



Impact of FDI on Economic Growth: Evidence from Pakistan

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Abstract

This study investigates the nexus between foreign direct investment and economic growth for Pakistan for 1980-2016. Using autoregressive distributed lag bounds co-integration and granger causality test. The results of ARDL bounds test show the existence of co-integration between economic growth, FDI, trade, physical capital and human capital. The results indicate the unidirectional causality from economic growth to FDI, to physical capital and to trade. The findings also express the one-way causality from human capital to labour force and physical capital. The bidirectional causality is found between physical capital and FDI, and between physical capital and human capital. The study suggests to adopt such policies that enhance human skills to attract more FDI for economic growth.

Keywords: FDI, Economic Growth, ARDL Bounds Testing Approach, Pakistan

JEL Codes: F21, O40

I. Introduction

The inflow of investment from one country to another country is called foreign direct investment. The various trade theories stated that a country invest in another country when donor country have unique competitive advantages over local companies in the host country. The internalization theory argues that a country invests through FDI in another country due to economies of scale that can reduce the cost of production. FDI is an important indicator to stimulate the economic growth. FDI is an indispensable for development with effect of different determinants, such determinants vary from country to country. Foreign direct investment contributed in different ways in dissimilar economies, such as FDI has mixed impact on economic growth in developing economies.

In any economy, there are various determinants that force FDI for contributing positively, for example, Carkovic et al. (2002) analyzed the association between growth and FDI for 1960-1995, and found that the relationship depends on trade openness, education level, financial and economic development of the recipient country. Similarly, Ek (2007) showed that FDI has not significant impact on economic growth in China for 1994-2003. Saqib, et al. (2013) investigated that FDI negatively affect the economy of Pakistan for 1981-2010. Johnson, A. (2006) showed that FDI enhance the host country economic growth with the help of technology and inflows of capital during 1980-2002.

According to the literature, FDI accelerates the economies of developing countries on the other hand FDI does not accelerate the economy of underdeveloped countries in the long run. FDI doesn't affect positively the underdeveloped countries due to various factors, which includes, instable economic and political conditions, security issues, and lack of appropriate law and order situation. Falki, N. (2009) exposed that FDI has not played a role to enhance economic growth in Pakistan. Similarly, Khan and Khan (2011) exposed that FDI is an accelerating factor of GDP in the long run for Pakistan for 1981-2008. Melnyk et al. (2014) also investigated that increase in FDI is positively correlated with the specific region's growth rate for post communism transition economies.

Juma, M. (2012) found that FDI has a positive and significant impact on economic growth for Sub Saharan Africa over 1980 to 2009. Khaliq, A. (2007) stated that inflow of FDI is positively correlated with economic growth in Indonesia during 1997 to 2006. Ghazali, A. (2010) exposed a bidirectional causality between FDI and domestic investment, and between domestic investment and economic growth. The study also found a one-way causality from FDI to economic growth.

Iqbal et al. (2010) found the bidirectional causality between economic growth and FDI for Pakistan during 1998 to 2009. Adewumi, S. (2007) concluded that FDI is contributing positively to economic growth, but insignificant in most of the developing economies for 1970-2003. Similarly, Zekarias, S. (2015) highlighted the effect of FDI on economic growth within the region of eastern Africa for the time duration 1980-2013, using the variables FDI, growth rate per capita GDP, domestic private investment, human capital and labor force. He examined that FDI is a key driver of economic growth, so there is the need to attract more FDI for growth.

The substantial body of literature shows a mixture of results about FDI and economic growth. Antwi et al. (2013) investigated a negative relationship between FDI and GDP, indicated by co-integration test in Ghana for 1980-2010. Atique et al. (2004) concluded that FDI greatly affect economic growth in trade regime for export promotion rather than import substitution for Pakistan during 1970 to 2001.

By studying the above literature, we stated that the effect of FDI varies from economy to economy, FDI has a positive impact on economic growth in developed economies (Melnyk et al., 2014; Juma, 2012; Khaliq, 2007), and on the other hand, FDI has a negative impact in underdeveloped economies (Saqib et al., 2013). Our study mainly focuses the region of Pakistan because the results regarding the impact of FDI on economic growth in Pakistan are different to that of different studies, such as: (Falki, 2009; Saqib et al., 2013; Khan and Khan, 2011; Ali, 2015; Ali and Rehman, 2015).

So, to find the recent results we are going to conduct this study because of no recent study have been conducted on it and the previous has different results. The purposes of the study are; a) to find out the long run relationship between economic growth and foreign direct investment, and b) to expose the causality between economic growth and foreign direct investment. The study is organized as; Section 2 contains methodology. The data and the results are reported in Section 3 and Section 4 respectively. The conclusion is in Section 5.

