The Role of FDI in Economy of Pakistan for the Period of 1971-2018

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Abstract

Foreign direct investment (FDI) affects the economic growth of the host economy through technology transfer, human resource formation, global market integration and enhancement of competition. A variety of previous empirical studies indicate that FDI is an essential source in the host country's economic growth. Some studies also came up with the ambiguous results, provided that the current study aims to investigate the impact of foreign direct investment on the economic growth of Pakistan. The study utilizes time series data over the period of 1971 to 2018. Autoregressive Distributed Lag-Error Correction Model (ARDL-ECM) technique has been applied to investigate the short-run and long-run effects. The results of the study show that FDI has a positive and a significant impact on the economic growth of Pakistan in both short-run and long-run analysis.

Keywords: Foreign Direct Investment, Economic Growth, Economy of Pakistan, ARDL-ECM Model

Introduction

Like other developing countries, rapid industrialization is very crucial in Pakistan to keep pace with its development requirements. But the low rate of gross domestic savings, insufficient investment and a lower level of technology in the country is a hindrance in the way of required industrialization process. In past, foreign aid and grant were used by developing countries to bridge this gap. But, with the inception of globalization in the world, as most of the developing countries have been changed from aid-dependent economies to trading economies and investment has been seen as a stimulus for the economic growth of developing and emerging economies.

Various economists, institutions and politicians all over the world believe that foreign direct investment (FDI) boosts economic growth of the host country and it resolves the economic issues of the developing economies. (**Mencinger, 2003**) As formation of capital and new technology act as vehicles of economic growth, so it is expected that FDI will promote economic growth of host countries**. (Wang, 2009)** According to the report of OECD in 2002, FDI is considered as the only source of economic growth by the countries having weak economic conditions. Given that, FDI is given special treatment by many countries especially developing economies. **(Carkovic & Levine, 2002)** Foreign direct investment spurs domestic investment in the host country and improves human capital and domestic institutions. It is an essential source of technology transfer to developing economies. **(Makki & Somwaru, 2004)** Even some government institutions bear costs by utilizing public funds to attract FDI inflows; this indicates their interest level in foreign direct investment. **(Ford, Rork, & Elmslie, 2008)** The special treatments given to FDI inflows include exemptions of import duties, tax holidays, land provisions and direct subsidies. **(Hanson, 2001)**

Although various past empirical studies indicate a positive impact of FDI on the economic growth of the host country but the magnitude of that impact may vary country to country depending on the infrastructure, human capital, domestic investment, investment policies and overall macroeconomic policies. The literature on the role of FDI on the economic growth is still a debatable topic. The current study aims to investigate the impact of FDI on the economic growth of Pakistan.

Literature Review

The role of FDI on the economic growth has been considered as an interesting subject of international development and a huge number of empirical studies have focused on the role of FDI in developed and developing economies. FDI has huge effects on the economic growth and development of host countries. It positively influences production processes, employment, exports, imports and the welfare of the host country. It also affects balance of payments of the host economy as acts as an essential source of economic growth**. (Agrawal, 2015)** investigated the association between FDI and economic growth in BRICS countries over the period of 1989 to 2012. The results of the study reveal that there is co-integration between FDI and economic growth at the panel level; it indicates that the existence of long term equilibrium relationship between the variables. **(Adams, 2009)** analyzed the impact of FDI and domestic investment on the economic growth of Sub-Saharan Africa and found that FDI is positive and significant only in the OLS estimation.

(Umoh, Jacob, & Chuku, 2012) empirically analyzed FDI and economic growth rate in Nigeria over the period of 1970-2008. The results of the study found positive causal relationship between FDI and economic growth rate. **(Dritsaki, Dritsaki, & Adamopoulos, 2004)** examined the association among FDI, trade and economic growth rate in case of Greece between the period of 1960 and 2002. The results of the study reveal the presence long-term equilibrium relationship among the variables. **(Khawar, 2005)** investigated the effects of FDI on the economic growth and the study found positive and significant correlation between FDI and growth. **(Agrawal & Khan, 2011)** examined the impact of FDI on the economic growth of China and India. The study utilized multiple linear regression model over the period of 1993 to 2009. The results of the study reveal that the economic growth is lesser influenced by FDI in India as compared to China. It means, China has utilized FDI inflows more effectively as compared to India.

