Financial development, trade openness and growth in India

Raghutla CHANDRASHEKAR
Central University of Tamil Nadu, India
chandrashekareco@gmail.com
T. SAMPATH
Telangana University, India
sampatheco@gmail.com
Krishna Reddy CHITTEDI
University of Hyderabad, Telangana, India
krc@uohyd.ac.in

Abstract. *This paper studies the relationship between the financial development, trade openness and economic growth in India. The Phillips-Perron (PP) test is used to check the order of integration of the variables. We apply both Johansen co-integration and Granger causality methodologies for a long run relationship and the direction of the Causality between the variables. Our findings confirm that there exist the long run relationship among financial development, trade openness, and growth. Results also support the idea that country may experience faster per-capita growth with a growing degree of trade openness through gains in country productivity associated with capital accumulation. Finally, the direction of the causality results followed mixed.*

Keywords: financial development, trade openness, economic growth, co-integration, India.

JEL Classification: F43, G21, O16.

1. Introduction

The effectiveness of the liberalization policies are of vital importance for the financial development and international trade environment for promoting economic growth and performance of an economy. The economic growth is a highly debated issue all across the world. Growth is one of the imperative criteria to deem the performance of an economy. It identifies the main drivers and the key source of economic growth. A vast number of empirical studies have been investigated on this view. These studies have used various drivers of growth encompassing both foreign and domestic investment, financial development and export. The present study aims to explore the link between financial development, trade openness and economic growth by employing the time series techniques.

The strength of the finance and economic growth relationship is ultimately a matter empirical evidence (King and Levine, 1993b; Levine, 2005). The empirical financial literature has now widely accepted that financial sector development constitutes a potentially important mechanism for long-run economic growth (Levine, 2003; Demetriades and Andrianova 2004; Demetriades and Hussein, 1996; Goodhart, 2004). The earliest authors are of the notion that finance could be an engine of economic growth (Gurley and Shaw, 1955; McKinnon, 1973; Shaw, 1973). Furthermore, Beck, 2002; Sachs and Warner, 1995, have argued that the level of financial development and global trade openness are among the most important variables of economic performance. The linkage between financial development, trade openness and economic growth is one of the most vibrant research topic in economic literature and has been taken at length by many researchers. There have been a number of studies both theoretically and empirically in the field of financial development and economic growth. In additional following studies have shed light on the present study to a great extent (Kletzer and Bardhan, 1987; Demetriades and Hussein, 1996; Rousseau and Wachtel, 1998; Kar et al., 2011; Kónya, 2006). Most of the literature have explored that exports has positive impact on growth (Ullah et al. 2009). Although export-led growth or growth led exports empirically has been investigated by pioneer authors (Krugman, 1979; Bahmani, 1993; Medina-Smith, 2000; Clare et al., 2002; Gabrielle, 2004; Tang, 2006; Ummalla and Chandrashekar, 2015). However, Blackburn and Hung (1998), in their theoretical model also predict that economic growth attributed to the both financial development and international trade liberalization. Furthermore, the direction of causality still shows conflicting results (Romer, 1986; Lucas, 1988; Grossman and Helpman, 1991; Rebelo, 1991; Pagano, 1993; Khan, 2001, among others).

Although there is a vast literature about the association among growth, exports, imports and financial development but there is a dearth of literature on financial development, trade openness and growth literature on India is limited. The present study contributes to the literature by extending the financial development, trade openness and growth nexus for emerging country in India for the period 1975-2014. Firstly, previous time series studies for India which concentrated on the three financial development indicators, we include gross savings and gross capital formation as a two more variable. Secondly, financial development indicators to capture the individual dimension of financial

development. Thirdly, causality test results as followed mixed, but previous study shows that both unidirectional and bidirectional, but this study also find a no causality on gross savings and broad money with all variables.