II. Methodology

To investigate the impact of foreign direct investment on economic growth we have used various tests and variables. The dependent variable is economic growth, and independent variables include physical capital, labor, FDI, human capital and trade.

$$Y = f (PK, L, FDI, HK, T)$$

The functional form of the above model is written as by modifying in time series form.

$$Y_t = \alpha_0 + \alpha_1 PK_t + \alpha_2 L_t + \alpha_3 FDI_t + \alpha_4 HK_t + \alpha_5 T_t + \mu_t$$

Where, Y is used for economic growth, PK denotes physical capital, L represents labor force, HK is human capital, FDI and T shows foreign direct investment and trade respectively. The word t expresses the period 1980-2016, α_0 is intercept, α_1 is the elasticity of physical capital with respect to economic growth, α_2 is the coefficient of labor force, α_3 is the slope coefficient of FDI, α_4 is the coefficient of human capital, α_5 is the coefficient of trade and μ is the error term.

The unit root test is employed to find the order of integration. After this the ARDL bounds co-integration test, causality test and various diagnostic tests are applied.

II.I. Unit Root Test

To check the order of integration of variables, the unit root test is applied. It is recognized that the strategies to find the unit root is complicated in the literature. We have employed the ADF test. The ADF also called Dickey Pantula test, is supported linear regression. The ADF used in the replacement of correlation because ADF can handle most complex and bigger models. The augmented Dickey Fuller (ADF) statistic is a negative number. The requirement for the ADF test is as follows:

$$\Delta Y_t = \alpha + \beta t + \rho Y_{t-1} + \zeta_i \sum_{i=1}^p \Delta Y_{t-1} + \mu_t$$

The ADF test includes lagged difference as a key component in order to oppose auto-correlation. This study also uses ARDL approach to analyze the co-integration between FDI and economic growth in Pakistan.

II.II. ARDL Bounds Testing for Co-Integration Approach

Autoregressive distributed lag is applied because all the variables are stationary at the mixed level, some are stationary at first difference and others are at level. Due to this we have used ADRL bounds testing co-integration approach which shows the co-integration relationship between the variables. If the error correction term (co-integration equation) is negative it shows the existence of long-run co-integration relationship among the variables.

We have also applied various tests, including serial correlation LM test to check the autocorrelation, Breusch pagan Godfrey test for heteroskedasticity, Ramsey Reset test for model's functional form, and Jarque Berra test to check the normality of variables. To find the direction and causal relationship between variables, we have applied granger causality test.

II.III. Data

To identify the relationship, we have used different indicators. GDP per capita (constant 2010 US\$) in logarithmic form is used as economic growth, log of gross fixed capital formation (constant 2010 US\$) is used as physical capital, the net inflow of foreign direct investment as a share of GDP, trade as a percentage of GDP, and labor force (participation rate). We extract the data of such variables from world development indicators, 2017 (WDI). The average year of schooling, including primary, secondary and higher education is used as a proxy of human capital, and the data are taken from Barrow and Lee.

III. Results and Discussion

To investigate the impact of foreign direct investment we have applied various tests and techniques. This section contains the empirical results and discussion. The ADF test is used to identify the order of integration. Table 1 shows the results of unit root test.

Table 1 Results of ADF Test

Variables	Levels	First Difference
Y	-0.5806	-3.6712
PK	-2.0138	-4.6523
L	-0.5689	-6.0858
FDI	-2.5878	
HK	0.9590	-9.5278
T	-2.9557	

All variables are stationary at first difference except foreign direct investment and trade which are stationary at level. All variables are not stationary at the same level so that's why ARDL technique is appropriate to find the co-integration. Table 2 shows the lag length of each variable that is 4. The result of F-stat exposed the co-integration relationship between economic growth, labor force, capital, foreign direct investment, human capital and trade.

Table 2: Results of ARDL Bounds F-test Co-Integration

Variables	Lag length	F-stat	Critical Value 1%		Critical Value 5%	
			I(0)	I(1)	I(0)	I(1)
Y PK,L,FDI,HK,T	(4,4,4,4,4,4)	45.008	3.06	4.15	2.39	3.38

Table 3 contains the results of the long and the short run ARDL co-integration. The value of R-square is favorable for our model. The short run results of ARDL are significant for physical capital, foreign direct investment, human capital, trade, and labor. The variable labor and trade have negative value and all other variables have positive value. The negative and significant error correction term shows the long run relationship among the variables.

In the long run, physical capital, FDI, human capital and trade have a positive impact on economic growth. The coefficient of capital shows that a 1% increase in capital causes a 0.58% increase in economic growth at 5% at the level of significance. Similarly, the coefficient of FDI expresses that a 1% change in FDI causes 2.53% change in economic growth. The coefficient of human capital indicates that a 1% change in human capital causes 17.56% change in economic growth at 5% level of significance. The coefficient of trade exposes that a 1 percent change in trade causes a 0.76% change in economic growth at 10% level of significance. The labor force has a negative effect on economic growth, which is insignificant, but mostly labor have a positive impact on economic growth.

