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Is globalization detrimental to financial development? Further evidence from a very large emerging economy with significant orientation towards policies

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Abstract: This study attempts to explore the relationship between globalization and financial development by endogenising economic growth, population density, inflation and institutional quality for India during the period from 1971-2013. Using the more conclusive Bayer-Hanck (2013) combined cointegration method, the study provides evidence of cointegration among these variables. The long run and short run estimates from the ARDL model and causality tests respectively suggest that globalization in its all forms (political, social and economic) and its overall measure as well as inflation are detrimental to financial development, while economic growth and population density both promote financial development. Further, the results also point out that institutional quality is not conducive to financial development in India, and there exists a feedback effect between financial development and inflation. Moreover, financial development is influenced by economic growth, institutional quality and population density.

JEL Classifications: F00, F36, C22

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1. Introduction

Ever since the seminal work of Mishkin (2009), a new strand of the empirical research has emerged in applied finance and macroeconomics with the objective of exploring the linkage between financial development and globalization. Exploring the causal linkage between financial development and globalization is in fact an issue of substantial importance for governments and regulatory authorities in general and developing economies in particular. The authorities and countries are increasingly more concerned with improving their financial inclusiveness, having a better management of the banking system and maintaining an overall financial stability. Although the relationship between globalization and financial development may be akin to the chicken and egg problem, it is mostly argued in the theoretical and empirical literature that it is globalization that can strongly lead financial development rather than the other way round (Mishkin 2006, 2009, Rodrik 2007, Girma and Shortland 2008, Huang 2010, Law et al. 2015).

Globalization has been gaining more popularity as an engine of enhancing growth prospects in emerging economies. The inflows of foreign capital backed up by domestic financial reforms in those economies have also boosted the potency and growth of their financial markets. One of the most important reasons for selecting the Indian economy as a case for our empirical analysis is because of the fact that India is a very large developing and has intensively and gradually initiated liberalization and financial measures since the early 1990s. Therefore, it is important that we develop an understanding of whether globalization has translated into having a substantial influence on the financial development of this major emerging economy. To the best of our knowledge there has been no systematic analysis of financial development for India in an era of a rapidly changing globalised world where financial capital is moving at a rapid pace across borders. Therefore, there are changing trends and patterns of international financial and real markets around the globe that are partly shaping the domestic financial reforms of developing economies along with automatic evolution of domestic policies (purely determined by a set of domestic factors) which in turn determine the overall financial development of the emerging economies. In this context, the present study finds relevance in examining the relationship between globalization and financial development for India since this country is not only an emerging economy but it also the second most populous country in the world with active social and economic policies of planned development and vast geographical space. It is logical to

believe that globalization has provided potential benefits to the Indian economy by helping to develop the financial capacity of its banking sector through improving the institutional quality.

Mishkin (2009) in his seminal paper hypothesized that globalization leads to financial development. His argument is based on the fact that this phenomenon is a key driver to stimulating institutional reforms in developing countries, through which it can bring about financial development and economic growth.¹ By encouraging these smaller economies to increase their participation in the global financial markets, the advanced countries can create the required matching incentives for the developing countries to implement the reforms that enable them to achieve higher economic growth. Institutions establish rules, legal and property rights and sound and efficient financial systems for the desired use of capital for productive purposes. Globalization of the domestic financial system by opening up to foreign financial markets can encourage financial development and economic growth. Minsky (1982) has already been aware of the stage of securitization of assets and the dangers that it poses. This author claims that the scope for financial fragility develops during the expansion phase of a business cycle because borrowers and lenders' risks become imprudently low.

The opening up of domestic markets to foreign goods can also contribute to promoting the development of better institutions and can be a key driver of financial development in developing economies. Trade liberalization, which is supposed to produce a more competitive environment, would lower the mark-up over the cost of the entrenched domestic firms. Accordingly, international trade would generate demand for reforms that will make the financial system more efficient. Thus, these entrenched domestic firms would more likely support reforms that promote a deeper and more efficient financial system. Also, the existing empirical research indicates that

¹ It must be noted that globalization is unlikely to lead to financial development and economic growth on its own, in the absence of a stronger institutional reforms or quality in developing economies. Thus, globalization requires stronger institutional quality because this quality is crucial in promoting financial development and economic growth in developing countries (Rodrik 2007, Mishkin, 2009). In this vein, the question that arises is: how to improve institutional quality? In this case, our reading of the theoretical elements of the institutional reforms proposed by Mishkin (2009) suggests that enhanced corporate governance, strengthened property rights, improved legal system, and successful deregulations of product and labour markets, enriched quality of financial information, minimal corruption, and improved regulation and supervision of the banking system are essential elements in building an institutional infrastructure that will eventually ensure a well-functioning financial system. Both Mishkin (2006) and Rodrik (2007) have a more extensive discussion of the elements of the financial infrastructure as well as references to that literature.

deeper financial sectors are positively associated with greater trade openness (Rajan and Zingales 2003, Svaleryd and Vlachos 2002).

There is also another set of literature which argues that financial development leads to higher rate of economic growth and development, because it effectively aligns saving and investment decisions of economic agents (Levine, 2000). Although most of the literature argues that the financial system is the channel through which financial globalization can influence economic growth development (García, 2011) but the relationship can also go in the reverse direction. Financial development through domestic reforms can intensify trade and capital flows, and thereby can lead to higher economic growth. In this context, Obstfeld (1994) argues that international portfolio diversification appears to be a calibrated mechanism of world portfolio, shifting from safe low-yield capital to riskier high-yield capital that enables most countries to enhance their economic growth momentum resulting from global financial integration. Globalization further reduces international transaction costs and would establish a correspondence between the financial and real sectors of a global magnitude. In others words, globalization would facilitate exchanges in the real economy at a global scale.

This study contributes to the applied macroeconomics literature in three ways. First, it explores the relationship between globalization and financial development by endogenising key variables such as economic growth, population density, inflation and institutional quality by using annual data over the period 1971-2013 in the Indian context. Second, it utilizes a more powerful cointegration technique developed by Bayer-Hanck (2013). A unique feature of this newly developed cointegration test is that it allows one to combine the results of different individual cointegration tests to provide a more conclusive result. It proposes to combine the computed significance levels (p-values) of several individual cointegration tests. Third, it focuses on the importance of various measures of globalization in driving financial development and economic growth. In order to test this hypothesis, the study considers the globalization index constructed by Dreher (2006) in all its three dimensions and relates the same indicator with financial development and economic growth. Contrary to the usual expectations, we find that globalization is detrimental to financial development and economic growth is positively related to financial development in India. Population density helps to achieve financial development but

inflation and institutional quality impede financial development. Moreover, globalization Granger causes financial development.

The remainder of the paper is organized as follows. Section 2 provides an overview of India's financial system. Section 3 discusses the review of the related literature. Section 4 describes the econometric methodology and data sources, while Section 5 discusses the empirical results. Finally, Section 6 summarizes the key findings, and implication for policy and offers some possible directions for future research.

2. An overview of India's financial system

Before India's independence in 1947, the Indian financial system is believed to be fairly advanced by developing countries' standards, as it was featured with a significant presence of foreign banks, domestic commercial banks, cooperative banks and a stock market. The process of development of the financial institutions and markets during the post independence period was largely guided by the process of planned economic development that was pursued in India. As a result, two nationalization waves in 1969 and 1980 brought the operation of the banking system strongly under the domain of the public sector's monopoly because of the paramount importance of the social control policy. Until the reforms of 1991, the banking industry in India was highly regulated with its social control policy. The financial system of the country as a whole was mandated to adopt a bank-dominated financial development (as banking was believed to be the prime driver of economic change) that aimed at meeting the needs of the disadvantaged agriculture and other priority sectors. Since corporate firms were considered financially constrained, they were supported by the emergence of the banking sector and capital markets. The households with higher savings diversified their savings into the banking sector with an expectation of higher returns. Therefore, households channeled their savings into the banking industry, and thereby the banking sector invested a larger proportion of the household deposits in the capital markets (See Kendal, 2012).

The Reserve Bank of India (RBI) has been regulating money and credit markets, and capital market remained within the purview of Securities Exchange and Board of India (SEBI). In the context of the balance of payments (BOP) crisis in early 1990s, a comprehensive structural

and financial sector reforms were initiated in India as acclaimed by the Narasimham Committee in November 1991, which eventually became the starting point for gradual deregulation of the banking industry and its integration with the rest of the financial markets (RBI, 2006). This is clearly evidenced by the recent World Bank report in which Kumar (2008), using survey responses from the central bank regulators and commercial banks from 54 countries around the world, concluded that India still suffers from some of the longest wait times and highest document requirements for deposit accounts, despite having the lowest fees of the 54 countries surveyed (see Kendal, 2012).

Before 1992, the capital market in India was highly regulated under the purview of social control and planned economic policies. Another important reform process witnessed by the Indian capital market was the introduction of the National Stock Exchange (NSE) in 1994 that facilitated nationwide stock trading, electronic display and clearing and settlements process. On the account of realizing competitive environment from NSE, Bombay Stock Exchange (BSE) was no more an exception in the gradual set up of electronic and rolling settlement systems in 1995 (Chakraborty, 2010). Figure 1 shows the rising trends in the financial development and globalization indices for the Indian economy.