The keen question ramble in the mind of many scholars is that whether there is any inter-linkage among financial development and international trade to accelerate economic growth. This study aims to investigate the existence of the long run relationship between financial development, trade openness, economic growth and direction of causality between these variables. The rest of the article is structured as follows: Section 2 the literature on the relationship between financial development and economic growth and international trade and financial development. Section 3 defines description of the data and methodology. Section 4 presents a brief outline of financial development in India economy with estimations. Section 5 provides empirical results and discussion. Section 6 presents in summary and concluding remarks.

2. Financial development, trade openness and economic growth: An overview

2.1. Financial development and economic growth

The rich debate on the role of the financial sector development in economic growth is still flourishing and is still interesting to both theoretical as well as empirical studies that investigate the links between the two variables (Ang, 2008; Murinde, 2012). Central to the debate is whether the economic growth can explain the financial sector growth or development of financial sector that drives economic growth. The first hypothesis, usually known as 'demand-following' contends that finance is led by rather than leads economic growth and also finance plays a minor role in economic growth. In this line of reasoning, finance is merely a by-product or an outcome of overall growth in the real side of the economy (Robinson, 1952). It is argued that when an economy grows, expands the financial products, financial institutions, and financial services emerge in the financial market in response to higher demand for financial services. Consequently, the real sector of the economy grows, the financial system develops thereby increasing the opportunities for acquiring liquidity for funding investment and for reducing risk. In contrast to the above, second hypothesis commonly known as 'supply-leading' contends that financial sector development is a necessary pre-condition for economic growth; consequently, finance leads economic growth and causality runs from financial sector development to economic growth. According to (King and Levine, 1993a) economic growth can be induce by the quantity and the composition of financial development variables through increasing savings which consist of financial assets, thereby spawning capital formation.

In addition to the above two hypotheses, contrast of prominent author emphasize that (Blackburn and Hung, 1998, Blackburn et al., 2005; Greenwood and Smith, 1997) financial sector development and economic growth can mutually complement each other making financial sector deepening and economic growth. Where bi-directional causality running between economic growth and financial development. And also other strand argue that financial development do not promote economic growth (De Gregorio and Guidotti, 1995). For the conflicting empirical evidence outlined above is true

for Sub-Sahara African countries (Murinde, 2012). For some pioneer authors view that there is a long run association between financial development and economic growth but ambiguous of the direction of causality. For instance, Wolde-Rufael (2009) and Fowowe (2011) are found a bi-directional causality between financial development and economic growth. And also Agbetsiafia (2004) found a unidirectional causality between the two variables, finally where financial sector development can act as an 'engine of growth' and also can play a key role in the process of economic development.

2.2. Trade openness and financial development

According to (Baltagi et al., 2009; Kim et al., 2010a, 2010b) research that views into the relationship between international trade and financial development is now emerging. The link between international trade and financial development the theoretical Rajan and Zingales (2003), as well as empirical Wolde-Rufael (2009), Gries et al. (2009) as explained in the literature. According to Rajan and Zingales (2003), Law and Demetriades (2006) hypothesis that financial development promoted competition when a country opens borders to both trade and capital flows. In a similar vein, Beck (2002) Stated that economies with a better-developed financial system have a two advantages higher export share and trade balance in manufactured goods. Svaleryd and Vlachos (2002) showed that there was an economically significant connection between trade policy and financial markets with where causation running in both directions of variables. Kim et al. (2010a) found that there were a positive long run association and a negative short-run association between trade openness and financial development.

Finally, above literature concludes that there is some evidence that financial sector development may be important for long-run economic growth, neither the cross-section nor the time series empirical evidence is unambiguous in its findings that financial development leads to economic growth. Moreover, this is also true for the association between financial development and trade openness.

3. Data and empirical methodology

Our study used annual data from the period of 1975-2014 containing variables, GDP per capita (proxied by Economic growth (Y)). Openness (TO) (sum of imports and exports as percentage of GDP). We use Financial development indicators such as (M1) domestic credit to private sector by banks, (M2) money and quasi money including gross savings, (M3) domestic credit to private sector refer to gross capital formation and broad money and this three indicators are in percentage of GDP. The data is collected from the 2016 edition of the world development indicators (WDI). The study applied unit root test to detect the stationaries, Johansen cointegration to test to see the long run long run relationship between variables and also applied granger causality.

