

Finance-Growth Nexus: A comparative study of Pakistan, India, and Bangladesh

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ABSTRACT

The Finance-Growth nexus has been a subject of hot debate among various economists; however, the results of it have been inconclusive. Based on Financial Development–Growth nexus theories, this study examines the finance-growth hypothesis in Pakistan, India and Bangladesh from 1987 to 2016. Financial Development Index (FDI) is used as a measure for FD and TO is measured as a ratio of imports plus exports to Gross Domestic Product (GDP). Data were obtained from the secondary source of World Bank indicators. First, this study develops the FDI by using Principal Component Analysis (PCA). Further, it uses this index for checking the long run and short run relationship between FD and TO with EG in selected countries. Autoregressive Distributive Lag (ARDL) to co-integration framework is applied for the analysis. The results shows that TO and FD have a long run relationship with EG, however, there is negative relationship among variables in the short run which implies that finance and trade are the domains of policy-making, and therefore, implications of such policies cannot be measured in a short time. Findings of the study imply that financial development and TO are important determinants of EG. Therefore, economies under discussion in this study should continue to focus on the development of their financial sector and formulation of liberal policies to promote international trade to achieve a high and sustainable EG.

Keywords: Trade openness, financial development, principle component analysis.

INTRODUCTION

Finance-growth nexus is not a new phenomenon. Its roots can be found out from the work of Bagehot (1873) and Schumpeter (1911). They believe that financial development (FD) improves resource allocation efficiency; thereby, it is instrumental in enhancing economic growth. Their arguments were substantiated by various economists as, Ndikumana (2000), and Levine (2003; 2005). On the other hand, several economists including Shan and Morris (2002) are of the view that there is no relationship between the two. Similarly, association among trade openness (TO) and economic growth (EG) have been investigated by various authors. Yanikkaya (2003) developed the association among TO and EG. Whereas Lee, Ricci (2004) also found the association among TO and EG. Their arguments were additional advanced by Fung (2009) and Menyah, (2014) who

observed that economies with advanced financial development (FD) tend to grow faster and expand trade. Therefore, FD is pro-growth and pro-trade. As evident from the above discussion, results of the prior literature on finance growth nexus are inconclusive. There may be various reasons for these variations like estimation techniques and proxies to measure FD. The recent studies have recognized numerous channels over which FD may promote EG among them the most cited are i) information regarding investment avenues, ii) conditions of the financial institutions iii) ease of doing business Index iv) exchange of goods and services across borders. These factors may influence investment and trade in the economy which leads to EG. Based on the Comparative Advantage theory of international trade, the trade among nations increase output, consumer welfare, employment and leads to EG. For efficiency in international trade a robust financial system is sine qua non. Due to this reason, firms urge for institutional reforms which make the financial system more efficient. These reforms increase the financial system's magnitude and increase EG (Do, 2004). Nevertheless, the prior studies have ignored these channels although the recent study focuses on finance-growth nexus. This study intends to fill the existing gap in the literature in several ways. First, this study employs a financial development index (FDI) by using "Principal Component Analysis (PCA)" for long run and short run relationship between the variables for the study. Second, this study applies Autoregressive Distributive Lag (ARDL) co-integration framework for the analysis. Third, this study has included TO to test the impact of TO on FD and EG in the developing countries included in the sample. Financial development index (FDI) provides confidence to investors to invest more which leads to FD (Awad and Ragab, 2018). Similarly, TO also increases FDI which leads to (FD). Therefore, (TO) and (FD) play a significant role in EG.

