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Foreign Direct Investment and Economic Growth in Pakistan: An Analysis of the Role of Capital Formation, Trade Openness, and Labor Force (1981–2010)

Asma Ameer Afzal[1], Gulzar Fatima [2], Dr. Muhammad Shabbir [3]

Asma Ameer Afzal
M.Phil. Scholar, Department of Economics, Women University of Bagh AJK
Email: asmaamirkhan889@gmail.com

Gulzar Fatima
Visiting Lecturer, Department of Economics, Kotli University AJK

Nazish Roshan
Lecturer Economics, Post Graduate Boys College Rawalakot AJK

Dr. Muhammad Shabbir*
Assistant Professor, Department of Economics, University of Kotli AJK
Email:Khan_shabbir7@yahoo.com,
ORCID:https://orcid.org/0000-0001-9739-1500

Abstract

Purpose: The current study examines the effect of foreign direct investment (FDI) on economic growth of Pakistan during the period 1981–2010. It examines the growth performance of gross domestic product (GDP) and explores long-term patterns of FDI inflows and labor force participation in the country.

Methodology: The relationship between GDP, FDI, gross fixed capital formation (GFCF), trade openness (TO), and the labor force (LF) is analyzed using a multiple regression framework. In this model, GDP taken as a dependent variable, while FDI, GFCF, TO, and LF were treated as explanatory variables that explore both capital and structural aspects of the economy.

Findings: The results reveal that the overall model is statistically significant. FDI demonstrates a strong and positive influence on GDP growth, confirming its role as a vital contributor to Pakistan's economic performance. Conversely, GFCF exhibits a negative and significant relationship with GDP, suggesting inefficiencies in domestic investment activities.

Practical Implications: The findings highlight the need for policy initiatives aimed at improving the investment climate, strengthening governance, and encouraging productive FDI inflows. Foreign investment not only enhances technology transfer and competitiveness but also supports human capital development and increases government revenues through corporate taxation. Strengthening these areas can help Pakistan achieve sustained and inclusive economic growth.

Keywords:

Foreign Direct Investment (FDI); Economic Growth; Gross Domestic Product (GDP); Gross Fixed Capital Formation (GFCF); Trade Openness (TO); Labor Force (LF); Pakistan; Multiple Regression Analysis; Investment Climate; Policy Implications

JEL Classification: F21, F43, O47, O53, C33

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Introduction

Background of the Study

Foreign direct investment (FDI) and economic growth have been a long-term topic of academic discussion among economists and policy makers especially in a developing economy like Pakistan. A large number of studies have been conducted in a variety of research into this connection with mixed findings. Indicatively, Ali (2014) and Saqib (2013), find out a negative impact of FDI on the economic growth of Pakistan, which indicates that foreign investment is not always associated with the desired results in the developing environment. On the other hand, Muntah (2015) and Naseer (2013) found out there is a positive and statistically significant correlation between FDI inflows and economy growth and highlighted the contribution of FDI to the accumulation of capital, technology transfer, and employment.

Pakistan being a developing economy is constantly facing problems of maintaining a stable growth curve. Fast growth and development require that increased amounts of foreign capital flow. The growth in the inflows of FDI is linked to the growth in the industrialization, growth in technology and the general growth in the economy. Umer (2014) also explored that a strong correlation between FDI and economic growth and the significance of government policies that encourage and sustain foreign investment in Pakistan.

Problem Statement and Research Gap

The analysis of the effects of foreign direct investment (FDI) in Pakistan began soon after the independence of the country, which resulted in a large amount of academic literature on the topic. However, the literature on studies conducted before has mostly focused on the direct relationship between FDI and gross domestic product (GDP), much of which has been ignoring other economic variables that can help moderate the relationship. Different aspects of FDI have been researched (Yunas, 2014; Muntah, 2015; and Baigh, 2016); nevertheless, the moderating effect of such variables as trade openness (TO), gross fixed capital formation (GFCF), and labor force (LF) has been underestimated.

Our study attempts to fill in this gap by incorporating TO, GFCF, and LF as moderating covariates in the FDI-GDP nexus. As far as we know, this integrative strategy widen the analytical horizon of preceding studies. By using annual time-series data, revealing 1980 2017, which have been obtained via authoritative compilations of such data including the World Development Indicators (WDI), the study aims to provide a more differentiated explanation of the influence of FDI on the Pakistani economic path under the influence of these moderating factors.

Research Questions

What is the relationship between FDI and GDP in Pakistan?

How does Pakistan's GDP respond to changes in FDI when trade openness, gross fixed capital formation, and labor force act as moderating variables?

To what extent do TO, GFCF, and LF influence the impact of FDI on GDP growth in Pakistan?