3.1. Econometric analysis

This study investigates the relationship among the financial development, international trade and economic growth by using time series econometric methodology. To this aim first Phillips-Perron unit root test to confirm the stationarity of the variables. Then

Johnsen and Juselius (1990) co-integration is employed to investigate the cointegration association between financial development, international trade openness and economic growth with the variables as GDP and the explanatory variables. Furthermore, to determine the direction of causality between the variables, the research study has employed the granger causality test.

In our empirical study log-linear specifications of the variables are used and to the following estimation equation as:

In $G_t = \beta0 + \beta1 InM1_t + \beta2 InM2_t + \beta3 InM3_t + \beta4 InTO_t + \varepsilon_t$

where:

G_t, $M1_t$, $M2_t$, $M3_t$, and TO_t represent economic growth, domestic credit to private sector by banks, money and quasi money, and domestic credit to private sector and trade openness respectively. $\beta1$, $\beta2$, $\beta3$, and $\beta4$, contribute for the elasticity of the explanatory variables.

Test for order of integration

We have used the Phillips-Perron (PP) unit root test for empirical analysis. The order of integration of the selected variables has to be investigated to check whether series are stationary. The null hypothesis for PP test is that series has unit root. If the PP series is non-stationary at level, the PP series should be taken in order of first difference to make the series stationary. pp stationary series at the level donated by I (0) and pp stationary series at the first differences donated by I (1). The unit roots tests should be started from the most general models such as trend and intercept (Enders, 1995).

The estimation equation can be written as follows

$$\Delta y_{t-1} = a_0 + \lambda yt - 1 + a_2 t + \sum_{i=2}^{p} \beta j \, \Delta y_{t-1+1} + \varepsilon_t$$

where:

y, t, a, ε_t, and P are variables used which is refers to the dependent variable, trend, intercept, Gaussian white noise and the lag level respectively.

Johansen's cointegration procedure

To analyse the long-run link between three variables such as financial development, trade openness and economic growth and confirm they are stationary at first difference, the results in the Table 1 indicate that according to the PP procedures variables have the same order of integration I(1). The next step is to investigate the long-run co-integration equilibrium relationship between variables. We have used Johansen, 1988 model to test the co-integration. Johansen test help to identify the long-run association among variables.

The Johansen methodology can be written equation as follows;

$X_t = \Pi_1 X_{t-1} + \cdots + \Pi_k X_{t-k} + \mu + e_t$ (for t = 1,…, T)

where:

X_t, X_{t-1}, and X_{t-k} are vectors of level and lagged values of the variables respectively which is integrated order of I(1); $\Pi_1, \ldots, \Pi_k$ are coefficient matrices with (PXP) dimensions. μ, and e_t are intercept vector and vector of random error (Katircioglu et al., 2007).

Granger causality test

In third step, after determining existence of co-integration relationship (Katircioglu et al., 2007) then causality must exist either unidirectionally or bidirectionally. Further step is to investigate the time series data test for the direction of causation purpose we have used granger causality method as proposed by granger (1988). Granger causality test is run by retaining the Vector Error Correction (VEC) model framework. Furthermore, as emphasized in granger (1988) both the relationship between co-integration and granger causality is estimated.

Granger (1988) suggests the following equation of causality model;

$$Z_t = \sum_{j=1}^{m} a_j Z_{t-1} + \sum_{j=1}^{m} b_j Y_{t-j} + \varepsilon_t$$

$$T_t = \sum_{j=1}^{m} c_j Z_{t-1} + \sum_{j=1}^{m} d_j Y_{t-j} + \eta_t$$

where:

b_j is statistically significant; Y_t Granger causes Z_t. However if c_j is different than zero; Z_t Granger causes Y_t respectively.