LITERATURE REVIEW

The literature on the finance growth nexus for this study can be divided into four categories: i) FD and EG ii) FD and TO iii) TO and EG and iv) FD, TO and EG. These groups of literature are discussed as under:

Financial development-Economic growth

Prior evidences suggest the FD and EG association into four research hypotheses: "i) supply leading hypothesis, ii) demand following hypothesis, iii) finance growth indifference hypothesis and iv) reciprocal hypothesis. Supply leading hypothesis

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explained that that finance is the major determinant of EG". King and Levine (1993), Ductor and Grechyna (2015) Jedidia, Boujelbene & Helali (2014) Ahmed & Wahid (2012) incorporated endogenous growth philosophy into the "supply leading hypothesis". "The demand-following hypothesis" describes the criteria according to the financial institutions' perspective. For instance, the products is a responsive to the demand for these institutions by savers and investors in the real sector (Bolton, Santos, (2016), Gennaiolli, (2012). "Finance-economic growth indifferent hypothesis" found no causal association among FD and EG. (Jedidia, Boujelbene & Helali , 2014); (Shan and Moris, 2002). The reciprocal hypothesis establishes the existence of bi-directional association among FD and EG (Cecchetti & Khrroubi, 2012) (Fung, 2009). FD and trade liberalization have gained significant attention in the literature of EG. It is discussed that FD and trade openness increase EG in developing countries (Grossman, 1992; Redding, 1999). Several researchers have discussed the bi-directional relationship among EG and FD. For example, (Fase and Abma, 2003) suggest that bidirectional link among FD and EG. Swamy & Munusamy (2019) investigated the relationship between finance and EG in advanced economies by using a panel data from 1983 to 2013 for 24 economies. The findings recommend that there is an inverted U-shaped association among finance and growth in the long run. The study also concludes that after the threshold level finance is harmful for EG. The authors argue that FD should be associated with optimal growth performance. Ang and McKibbin (2007) stated that EG has a positive association with FD in Malaysia.

Financial development –Trade openness

Various studies establish a link between FD and TO. These studies reveal that TO is instrumental in strengthening FD in an economy (Griffith-Jones, 2010); (Chandrasekhar, 2010). According to (Svaleryd & Vlachos, 2002) TO and capital flows are pivotal for FD of the economy. The TO has positive effect on FD. The FD and trade liberalization have gained substantial attention in the literature of EG. It is discussed that FD and TO increase economic growth in developing countries (Grossman, 1992; Redding, 1999). Do and Levchenko (2006) discussed that FD and TO has a relationship with economic growth in Pakistan. Prior studies suggest that the developed financial system enhance the TO which lead to help the gain export revenues. (Beck, 2002; Svaleryd and Vlachos, 2005). Similarly, TO boost the FD. (Law, 2006). Another opposite views, Arora, (2004) argued that TO creates the economic uncertainty which lead to international shocks. TO not only increase demand of insurance and other financial services but also lead to expansion of a financial system and EG (Newbery & Stiglitz, 1984; Satyanarayana Murthy, Kumar Patra, & Samantaraya, 2014).

Trade openness – Economic growth

The TO-EG nexus traces its roots from the neo-classical theory which establishes a strong causality from TO to EG. Since openness of trade integrates domestic economy with rest of the world, thus it results in increase in imports and exports thereby

enhancing specialization and efficiency (Shahbaz, 2009; 2012). Anoruo (2000) observed a bi-directional causality among EG and TO while Marsahall (1985) found uni-directional association among the two. It has also been established that TO stimulates R&D in the economy which leads the EG (Grossman (1991). Nandi & Kumar (2005) found the association among EG and import and export. They found that export has a positive link while import has a negative association with EG. Rodriguez and Rodrik (1999) stated that TO foster the EG. Shayanewako V. B (2018) studied the association among TO and EG in BRICS countries. They used ARDL bounds test to "co-integration and the Granger causality" tests. The findings recommend that long-run bidirectional association among TO and EG.

Financial Development--- Trade Openness -- Economic Growth

Relationship among FD, TO and EG has been broadly discussed in the literature related to EG but the results are still inconclusive.

Rahman, Shahbaz & Farooq (2015) studied the association among FD, TO and EG. This study used time series data and used "ARDL bounds testing approach to co-integration". They concluded that there is a long-run relationship among the above variables. Uddin et al. (2014) also investigated the linkage among the above stated three variables by using time series data. In addition to "ARDL bounds testing approach to co-integration", they applied innovative accounting approach for causality. They developed long term association among FD, TO and EG.

