countries with open capital account over some or all of the periods found to be enjoyed a significant greater increase in financial depth than the counters with continuing capital account restrictions. The indirect effect of financial integration on growth via financial depth is evaluated by the variable KALIB which is calculated by multiplying the coefficient measuring the impact of financial integration on financial development with that of measuring impact of financial deepening on growth. And it was found positive for the period 1986-1995”.

Ang (2009) examined “FDI-growth nexus in small open economy of Malaysia by controlling for the level of financial development. Using time series data from 1965-2004, results revealed that FDI and financial development are positively related to output in long run and impact of FDI on output is augmented through financial development. Using causality tests available in literature (co-integration and VECM), it was found that FDI has no direct causal effect on growth, however it stimulates economic growth through financial development”.

Lee and Chang (2009) studied “the interrelationships among FDI, financial depth and real output including the long-run equilibrium as well as causality for a set of 37 countries using annual data for the period 1970-2002 by applying panel co integration and panel error correction models. Study found that the financial development indicators have larger effects on growth than does FDI”. With the help of following function, they entangled the relation in FDI-finance-growth nexus.

\[ \text{Output} = f (\text{FDI and FD}) \]

FD for Financial Development

The evidence was found in the study that relation between FDI and growth is endogenously influenced by the development of domestic financial sector i.e. when
a country has solid financial system; it is in better position to reap the benefits of FDI. A similar study in the context of Indian economy was made by Arora and Verma (2009).

Ferreira and Laux (2009) examined “the importance of portfolio investment flows in future growth of the countries while taking cross-country data for the period 1988-2001. With specially designed models, the study found an evidence of significant relation between financial integration and growth, thus suggested that openness to portfolio flows is conducive to economic growth. In a collection of 50 developed and developing countries, overall results suggest that openness to portfolio flows in both directions is associated with growth and volatility that comes with these”.

Using an international panel data of 83 countries, Osada and Saito (2010) found that “the effects of financial integration on economic growth differ considerably depending on the type of external assets and liabilities as well as characteristics of the countries that experience financial integration. Foreign direct investment liabilities have positive impact on growth while other component especially public debt has negative effect. In general, study found evidence that good institutions and developed financial markets benefits more from financial integration and countries in Western Europe and North America as well as those in East Asia are more likely to meet these conditions. Study also revealed that effects of financial integration on economic growth changed over time i.e. it is time variant”.

Alfardo et. al. (2010) concentrated on “the role of local financial markets in enabling the FDI to promote growth through backward linkages (technological transfer). With a sample of 60 developed and developing countries (21 OECD & 39 OECD) covering the period of 19 (1984-2003) years, it was found that when domestic financial markets are more developed, benefits from such investments are more”.

Saidi and Aloui (2010) aimed at determining “the relation between capital account liberalization and economic growth. Investigation based on the use of
qualitative indicator\textsuperscript{5}, reflecting the position of the country has been made. With the help of GMM system of dynamic panel, it was found, in case of OECD countries this process foster economic growth unlike the case of non OECD where coefficient comes out to be negative and these were the countries (developing mostly) which are known for economic and financial crisis after financial openness, they argued”.

\textbf{Pisani (2011)} also addressed “the issue of relation between macroeconomic performance and financial openness in developing countries. The study highlighted that macroeconomic instability that affects more financially open emerging economies can be explained in terms of imperfect international financial integration. The study constructed a stochastic dynamic general equilibrium model based on small open economy (Malaysia). Impulse response and simulation analysis have shown that in more financially open regimes volatility amplifying effects of financial frictions are more”.

\textbf{Masten et. al. (2011)} empirically analysed “the role of financial development and financial integration in the growth dynamics of transition countries. Distinguishing the normal times from the periods of financial crises, focus is made to study the role of financial development in determining the impact of international financial integration on economic growth. For 31 European Union countries, the evidence of direct positive effect of financial development and financial integration on growth has been found during the period 1995-2004. However, this positive effect appears to be non-uniform across the countries and time with larger impact on transition economies, thereby concluding that financial development and financial integration both have increased coverage in the last decade. In the second stage of indirect relation of financial integration on growth, it was confirmed that financial openness contributes to financial development and thereby stimulates growth. Thus, the significant increase in financial depth of domestic financial markets, due to higher financial integration verify that in addition to direct effect there also exists indirect positive effects of international financial integration on growth that operates through development of domestic financial

\textsuperscript{5} Used SHARE (a qualitative index for measuring financial openness) manufactured by Klein and Oleivi (2008).
markets and study rejects the view that more financially integrated economies suffer more from credit crunch effect in crises”.