Table 3: Results of ARDL Co-Integration

Variables	Short run Results		Long run Results	
	Coeff.	Prob.	Coeff.	Prob.
Y (-4)	-0.8937	(0.0003)		
PK	-0.5763	(0.0136)	0.5877	(0.0206)
PK (-4)	0.4874	(0.0000)		
LF	0.0223	(0.0050)	-0.0617	(0.1951)
LF (-4)	-0.0170	(0.0004)		
FDI	-0.0111	(0.1938)	0.0253	(0.0879)
FDI (-4)	0.0488	(0.0002)		
HK	0.1258	(0.0309)	0.1756	(0.0426)
HK (-4)	0.2569	(0.0001)		
T	-0.0006	(0.3344)	0.0076	(0.0815)
T (-4)	-0.0015	(0.0096)		
Coint-Eq.(-1)	-0.1301	(0.0001)		
Constant	5.5794	(0.0255)	-4.9359	(0.0470)
R ²	0.9999			

Table 4 contains the results of residual and stability diagnostics. We have applied the autocorrelation test to check the serial correlation of residual, the results express that there is no serial correlation in the residual. The Breusch Pagan Godfrey test is applied to check the heteroskedasticity, the null hypothesis of 'no hetero' is accepted as the probability is greater than 0.10. To find the distribution of the error term, the Jarque Berra (JB) test is used, the

null hypothesis is ‘residual are normally distributed’. The p-value of JB is greater than 0.10 which is failed to reject the null hypothesis. It means the error term is normally distributed. Another test is applied to check the functional form of our model. The Ramsey reset test exposed that the functional form of the used model is good.

Table 4: Results of Residual and Stability Diagnostics

Tests	F-stat	P-value
Serial correlation LM test	3.9164	(0.3365)
Breusch Pagan Godfrey (Heteroskedasticity) test	2.2326	(0.2793)
Ramsey Reset test	1.0102	(0.4207)
Jarque-Berra test	0.4829	(0.7854)

Table 5 contains the results of granger causality test which shows that there is unidirectional causality running from economic growth to foreign direct investment, from economic growth to fixed capital, from economic growth to the labor force, and from economic growth to trade. The findings also express the one-way causality from human capital (average year schooling) to labor and physical capital. The bidirectional causality is also found between physical capital and foreign direct investment, and between physical capital and human capital. There is no causal relationship between trade and any other variable.

Table 5: Granger Causality Test

Variables	Y	PK	L	FDI	HK	T
Y		11.8963*	3.0972*	4.9317*	0.4491	2.3439*
(Prob.)		(0.0002)	(0.0599)	(0.0141)	(0.6424)	(0.1133)
PK	1.4118		0.1165	4.4750*	4.5467*	1.0137
(Prob.)	(0.2594)		(0.8904)	(0.0199)	(0.0188)	(0.3749)
L	0.4705	3.1759*		2.0182	0.0395	1.1013
(Prob.)	(0.6292)	(0.0561)		(0.1505)	(0.9613)	(0.3455)
FDI	1.4405	7.1787*	0.0647		0.2396	0.7302
(Prob.)	(0.2527)	(0.0028)	(0.9375)		(0.7884)	(0.4902)
HK	1.3599	5.6710*	5.7200*	1.6711		1.8076
(Prob.)	(0.2720)	(0.0081)	(0.0079)	(0.2051)		(0.1815)
T	0.4063	0.4158	1.5754	1.0997	1.7502	
(Prob.)	(0.6697)	(0.6635)	(0.2236)	(0.3460)	(0.1910)	
Obs.	35	35	35	35	35	35

IV. Conclusions and Policy Implications

This study explains the nexus between FDI and economic growth for Pakistan over 1980 to 2016, using ARDL and causality test. The results of ARDL bounds test show the existence of co-integration between economic growth, FDI, trade, physical capital and human capital. The short run results of ARDL are significant and positive for fixed capital, FDI, human capital. The variable labor and trade have negative impact on growth in the short run. The negative and significant error correction term (cointEq.) shows the long run association among the variables. In the long run, physical capital, FDI, human capital and trade have a positive impact on economic growth. The coefficient of capital shows that a 1% increase in capital causes a 0.58% increase in economic growth. Similarly, the coefficient of FDI expresses that a 1% change in FDI causes 2.53% change in economic growth. The coefficient of human capital indicates that a 1% change in human capital causes 17.56% change in economic growth. The coefficient of trade exposes that a 1 percent change in trade causes a 0.76% change in economic growth. The results also show the one-way causality from economic growth to foreign direct investment, to physical capital, to the labor force, and to trade. The findings also express the one-way causality from human capital to labor force and physical capital. The bidirectional causality is found between FDI and physical capital, and between physical capital and human capital. There is no causality relationship between trade and any other variable. Mostly, the inflow of foreign direct investment occurs in those countries where human capital is strong. It means that government should enhance the human skills for attracting more FDI. For this purpose, government should focus on education in the country, including vocational training institutions and other quality education institutions for enhancing the human skills. The countries which have policies to attract more FDI have the power to enhance their economic growth. With the help of foreign direct investment, a country can reduce unemployment by creating more employment opportunities.

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