Shaheen (2011) studied the association between international trade, FD and EG for the Pakistan economy. They employed "autoregressive-distributed lag (ARDL)" for their analysis and found a positive relationship among variables. Chimobi (2010) explored the association among FD, TO and EG in the case of Nigeria for the period from 1970 to 2005. He found no relationship between the variables. Katircioglu, Kahyalar & Benar (2007) studied the association among above said variables in India and found a long run association among them. Yucel (2009) studied the association among FD, TO and EG in Turkey. Altaee, Saied, Esmaeel & Adam (2014) examined the relationship among FD, TO and EG for Oman. They found unidirectional relationship between EG to FD whereas "variance decomposition" analysis show a link among EG and FD.

Kar, Nazlioglu (2014) studied the causality among trade liberalization, FD and EG in Turkey from 1989 to 2007. Results demonstrate that there is bidirectional causality between EG and TO, EG causes FD and FD leads to trade liberalization. Therefore, there is a strong linkage among FD, TO and EG in Turkey. Alatee (2014) studies the linkages between TO, FD and EG in Bahrain. The time series data from 1980 to 2012 were used for analysis. The authors employed "Vector Error Correction Model (VECM), Variance Decomposition analysis (VDC) and Impulse Response Function (IRF)", techniques to examine the casualty relationship among variables. They concluded that TO

and FD have positive effect on EG. However, EG has no effect on trade and FD.

Abida and Zghidi (2014) examines the interrelationship between FD, TO and EG by using panel data of North Africa (Tunisia, Morocco, and Egypt). They employed “Generalized Method of Moment (GMM)” technique analysis. The results reveal that there is a positive relationship between TO and EG. It also revealed that TO is an important factor for FD.

Rehman & Nasir (2015) traces the linkages between, FD, TO and EG in Saudi Arabia 1971-2012. They employed “Johnson and Juselius (JJ)” techniques for the analysis. Results reveal that there exists a positive relationship among variable. So far direction of the causality is concerned, the study exhibits a unidirectional association among EG and TO whereas TO cause EG.

Sohag et.al (2019) found the impact of FD on EG Malaysia and Indonesia. They used “Autoregressive distributed lags (ARDL)” and threshold regression for the analysis. Results reveal that FD promoted the EG in both economies during the period under study. It was also revealed that there is inverted U-shaped relationship between FD and EG in the case of Malaysia whereas U-shaped relationship existed in the case of Indonesia. It means that not all measures of FD promote EG. Ayad and Belmokaddem (2017) found the association among FD, TO and EG. The results show that FD, TO has no impact on EG.

Chandio et.al (2017) studied the association among FD, TO and EG in Pakistan over the period 1970 to 2014. They employ “ADF and P-P unit root tests and Co-integration” test for analysis. They found long run bidirectional relationship among from EG to FD and from TO to FD. Whereas, there is unidirectional relationship between TO to EG.

Asghar and Hussain (2014) examined the relationship between financial development and economic growth in developing countries for the period from 1978 -2012. They used financial development index and panel co integration test for analysis. Results revealed that there is a long run relationship between FD and EG in developing countries.

From the above discussed literature, it is evident that empirical evidence on nature of relationship among FD, TO and EG is still inconclusive. Thus, the present study is pertinent to gauge the linkages between FD, TO and EG in Pakistan India and Bangladesh. Based on literature, we have developed following hypothesis for our analysis.

H1-Trade openness and financial development have a positive impact on economic growth in Pakistan.

H2-Trade openness and financial development have a positive impact on economic growth in India.

H3-Trade openness and financial development have a positive impact on economic growth in Bangladesh.

RESEARCH METHODOLOGY

This study employed the data from 1987 to 2016. The data obtained from the World Bank indicators. This research used EG as the dependent variable. It is measured by Real GDP. This study used TO as an independent variable and it is measured as

(Import+ Export /Nominal GDP). We used three proxies for construction of FDI. FDI1, broad money as a percentage of GDP (M2/GDP); FDI2, market capitalization as a percentage of GDP (MC / GDP) and FDI3, private sector credit as a percentage of GDP (PSC/GDP). Authors developed the FDI by using the Principle Component Analysis. Further, we applied the “ADF Augmented Dicky Fuller (ADF)” test for checking stationary. Then we applied the ARDL co-integration and Johnson co-integration test for our analysis.

