Relationship Among International Trade in Services, Economic Growth and Financial Development in India

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ABSTRACT

The study aims to investigate the relationship between financial development, economic growth and international trade in services. The Augmented-Dickey- Fuller (1981) and Phillips- Perron (1988) unitroot testsarea- pplied to test the stationarity. The co-integration test is run to examine the longrun relationship among these variables. Further, the direction of causality is tested by the Granger causality test. All the variables are found integrated at first order. The Johansen co-integration test confirms the long run relationship among all the three variables. The overall results indicate that there is long-run equilibrium among all the three variables.

Keywords: Stationarity, Co-integration, Granger causality.

1. INTRODUCTION

Many authors investigated the relationship between economic growth and financial development. Their findings suggest that financial development of the country leads to economic growth. A well-functioning financial system also ha sa positive impact on export in addition to its impact on GDP. So, financial development can be taken as a source of competitive advantage for international trade.

According to literature, financial development and trade of the country foster its growth (Rahman et. al. 2015). Several studies such as (Beck 2001), Hamdi et. al., (2013), Menyal et. al. (2014) and Gokmenoglu et. al. (2015) proved the long run relationship among economic growth, financial development, and trade of the country. But no study highlighted the combined effect of economic growth and financial development on international trade. The present study aims to analyze the relationship between economic growth, financial development, and trade in the context of India over the period 1980 to 2015. The study further investigates the direction of the relationship between these three macro-economic variables. Here, we have focused on trade in services which remained overlooked in all previous work.

2. LITERATURE REVIEW

The literature highlights the positive role of financial development and trade in economic growth. The causal relationship between economic growth, trade and financial development is identified by many authors. Some of the studies in this context are reviewed in the study to explore the nature of variables

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and their relationship.

Beck (2001) argued that a country with a well-developed financial sector has a comparative advantage in manufacturing industries. By using panel data of 65 countries, the findings indicate that financial development has a large casual impact on both levels of export, import and trade balance of manufacturing goods.

Katircioglu, Kahyalar & Benar (2007) examined the cointegration and casual relationship between financial development, international trade and economic growth in India by using annual data from 1965 to 2004. The study found a long run equilibrium relationship between financial development, international trade and economic growth. Further, a unidirectional causal relationship was found that run from real income to exports and imports, from exports to imports, M2 and domestic credits, from M2 to imports, from imports to domestic credits. The bidirectional causality wasfound between real income and M2, and between real income and domestic credits. But no direction of causality has been obtained between M2 and domestic credits.

Muhammad, Rahman and Abdul (2012) found the long run relationship among financial development, international trade and economic development in the context of Australia. The causality analysis explained that financial development Granger causes economic growth while trade and export and import are Granger-caused by financial development.

Hamdi et. al. (2013) examined the dynamic relationship between economic growth, financial deepening and investment activities in Tunisia from 1961 to 2010 by using a VECM framework. The short-run result indicates that there is no evidence for finance led growth in the context of Tunisia while in the long run there is an inverse relationship. It also explains that investment promotes growth in boththe short run as well as long-run period.

Menyal et. Al. (2014) analysed the causal relationship between financial development and economic growth by incorporating international trade in the model. The study is based on panel data of 21 African countries from 1965 to 2008. The study found the limited relationship between trade and financial development. The hypothesis for trade-led growth and finance led growth is rejected for a large number of countries.

Gokmenoglu et. al. (2015) investigated the long run relationship and its direction among economic growth, financial development and trade. The study found that change in economic growth leads to a change in import while financial development leads to a change in economic growth and vice-versa. The study is based on time series data of Pakistan over the period 1967-2013.

Jouini (2015) identified the positive linkages between economic growth and trade openness for six Gulf Cooperation Countries over the period 1980 to 2010. The co-integration test result showed that economic growth positively responds to trade openness in both the short run and long run.

Bhattacharya and Bhattacharya (2016) stated that all the three variables export and import of merchandise and services and economic growth are co-integrated. Further, it indicates growth in per capita GDP is Granger caused by the export of merchandise and services and import of merchandise and services in the long run. On the other side, it is also observed that import of merchandise and services and economic growth per capita Granger cause the export of merchandise and services in the long run while export of merchandise and services and economic growth per capita Granger cause import of merchandise and services in the long run. Additionally,a short-run bidirectional causal relationship is found between the export of merchandise and services and economic growth.

Yakubu (2018) analyzed the effect of financial development on international trade in Africa by using the data of 46 countries for the period from 1980-2015. The study found that private credit has no role in the promotion of trade while domestic credit positively contributes towards trade. The study suggested

that improvement in the level of private credit decreases export and trade openness while the increase in domestic credit improves export and trade openness.