Research Objectives

This study explores the impact of foreign direct investment (FDI) on the growth of gross domestic product (GDP), taking into account the roles of trade openness (TO), gross fixed capital formation (GFCF), and the labor force (LF) as key economic factors It further seeks to explore how these variables interact and modify the connection between FDI and GDP throughout the period from 1980 to 2017.

Significance of the Study

This research investigates a deeper understanding of the relationship between foreign direct investment (FDI) and economic growth by incorporating key macroeconomic variables that have been emphasized in prior research studies. In contrast to earlier work, it considers the moderating roles of trade openness, capital formation, and the labor force to present a more comprehensive policy perspective. The key findings are helpful to policymakers in designing strategies that attract more productive FDI inflows and enhance their contribution toward achieving sustainable economic growth in Pakistan.

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REVIEW OF LITERATURE

It is well recognized that Foreign Direct Investment (FDI) plays a central role in economic growth of both advanced and emerging economies. The processes and the extent of the effect of FDI to national output have been the subject of wide research among scholars, and hence the empirical evidence is still informal due to the differences in time coverage, methods of econometrics, and country-specific circumstances.

Onu et al. (2012) have discussed the experience of FDI and economic growth in Nigeria using annual reports between 1986 and 2007. With the help of Ordinary Least Squares (OLS) regression framework, the authors included such variables as Gross Domestic Product (GDP), Foreign Direct Investment (FDI) inflows, savings, tax income, foreign exchange, and governmental expenditure on education. Their results endorse the fact that both FDI and savings have a positive impact on growth but higher tax revenue would seem to have negative effects on the same. Surprisingly, the statistically significant relation between public expenditure on education and GDP was absent.

In the Pakistani, Saqib et al. (2013) examined how FDI is related to the growth of the economy based on 1981 to 2010 data. The study estimated a model using OLS after tests of stationarity conducted using Augmented Dickey-Fuller (ADF) procedure. The findings indicate that FDI inflows, trade openness, and savings have a positive influence on the GDP growth and inflation and external debt have a negative impact.

Karimi et al. (2014) focused on Malaysia and embraced a range of econometric tools, i.e. ADF unit root test, Toda Yamamoto causality test, ARDL bounds test, and Johansen co-integration. No other basis is drawn by relying on the Cobb-Douglas production model; the authors made the conclusion that FDI has an indirect but positive effect on long-term economic growth in Malaysia, and the reason why is based on the fact that foreign investment supports sustainable economic growth in dependent situations where local capacity building efforts are integrated.

Umer (2014) further advanced the discussion on the research on Pakistan by using Autoregressive Distributed Lag (ARDL) framework of analysis of annual data during 1960 and 2011. Trade openness, tariff rates, international taxation, investment and human capital were some of the explanatory variables used in the analysis. Results have shown that trade openness, investment, and human capital act as significant growth stimulators, but tariff rates and taxes related to trade are limiting factors to the economic performance.

The same tendency was noted by Muntah et al. (2015) when they studied the Pakistani economy over the period of 19952011. Through OLS estimation and the Durbin-Watson test of autocorrelation, the research had discovered that FDI inflows, remittances and inflation were positively related to GDP, but external debt had a negative effect.
Tamilselvan et al. (2015) used simple regression to analyze the experience of India during the liberalization period (19912014). They have reported a strong, direct relationship existing between the inflows of FDI and GDP growth, which means that liberal economic policies promoted the inflow of foreign capital, which in turn promoted the growth of the national output.
In the same manner, Gupta et al. (2015) estimated the role of FDI in India in the period of 200012 and 201213 by using OLS estimation, which was complemented with the Durbin-Watson test. The empirical data supported the assumption that FDI has a powerful, positive impact on the GDP, thus, highlighting the contribution of foreign investment as an economic growth driver.
Baig et al. (2016) in another study of Pakistan evaluated the links of FDI to GDP based on 19912012 data. Using the unit-root tests, the Johansen co-integration and the Granger causality methods, the authors found that there was a long run interdependence between GDP, FDI, domestic capital and labor force. The findings showed that domestic capital and labour have a positive relationship with GDP, but direct relationship between FDI inflows and growth is negative. This finding implies that the capacity of Pakistan to obtain the advantages of foreign investment depends on structural and institutional preparedness in the country.
Together, all these studies indicate that the effect of FDI on economic growth is not homogeneous and deterministic. Although many studies highlight the positive impact of FDI through transfer of technology, employment, and improvement of productivity, other studies highlight the negative effects of weak policy systems and limited absorption capacity. Therefore, to gain a subtle insight into the dynamics of Pakistan growth, moderating variables in FDInexus growth analysis, including openness to trade, capital formation, and labor force participation, need to be introduced.