Research Model

This study developed the relationship between FD, TO and EG in Pakistan, India and Bangladesh by using the following basic model.

$$Y = f(\text{FD}, \text{TO})$$

Y=EG: measured by “real GDP per capita”.

FD=Financial Development: measured by Financial Development Index constructed on the basis of FDI1, broad money as a percentage of GDP (M2/GDP); FDI2, market capitalization as a percentage of GDP (MC / GDP) and FDI3, private sector credit as a percentage of GDP (PSC/GDP).

TO= Trade Openness: measured by “imports plus exports” divided by nominal GDP.

The following equation is developed by the above econometric nexus.

$$LGDP = \alpha + \beta_1 LFDI + \beta_2 LTO + \varepsilon_t$$

Where ε_t is the error term in the model?

Estimation Procedure

This study used PCA for measuring FDI. The PCA is a multivariate method. It is used to convert the original data into a linear set of combinations (Hye & Dolgoplova, 2011). Next, Phillips and Perron (1988) are applied to check the order of integration. Further, we applied the ARDL and Johnson co-integration test. A dynamic UECM (unrestricted error correction model) can be evaluated from the ARDL to incorporate the short run effects in long-run equilibrium without having any effect on the long run information (Mahalik, Babu, Loganathan, & Shahbaz, 2017). The appropriate UECM model is given below:

$$\Delta LGDP_t = \alpha_1 + \alpha_{LGDP} LGDP_{t-1} + \alpha_{LFDI} LFDI_{t-1} + \alpha_{TO} LTO_{t-1} + \sum_{i=1}^p \alpha_i \Delta LGDP_{t-i} + \sum_{j=0}^q \alpha_j \Delta LFDI_{t-j} + \sum_{k=0}^r \alpha_k \Delta LTO_{t-k} + \mu_t \quad (1)$$

$$\Delta LFDI_t = \beta_1 + \beta_{LGDP} LGDP_{t-1} + \beta_{LFDI} LFDI_{t-1} + \beta_{TO} LTO_{t-1} + \sum_{i=1}^p \beta_i \Delta LFDI_{t-i} + \sum_{j=0}^q \beta_j \Delta LGDP_{t-j} + \sum_{k=0}^r \beta_k \Delta LTO_{t-k} + \mu_t \quad (2)$$

$$\Delta LTO_t = \gamma_1 + \gamma_{LGDP} LGDP_{t-1} + \gamma_{LFDI} LFDI_{t-1} + \gamma_{TO} LTO_{t-1} + \sum_{i=1}^p \gamma_i \Delta LTO_{t-i} + \sum_{j=0}^q \gamma_j \Delta LFDI_{t-j} + \sum_{k=0}^r \gamma_k \Delta LGDP_{t-k} + \mu_t \quad (3)$$

Short run equation

$$\Delta LGDP_t = \alpha_1 + \sum_{i=1}^p \alpha_i \Delta LGDP_{t-i} + \sum_{j=1}^q \alpha_j \Delta LFDI_{t-j} + \sum_{k=1}^r \alpha_k \Delta LTO_{t-k} + ECT_{t-1} + \mu_t$$

Long run equation

$$LGDP_t = \alpha_1 + \sum_{i=1}^p \alpha_i LGDP_{t-i} + \sum_{j=0}^q \alpha_j LFDI_{t-j} + \sum_{k=0}^r \alpha_k LTO_{t-k} + \mu_t$$

$$B_{CONSTANT} = \frac{\alpha_1}{(1 - \sum_{i=1}^p \alpha_i)} \quad B_{LFDI} = \frac{\sum_{j=0}^q \alpha_j}{(1 - \sum_{i=1}^p \alpha_i)} \quad B_{LTO} = \frac{\sum_{k=0}^r \alpha_k}{(1 - \sum_{i=1}^p \alpha_i)}$$

In the above equation α_1 is the constant. α_i , α_j , and α_k are the long-run elasticities.

$B_{CONSTANT}$, B_{LFDI} , and B_{LTO} are coefficient of constant, financial development, trade openness and real deposit rate respectively.