3. OBJECTIVES

The paper aims to investigate the long run relationship among economic growth, financial development and international trade in services. It further tests the direction of the relationship between the variables to draw a meaningful conclusion.

4. DATA AND METHODOLOGY

4.1 Data

The present study is based on annual time series data for the period from 1981 to 2015, collected from the World Bank Indicators Database. The variables included in the study are GDP, financial development and trade in services. Since there is no direct indicator available to measure financial development, the domestic credit to the private sector as a percentage of GDP is included as a proxy variable to measure financial development of the country (Beck 2002). Although, it only measures the part of mobilized savings which is provided to the private sector. It doesn't include credit provided to the private sector by the central bank. The trade variable measures export and import of trade in services in India. the constant GDP is used as a proxy for economic growth.

4.2 Methodology

The study investigates the interrelationship among three variables i.e. economic growth, financial development and international trade in services by using time series analysis. First of all, the ADF and PP unit root test is run to test the stationarity of all the three variables. Then Johansen and Wald's test isused to examine the relationship and its direction among the variables respectively.

In our study,following the log-log model is used:

$$LTRAD_t = \beta_1 + \beta_2.LGDP_t + \beta_3.LFD_t + e_t \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where *trad*, *GDP* and FD are traded in services, gross domestic product and domestic credit to private sector respectively. β_1 β_2 and β_3 show the elasticity of explanatory variables.

Unit root test

Prior to the co-integration test, the PP and ADF test of stationarity is run to find the order of integration of all the variables. The null hypothesis in both test states that the series has unit root i.e. series is non-stationary. If the series is found stationary at level, it is denoted by I(0) and I(1) if it has a unit root. The stationarity of data is tested with or without trend and intercept. The general model which includes both intercepts, as well as a trend, can be written as follows:

$$\Delta y_{t-1} = \alpha_0 + \lambda y_{t-1} + \alpha_1 t + \sum_{t=2}^{p} \beta_{j=1} \alpha_j \Delta y_{t-1+1} + \epsilon_t$$

$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where y is an independent series, t is trend and e is white noise.

Co-integration Test

After unit root test if it is found that all the three variables have unit root and are integrated of same order i.e. I(1), then we will run a co-integration test to examine the long run relationship among all the three variables. Here we will use the Johansen co-integration test for this purpose. According to Johansen test, the variables have cointegration if there is at least one co-integrating vector (Johansen 1988).

Granger Causality Test

The Granger Causality test is performed to find out the direction of the long-run relationship among the variables. If there are co-integrating vectors in the model then simple causality under VAR approach cannot be undertaken. Therefore, the Granger Causality test is performed under a VECM framework. Granger 1988 has suggested the following model of causality:

$$Y_t = \sum_{j=1}^{m} \alpha_j Y_{t-j} + \sum_{j=1}^{m} bj\, X_{t-j} + e_t \ldots\ldots (3)$$

$$X_t = \sum_{j=1}^{m} c_j X_{t-j} + \sum_{j=1}^{m} dj\, Y_{t-j} + e_t \ldots\ldots (4)$$

If b_j is found non zero and significant then it can be concluded that X_t granger causes

Y_t.Similarly, if d_j is found significant that means Y_t granger causes X_t.

Multiple Regression

The multiple regression is run to identify the short-run relationship between the variables. The trade in services is explained as a function of GDP and financial development. The regression can be written as follows:

$$\mathbf{LTRAD_t = \beta_1 + \beta_2.LGDP_t + \beta_3.LFD_t + e_t} \text{.....(5)}$$

The coefficient values β^1 **and** β^2 show the percentage change in trade due to change in GDP and financial development respectively.

5. EMPIRICAL RESULTS

The preconditions of co-integration analysis are that the variable must non-stationary at the level and integrated of the same order. The ADF and PP test of stationarity results are shown in Table 1. All the variables are found non-stationary at the level by both ADF and PP test. At first difference, all three variables are found stationary at first level by PP test. But as per ADF test, only two variables i.e. GDP and Trade are found stationary at first difference. So, we move further to test co-integration based on findings of Phillip-Perron test which shows that all the variables – LGDP, LFD and LTRADhave unit root or they are integrated at order one i.e. I(1).