4. Financial development, trade openness and economic growth in India

India's dismal economic growth can be attributed to multitude of factors, there is financial intermediaries providing finance to industries, it has been argued, that can that can lead to increasing economic growth. The developing economy foster through various channels: relatively well financial developed system have a comparative advantage in domestic industries and sectors such as technical modernizations, manufacturing, and technology allocation that rely on via external finance which is called foreign direct investment (FDI). Expanding the Industries while increasing production capacity actively contribute towards economic growth. The financial system provides a broad range of services to entrepreneurs and government sectors which have a contributory role to economic growth. Finally, widely evident from the fact that economies with a well-developed financial system and motivated international trade with a higher share of exports, flourishing have been registering higher economic growth compared to the economies with low-developed financial system.
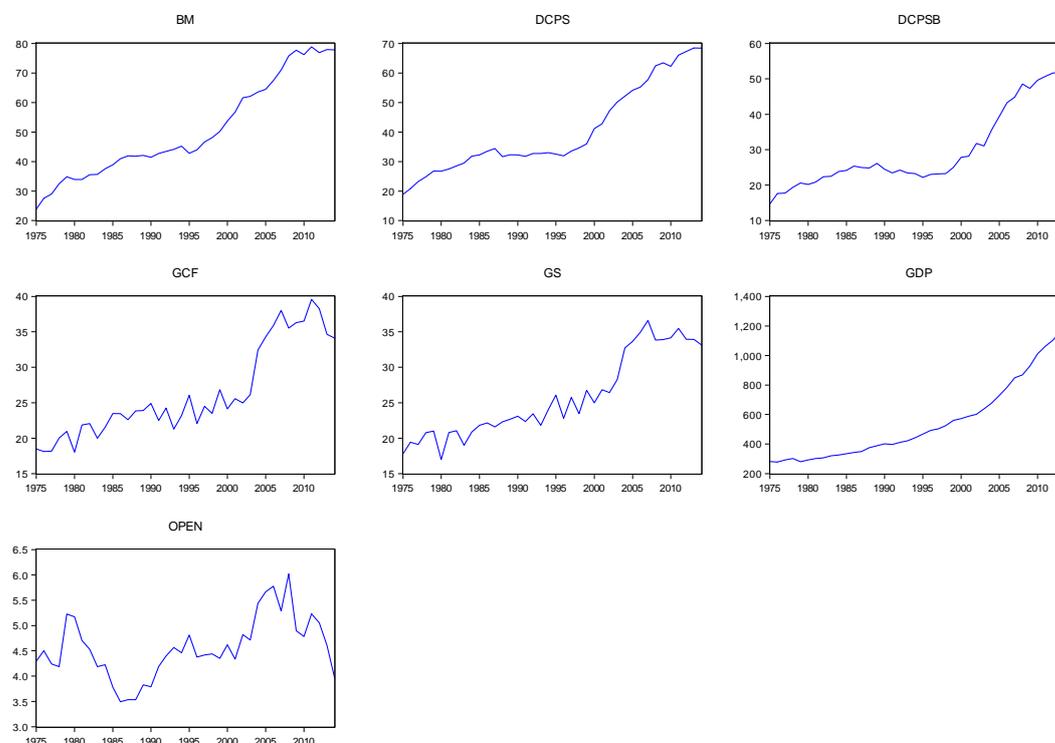
Table 1. *Average annual percentage of GDP of each our variable in the model: 1975-2014.*

Year	DCPSB	DCPS	GCF	GS	BM	OPENNESS
1975-1980	18.35	23.51	18.96	19.18	30.23	4.60
1981-1985	22.73	29.87	21.77	20.70	36.26	4.28
1986-1990	25.15	32.78	23.74	22.37	41.62	3.63
1991-1995	18.86	32.50	23.45	23.55	43.63	4.48
1996-2000	24.45	35.43	24.20	24.75	48.50	4.44
2001-2005	33.18	49.26	28.68	29.58	61.67	4.99
2006-2010	46.69	60.20	36.45	34.69	73.62	5.35
2011-2014	51.46	67.56	36.64	34.12	77.84	4.71

Note: percentage of GDP according to World Bank (WDI).