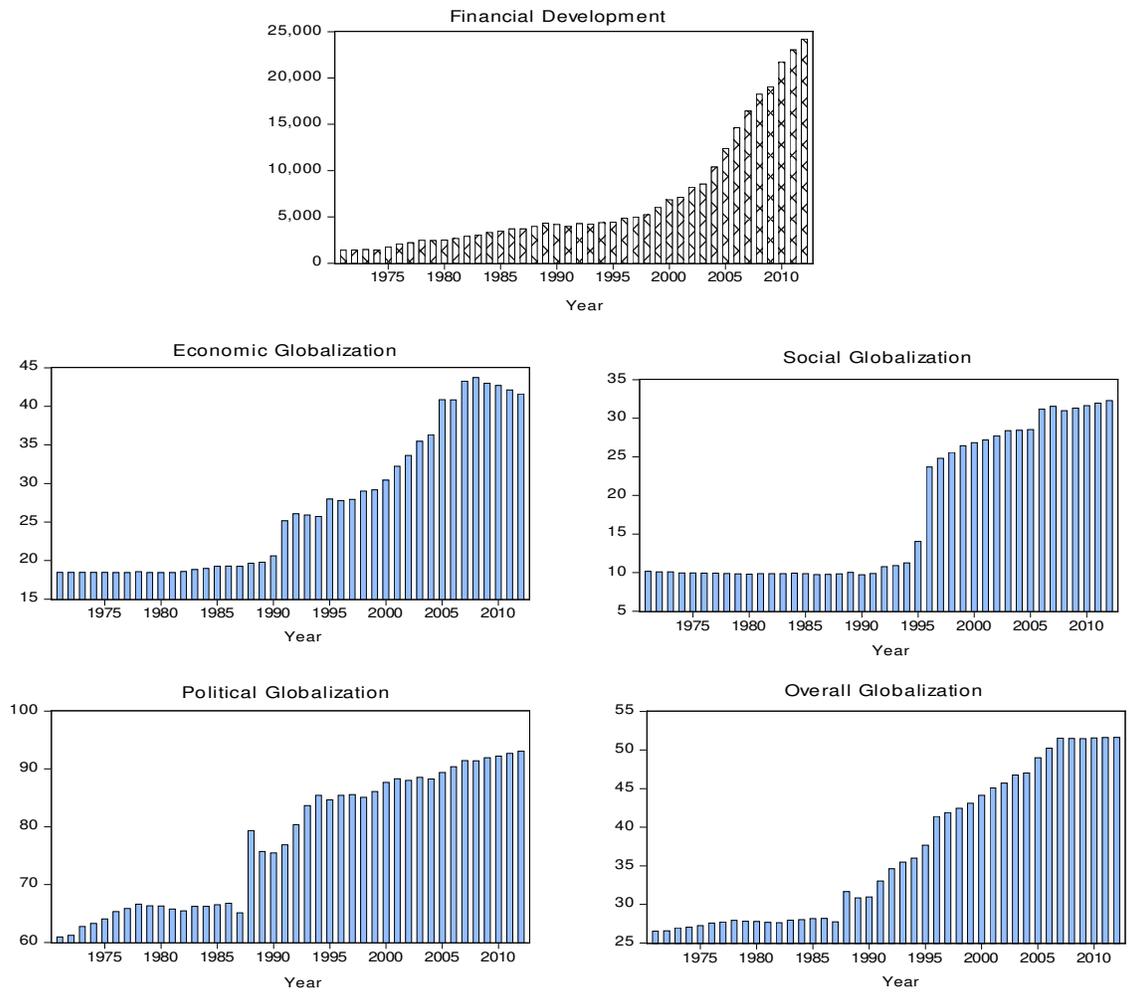


Figure 1. Trends in Financial Development and Globalization

3. Review of related literature

Most of the modern macro-financial economics literature has claimed that financial system development (i.e. banking sector and stock market) is assumed to be one of the potential channels of enhancing economic growth across countries (Levin 1997, 2002, 2003, Rajan and Zingales 1998, Ang 2008a, b, Beck et al. 2000, Liu and Hsu 2006, Fung 2009, Sun et al. 2011, Hsueh et al. 2013). By contrast, the recent literature on the global economic crisis of 2007-09 has recognized the adverse consequence of financial system development on economic growth and development (Sun et al. 2011, Law and Singh 2014, Law et al. 2015). Given these developments, an important question that arises here is: why are so many countries still either remaining financially under-developed or are remaining quite vulnerable to financial crises despite the

existence of a robust financial system activity around the world? In investigating this question, several researchers have taken empirical attempts in understanding the link between openness and financial development (Rajan and Zingales 2003, Baltagi et al. 2009, Law 2009, Kim et al. 2010).

Despite undertaking cautious reforms in areas of trade openness and financial openness as these reforms have dynamic implications for financial development, it is seen that most of the countries have been adversely affected due to multiple occurrence of crises, such as the 1997-98 South East Asian Economic crisis and the 2007-08 Global Financial crisis. In this regard, the recent literature (Mishkin 2009, Girma and Shortland 2008, Huang 2010, Law et al. 2015) emphasized that the role of globalization could be an ideal mechanism for answering the question raised above. It also appears to be one of the potential channels of stimulating financial development and enhancing higher economic growth. In this context, understanding the potential role of globalization in financial development in emerging and growing economies is a crucial policy concern confronting policymakers and the concerned governments.

Apart from those external factors, there has been a substantial theoretical literature arguing that inflation impedes financial deepening in developing and developed countries. Influenced by this emerging debate and conventional thinking on macroeconomic theory, Boyd et al. (2001) empirically establish that inflation is one of the important determinants of financial development as price rises harm financial development. This could be because of the fact that inflation erodes the real value of depositor's savings in domestic currencies, despite the presence of higher rates of return offered by the banks on their deposited money. An increase in the rate of inflation (inflation risk) induces money lenders to store their money by shifting their money holdings from savings into alternative real, financial, physical assets and create human capital activities that would provide a better hedge against inflation risks. Given this perspective, we believe that financial development is likely to be hurt due to the presence of high inflation rates in the economy. Moreover, these findings are also consistent with the views of Rosseau and Wachtel (2002), Rosseau and Yilmazkuday (2009) and Huang et al. (2010), which have argued that cost of inflation weakens the effectiveness of financial deepening. In a similar vein, Naceur et al. (2014) examine the impact of inflation on the financial sector performance in the case of 12

MENA countries and observe a significant and negative effect of inflation on financial development.

Considering a similar perspective, Khan et al. (2006) use panel data from 1960-1999 for 168 industrial and developing countries in their empirical analysis and raise the issue of whether inflation affects the different components of financial depth (i.e. banking sector and stock market activities), besides considering the influence of other control variables (as income, trade openness and government size) on financial development. They find that below a threshold level of inflation (i.e. 3.0% and 6.0%) depending upon the specific measure of financial depth used in the analysis, an increase in the inflation rate has a small positive or insignificant effect on financial depth in majority of financial components. They further find an adverse effect of government size (public sector) on financial development, suggesting that this may be the case because governments with weak fiscal positions are tempted to engage in financial repression. Bittencourt (2007) examine the impact of inflation on financial development in Brazil from 1985-2002 and find a detrimental effect of inflation rates on financial development.

Gelisme et al. (2012) examine the impact of inflation on financial development in Turkey for 1971-2009. By using the ARDL bounds testing approach, they find a negative effect of inflation on financial development. Abbey (2012) examines the impact of inflation on financial development in Ghana using the quarterly data from 1990-2000 and states that inflation affects negatively financial development. In a similar vein, Akosah (2013) examines the dynamic link between inflation and financial development, using annual data from 1964-2012 and find that inflation negatively influences financial development and that a unidirectional causality flows from inflation to financial development.

Naceur et al. (2014) also examines the determinants of financial development for 12 MENA regions by considering a panel data from 1960-2006. In their study, they emphasize the role of inflation along with other macroeconomic factors (e.g. investment, savings, trade openness and financial liberalization) on financial sector development in those MENA countries. Their key findings suggest that inflation discourages private sector credit (i.e. banking sector development). They also imply that inflation risk limits the choice of private activity, and thereby encourages major capital outflows. The weak incentives for private investments decrease

the demand for credit. Subsequently, Tinoco-Germino et al. (2014) examine the long-term relationship between inflation, private sector bank credit and economic growth for Mexico over the period 1969-2011. By using the ARDL cointegration bounds testing approach, their results suggest that inflation rates are detrimental to long-run financial development and economic growth.

In terms of looking at the impact of population density on financial sector development, Schiever and Shoven (1997) develop the argument that aging population may affect the composition of financial markets. Siegel (1998) argues that population aging affects financial markets through saving and investment channels. Initially, people save more money in a banking system that ultimately enables the investors to invest money from the bank into stock market in order to get higher rates of returns. The resulting higher degree of investments induces higher stock prices. This indirectly implies that the people withdraw money from the banking system when they become old in order to support old age consumption, which in turn drives down the prices of stock market in the economy. Influenced by these theoretical arguments, Poterba (2004) examines the potential impact of population aging on asset returns in the US economy and finds that aging matters in the dynamics of financial market development. This is in the sense that demographic dividends play a vital role in the development of financial markets and people at old age impede financial market development in developed nations due to increasing demand for consumption. Using cross sectional and panel techniques, Bodernhorn and Cuberes (2010) find a positive and strong correlation between subsequent city growth, population growth and financial development in the Northeastern region of the United States for the period of 1770-1870. This implies that an increase in population density adds to city growth, and thereby places higher demand for a greater number of bank branches in each and every spheres of the city.

Before discussing the role of globalization in driving financial development, it is better to analyze the effect of globalization on economic development. Stiglitz (2003, 2004) in his seminal paper recognizes the potential role of globalization on economic growth in the case of emerging nations. Influenced by the pioneering works of Stiglitz (2003, 2004), many researchers have conducted several empirical investigations of the globalization-economic growth nexus for other emerging economies. For instance, Dreher (2006) examine a the role of globalization on economic growth for a number of 123 developed and developing economies by using a new

index of globalization and his findings emphasize that countries which are more globalized experienced higher growth and vice-versa. Similarly, Rao et al. (2011a) point out that countries with higher levels of globalization have higher steady state growth rates. Subsequently, Rao et al. (2011b) find a positive impact of globalization on economic growth in major Asian countries. In contrast, using the same index of globalization, Feridun et al. (2006) find an adverse impact of globalization on economic growth in Nigeria.

While empirically addressing the impact of globalization on economic growth, we have notice that globalization has been gaining wide popularity in enhancing growth prospects of emerging economies. However, there is still insufficient empirical evidence that supports that globalization plays a significant role in promoting financial development for emerging economies. In such scenario, Mishkin (2009) in his seminal paper argues that globalization is an important source of financial development. This mainly happens because globalization can advance institutional reforms and economic conditions that promote financial development, which are also necessary for achieving higher economic growth in developing economies. Mishkin further emphasizes that the effect of globalization strengthens financial institutions and helps them to be more competitive in achieving a higher degree of financial development. The process of globalization deals with the pro-market oriented reforms that largely help domestic banking sectors and stock markets as these are integrated with international financial markets and investments. Financial market development would lead to financial inclusion and would also provide greater amounts of financial services to households, investors and governments that help mitigate the demand for private sector consumption and investment activities. With this background, we can conclude that globalization may lead to financial development and hence more economic growth.