EMPIRICAL ANALYSIS

FDI is constructed for Pakistan India and Bangladesh by using the PCA which is presented in table 1. In the case of Pakistan, the first principal component PC_1 explained 61.25%, second principal component PC_2 explained 24.77% and third principal component PC_3 explained 13.98% of the standard variance. While in case of India, the PC_1 explained 67.33%, PC_2 explained 20.39% and PC_3 explained 13.98% of the standard variance. In case of Bangladesh, the PC_1 explained 67.33%, PC_2 explained 20.39% and PC_3 explained 13.98% of the standard variance. As the PC_1 of each country was responsible for the major contribution in the variance so PC_1 of each country is selected for construction of FDI. For this purpose, the corresponding eigenvectors (i.e. vector 1) were used as weights for the proxies FDI1, FDI2 and FDI 3. For Pakistan, the weights for FDI1, FDI2, and FDI3 were 0.6215, 0.2965 and 0.4925 respectively. For India, the weights for FDI1, FDI2, and FDI3 were 0.6405, 0.5762 and 0.4762 respectively. For Bangladesh, the weights for FDI1, FDI2, and FDI3 were 0.6266, 0.5632 and 0.4245 respectively. The equations and respective graphs for the construction of FDI's for Pakistan, India, and Bangladesh are given as follows:

$$FDI_{India} = 0.6405 * FDI1 + 0.5762 * FDI2 + 0.4762 * FDI3$$

$$FDI_{Pakistan} = 0.6215 * FDI1 + 0.2965 * FDI2 + 0.4925 * FDI3$$

$$FDI_{Bangladesh} = 0.6266 * FDI1 + 0.5632 * FDI2 + 0.4245 * FDI3$$

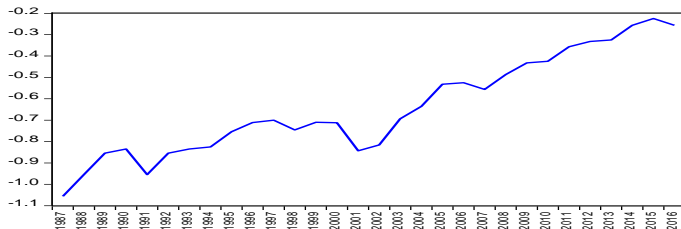
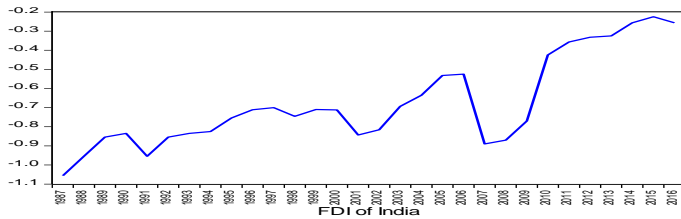
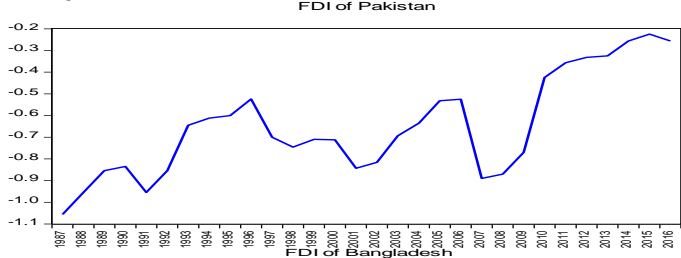


Table 1: Principal Component Analysis

Variable	Pakistan			India			Bangladesh		
	LGDP	LFDI	LTO	LGDP	LFDI	LTO	LGDP	LFDI	LTO
F-statistic (Wald test)	5.112**	4.435*	3.399	5.662**	6.121*	3.144*	5.338**	3.555*	3.144
Critical values	1% level	5% level	10% level	1% level	5% level	10% level	1% level	5% level	10% level
Lower bounds	3.81	3.05	2.68 ^a	3.81	3.05	2.68 ^a	3.81	3.05	2.68 ^a
Upper bounds	4.92	3.97	3.89	4.92	3.97	3.89	4.92	3.97	3.89
Diagnostic test									
R ²	0.5476	0.5422	0.5533	0.5266	0.5754	0.5765	0.5145	0.5214	0.5654
Adj-R ²	0.2838	0.3155	0.3271	0.2758	0.2855	0.3188	0.2795	0.3785	0.3654
F-statistic	2.1571*	2.3292	2.4141	2.2891*	3.3112	2.1182	3.1853*	2.1145	2.2586**

Note: FDI: M2/GDP; FDI2: MC / GDP; FDI3: PSC/GD

Authors' own calculation.