India the graph above shows that all selected variables spanning the period from 1975-2014. For instance, while the Broad money, domestic credit to the private sector by banks, gross savings, gross capital formation, domestic credit to private sector, and, trade openness, 23.84%, 18.83%, 14.64%, 18.47%, and 17.80%, respectively in 1975. And 53.70%, 41.13%, 27.85%, 24.11% and 24.9% in 2000. Similarly, 77.7%, 68.44%, 51.57%, 34.09% and 33.14% in 2014. Which is measured as percentage of GDP, financial performance in the India has continuously increasing annual average and also gross domestic product (per capita) except unparalleled trade openness.

Table 2. *Results of Phillips-Perron unit root test*

	Statistical level	Statistics 1st difference
BM	-0.309623	-4.944107*
DCPS	0.480678	-4.935499*
DCPSB	0.275307	-5.998803*
GCF	-1.079581	-7.821477*
GS	-0.863671	-9.401235*
EX	0.164296	-8.040721*
IM	-0.081216	-5.243315*
GDP	13.04816	-5.045076*

Note: The table report the results of PP tests. PP test is selected based on the Bartlett kernel and for Bandwidth is Newey-West method and Where (*) denote significance level at 1 percent ant. [1]

Table 3. *Johansen's cointegration estimation results*

Unrestricted Cointegration Rank Test (Trace)

Rank	Eigenvalues	Statistics: Trace	0.05 Critical Value	Prob.**	Conclusion (H0)
0	0.784102	188.3154*	125.6154	0.0000	Rejected
1	0.643965	130.0634*	95.75366	0.0000	Rejected
2	0.619634	90.81981*	69.81889	0.0004	Rejected
3	0.571090	54.08824*	47.85613	0.0116	Rejected

Note: Trace test indicates 4 cointegrating equation (s) at the 0.05 level and (*) denotes rejection of the hypothesis at the 0.05 level and (**) Mackinnon-Haug-Michelis (1999) p-values

Table 4. *Granger Causality results*

	GDP	DCPSB	DCPS	GCF	GS	BM	OPEN
GDP	-	0.96385	0.13292	1.11304	0.81082	3.18956	1.44908
	-	(0.3922)	(0.8760)	(0.3409)	(0.4534)	(0.0546)	(0.2498)
DCPSB	0.54908	-	0.74339	0.03687	0.86781	0.68098	4.56176
	(0.5828)	-	(0.4835)	(0.9638)	(0.4295)	(0.5133)	(0.0181)
DCPS	2.90570	0.94640	-	0.59401	1.03653	0.74339	4.04710
	(0.0693)	(0.3987)	-	(0.5581)	(0.3663)	(0.4835)	(0.0271)
GCF	3.36160	0.07917	0.72288	-	0.03687	0.86781	0.91719
	(0.0473)	(0.9241)	(0.4931)	-	(0.9638)	(0.4295)	(0.4099)
GS	0.24046	0.26767	0.70891	0.07917	-	0.68098	0.72288
	(0.7877)	(0.7669)	(0.4997)	(0.9241)	-	(0.5133)	(0.4931)
BM	4.88192	0.20795	0.94640	0.26767	0.20795	-	0.70891
	(0.0141)	(0.8133)	(0.3987)	(0.7669)	(0.8133)	-	(0.4997)
TO	0.19046	0.69541	0.23886	1.77291	0.59401	1.03653	-
	(0.8275)	(0.5063)	(0.7889)	(0.1861)	(0.5581)	(0.3663)	-

Note: significance at 5% level. P-values and F-statistics, respectively.