Moreover, the argument provided by Mishkin (2009) is linked to the conceptual understanding and lacks empirical findings. Along the line of the Miskin (2009) hypothesis, the globalization-financial development nexus has been investigated in many recent empirical studies (Garcia 2011, Falahaty and Law 2012, Law et al. 2015). Garcia (2011) examines the impact of globalization on financial development for 26 transition countries covering the annual data from 1995-2008. By employing the Blundell and Bond (1998) dynamic panel technique,

Garcia (2011) indicates that financial globalization has a positive and significant effect on the financial system in the transition countries. In a similar study, Falahaty and Law (2012) investigate the linkage between globalization and financial development, using the data for the Middle East and North African (MENA) countries over the period 1991-2007. Using the Panel Vector Auto-regressive (PVAR) and Fully-Modified Ordinary Least Squares (FMOLS) approaches, they report that globalization positively affects financial development and economic growth in the MENA region, while globalization does not play any role in driving institutional quality. Their findings also suggest that governments should play a major role in designing appropriate economic policies to derive the optimal results from globalization in the MENA region. Similarly, Law et al. (2015) investigate the dynamic effects of globalization on institutions and financial development for the East Asian economies, using panel data tests. Their empirical study provides evidence that globalization has a significant influence on institutional quality, and that institutional reforms in turn facilitate and support financial development, in particular the development of the banking sector. Globalization is also found to have a favorable direct impact on stock market development, without passing through the institutional quality channel.

While looking at the above theoretical and empirical studies, it is surprising to note that there does not exist empirical evidence on the globalization-financial development nexus for a very large developing country like India. In an attempt to fill this research gap in the current empirical literature, this study makes an initial attempt to examine the impact of globalization on financial development in India by endogenizing economic growth, population density (urbanization) and inflation which are crucial factors in influencing globalization and economic growth and exerting their impacts on financial development.

4. Econometric methodology

The prime objective of the present effort is to examine the impact of globalization (economic globalization, social globalization and political globalization) on financial development for the Indian economy. We have considered population density in urban India and inflation as potential determinants of globalization and financial development². Law et al. (2009)

² See Bodenhorn and Cuberes (2010)

incorporate capital market development and trade openness in the financial development function. Naceur et al. (2014) consider the role of investment, savings, trade openness and financial liberalization, while investigating the drivers of financial development. Law et al. (2015) indicate that economic globalization and gross domestic product are the main drivers of financial development. Kandil et al. (2015) examine the effect of globalization on financial development (using various indicators of financial development). We note that none of these studies have employed key measures of globalization including economic growth, urban population density and inflation to examine their effects on financial development for the Indian economy.

The general form of financial development function is formulated as follows:

$$FD_t = f(Y_t, PD_t, F_t, I_t, G_t) \quad (1)$$

$$\ln FD_t = \beta_1 + \beta_2 \ln Y_t + \beta_3 \ln PD_t + \beta_4 \ln F_t + \beta_5 \ln I_t + \beta_6 \ln G_t + \mu_i \quad (2)$$

where $\ln FD_t$ is the natural log of real domestic credit to the private sector per capita and is used as a proxy for financial development. $\ln Y_t$ is the natural log of real GDP per capita which serves as a measure of economic growth. $\ln PD_t$ is the natural log of population density per capita and $\ln F_t$ is the natural log of the consumer price index used as a measure of inflation. $\ln I_t$ is the natural log of institutional quality index based on corruption, rule of law, bureaucratic quality, government repudiation of contracts and risk of expropriation, $\ln G_t$ is the natural log of globalization index [economic globalization ($\ln EG_t$), social globalization ($\ln SG_t$) and political globalization ($\ln PG_t$)]. The error term which is assumed to have a normal distribution is indicated by μ_i .

The current study carries out the empirical analysis over the period 1971-2013. We have combed the World Development Indicators (CD-ROM, 2014) to collect the data on real GDP, population density (number of people per square kilometer), consumer price index (a measure of

inflation) and domestic credit to private sector (a measure of financial development)³. The data on institutional quality index based on corruption, rule of law, bureaucratic quality, government repudiation of contracts and risk of expropriation are obtained from the International Country Risk Guide (ICRG). The data on indices of economic globalization, social globalization, political globalization and the overall globalization index are borrowed from Dreher (2006)⁴.

4.1 Bayer and Hanck Combined Cointegration Approach

In econometric analysis, a time series data set is said to be integrated if two or more series are integrated. This is possible when some linear combination of them has a lower order of integration. Engle and Granger, (1987) formalized the first approach of the cointegration test, which is a necessary criterion for stationarity among non-stationary variables. This approach provides more a powerful tool when the data sets are of limited length or the sample size is very short. Later, another cointegration test known as the Johansen maximum eigen value test was developed by Johansen (1991). Since it permits a multiple cointegrating relationship, this test is widely applied than the Engle–Granger cointegration test. Another interesting approach of cointegration testing that is based on derived residuals is the Phillips–Ouliaris cointegration test which was developed by Phillips and Ouliaris (1990). Other important approaches include the error correction model (ECM)-based F-test of Boswijk (1994), and the ECM -based t-test of Banerjee et al. (1998).

However, different tests may give rise to deriving different results, and hence varying inferences. To enhance the power of the cointegration test, with the aim of generating a joint test-statistic for the null hypothesis of no-cointegration, Bayer and Hanck (2013) propose a cointegration test that is called the Bayer-Hanck combined test which is based on the p-values of the Engle and Granger (1987), Johansen (1991), Boswijk (1994) and Banerjee et al. (1998) tests. Since this new approach allows us to combine the results of various individual cointegration tests to provide a more conclusive finding, this technique is also applied to the current study to check the presence of a cointegrating relationship among globalization and financial development while reckoning for other determinants. Following Bayer and Hanck (2013), the combination of

³ We used deflated inflation to convert the series of “domestic credit to private sector” into real terms.

⁴ Updated data on all the measures of globalization is available at <http://globalization.kof.ethz.ch>

the computed significance levels (p-values) of individual cointegration tests is derived from the Fisher (1932) formulae as follows:

$$EG - JOH = -2[\ln(p_{EG}) + (p_{JOH})] \quad (3)$$

$$EG - JOH - BO - BDM = -2[\ln(p_{EG}) + (p_{JOH}) + (p_{BO}) + (p_{BDM})] \quad (4)$$

where the p-values of various individual cointegration tests, such as Engle and Granger (EG), Johansen (JOH), Boswijk (BO), and Banerjee et al. (BDM) are shown by p_{EG} , p_{JOH} , p_{BO} and p_{BDM} . In order to make a decision on whether cointegration exists or not between the variables, we use Fisher statistics. We tend to conclude that cointegration exists if we reject the null hypothesis of no cointegration when the estimated Fisher statistics exceed the critical values provided by Bayer and Hanck (2013).

After examining the long run relationship between the variables, we use the Granger causality test to determine the causal relationship between the variables. If there is a cointegration between the series, then the vector error correction method (VECM) can be developed as follows:

$$(1-L) \begin{bmatrix} \ln FD_t \\ \ln Y_t \\ \ln PD_t \\ \ln F_t \\ \ln I_t \\ \ln G_t \end{bmatrix} = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \\ a_4 \\ a_5 \\ a_6 \end{bmatrix} + \begin{bmatrix} b_{11i} & b_{12i} & b_{13i} & b_{14i} & b_{15i} & b_{16i} \\ b_{21i} & b_{22i} & b_{23i} & b_{24i} & b_{25i} & b_{26i} \\ b_{31i} & b_{32i} & b_{33i} & b_{43i} & b_{53i} & b_{36i} \\ b_{41i} & b_{42i} & b_{43i} & b_{44i} & b_{45i} & b_{46i} \\ b_{51i} & b_{52i} & b_{53i} & b_{54i} & b_{55i} & b_{56i} \\ b_{61i} & b_{62i} & b_{63i} & b_{64i} & b_{65i} & b_{66i} \end{bmatrix} \times \Delta \begin{bmatrix} \ln FD_{t-1} \\ \ln Y_{t-1} \\ \ln PD_{t-1} \\ \ln F_{t-1} \\ \ln I_{t-1} \\ \ln G_{t-1} \end{bmatrix} + \begin{bmatrix} \alpha \\ \beta \\ \delta \\ \phi \\ \vartheta \\ \varphi \end{bmatrix} ECM_{t-1} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \\ \varepsilon_{6t} \end{bmatrix} \quad (5)$$

where the difference operator is $(1-L)$ and ECM_{t-1} is the lagged error correction term, generated from the long run association between the variables. The long run causality exists if the coefficient of the lagged error correction term is significant, based on the t-test statistic. The existence of a significant relationship in the first differences of the variables provides evidence on the direction of the short run causality. The joint χ^2 statistic for the first differenced lagged independent variables is used to test the direction of the short-run causality between the

variables. For example, if $b_{51,i} \neq 0 \forall_i$ it shows that globalization Granger causes financial development, and similarly financial development causes globalization in Granger sense if $b_{15,i} \neq 0 \forall_i$.

5. Empirical results and discussions

At a primary level, Table 1 which shows that the descriptive statistics and pair-wise correlations among the variables indicates that financial development ($\ln FD_t$), economic growth ($\ln Y_t$), population density ($\ln PD_t$), inflation ($\ln F_t$), institutional quality ($\ln I_t$), economic globalization ($\ln EG_t$), social globalization ($\ln SG_t$), political globalization ($\ln PG_t$) and overall globalization ($\ln G_t$) follow the normal distribution as confirmed by the Jarque-Bera test. The correlation analysis shows a positive correlation between economic growth and financial development. Population density is positively correlated with financial development. On the other hand, a negative correlation exists between inflation and financial development and that institutional quality is inversely linked with financial development. The correlation between financial development and globalization (economic globalization, social globalization, political globalization) is also negative for India.