Figure 1 represents the change in financial development in India. It shows a steady increase from 1987 to 1990 and a moderate increase from 1991 to 1994. It continuously increases from 2002 to 2016. Figure 2 indicates the change in financial development in Pakistan. It shows that steady increase from 1987 to 1989 and increases from late 1991 from 1996. It continuously increases from 2009 to 2016. Figure 3 shows the change in financial development in Bangladesh. It indicates that an increase from mid of 1991 to 1997 and shows also increase from 2001 to 2005. It continuously increases from 2008 to 2016.

Table 2: ADF Test

Variables	Pakistan		India		Bangladesh	
	t-stat	P-value	t-stat	P-value	t-stat	P-value
LGDP	-1.5542	0.1125	-1.3344	0.2425	-1.6644	0.5322
LTO	-0.6551	0.5625	-0.7331	0.4425	-0.9987	0.5955
LFDI	-1.4423	0.3456	-1.6623	0.3744	-1.8833	0.2276
Δ LGDP	-3.4523**	0.0434	-3.3258*	0.0255	-3.9366**	0.0334
Δ LTO	-4.5326*	0.0023	-4.9875*	0.0011	-4.8760*	0.0044
Δ LFDI	3.4452**	0.0456	3.6985**	0.0333	3.7725**	0.0352

Note: * and ** represent 1% and 5% significance level respectively.

Authors' own calculation

Table 2 indicates the findings of the ADF. The results show that all the variables are not stationary at level 1(0) but they became stationary at first difference I (1) as the p-value is less than 5%. So, table 2 reveals that data series of all the variables do not have a unit root at the first difference in the case of Pakistan, India, and Bangladesh.

Table 3: ARDL Co-Integration

	Pakistan			India			Bangladesh		
	P	P	P	P	P	P	P	P	
	C	C	C	C	C	C	C	C	
Eigen values	1.8374	0.7429	0.4196	1.6524	0.6825	0.3826	1.7256	0.7758	0.3952
Variance proportion	0.6125	0.2477	0.1398	0.6733	0.2039	0.1228	0.7242	0.1625	0.1133
Cumulative proportion	0.6125	0.8602	1	0.6733	0.8772	1	0.7242	0.8867	1

Variable	Vect r1	Vect r2	Vect r3	Vect r1	Vect r2	Vect r3	Vect r1	Vect r2	Vect r3
FDI1	0.6215	-	-	0.6405	-	-	0.6266	-	-
		0.2139	0.7365		0.2368	0.7851		0.2009	0.7400
FDI2	0.2965	-	-	0.5762	-	-	0.5632	-	-
		0.4425	0.6465		0.4589	0.6711		0.4451	0.6125
FDI3	0.4925	-	-	0.4762	-	-	0.4245	-	-
		0.365	0.1652		0.8765	0.1325		0.8125	0.1736

Note: *, ** and *** represent 1%, 5% and 10% significance level respectively. Critical values bounds are from Pesaran, Shin, and Smith (2001).

Authors' own calculation

Table 3 reports the results of the "autoregressive distributed lag (ARDL) cointegration" test. There are two co-integrating vectors found when, FD (LFDI), TO (LTO) and EG (LGDP) used as dependent variables in case of Pakistan. There are three co-integrating vectors found when EG (GDP), FD (LFDI) and TO (LTO) used as dependent variables in the case of India. There are two co-integrating vectors found when EG (GDP), FD (LFDI) and TO (LTO) used as dependent variables in the case of Bangladesh. These results proved the fact that EG showed a long run relationship with FD and TO in case of Pakistan, India, and Bangladesh.