(De Mello, 1999) argued about the twofold impact of foreign direct investment (FDI) on the economic growth. First of all, capital accumulation spurs economic growth in the host country. Due to FDI inflows result in technology advancement and improvement in the existing physical capitals in the host country. Secondly, foreign direct investment positively affects economic growth with the help of transferring, labour trainings and management skills. **(Tintin, 2012)** investigated the impact of FDI on the economic growth with the help of a sample of 125 economies over the period of 1980 to 2010. The sample includes both developed and developing economies. The results obtained from the study show that FDI spur economic growth in developing, developed and least developing economies but the growth in the developing countries is comparatively higher than other developed and least developing countries. **(Aga, 2014)** analysed the impact of FDI on the economic growth of Turkey between 1980 and 2012. The study reveals that there is no any long-term relationship between FDI and growth in Turkey. Furthermore, the results show that there is no Granger causal relationship between FDI and growth.

Data

We utilize time series data over the time period of 1971-2018 in the study to investigate the impact of FDI on the economic growth of Pakistan. We have taken data from World Bank Development Indicators (WDI) for the variables real GDP per capita, FDI inflows, gross capital formation and population. The real GDP per capita is taken at current US dollar. Population is described as the people between 15 and 64 years old. For convenience of data analysis, the variables data are taken as natural logarithm form; real GDP per capita, FDI inflows, gross capital formation and population are represented as lnGDP, lnFDI, lnGCF and lnPOP respectively. We have used Eviews 10 software for data analysis.

Methodology

We have used ARDL-ECM approach for estimation of data. The ARLD model is one of the most effective and appropriate model for examining the dynamic association between the variables. Many studies such as **(Pesaran, Shin, & Smith, 2001)**, **(Bahmani-Oskooee & Mitra, 2008)**, **(De Vita & Abbott, 2002)**, **(Pacheco López, 2005)**, **(Zachariadis, 2006)** and **(Chaudhry & Choudhary, 2006)** have proved the efficacy of this technique. Therefore, in this study, we investigate the impact of foreign direct investment on the economic growth of Pakistan in both short run and long run through ARDL-ECM technique. The ARDL technique involves a single concentrated form of the equation whether the regressors should be a mixture of at level, I(0) and first difference, I(1) or only I(0) or only I(1). But there should not be I(2) variables in ARDL method of estimation or else, the model will come up with inaccurate findings. The ARDL estimation technique is well-known for data estimation of a small sample size i.e. 30 to 80 observations for more reliable and robust results. **(Narayan, 2005)** The econometric model used in our study is as follows:

$$lnGDP_t = \alpha_\circ + \beta_1 lnFDI_t + + \beta_2 lnGCF_t + \beta_3 lnPOP_t + \varepsilon_t$$

Where
lnGDP = Log of real GDP per capita
lnFDI = Log of foreign direct investment inflows
lnGCF = Log of gross capital formation
t = stands for the time period from 1971 to 2018
ε = Represents the Error term while β_1, β_2 and β_3, are the relevant parameters

In this study, first of all we test descriptive statistics for Mean, Median and Standard Deviation. In the second step, unit root tests have been done to check the stationarity of the variables. The next important step is lag length criterion to check the optimal lag for the model. In the fourth step of the study, we have run ARDL model for long-run and short-run analysis. For checking the stability and sensitivity of the model, CUSUM and CUSUM sq have been utilized in the study.

Results and Discussions

Descriptive Statistics

There are 48 observations in the statistical description given in table 1 below. As it can be seen, as compared to lnGDP, the mean value of lnFDI is considerably small. It was observed that the values for the FDI were small for some years, while some years show high values. Therefore, it can be seen that value of standard deviation for lnFDI is considerably high.

Table 1. Descriptive Statistics

Variables	Mean	Median	Max	Min	Std. Dev.	Kurtosis	Skewness
lnGDP	6.9018	6.9014	8.3275	5.4763	0.6332	3.2078	0.0065
lnFDI	0.95403	0.8266	3.9975	0.0079	0.8508	6.8485	2.5883
lnGCF	4.2206	4.2204	4.8822	3.5595	0.3342	3.6484	-0.6080
lnPOP	18.0813	18.1440	18.9642	17.1984	0.4620	1.97840	-0.3017

Unit Root Tests

The unit root test results are shown in the above table 2 below. It is shown that some variables such as lnFDI and lnPOP are stationary at level i.e. I(0). Whereas, some variables such as lnGDP and lnGCF have unit roots but they become stationary at first difference I(1).