Table 1. Descriptive Statistics and Pair-wise Correlations

Variable	$\ln FD_t$	$\ln Y_t$	$\ln PD_t$	$\ln F_t$	$\ln I_t$	$\ln EG_t$	$\ln SG_t$	$\ln PG_t$	$\ln G_t$
Mean	8.4869	9.8647	5.6823	3.6706	1.6709	3.2371	2.7379	4.3415	3.5728
Median	8.3526	9.7603	5.7071	3.7337	1.6094	3.2362	2.3476	4.3800	3.5207
Maximum	10.0943	10.7581	6.0305	5.1972	2.0794	3.7780	3.4747	4.5332	3.9442
Minimum	7.2558	9.3234	5.2521	2.0070	1.3862	2.9139	2.2731	4.1098	3.2778
Std. Dev.	0.8126	0.4439	0.2371	0.9340	0.1766	0.3255	0.5207	0.1491	0.2547
Skewness	0.4641	0.5529	-0.2338	-0.1248	1.1735	0.4409	0.3961	-0.1718	0.2637
Kurtosis	2.3505	2.0971	1.8119	1.7633	3.8204	1.6577	1.2385	1.3390	1.4094
Jarque-Bera	2.2463	3.5664	2.8527	2.7854	2.8189	4.5142	3.5278	5.0342	4.9140
Probability	0.3252	0.1680	0.2401	0.2484	0.2021	0.1046	0.1482	0.0806	0.0856
$\ln FD_t$	1.0000								
$\ln Y_t$	0.4887	1.0000							
$\ln PD_t$	0.2833	-0.5028	1.0000						
$\ln F_t$	-0.5327	-0.0533	0.0917	1.0000					
$\ln I_t$	-0.0180	-0.0606	0.0324	0.0570	1.0000				

$\ln EG_t$	-0.1182	0.0318	-0.1459	0.0061	0.0131	1.0000			
$\ln SG_t$	-0.0439	0.2043	-0.1385	0.0371	0.0318	0.0187	1.0000		
$\ln PG_t$	-0.0167	0.1802	0.0660	0.0565	0.0664	0.0492	-0.0145	1.0000	
$\ln G_t$	-0.0112	0.2600	-0.0860	0.0543	0.0567	0.4073	0.5216	0.7630	1.0000

Testing the stationarity of the variables is a necessary condition for investigating cointegration. For this purpose, we apply the Augmented Dicky-Fuller (ADF) and the Philip Perron (PP) unit root tests with intercept and trend. The results are reported in Table 2. We find that financial development, economic growth, population density, inflation and globalization (economic globalization, political globalization and social globalization) are non-stationary in their levels. However, the ADF and PP unit root tests show that all the variables are integrated of I(1) order⁵.

Table 2. Unit Root Analysis

Variables	ADF Test		PP Test	
	T-Statistic	Prob. value	T-Statistic	Prob. value
$\ln FD_t$	-1.1212 (2)	0.9123	-0.8443 (3)	0.9527
$\ln Y_t$	-0.8978 (1)	0.9463	-1.4629 (3)	0.8261
$\ln PD_t$	0.1658 (2)	0.9969	3.9368 (3)	1.0000
$\ln F_t$	-3.0273 (1)	0.1372	-2.1567 (3)	0.5000
$\ln I_t$	-2.8584 (2)	0.1845	-2.8840 (3)	0.1780
$\ln EG_t$	-2.3171 (1)	0.4153	-2.2053 (3)	0.4741
$\ln SG_t$	-2.1221 (1)	0.5188	-1.8725 (3)	0.6504
$\ln PG_t$	-1.8262 (1)	0.6711	-2.4561 (3)	0.3470
$\ln G_t$	-1.9220 (2)	0.6236	-1.9205 (3)	0.6257
$\Delta \ln FD_t$	-5.0146 (1)*	0.0005	-5.0817 (3)*	0.0010
$\Delta \ln Y_t$	-5.4743 (1)*	0.0003	-9.5341 (3)*	0.0000

⁵ However, those tests provide ambiguous results due to their low explanatory power. They do not accommodate information about unknown dates of structural break stemming from the series, which further weakens the stationarity hypothesis. To resolve this issue, we have applied the Zivot-Andrews (ZA) unit root test which considers the presence of a single unknown structural break in the series. The results of the Zivot-Andrews structural break test are presented in Table 3. We find that all the variables have a unit root problem in the level in the presence of structural breaks. The structural breaks are found for the periods 1990, 1993, 1994, 1992 and 1991 (1988, 1989, 1991) in the series of financial development, economic growth, population density, inflation, institutional quality and globalization (economic globalization, political globalization and social globalization) respectively. We also note that all the variables are stationary in their first differenced form. This indicates that all the series are integrated of I(1). The results are available upon request from authors.

$\Delta \ln PD_t$	-6.0125 (2)*	0.0001	-4.8285 (3)*	0.0018
$\Delta \ln F_t$	-5.1501 (3)*	0.0008	-4.6724 (3)*	0.0029
$\Delta \ln I_t$	-5.0192 (2)*	0.0012	-6.5324 (3)*	0.0000
$\Delta \ln EG_t$	-3.6571 (2)**	0.0376	-5.2524 (3)*	0.0006
$\Delta \ln SG_t$	-3.7855 (2)**	0.0281	-4.0841 (3)**	0.0135
$\Delta \ln PG_t$	-5.5852 (3)*	0.0002	-8.7590 (3)*	0.0000
$\Delta \ln G_t$	-4.4861 (2)*	0.0049	-6.4980 (3)*	0.0000

Note: * and ** represents significance at the 1 and 5 percent levels. () shows the lag length.

All the unit root tests show that all the variables are stationary in the first difference, i.e. $I(1)$. In such a situation, the combined cointegration tests developed by Bayer and Hanck (2013) are suitable to examine whether cointegration exists among the variables. Table 3 illustrates the combined cointegration tests including the EG-JOH and the EG-JOH-BO-BDM tests. We find that the Fisher-statistics for these tests exceed the critical values at the 5% level of significance when we used financial development and inflation as the dependent variables. This rejects the null hypothesis of no cointegration among the variables in favor of cointegration. Similar results are also obtained by using economic globalization, political globalization and social globalization as measures of globalization. This confirms the presence of cointegration among the variables. We can conclude that there is a long run relationship between financial development, economic growth, population density, inflation, institutional quality and globalization (economic globalization, political globalization and social globalization) over the period 1971-2013 for India.

Table 3. Results of the Bayer and Hanck (2013) Combined Cointegration Analysis

Estimated Models	EG-JOH	EG-JOH-BO-BDM	Lag Order	Decision
$FD_t = f(Y_t, PD_t, F_t, I_t, EG_t)$	15.891*	22.773**	2	Cointegration Exists
$Y_t = f(FD_t, F_t, PD_t, I_t, EG_t)$	6.111	6.642	2	No Cointegration
$PD_t = f(Y_t, FD_t, F_t, I_t, EG_t)$	4.561	8.901	2	No Cointegration
$F_t = f(Y_t, FD_t, PD_t, I_t, EG_t)$	16.199*	27.810**	2	Cointegration Exists
$I_t = f(Y_t, FD_t, PD_t, F_t, EG_t)$	4.555	9.187	2	No Cointegration
$SG_t = f(Y_t, FD_t, PD_t, F_t, I_t)$	9.113	9.504	2	No Cointegration
$FD_t = f(Y_t, PD_t, F_t, I_t, SG_t)$	19.311*	29.045**	2	No Cointegration
$Y_t = f(FD_t, F_t, PD_t, I_t, SG_t)$	8.314	8.224	2	Cointegration Exists
$PD_t = f(Y_t, FD_t, F_t, I_t, SG_t)$	5.460	9.560	2	No Cointegration

$F_t = f(Y_t, FD_t, PD_t, I_t, SG_t)$	19.701*	34.330*	2	Cointegration Exists
$I_t = f(Y_t, FD_t, PD_t, F_t, SG_t)$	8.450	6.330	2	No Cointegration
$PG_t = f(Y_t, FD_t, PD_t, F_t, I_t)$	2.536	6.950	2	No Cointegration
$FD_t = f(Y_t, PD_t, F_t, I_t, PG_t)$	17.300*	21.603**	2	Cointegration Exists
$Y_t = f(FD_t, F_t, PD_t, I_t, PG_t)$	4.412	6.485	2	No Cointegration
$PD_t = f(Y_t, FD_t, F_t, I_t, PG_t)$	6.350	8.366	2	No Cointegration
$F_t = f(Y_t, FD_t, PD_t, I_t, PG_t)$	15.043**	25.307**	2	Cointegration Exists
$I_t = f(Y_t, FD_t, PD_t, F_t, PG_t)$	7.706	9.505	2	No Cointegration
$PG_t = f(Y_t, FD_t, PD_t, F_t, I_t)$	6.818	12.313	2	Cointegration Exists
$FD_t = f(Y_t, PD_t, F_t, I_t, G_t)$	15.969*	25.079**	2	No Cointegration
$Y_t = f(FD_t, F_t, PD_t, I_t, G_t)$	6.552	6.513	2	Cointegration Exists
$PD_t = f(Y_t, FD_t, F_t, I_t, G_t)$	5.077	12.199	2	No Cointegration
$F_t = f(Y_t, FD_t, PD_t, I_t, G_t)$	19.029*	23.102**	2	No Cointegration
$I_t = f(Y_t, FD_t, PD_t, F_t, G_t)$	6.573	13.686	2	Cointegration Exists
$G_t = f(Y_t, FD_t, PD_t, F_t, I_t)$	5.530	8.722	2	No Cointegration

Note: * and ** represent significance at the 1% and 5% levels. Critical values at the 1% (5%) levels are 15.845 (10.576) (EG-JOH) and 30.774 (20.143) (EG-JOH-BO-BDM), respectively. The lag length is based on the minimum value of the Akaike Information Criterion (AIC).

The Bayer and Hanck (2013) combined cointegration approach provides efficient empirical results but fails to accommodate structural breaks when investigating the presence of cointegration between the variables. This issue is resolved by applying the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration in the presence of structural breaks following Shahbaz et al. (2013). The ARDL bounds test is sensitive to the lag length selection, and thus we have used the AIC criterion to select the appropriate lag order of the variables. It is reported by Lütkepohl (2006) that the dynamic link between the series can be captured if the appropriate lag length is chosen. The results are reported in columns 2 and 3 of Table 5⁶. We use the critical bounds from Narayan (2005) to make a decision on whether cointegration exists or not.⁷ Our results show that the calculated F-statistic is greater than the upper critical bounds when we used financial development (FD_t) and inflation (F_t) as the

⁶ We have applied five tests for the lag order selection and robustness. These tests are the sequential modified LR test (each test is conducted at the 5% level), the final prediction error, the Akaike information criterion (AIC), the Schwarz information criterion (SIC) and the Hannan-Quinn information criterion. Each test suggests using an optimal lag of 2 for the empirical estimation. The results are not reported but would be available upon request from the authors.

⁷ The reason for using the Narayan (2005) bounds testing critical values over the critical values of Pesaran et al. (2001) is that the former values produce parsimonious results in small sample sizes. Therefore, the Narayan (2005) critical values are suitable for our analysis because our analysis has a small sample size.

dependent variables. Similar results are also found when we used other measures of globalization (economic globalization, political globalization and social globalization). This shows that the ARDL bounds testing analysis confirms our established long run relationship among the series (See Table 4).