5. Empirical results and discussion

In testing for Phillips-Perron (PP) we then determine the stationary nature of the variables. Table 1 presents the results for PP unit root test. PP test indicates that all variables are found non-stationary at their level, null hypothesis is rejected and stationarity found at first difference which confirms that all variables are integrated order of first difference or I (1) level alternative hypothesis is accepted.

Table 2 reports the long-run relationship from the Johansen cointegration estimation in order to evaluate the long-run association among the variables which are GDP per capita, trade openness and financial development indicators. Furthermore, in our proposed model of economic growth (Y) is a dependent variable while two are explanatory variables which is trade openness and financial development indicators. The evidence from

Johansen cointegration estimated results shows that the trace statistic values is greater than (188.3154) their (125.6154) critical values at 0.05 level. Our proposed model indicates that if null hypothesis rejected then there is no co-integration between the variables, while accepted alternative hypothesis confirms that there is cointegration between the variables. Results show that there is a long-run equilibrium association between economic growth, trade openness and financial development.

Table 3 provides results of Granger causality test after determining existence of long run link. This method is based on Granger causality estimations of a set of each caulomes and represents on seven variables in the system. To ensure that the empirical estimated values are in order as vertical values are independent variables and horizontal values are dependent variables, which is the lagged differenced coefficients of F statistical values which is determined as direction of short run Granger Causality. In our proposed model, the null hypothesis indicates that there is non-causality between variables. If null hypothesis rejected then the model confirms that independent variables cause the dependent variables.

There is Granger causality from economic growth cause the broad money (p = 0.0546) while the reverse causation from broad money to economic growth (p = 0.0141) is confirmed as bidirectional, its implying that the "complementarity hypothesis" was supported. The domestic credit to private sector by banks cause trade openness (p = 0.0181) and the causality from the domestic credit to private sector to trade openness (p = 0.0271) both having some *predictive power on each other*. The gross capital formation causes the economic growth (p = 0.0473), and also running causality from broad money to economic growth (p = 0.0141) confirms unidirectional causality where the "supply-leading hypothesis" was supported and the main finding is that the remaining two variables are shown that "neutrality hypothesis" does not seem to have any significant causality relationship between the variables.

The present study evidence presented results seems to indicate that there is running any causality in any direction financial development indicators and economic growth or financial development indicators and trade openness or between trade openness and economic growth in the majority of the emerging India.

6. Summary and concluding remarks

The objective of the study is to explore the long run relationship and direction of causality between financial development, international trade openness and growth in Indian context. To this aim, first Phillips-Perron (PP) unit root tests were applied and at this level all the variables were non-stationary, which means that null hypothesis cannot be rejected. However, the stationarity found at their first difference of the series is significant. Next step was to analyse the cointegration relationship between the variables by employing Johansen Test and found that there exists a long run relationship between financial development, international trade openness and growth. Furthermore, the direction of the causality was evaluated by Granger Causality method. Our Granger causality results show that causality follows both the unidirectional and bidirectional and

some variables do not provide any causality relationship between the variables. We find support for the *complementarity hypothesis, supply-leading hypothesis, and neutrality hypothesis in India.* And also argue that economic growth and financial development indicators may evolve independently of each other (Lucas, 1988), pioneer authors Shan (2005) and Shan et al. (2001) are found that the empirical support in some countries. Overall, the empirical findings indicate that a change in financial development precedes change in trade openness and this leads to increase in the economic growth.

Based on empirical analysis the study suggest following points for the economy, first, in India a change occurs in the per capita will leads to impact on financial development which will further affect the financial sector of the country and developed financial sector will be helpful to maintain stable economic growth. Secondly, economic growth stimulates broad money while broad money stimulates economics which is important to maintain a financial development for India. And also small influence on trade openness. Thirdly, to encourage the private sector by providing incentives for production, the total production of the economy will be increased which will promote international trade and which can take more active role in the development of the economy. Broadly study conclude that Indian financial development and Trade openness hypothesis has a positive impact on the economy.

Note

[1] Johansen's cointegration test results are same both trace test and maximum test but we keeping only trace values. If anyone requesting we will provide.

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