Table 4: Johansen Cointegration Test

Hypotheses	Pakistan		India		Bangladesh	
	Trace Statistics	Max Eigen values	Trace statistics	Max Eigen values	Trace statistics	Max Eigen values
R = 0	60.6343*	38.2180*	58.7841*	39.1187	63.2251*	42.8754
R ≤ 1	29.3562**	15.0108	31.3489**	16.1456	33.6622**	17.0833
R ≤ 2	13.3554**	8.3559	15.4565**	9.4896	16.9761**	10.1558
R ≤ 3	2.9514	3.1452	2.1452	2.6582	6.5561	7.6521

Note: * and ** represent 1% and 5% significance level respectively.

"Johansen cointegration" test is applied for testing the robustness. The results are described according to trace statistic and maximum eigenvalue in table 4. There are three cointegrating vectors while maximum eigenvalue tells that there are two cointegrating vectors for Pakistan, India, and Bangladesh. As the two statistics give different results so we consider the results of trace statistic as final. These results confirm the long-term relationships among the variables are valid and robust. Table 5 reports the long run and short run estimates. The FD and TO have a positive impact on economic growth. The positive impact of FD on economic growth, in the long run, implies that an increase in FD will enhance the ability of the financial intermediaries to supply more funds which help in boosting the economic growth and investment in Pakistan, India, and Bangladesh. Moreover, the increase in TO will help firms to export goods to foreign countries and in turn will boost economic activity in Pakistan, India, and Bangladesh. The higher FD co-efficient than TO suggests that the financial policy plays a much more vital role in the economic activity of Pakistan, India, and Bangladesh than their trading policy. But FD has a negative short-run impact on growth which suggests that FD is a time taking process it cannot be achieved in a short time. TO has a week significant positive impact on EG that suggests the EG is not that effective in short run. These results are consistent with (Khan, Qayyum, Sheikh, and Siddique, 2005). The significant negative speed of adjustment coefficient suggests that nearly

8.3% disequilibrium of the last period is adjusting shock in the long run equilibrium in the current period for the Pakistani economy. The negative and significant speed of adjustment coefficient suggests that nearly 7.54 % disequilibrium is adjusting shock in the long run equilibrium in the current period for the Indian economy. The negative and significant speed of adjustment coefficient suggests that nearly 6.21 % disequilibrium is adjusting shock in the long run equilibrium in the current period for the Bangladeshi economy.

Table 5: Long-run and short-run analysis

Long run	Pakistan		India		Bangladesh	
	Coeff	t-Stat	Coeff	t-Stat	Coeff	t-Stat
LFDI	3.2228*	3.1575	4.3338*	4.0215	2.8586*	4.0065
LTO	4.8854*	6.8512	2.8575*	7.6523	1.6642*	7.4425
Constant	23.2561*	10.2597	32.3251*	12.0654	19.8931*	12.2361
Short run	Pakistan		India		Bangladesh	
	Coeff	t-Stat	Coeff	t-Stat	Coeff	t-Stat
DLFDI	-	-2.886	-	2.886	-	-2.886
DLTO	0.0544**		0.0644**		0.0644**	
DLTO	0.0332*	2.5632	0.0332*	2.5632	0.0332*	2.5632
ECM (-1)	-0.0836*	-4.0125	-0.0754*	-3.0125	-0.0621*	-3.0956
Constant	0.1332*	21.152	0.1265*	19.088	0.1002*	2.325

Dependent Variable = LGDP. Note: * and ** represent 1% and 5% significance level respectively.

So, it is a slow adjustment process of the correctness of shocks in the short run to longer period equilibrium.