Table 4. Results of ARDL Bounds Testing Cointegration with presence of structural breaks⁸

Bounds Testing Approach to Cointegration				Diagnostic tests			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimated Models	Optimal lag length	Structural Break	F-statistics	χ^2_{NORMAL}	χ^2_{ARCH}	χ^2_{RESET}	χ^2_{SERIAL}
$FD_t = f(Y_t, PD_t, F_t, I_t, EG_t)$	2, 1, 1, 2, 2, 1	1990	7.606*	1.6602	[1]: 0.1871	[1]: 0.2016	[1]: 2.0009
$Y_t = f(FD_t, F_t, PD_t, I_t, EG_t)$	2, 2, 1, 1, 2, 2	1993	4.450	0.1251	[2]: 0.1071	[1]: 0.7182	[2]: 3.0818
$PD_t = f(Y_t, FD_t, F_t, I_t, EG_t)$	2, 1, 2, 1, 1, 2	1993	2.700	2.0560	[1]: 0.1611	[3]: 0.4009	[1]: 2.4079
$F_t = f(Y_t, FD_t, PD_t, I_t, EG_t)$	2, 2, 2, 1, 1, 2	1994	9.891*	1.3081	[1]: 0.1009	[2]: 2.6021	[1]: 0.3013
$I_t = f(Y_t, FD_t, PD_t, F_t, EG_t)$	2, 2, 2, 2, 2, 2	1992	5.478	1.3001	[1]: 0.1119	[2]: 2.1121	[1]: 0.3113
$EG_t = f(Y_t, FD_t, PD_t, F_t, I_t)$	2, 1, 1, 2, 2, 1	1991	3.001	1.3040	[1]: 0.1102	[1]: 0.8007	[1]: 2.1991
$FD_t = f(Y_t, PD_t, F_t, I_t, SG_t)$	2, 2, 1, 1, 2, 2	1990	7.890*	2.0491	[1]: 0.4008	[1]: 0.2070	[1]: 1.1192
$Y_t = f(FD_t, F_t, PD_t, I_t, SG_t)$	2, 1, 2, 1, 1, 2	1993	3.040	1.1626	[1]: 0.2816	[1]: 1.9031	[1]: 1.3011
$PD_t = f(Y_t, FD_t, F_t, I_t, SG_t)$	2, 2, 2, 1, 1, 2	1993	4.120	0.7044	[1]: 0.6695	[1]: 1.1381	[3]: 0.8071
$F_t = f(Y_t, FD_t, PD_t, I_t, SG_t)$	2, 2, 2, 2, 2, 2	1994	8.001**	1.1212	[2]: 0.1221	[3]: 1.4080	[3]: 2.8300
$I_t = f(Y_t, FD_t, PD_t, F_t, SG_t)$	2, 1, 1, 2, 2, 1	1992	4.950	1.1201	[2]: 0.1202	[3]: 1.4018	[3]: 2.8108
$SG_t = f(Y_t, FD_t, PD_t, F_t, I_t)$	2, 2, 1, 1, 2, 2	1989	2.704	2.2041	[1]: 0.2204	[1]: 1.1409	[1]: 2.1023
$FD_t = f(Y_t, PD_t, F_t, I_t, PG_t)$	2, 1, 2, 1, 1, 2	1990	6.408***	2.1307	[1]: 0.3051	[1]: 1.4648	[3]: 0.4674
$Y_t = f(FD_t, F_t, PD_t, I_t, PG_t)$	2, 2, 2, 1, 1, 2	1993	1.571	1.1073	[1]: 0.5818	[1]: 1.7215	[2]: 1.1508
$PD_t = f(Y_t, FD_t, F_t, I_t, PG_t)$	2, 2, 2, 2, 2, 2	1993	4.909	0.5951	[1]: 1.4058	[2]: 2.8028	[1]: 1.3014
$F_t = f(Y_t, FD_t, PD_t, I_t, PG_t)$	2, 1, 1, 2, 2, 1	1994	10.200*	0.1604	[1]: 0.9150	[4]: 1.8080	[1]: 0.7808
$I_t = f(Y_t, FD_t, PD_t, F_t, PG_t)$	2, 2, 1, 1, 2, 2	1992	4.890	0.1406	[1]: 0.5091	[4]: 1.8801	[1]: 0.7089
$PG_t = f(Y_t, FD_t, PD_t, F_t, I_t)$	2, 1, 2, 1, 1, 2	1988	4.735	0.1302	[2]: 0.2976	[4]: 3.8307	[1]: 0.8274
$FD_t = f(Y_t, PD_t, F_t, I_t, G_t)$	2, 1, 1, 2, 2, 1	1990	8.302**	2.3681	[1]: 1.8516	[2]: 0.2754	[1]: 1.4602
$Y_t = f(FD_t, F_t, PD_t, I_t, G_t)$	2, 2, 1, 1, 2, 2	1993	4.109	1.4204	[2]: 1.8597	[2]: 2.4517	[1]: 0.7171
$PD_t = f(Y_t, FD_t, F_t, I_t, G_t)$	2, 1, 2, 1, 1, 2	1993	4.403	1.6017	[1]: 0.7573	[4]: 1.6845	[1]: 0.6749
$F_t = f(Y_t, FD_t, PD_t, I_t, G_t)$	2, 2, 2, 1, 1, 2	1994	6.090**	1.3203	[2]: 0.9871	[1]: 4.3620	[1]: 2.7917
$I_t = f(Y_t, FD_t, PD_t, F_t, G_t)$	2, 2, 2, 2, 2, 2	1992	3.471	1.3031	[2]: 0.9718	[1]: 2.3206	[1]: 2.9179
$G_t = f(Y_t, FD_t, PD_t, F_t, I_t)$	2, 1, 1, 2, 2, 1	1991	2.907	2.1900	[2]: 1.5091	[1]: 2.5208	[2]: 3.6009
Level of Significance	Critical values (T= 42) [#]						
	Lower	Upper					

⁸ Structural breaks are based on ZA unit root test.

	bounds $I(0)$	bounds $I(1)$					
1%	6.053	7.458					
5%	4.450	5.560					
10%	3.740	4.780					

Note: The asterisks * and ** denote significant at the 1 and 5 per cent levels, respectively. T denotes the total number of observations used in the empirical analysis. The optimal lag length is determined by AIC. [] is the lag order of the diagnostic tests. # Critical values are collected from Narayan (2005) and T shows the number of observations.

Table 5 details the results of the long run and short-run analyses. We note that economic growth leads to financial development in the long run, suggesting that a 1% increase in economic growth expands financial development by 1.871%. The positive effect of economic growth on financial development is expected since higher economic growth would create significant employment opportunities in India and increase the demand for various financial products and services. More specifically, with an increasing financial development, people are likely to prefer to save greater proportion of their saved money income and deposit it in the formal banking system rather keeping the money in the hand of local borrowers (informal), as the banking system is safer compared to informally lending the money to the local borrowers. In view of this, one may believe that the demand for banking activities is likely to expand with increased employment and income. Apart from the development of the banking system, the increasing economic growth helps to expand the development of financial markets on the account of booming real estate and stock markets activities. This finding is incongruous with Chakraborty (2010) who reported that economic growth has a neutral effect on financial development. Shahbaz et al. (2007) report that economic growth plays a critical role in improving the performance of the financial sector via the financial servicing demand channel. The population density impacts financial development positively and significantly at the 1% significance level. Keeping other things constant, a 0.447% increase in financial development is due to a 1% increase in population density. An expansion of population would induce increasing economic activities and greater employment opportunities in an open economy along with higher rate of economic growth. This in turn allows people to demand more banking services, thereby incentivizing banks to expand the number of bank branches into both the rural and urban areas. This evidence is indicative of the development of banking sector in India on the account of population expansion. This finding is also consistent with the theoretical and empirical arguments of Kroos (1967), Siegel (1998), Poterba (2004) Bodernhorn and Cuberes (2010) in

which they have argued that urbanization or population density plays a vital role in the development of financial system activity (the banking sector and financial markets).

The linkage between inflation and financial development is negative and significant. It reveals that inflation retards financial performance, and hence financial development. Since a high inflation rate erodes the real value of depositor's savings in domestic currency, despite the higher rates of returns offered by banking system on bank savings, this induces the money lenders to convert their money into alternative real, financial and physical assets that would provide a better hedge against inflation risk. If this practice of alternative investments continues due to rising inflation risk, then less demand for financial services is expected to be taking place in the economy, thereby showing a resultant underperformance of the banking sector development. In view of this, we believe that rising inflation impedes the financial sector development. This finding is also consistent with Boyd et al. (2001) for 65 developed and developing countries, Khan et al. (2006) for 168 industrial and developing countries, Kim and Lin (2010) for 87 developed and developing countries, Bittencourt (2011) for Brazil and Wahid et al. (2011) for Bangladesh, Abbey (2012) for Ghana, Gelisme et al. (2012) for Turkey and Naceur et al. (2014) for the 12 MENA countries.

The results show that institutional quality adversely affects financial development, indicating that an improvement in institutional quality does not support the growth of financial system in the Indian banking sector. This finding is not consistent with the recent empirical findings of Law et al. (2015) which indicate a positive role for institutional quality in building financial capacity of the banking sector in the East-Asian region. The main reason is that reforms in the Indian scenario are half-baked in almost all fronts as argued by many analysts in India. The fact is that improved institutional quality generally attracts foreigners to do business and invest in the domestic national economy and thereby adding more branches in the banking sector. However, when it comes to institutional quality and governance, India stands much way behind many countries and those restrictions act as hurdles in the way to have a progressive banking and financial system. Therefore, one can say that the Indian financial development service is negatively linked with an improvement in institutional quality. This finding primarily goes against the theoretical argument of Mishkin (2009) in which he argues that institutional

quality development will improve financial development for the emerging economies. Institutional quality is improving in India but it is not improving in correspondence with the requirement of all other developments including financial development of the overall economy. Therefore, this is hurting the development of other sectors of the Indian economy.

Globalization (economic globalization, social globalization, political globalization) adversely affects financial development in the Indian economy. In the statistical sense, a 1% increase in globalization (economic globalization, social globalization, political globalization) adversely affects financial development by 0.0877% (0.2515%, 0.2279%, and 0.0834%), other things remaining the same. The adverse effect of globalization on financial development is expected to be possible because of the fact that the Indian economy, although highly integrated with the rest of the world soon after 1991 with the initiation of the new economic policy liberalization measures and the drastic domestic monetary and fiscal policy reforms, is guided by a government that has not been successful yet in attracting more investment and in participating in international trade with other countries, in comparison to other emerging economies like China. More specifically, economic globalization (e.g. capital inflows), social globalization (e.g., the sharing of cultural aspects) and political globalization (the diffusion of government policies) are found to determine financial development in the Indian economy in the absence of potential policy factors and measures in the system that could induce a greater development of the financial sector. Lastly, the impact of financial reforms on financial development is negative, which indicates that the reforms undertaken in India are also deteriorating the performance of the financial sector.