Table 2. Unit Root Tests

Variables	At level P-values	At first difference p-values	Order of Integration
lnGDP	0.7857	0.0000	I(1)
lnFDI	0.0470		I(0)
lnGCF	0.4766	0.0000	I(1)
lnPOP	0.0020		I(0)
*With constant and trend			

Optimal Lags

The below table shows the optimal lag selection for all variables along with Akaike Information-tion Criterion.

Table 3. Optimal Lags

Variables	Individual Optimal Lag
lnGDP	3
lnFDI	2
lnGCF	0
lnPOP	1
Akaike Information Criterion	-37.5734

Short Run Analysis

The below table indicates the results derived from the short-run estimations of the ARDL model. According to the short-run estimations, the adjusted values for F-statistics and R^2 are satisfactory. In table 4 below, -1.93750 is the coefficient of the ECM that is statistically significant. It indicates a convergence to the equilibrium path, the error correction process converges equilibrium path. The significant value of the error correction coefficient and its negative sign also validate the existence of long-run equilibrium in the model. According to the short-run analysis, the impact of the variable FDI is significant as well as positive on the economic growth of Pakistan. 0.44822 is the magnitude of coefficient of the ECM. The results derived for the variable FDI are consistent with endogenous theory as well as innovation based model. Hence, these results indicate that FDI spillovers boost the economic growth of Pakistan. **(Har, Teo, & Yee, 2008)** also found a positive and significant impact of FDI on the economic growth in case of Malaysia. The results are also consistent with **(Athukorala & Hill, 2000)** that also found positive impact of FDI on the economic growth. **(Khan, 2007)** also got positive impact of FDI on the economic growth in case of Pakistan. The study found that the variable gross capital formation (GCF) has a positive as well as significant impact on the economic growth of Pakistan in the short-run. The variable population also shows a positive and significant impact on the economic growth of Pakistan in the short-run analysis.

Table 4. Error Correction Model

Regressors	Coefficient	Standard Error	T-Ratio	Prob.
dlnGDP1	-0.38171	0.27643	-1.68430	0.2970
dlnGDP2	-0.66572	0.28339	-4.37533	0.0050
dlnFDI	0.44822	0.41606	2.33540	0.0430
dlnGCF	5.86248	1.35893	1.42622	0.0280

Regressors	Coefficient	Standard Error	T-Ratio	Prob.
dlnGCF1	-3.58422	1.79311	-0.87623	0.3910
dlnGCF2	-2.48632	1.87381	-2.44151	0.5080
dlnGCF3	-1.86250	1.34224	-2.44602	0.0960
dlnPOP	848.45	474.42	1.86482	0.0040
dlnPOP1	-685.78	248.70	-4.06902	0.0330
dlnPOP2	468.40	162.44	4.20080	0.0390
ecm(-1)	-1.93750	0.38579	-8.75424	0.0000
R-Squared	0.95442	S.D. of Dependent Variable	0.48753	
DW-statistic	4.68820	Equation Log-likelihood	-16.88422	

Long Run Analysis
Bounds Test

It is essential to have long-run relationship in the model. When long-run equilibrium relationship is found then ARDL technique could be utilized for estimation of long-run coefficients. As the calculated statistical values lie outside the critical bounds, then the null hypothesis i.e. absence of long-run relationship among the variable of the study could be rejected at 5% level of significance. The computed value of f-statistics is very sensitive for the technique of selected lag. The overall number of regressions which are generated through ARDL equation is; $((p+1)\ k) = (4+1)2 = 48$ used for every equation that has been computed. Where; the lag length is indicated by K and the number of variables is represented by P. From the equation (5), the F-statistics value is computed by utilizing OLS technique as mentioned in the table 5 below. So, the value computed for F-statics in the table 5 is 7.289 which is higher than the value of upper bound i.e. 3.71. It shows that there is long-run relationship in our model.

Table: 5 Bound Testing for the existence of a Level Long Run Relationship

Bound Critical Value				
Unrestricted intercept and no trend				
F-stat Value			I(0)	I(1)
7.289	99%		2.51	3.98
	95%		2.42	3.71
	90%		2.22	3.27

Long Run Elasticities

Table 6 shows the long-run estimations of the study. The estimated coefficients indicate that in the long-run the variable FDI positively as well as significantly impacts the economic growth (GDP) of Pakistan. The result obtained is consistent with the endogenous theory and Innovation-based growth model which shows that FDI spurs economic growth with the help of new technology, enhanced knowledge and technological spillovers.