Table 1: Stationarity Test

Variables	Augmented Dickey-Fuller Test		Phillips-Perron Test	
	At level	At 1st difference	At level	At 1st difference
LGDP	2.5183	-4.8846*	5.0245	-4.8935*
LFD	-0.5429	-2.1872	-0.1995	-5.4937*
LTRAD	-0.6293	-4.6336*	-0.6293	-4.6979*

* significant at 5 % level. (Source: author's calculation)

Co-integration Results

After the stationarity test, Johansen Test of co-integration is used to test co-integration among all three variables- Trade, economic growth and financial development. Since the Johansen test is very sensitive to lag length, the optimum lag for co-integration model is found out by using the VECM model. The optimum lag is found 1 as per LR, FPE, SC and HQ criteria while 3 as per only AIC. So the optimum lag would be taken as 1 for the co-integration test.

In our proposed model, International trade in services is taken as the dependent variable and economic growth and financial development are as the explanatory variable. For Johansen multivariate co-integration analysis, the null hypothesis is that there is no co-integration while the alternative hypothesis says there is one or more co-integration relationship between variables. The results of the Johansen test are shown in Table 2. According to Trace test, the null hypothesis i.e. there is no co-integration is rejected at a 5 percent significance level.The trace test statistics show only one co-integrating vector at the 5 percent significance level. Therefore, it can be inferred that there is a long run association among trade in services, financial development and growth.

Contrary, the Eigenvalue statistics of Johansen integration show contradictory results. As shown in table 2, trace statistics state that the null hypothesis i.e. there is no co-integrating, cannot be rejected at 5 and 10 percent significance level. But we can draw our conclusion that all the variables are related in the long run from Trace statistics of Johansen test of co-integration.

Table 2: Results of Johansen Co-integration Test

Hypothesized No. of CE(s)	Trace statistics	Critical value of 5 percent	Maximum Eigen Statistics	5 percent critical value
None	29.92805*	29.79707	17.44486	21.13162
At most 1	12.48319*	15.49471	11.35156	14.26460
At most 2	1.131628*	3.841466	1.131628	3.841466

*5 percent significance level (Source: author's calculation)

Granger Causality Test

The Johansen co-integration test confirms the long run relationship among the variables. Now in the next step of our analysis, we will analyze the direction of the relationship among the variables with Granger Causality test. The findings in Table 3 shows the result of Granger Causality test. The null hypothesis of the model explains that non causality between variables. If the null hypothesis which states that independent variable Granger-causes dependent variable is rejected.The results indicate that there is no bi-directional relationship between variables.The only uni-directional relationship found between trade and financial development and between trade and GDP at 5 percent and 10 percent significant relationship respectively. In short, we can say that trade is GDP driven while financial development is trade driven

Table 3: Granger Causality Results

Independent Variables	Dependent Variables		
	LTR AD	LGDP	LFINDEV
LTRAD	----	0.328001	0.850819*
LGDP	3.202158**	----	4.294046
LFINDDEV	1.372527	0.070685	----

*5 percent level of significan ce **10 percent level of significance (Source: author'scalculation)

Multiple Regression Results

The adjusted $R^2$of the regression model is found 0.127543. The Durbin Watson statistics is found 1.53 which indicates that there is no serial correlation in the regression model. The rule of thumb is that test statistic values in the range of 1.5 to 2.5 are relatively normal. Field (2009) suggests that values under 1 or more than 3 are a definite cause for concern.

As per multiple regression results, in the short run, the impact of financial development is found positive and significant while GDP is found negative but insignificant.

Table 4: Regression Result

Variables	
Constant	0.040762 (0.895157)
LGDP	-0.317245 (-0.450378)
LFINDEV	0.616528 (2.107613)*
Adjusted R^2	0.127543
Durbin watson stat	1.531101
No. of observation	34

* significant at 5 percent level (Source: author's calculation)

The overall results of the study suggest that all the variables – trade, growth, and financial development are interrelated in the long run but in the short run, no relationship is found between GDP and trade. Contrary, the positive relationship is found between trade and financial development. The coefficient of financial development i.e. 0.616528 indicates that in short-run 1 percent change in financial development level in the economy leads to around 0.62 percent change in trade in services.

6. CONCLUSION

The paper examined the long run relationship and its direction among economic growth, trade in services and financial development by applying Johansen co-integration and Granger causality test respectively. The Johansen test results confirm the long run relationship among all the three variables while the Granger Causality test result indicates thatthe causality is running from GDP to trade and from trade to financial development in India.

The above finding of the study found inconsistent with previous studies. The reason may be that we have included only trade in services while previous work was based on overall trade i.e. export and import of both goods and services. Here, we can conclude that GDP leads to positive change in international trade but unlike international trade, financial development may not be a source of competitive advantage for international trade in services.

The findings of the study suggest that Government of India should frame the policies which boost economic growth. The GDP growth encourages trade in services. Since trade plays a positive role in financial development, the government should allow free trade by eliminating the barriers to trade.

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