In the short run, we also find that economic growth stimulates financial development significantly. Moreover, the impact of population density on financial is positive and significant but inflation is significantly and inversely linked with financial development. Institutional quality is also inversely linked with financial development but is insignificant. The relationship between globalization (economic globalization, social globalization) and financial development is also statistically significant but is negative⁹. The impact of financial reforms implemented in 1990s is also negatively related to financial development and is statistically significant. The error

⁹ The impact of economic globalization on financial development is negative but statistically insignificant

correction coefficients for India are found to be negative (-0.1427, -0.1167, -0.2077, -0.1407), which shows a greater degree of adjustment from short-run disequilibrium to the long run equilibrium. Thus, each year the degree of short run disequilibrium for India is adjusted by 14.27%, 11.67%, 20.77% and 14.07% for the equation of political globalization, social globalization, economic globalization and overall globalization, respectively. We can conclude that the Durbin and Watson (*D-W*) statistic confirms the absence of no autocorrelation. Furthermore, the short-run model is free of serial correlation, heteroscedasticity, and *ARCH* problems. In addition, the *Ramsey* test also suggests that the functional form of the model is well defined and specified.

Table 5. The Long-and-Short Runs Results

Dependent variable = $\ln FD_t$								
Long-run analysis								
Variables	Coefficient	T-Statistics	Coefficient	T-Statistics	Coefficient	T-Statistics	Coefficient	T-Statistics
Constant	-30.9525*	-6.8982	-27.2776*	-10.1191	-27.4526*	-8.4059	-28.8394*	-10.6382
$\ln Y_t$	1.87100*	8.2284	1.8804*	14.8194	1.7689*	16.5505	2.0927*	17.0534
$\ln PD_t$	0.4470*	5.9108	0.3637*	8.1002	0.4517*	7.6676	0.4084*	8.1349
$\ln F_t$	-0.9342*	-3.5044	-0.6951*	-4.0054	-0.8993*	-5.1249	-0.8534*	-5.6535
$\ln I_t$	-0.0652**	-2.5234	-0.0691**	2.5510	-0.0802**	-2.3451	-0.1101**	-2.5234
$\ln EG_t$	-		...	...	...	...	...	...
	0.2515***	-1.6925						
$\ln SG_t$	...	...	-0.2279*	-5.1307	...	...	...	...
$\ln PG_t$	...	...	...	...	-0.0834*	-2.2678	...	...
$\ln GL_t$							-0.0877*	-4.3917
D_{1990}	-0.2966*	-2.4918	-0.3010*	-3.4093	-0.2161	-3.6817	-0.1835*	-3.7472
R^2	0.9819		0.9843		0.9837		0.9854	
Short-run analysis								
Variables	Coefficient	T-statistic	Coefficient	T-statistic	Coefficient	T-statistic	Coefficient	T-statistic
Constant	0.2425*	3.2516	0.2675**	2.6771	0.2328**	3.5519	0.2361**	2.7286
$\Delta \ln Y_t$	0.9633*	4.1711	0.9246*	3.2950	0.9838*	4.4852	1.0321*	4.1326
$\Delta \ln PD_t$	0.6338***	1.8545	0.7417*	4.3169	0.5809***	1.9320	0.5919*	2.1401
$\Delta \ln F_t$	-0.6901*	-5.5002	-0.6939*	-4.4337	-0.7072*	-5.7351	-0.7113*	-4.8856
$\Delta \ln I_t$	-0.0381	-0.9059	-0.2180	-0.4451	-0.0461	-0.9790	-0.0439	-0.9973
$\Delta \ln EG_t$	-0.0663	-0.6393	...	...	...	...	...	...
$\Delta \ln SG_t$	...	...	-0.0220	-0.2375	...	...	...	...

$\Delta \ln PG_t$	...	...	...	...	-0.1491	-1.0868	...	...
$\Delta \ln G_t$	...	...	...	...	...	...	-0.0914	-0.3634
D_{1990}	-0.0555**	-2.4711	-0.0638**	-2.0853	-0.0549*	-2.8396	-0.0571**	-2.1407
ECM_{t-1}	-0.1427**	-2.5050	-0.1167**	-2.5461	-	0.2077***	-1.7930	-0.1407**
R^2	0.5757		0.5645		0.5949		0.5680	
F-statistic	6.3968*		6.1125*		6.9245*		6.0122*	
D. W	1.9847		1.9397		1.9890		2.0045	
Short run diagnostic tests								
Test	F-statistic	Prob. value	F-statistic	Prob. Value	F-statistic	Prob. value	F-statistic	Prob. Value
$\chi^2 NORMAL$	1.1120	0.5732	0.8090	0.6450	2.3011	0.1110	1.8008	0.4400
$\chi^2 SERIAL$	2.1800	0.1306	2.1801	0.1180	0.7660	0.4665	2.2013	0.1401
$\chi^2 ARCH$	0.0123	0.9608	1.7072	0.3390	1.8090	0.2633	0.9604	0.3307
$\chi^2 WHITE$	1.5000	0.1901	0.6600	0.8131	0.7000	0.6801	0.8092	0.7730
$\chi^2 REMSAY$	2.3042	0.1102	1.3509	0.2131	0.5690	0.2022	2.2206	0.1301

Note: * and ** show significance at the 1% and 5% levels of significance, respectively.

Moreover, the stability of the ARDL parameters is investigated by employing the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMsq) suggested by Brown et al. (1975). It is important to note that model specifications can also lead to biased coefficients estimates that might influence the explanatory power of the results. Both CUSUM and CUSUMsq are widely used to test the constancy of parameters. Furthermore, Brown et al. (1975) point out that these tests help to test the dynamics of parameters. Hence, the expected value of recursive residual is zero leading to accept the null hypotheses of parameters' constancy. The plots of both CUSUM and CUSUMsq are shown in Figures 2 to 9 at the 5 percent level of significance and the results indicate that the plots of both tests are within the critical bounds at the 5 percent level of significance except Figure 2. This figure indicates the presence of a structural break in 2008, which is related to the global financial crisis that has affected the Indian economic growth. Leow (2004) suggests that one should not rely on graphs due to their poor explanatory power and recommends the Chow forecast test to corroborate the presence of structural breaks. The result of the F-statistic shows an absence of structural break in the short run model and further implies that our estimates are reliable and efficient¹⁰.

¹⁰ The results are available upon request from authors.

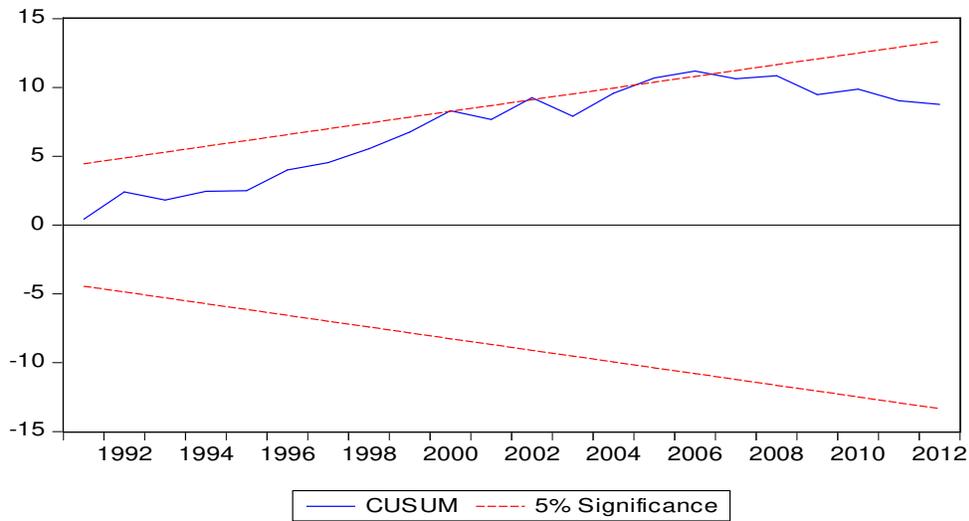


Figure 2. Plot of Cumulative Sum of Recursive Residuals of Economic Globalization

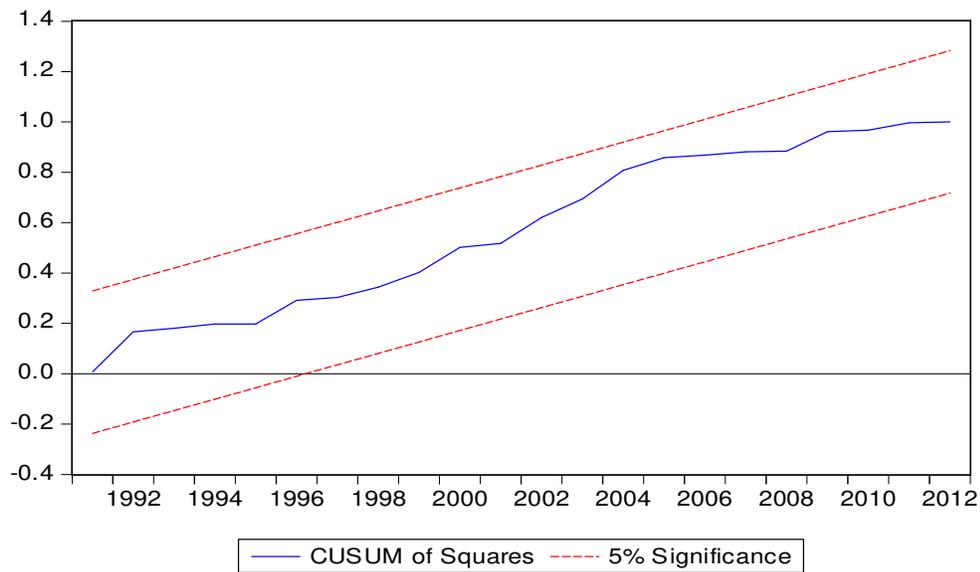


Figure 3. Plot of cumulative sum of squares of recursive residuals of Economic Globalization