Table 6: VECM

Pakistan	Short run		Long run	
	LnGDPt	LnFDIt	LnTo	LnECTt-1
LnGDPt	-----	2.1952***	3.2342**	-0.1033*
LnFDIt	1.2556	-0.0723	-0.0516	-0.0005
LnTo	-0.1687	-----	1.011	-0.5311*
	4.3215**	0.3133	-0.3643	-0.0054
	-0.0118	-0.7351	-----	-0.5649*
				-0.0029
India	Short run		Long run	
	LnGDPt	LnFDIt	LnTo	LnECTt-1
LnGDPt	-----	2.0852***	3.2245**	-0.1022*
LnFDIt	1.2331	-0.0733	-0.041	-0.0004
LnTo	-0.0481	-----	1.021	-0.5222*
	4.3113**	0.3002	-0.3332	-0.0044
	-0.0111	-0.6432	-----	-0.5233*
				-0.0022
Bangladesh	Short run		Long run	
	LnGDPt	LnFDIt	LnTo	LnECTt-1
LnGDPt	-----	2.1643**	3.2180**	-0.1002*
LnFDIt	1.2236**	-0.0542	-0.0322	-0.0002
LnTo	-0.2552	-----	1.001***	-0.5222*
	4.2672**	0.30122	-0.3432	-0.0044
	-0.0105	-0.72	-----	-0.5322*
				-0.002

Note: * and ** represent 1% and 5% significance level respectively.

Table 6 represents the "vector error correction model (VECM)". The findings suggest that FDI and to have a bi-directional long-run relationship in Pakistan. GDP has a short-run uni-directional relationship with FDI. Although, GDP has a short-run bidirectional relationship with TO in Pakistan. Further, the results recommend the GDP has a bidirectional relationship with FDI and to in the short and long run in India. The results validate the FDI and to have a bi-directional long-run relationship in Bangladesh. Moreover, GDP has a short-run

unidirectional relationship with FDI, but GDP has also a short-run bidirectional relationship with TO in Bangladesh.

DISCUSSION

This study develops link between TO, FD and EG of India, Pakistan, and Bangladesh. Firstly, this study develops FDI by using PCA. Furthermore, this study uses this index for checking the short run and long run association among FD and TO with economic growth of India, Pakistan and Bangladesh. The results of the “ARDL co-integration” prove the fact that FD and TO have a long run relationship with EG in Pakistan, India, and Bangladesh. The findings proved that the FD is not a short-term process. It requires time for development. The results also confirm the foreign direct investment is the basic source of FD in these countries. Moreover, the findings of the study also confirm that TO increase FDI which leads to increase in FD. Further, we applied the “Johnson co-integration” test as a robust test. The results confirm that the long-term relationships among the variables are valid and robust. Both FD and TO have a positive impact on long-run EG. Moreover, FD has a positive impact on EG in the long run. This recommends that the increase in FD leads to enhanced capability of financial intermediaries to supply the funds and this will help to increase EG in Pakistan, India, and Bangladesh. Further, the increase in TO will help the firms to export goods to foreign countries which will in turn boost economic activity in Pakistan, India, and Bangladesh. The findings of the short-run relationship reveal that FD has a negative effect on EG. It recommends that FD is a time taking process it cannot be achieved in a short time. TO has a weak significant positive impact on EG which suggests that EG is not that effective way in the short run. The findings also recommend that it is a slow adjustment process of the correctness of shocks in the short run to longer period equilibrium. The findings of the study suggest some recommendations for the policymakers. They should focus on those policies which help to promote development of financial sector.

Conclusion and Recommendation

This study comprises three countries namely Pakistan, India and Bangladesh. It develops the relationship between FD, TO and EG. Firstly, this study develops FDI by using the PCA. The results of the “ARDL co-integration” prove that FD and TO have a long run relationship with EG in Pakistan, India, and Bangladesh. The findings of the short-run relationship reveal that the FD has a negative effect on EG. It recommends that FD is a time taking process it cannot be achieved in a short time. This study extends the EG and FD literature with respect to three countries. Moreover, it opens broad avenues for future researchers in several ways. This study has several limitations. First of all, this study did not use the whole EG proxies due the shortage of time. Secondly, this study used the data from 1987 before this period data were ignored due to its non-availability. The findings of the study recommend that Governments of Pakistan, India and Bangladesh should vigorously pursue financial reforms and devise policies for liberalization of their trade in order to boost FD and EG in respective countries. Future

researchers may apply different econometric methods for analysis of Finance Growth nexus in multiple country data by using different variables of interest.

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