**Chen and Quang (2012)** for 80 countries during the period 1984-2007 investigated “the particular conditions in which international financial integration is growth enhancing. They used non panel techniques with real per capita GDP growth as dependent variable and found that in order to realize the benefits of international financial integration countries should satisfy certain threshold conditions like level of economic, institutional and financial development and inflation rate. Different behavior of foreign direct investment and portfolio liabilities compared to debt liabilities has been revealed. They applied panel threshold regression model developed by Hansen (1999) using various complementary indicators of financial integration”.

**Ray (2012)** re-examined “the causal relation between international integration and economic growth, in case of India, covering the period 1990-91 to 2010-11 including 21 annual observations. Taking real GDP as proxy for economic growth and financial integration as the ratio of sum of capital inflows and capital outflows to GDP, he applied Johansen co-integration test and confirmed that long run relation exists between the two. Also granger causality test found the existence of unidirectional causality from economic growth to international financial integration and not vice versa. This indicates that economic growth accelerates financial integration of India with global world but international financial integration does not found to have any impact on economic growth. However, these are short run tendencies”.

**Kim et. al. (2012)** examined “the relation of financial openness and economic growth and macroeconomic uncertainty using a cross section of 70 countries over the period 1960-2007. The study found complex trade-off between the adverse short run and beneficial long run effects of financial openness. Using de facto measures of financial openness (stock measures), study explored the both time series dimension and cross country differences to assess the short run and long run effects of financial openness with the help of ARDL (Autoregressive Distributed Lag) approach. However, the data shows that output growth uncertainly decreases
with financial account liberalization in long run thus suggesting financial openness as potential contributor towards moderation”.

In the most recent research, Owusu and Odhiambo (2013) in case of Nigeria established “a long run relationship between economic growth and financial liberalization\(^6\) by employing ARDL bounds test approach and using GDP (excluding the contribution from oil and gas, as well as financial services sector) as growth indicator for the period (1969-2008). Study confirmed the positive significant effect in short as well as long run of financial liberalization policies on economic growth”.

Above review of literature has indicated that there are many studies focusing on the impact of financial openness and integration on economic growth and other macroeconomic indicators along with the channels through which international financial integration is beneficial for enhancing the growth of the economies participated. Many of the studies (Klein & Oleivi (2008), Masten et. al. (2011), James (2009), Levine (2001), Gregorio (1999) etc) have focused on the channel of financial development for reaching the benefits of international financial integration to economic growth.

There is widespread view that financial development has positive impact on economic growth of a country. This view was proposed by Schumpeter (1911), Gurley and Shaw (1955), Goldsmith (1969), Hicks (1969), McKinnon (1973). Many recent empirical studies like Thornton (1994), Ahmed & Ansari (1998), Calderon & Liu (2003), Bhattacharya & Sivasubramanian (2003), Graff (2003), Fase & Abma (2003), Christopoulos & Tsionas (2004), Liu & Hsu (2006), Yang & Yi (2007), Ang (2008), Wadud (2009), Anwar & Nguyen (2011), Dawson (2010), Esso (2010), Bittencourt (2012), Bojanic (2012), Mahajan & Verma (2014) etc have supported this view. Financial development contributes to economic growth mainly through two channels (Gregorio (1999), Ang (2009) and Esso (2010)). First, by increasing the efficiency of accumulated capital that leads to an increase in marginal productivity of capital; and second, by increasing the rate of saving and hence investment through increased number of and well performing financial institutions. The efficiency channel has been considered stronger one (Calderon & Liu, 2003). In

\(^6\) Used index based on policies which is calculated by principle component analysis.
the literature, specific factors have been identified that account for influence of financial development on economic growth (Apergis et.al., 2007). Financial market development (i) reduces transaction costs and facilitates management risk, (ii) mobilizes and pools savings, (iii) eases the exchange of goods and services, (iv) makes available required information for possible investment, and (v) monitors investments and exercises corporate governance. According to Anwar & Sun (2011), the contribution of financial development towards economic growth is in the form of increased confidence of people in financial system which actually facilitates an increase in saving and, as a result, increases funds for investment. Shen et. al. (2006) in their study discovered non-linear relation between financial development and economic growth. According to them, at different levels of economic development, financial structure of an economy is different.

With this backdrop and widespread conception of relation of financial development in economic performance of any country, the study has articulated the role of financial development in explaining impact of international financial integration on economic growth. Therefore, apart from direct relation between international financial integration and economic growth, we have first found significant (if any) impact of financial integration on financial development and then the impact of latter on economic growth.