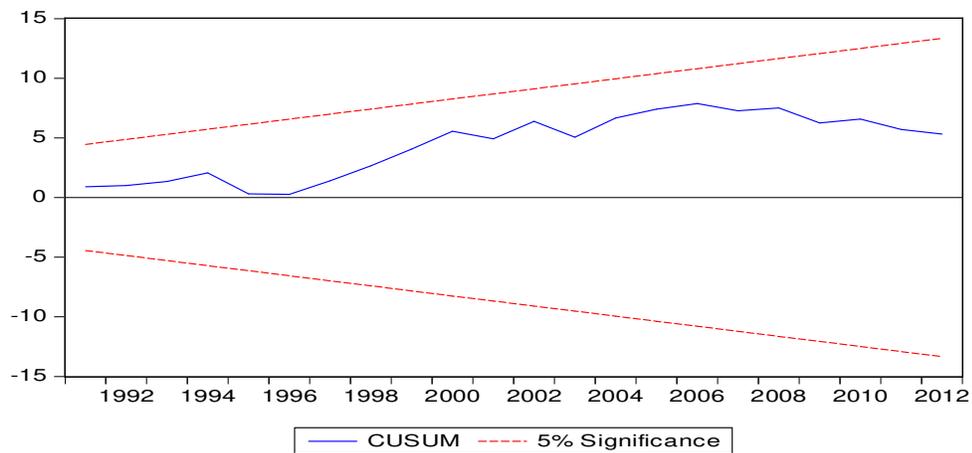


Figure 4. Plot of Cumulative Sum of Recursive Residuals of Social Globalization

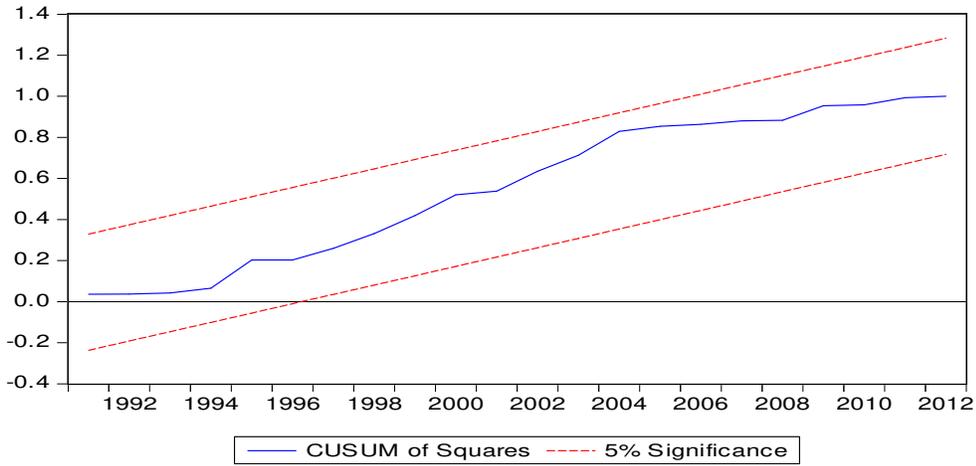


Figure 5. Plot of cumulative sum of squares of recursive residuals of Social Globalization

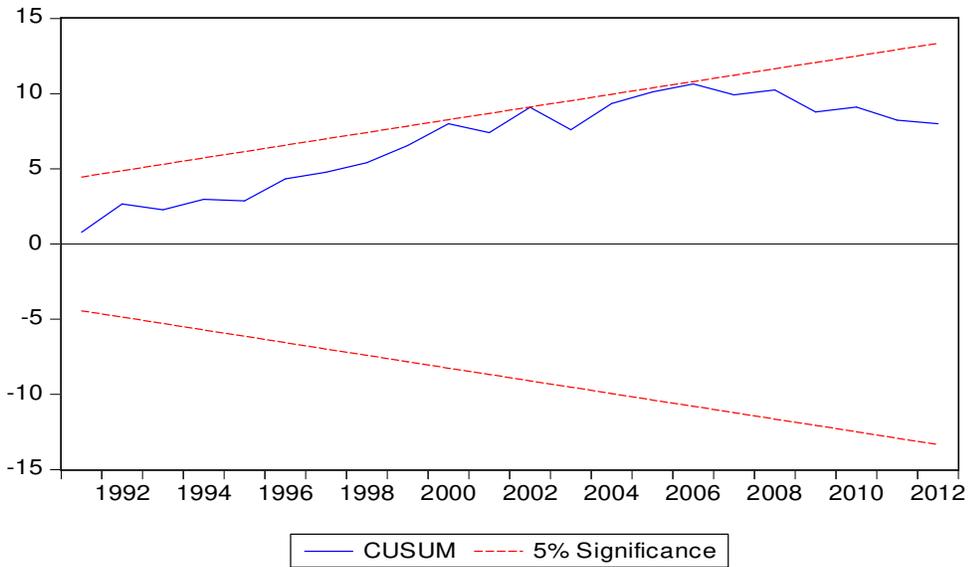


Figure 6. Plot of Cumulative Sum of Recursive Residuals of Political Globalization

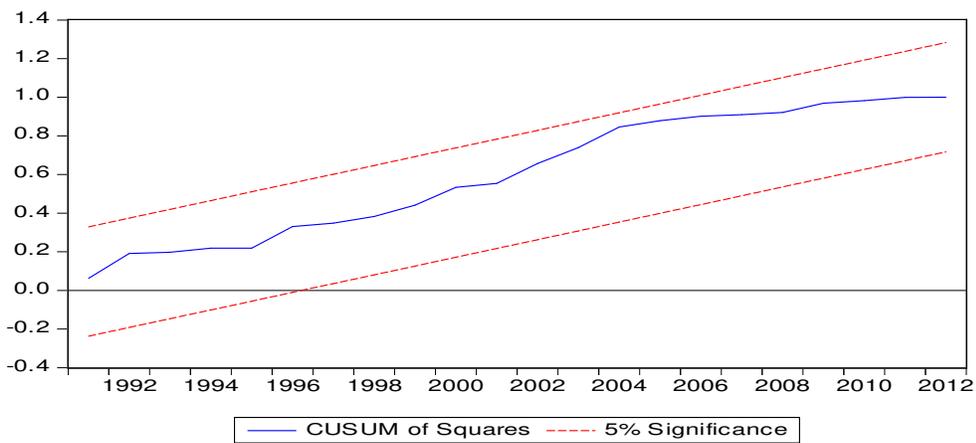


Figure 7. Plot of cumulative sum of squares of recursive residuals Political Globalization

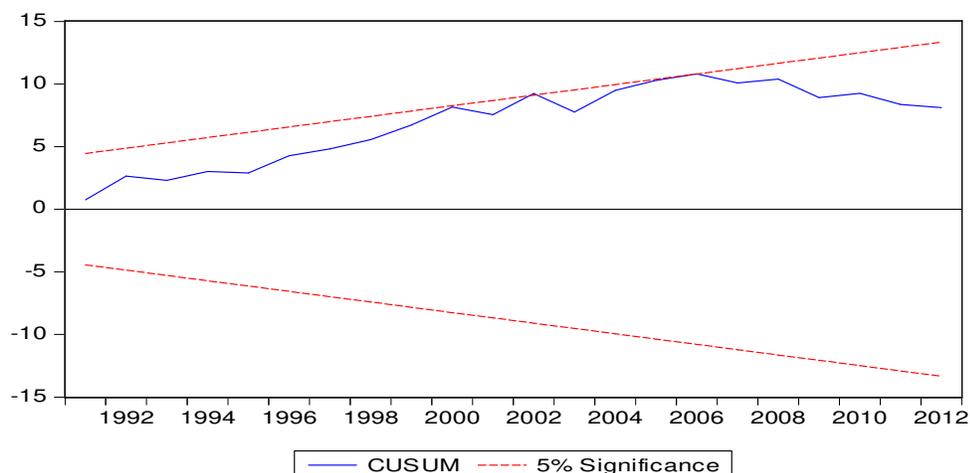


Figure 8. Plot of Cumulative Sum of Recursive Residuals of overall globalization

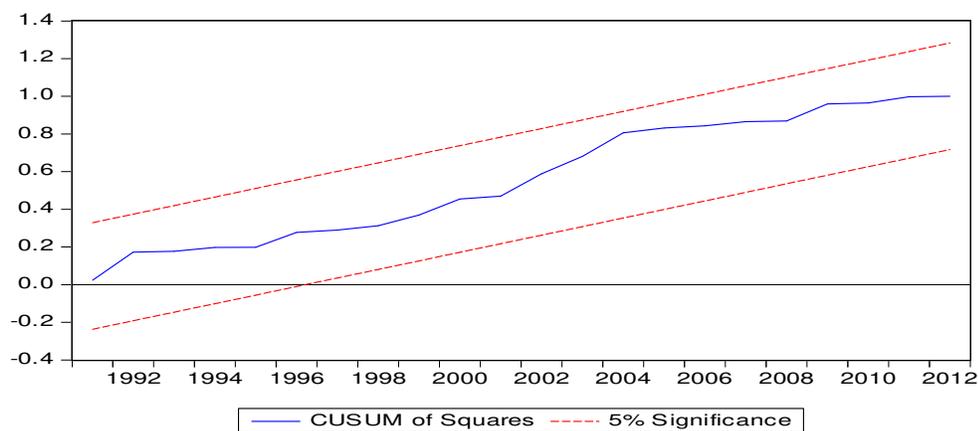


Figure 9. Plot of cumulative sum of squares of recursive residuals of overall globalization

5.1 The Causality Analysis

When cointegration is confirmed, there must be a unidirectional or bidirectional causality among the variables but the direction is not known. We thus examine this relationship within the multivariate VECM framework. Such knowledge is essential for formulating appropriate financial policies for sustainable economic growth and development in India. The results reported in Table 6 reveal that in the long run, economic growth Granger causes financial development¹¹. A unidirectional causal relationship exists running from population density to financial development. Further, inflation causes financial development, and in turn, financial development causes inflation in the Granger sense i.e. a feedback effect. A unidirectional causality is also found running from institutional quality to financial development and inflation.

¹¹ The lag length used in the causality analysis is based on AIC as shown in Table 3.

Globalization (economic globalization, political globalization, social globalization) also Granger causes financial development and inflation as well. Population density Granger causes inflation.