In the long-run analysis, there is a positive but insignificant impact of the variable gross capital formation (GCF) on the economic growth (GDP) of Pakistan. There is a positive as well as significant impact of the variable population on the economic growth (GDP) of Pakistan in the long-run analysis. The population in the study comprises of the people of 15 to 64 years old and it is used

as labor. The result is consistent with the exogenous growth theory that states that technology enhancement and knowledge transfer leads to labor efficiency that positively affects GDP.

Table 6 Long Run Elasticities

Regressors	Coefficient	Standard Errors	T-Ratio	Prob.
lnFDI	5.3821	0.2132	-1.758	0.0260
lnGCF	0.6321	0.8740	0.964	0.6698
lnPOP	0.4838	0.6731	-0.882	0.0471

Sensitivity Analysis and Stability Test

For stability and sensitivity of the model, CUSUM and CUSUM sq have been utilized in the study. As straight light can be observed in the above figure 1 and figure 2 which indicate 5 percent critical bounds for the CUSUM and CUSUM sq utilized for checking parameter stability. The CUMSUM and CUSUMsq in the above graphs are significant at 5 percent significance levels i.e. plots lie between the critical bounds which show the stability of the parameters in the model. For checking serial correlation, Lagrange Multiplier (LM) statistic test has been applied. The F- value calculated through LM test is 0.72 that means there is no issue with the serial correlation.
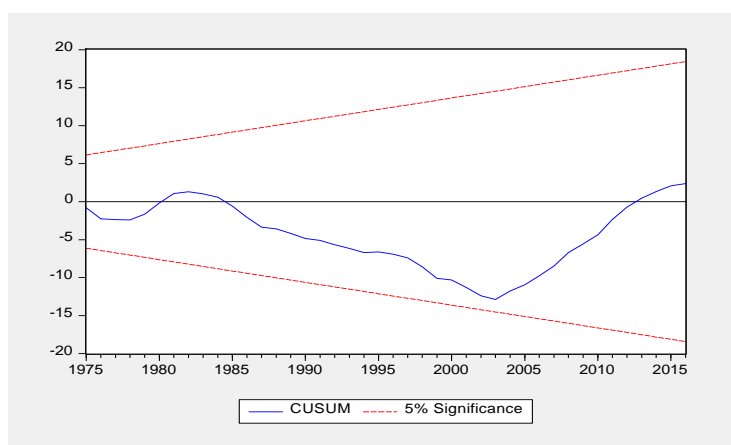

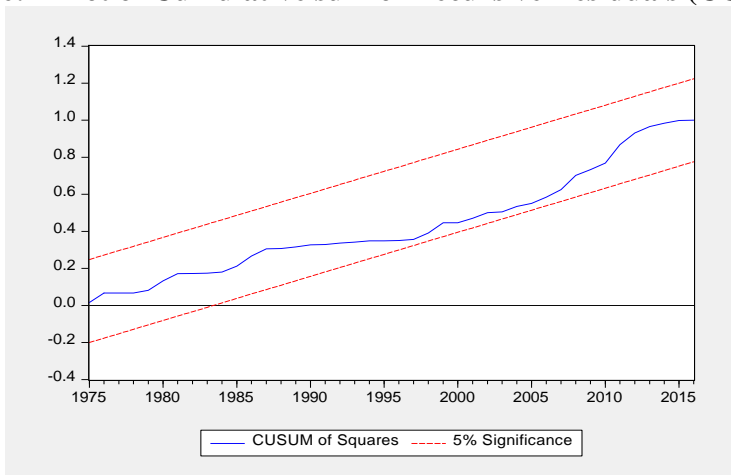**Figure: 1 Plot of Cumulative sum of Recursive Residuals (CUSUM)**

Figure 2: Plot of Cumulative sum of Squares of Recursive Residuals (CUSUMq)

Conclusion

The study utilized ARDL-ECM technique to investigate the impact of FDI on the economic growth (GDP) of Pakistan. Time series data over the period of 1971-2018 has been used to find out the short-run and long-run effects. Moreover, for confirming the long-run relationship in the model, bound testing approach has been applied. The results obtained from the study reveal that foreign direct investment has a positive as well as significant impact on the economic growth (GDP) of Pakistan both in the short-run and long-run. Therefore, the government should offer more consistent and attractive policies to enhance foreign direct investment in Pakistan.

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