Table 6. VECM Granger Causality Analysis

Dependent Variable	Types of Causality						
	Short run						Long Run
	$\sum \Delta \ln FD_{t-1}$	$\sum \Delta \ln Y_{t-1}$	$\sum \Delta \ln PD_{t-1}$	$\sum \Delta \ln F_{t-1}$	$\sum \Delta \ln I_{t-1}$	$\sum \Delta \ln EG_{t-1}$	ECM_{t-1}
$\Delta \ln FD_t$	...	2.9665*** [0.0678]	1.8001 [0.1832]	0.1002 [0.9050]	5.9060* [0.0101]	1.4171 [0.2587]	-0.0838* [-3.6116]
$\Delta \ln Y_t$	7.1538* [0.0030]	...	8.2044* [0.0015]	2.6264*** [0.0895]	3.2906** [0.0524]	1.9737 [0.1572]	...
$\Delta \ln PD_t$	7.3998* [0.0024]	7.8187* [0.0018]	...	3.7643** [0.0348]	1.5163 [0.2461]	14.6580* [0.0000]	...
$\Delta \ln F_t$	8.0227* [0.0017]	4.6284** [0.0180]	2.5978*** [0.0917]	...	1.3102 [0.3362]	0.5877 [0.5621]	-0.6232* [-3.1258]
$\Delta \ln I_t$	0.4014 [0.6732]	3.4094** [0.06531]	1.2463 [0.1440]	2.10630 [0.1240]	...	2.4082 [0.1186]	...
$\Delta \ln EG_t$	0.0209 [0.9793]	0.4004 [0.6735]	2.4163 [0.1064]	0.0592 [0.9246]	1.9447 [0.1556]	...	...
	$\sum \Delta \ln FD_{t-1}$	$\sum \Delta \ln Y_{t-1}$	$\sum \Delta \ln PD_{t-1}$	$\sum \Delta \ln F_{t-1}$	$\sum \Delta \ln I_{t-1}$	$\sum \Delta \ln SG_{t-1}$	
$\Delta \ln FD_t$	...	9.6704* [0.0006]	2.9584*** [0.0677]	11.7119* [0.0002]	6.0660* [0.0098]	1.9447 [0.1556]	-0.0724* [-3.4934]
$\Delta \ln Y_t$	6.1336* [0.0058]	...	6.1598* [0.0057]	1.1904 [0.3180]	4.2069** [0.0244]	1.2647 [0.2969]	...
$\Delta \ln PD_t$	4.1422** [0.0258]	4.2183** [0.0243]	...	5.8715** [0.0070]	1.5106 [0.2497]	0.4777 [0.6248]	...
$\Delta \ln F_t$	17.0788* [0.0000]	3.7853** [0.0346]	4.0294** [0.0286]	...	1.2109 [0.3502]	0.6945 [0.5074]	-0.5463* [-3.3348]
$\Delta \ln I_t$	0.4140 [0.6990]	3.4940*** [0.0643]	1.2060 [0.1490]	2.1630 [0.1234]	...	2.4829 [0.1096]	...
$\Delta \ln SG_t$	0.7824 [0.6446]	0.6681 [0.5201]	0.0942 [0.9104]	0.3635 [0.6982]	1.9890 [0.1378]	...	...
	$\sum \Delta \ln FD_{t-1}$	$\sum \Delta \ln Y_{t-1}$	$\sum \Delta \ln PD_{t-1}$	$\sum \Delta \ln F_{t-1}$	$\sum \Delta \ln I_{t-1}$	$\sum \Delta \ln PG_{t-1}$	
$\Delta \ln FD_t$	...	10.5502* [0.0004]	5.5501** [0.0191]	19.0545* [0.9158]	6.7670* [0.0087]	2.9292*** [0.0694]	-0.3156* [-3.0302]
$\Delta \ln Y_t$	5.8101* [0.0074]	...	6.2665* [0.0053]	1.1033 [0.3449]	4.2609** [0.0234]	1.6200 [0.2147]	...
$\Delta \ln PD_t$	4.5695** [0.0185]	4.2144** [0.0244]	...	5.7152* [0.0079]	1.6100 [0.2440]	1.0350 [0.9865]	...
$\Delta \ln F_t$	25.7985* [0.0000]	4.3181** [0.0288]	3.5601** [0.0414]	...	1.9561 [0.2412]	1.9346 [0.1647]	-0.5979* [-3.3656]
$\Delta \ln I_t$	1.2414	3.9959***	0.0600	2.0063	...	2.1892	...

	[0.2220]	[0.0562]	[0.9800]	[0.1531]		[0.1560]	
$\Delta \ln PG_t$	0.3331 [0.7193]	0.6222 [0.5435]	0.1863 [0.8310]	0.2235 [0.8010]	1.9090 [0.1381]	...	...
	$\sum \Delta \ln FD_{t-1}$	$\sum \Delta \ln Y_{t-1}$	$\sum \Delta \ln PD_{t-1}$	$\sum \Delta \ln F_{t-1}$	$\sum \Delta \ln I_{t-1}$	$\sum \Delta \ln GL_{t-1}$	
$\Delta \ln FD_t$	...	6.4558* [0.0047]	3.0367*** [0.0609]	9.5549* [0.0006]	7.0767* [0.0033]	0.1605 [0.8524]	-0.0520* [-3.2351]
$\Delta \ln Y_t$	5.6811* [0.0081]	...	5.5342* [0.0090]	1.1201 [0.3395]	5.2009** [0.0190]	0.8802 [0.4251]	...
$\Delta \ln PD_t$	2.8518*** [0.0735]	2.8145*** [0.0758]	...	3.4785** [0.0384]	2.4401 [0.1140]	1.7614 [0.1891]	...
$\Delta \ln F_t$	10.9414* [0.0003]	4.7373** [0.0166]	2.3118 [0.1171]	...	1.6195 [0.2601]	1.1047 [0.3458]	-0.6191* [-3.1218]
$\Delta \ln I_t$	1.3434 [0.2102]	3.5966** [0.0262]	0.2606 [0.8401]	2.1563 [0.1130]	...	2.1912 [0.1401]	...
$\Delta \ln GL_t$	0.6314 [0.5337]	0.4988 [0.6122]	1.1807 [0.3209]	0.2221 [0.8021]	1.9999 [0.1345]	...	...

Note: *, ** and *** denote significance at the 1, 5 and 10 per cent levels, respectively.

Table 6 shows that in the short run, a feedback effect exists between economic growth and financial development and that institutional quality causes financial development. Further, population density causes economic growth and financial development. The unidirectional causality is running from inflation to economic growth and population density. The feedback effect exists between institutional quality and economic growth. Financial development Granger causes inflation, while economic globalization leads population density. Finally, political globalization Granger causes financial development.

6. Concluding remarks and policy implications

The empirical literature often argues that understanding the sources of financial development appears to be a key concern for policy makers and governments of developing economies. This is due to the stimulating effect of financial development on economic growth and development. In this regard, Mishkin (2009) in his seminal theoretical paper argues that maintaining greater degree of financial development and the resulting higher economic development are possible, while considering the role of globalization. Following such an argument, little empirical research has evolved in recent times to establish a new branch of research in the applied macroeconomics literature (Falahaty and Law 2012, Law et al. 2015). In

this context, the present study attempts to examine the role of globalization in terms of its influence on financial development in India by endogenising other crucial factors, such as economic growth, institutional quality, population density and inflation. In doing this, our main contribution is twofold. First, for the first time in this literature, we have taken a new tradition of looking at the impact of globalization on financial development for the Indian case by controlling economic growth, institutional quality, population density and inflation as the key determinants in the financial development function. Second, we employ the combined and bounds testing cointegration tests as developed by Bayer-Hanck (2013) and Pesaran et al. (2001), respectively, in order to estimate the long-run and short-run relationships of the model.

Our main empirical finding confirms the existence of cointegration between the variables. Besides, we find that the acceleration of globalization (measured in three dimensions - economic, social and political globalization) weakens financial development in India. Economic growth and population density (urbanization) positively contribute to financial development. However, inflation along with institutional quality impedes financial development. Moreover, globalization (economic, social and political) Granger causes financial development. A feedback also exists between financial development and inflation. On the other hand, financial development is Granger caused by economic growth and population density. A unidirectional causality is observed to run from institutional quality to financial development.

The findings reveal that all types of globalization as well as overall globalization have an adverse consequence on financial development in India, indicating that this result does not support the Mishkin (2009) thesis which assumes that globalization appears to be a key weapon in promoting institutional reforms to enhance development of financial system, particularly in achieving the banking sector development. The possible reason for the adverse effect of globalization on financial development in the Indian economy could be due to the fact that institutional quality is not designed with transparent norms and rules in place that can support globalization to have its positive spillover impacts on the financial development.

These findings have relevant policy bearings, suggesting that it is more important for the Indian economy to design sound institutions or appropriate domestic economic conditions that

reduce uncertainty, allowing for good governance, maintaining effective property rights, strengthening the law and order system, eliminating corruption and channeling scarce resources to more productive investment activities. In doing this, it is believed that better institutional quality will promote better financial systems and economic development. In other words, this indicates that globalization has the usual upward tendency of enhancing financial development in developing economies through institutional reforms as recognized in the previous literature (Mishkin 2009, Falahaty and Law 2012, Law et al. 2015), which would enable the Indian economy to reap the reasonable potential benefits of globalization. Without aligning or synchronizing different policies simultaneously with the globalization parameters, India would not be successful in reaping those full benefits.

In terms of further policy implications, it is worth stressing that both economic growth and urbanization add to financial development in India. This result intuitively reveals that larger economic sizes and a growing urban population can't boost the factors relevant for promoting financial development in an emerging economy like India unless this development incorporates the required high standards of institutional reforms in areas of financial markets, property rights and governance, as is the case with many developed economies. It is believed that an immature financial development will only benefit the rich in the society, while the poor will be left out and will not be able to share the full benefits realized from the financial development process.

From a policy perspective, this study suggests that institutional reforms or better institutional quality call for a greater and urgent policy actions by the policy makers in order to achieve maturity in the development of the Indian financial system. Then only, it will allow the globalization process to produce its positive and desired results for financial development, which in turn would prompt the Indian economy to create greater circumstances, opportunities and capacities for benefitting a larger section of the society and achieving higher inclusive development in the economy. Viewed with such a policy perspective, it again seems that globalization acts as a "current strategy" through which institutional quality is becoming an essential infrastructure in stimulating correct financial development for the Indian economy in particular and other developing economies in general.

Based on the above works and findings, this study can be extended in various ways for future research investigations. In the first place, the role of globalization on financial development in India can again be revisited by considering the institutional quality factor. How far (and to what an extent) the institutions built over the years accommodate the financial development and shocks emerging from globalization and financial integration? In the second place, studying the impact of globalization on income inequality by endogenising the role of financial development, institutional quality and economic growth is another promising area of research in an emerging economy like India. This will address to what extent the financial inclusion is able to address the problem of inequality in the Indian society and all other emerging developing economies. In overall, these directions of future research would be quite useful as they may provide additional insights for policy makers and governments not only for emerging countries like India but also for other developing economies while developing policy formulation in the future years.

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