RESEARCH METHODOLOGY

Annual time series data from 1980 to 2017 was used in the present study. The World Development Indicators (WDI) and International Financial Statistics (IFS) provided the data in accordance with the study's variables.
The research study adopt the fallowing functional form to examin the impact of foreign direct investment on Pakistan’s economic growth
GGDP = f(GFDI, GGFCF, GLF, GTO)
The fallowing linear econometric model has been applied.

$$GGDP_t = \beta_0 + \beta_1 GFDI_t + \beta_2 GGFCF_t + \beta_3 GLF_t + \beta_4 GTO_t + \varepsilon_t$$

Where:
GGDP refers to the growth rate of the gross domestic product.
GFDI indicates the growth rate of foreign direct investment.
GGFCF represents the growth rate of gross fixed capital formation.
GLF denotes the growth rate of the labor force.
GTO shows the growth rate of trade openness.
εt represents the error term in the model.

Estimation Technique

The Autoregressive Distributed Lag (ARDL) approach has been applied to find out the the short-run and long-run dynamics among the variables. The ARDL model is suitable when variables are integrated of mixed order, i.e., I(0) and I(1), and it performs well with small sample sizes. The general ARDL representation for two variables, X and Y, is given as:
The ARDL specification in case of our model can be expressed as:
This specification helps in distinguishing the short-run effects through the differenced terms and the long-run equilibrium relationship through the lagged level terms.

RESULTS AND DISCUSSION

The study employs the ARDL model to analyze how Gross Domestic Product (GDP), Foreign Direct Investment (FDI), Gross Fixed Capital Formation (GFCF), Labor Force (LF), and Trade Openness (TO) are related in Pakistan over the period 1980–2017. The analysis involves several steps, including unit root testing to check data stationarity, co-integration analysis to identify long-run relationships among variables, and both long- and short-run estimations to capture dynamic effects. In addition, diagnostic tests were conducted to confirm the stability and reliability of the estimated model.

Unit Root Test

Augmented Dickey-Fuller (ADF) test was applied to determine the stationarity of each variable. The results has been presented in table 4.1.

Table 4.1: Unit Root Test Results (ADF Test)

Variable	At Level (P-Value)	First Difference (P-Value)	Decision
GGDP	0.0084	—	I(0)*
GFDI	0.0001	—	I(0)*
GGFCF	0.0000	—	I(0)*
GTO	0.0000	—	I(0)*
GLF	0.6084	0.0001	I(1)**

Note: The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

The findings indicate that GDP, FDI, GFCF, and trade openness are stationary at their level forms, whereas the labor force variable attains stationarity after taking the first difference. This combination of level and first-difference stationary variables supports the application of the ARDL technique for empirical estimation.

Optimal Lag Length Selection
An appropriate lag length was selected by using information criteria such as AIC, SC, and HQ.

Table 4.2: Optimal Lag Selection Criteria

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-642.1963	NA	2.35e+10	38.07037	38.29483	38.14692
1	-588.9367	87.72160*	4.55e+09*	36.40804*	37.75483*	36.86734*
2	-565.8153	31.28197	5.62e+09	36.51855	38.98766	37.36058
3	-547.3628	19.53795	1.10e+10	36.90369	40.49513	38.12848

Source: Author's own calculation.
The results presented in the tabbe 4,2 indicates that all three criteria suggest one lag as optimal. This choice confirms effectual estimation while preventing model overfitting.

Bound Test for Co-integration
ARDL bounds test procedure was applied to confirm the long-run equilibrium among the variables. The results has been presented in table 4.3.

Table 4.3: Bounds Test for Co-integration

Test Statistic	Value	K
F-statistic	5.476426	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Pesaran and Pesaran (1997).
Since the computed F-statistic (5.47) exceeds the upper bound at all significance levels, the null hypothesis of no co-integration is rejected, confirming a long-run relationship among GDP, FDI, GFCF, LF, and TO.

Long-run Relationship
Table 4.4: Long-run ARDL Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GFDI	0.068	0.02	3.89	0.0025
GGFCF	-0.38	0.14	-2.64	0.0230
GLF	0.04	0.02	2.16	0.0532
GTO	0.25	0.08	2.98	0.0125
C	7.44	1.39	5.33	0.0002

R^2	Adj. R^2	D.W	F-Statistic	Prob(F)
0.89	0.70	1.79	4.56	0.006

Source: Author's own calculation (EViews 9).
The coefficient of FDI is positive and significant, indicating that a 1 percent increase in FDI leads to a 0.07 percent rise in GDP. GFCF has a negative and significant effect on GDP, suggesting inefficiencies in domestic investment due to instability. Trade openness and labor force are both positive and significant, showing that external trade and

employment expansion contribute to economic growth. The model demonstrates strong explanatory power with $R^2 = 0.89$, indicating that 89% of GDP variation is explained by the independent variables.

Short-run Dynamics (ECM)

Table 4.5: Short-run ARDL Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GFDI)	0.01	0.01	1.53	0.1544
D(GFDI(-1))	-0.01	0.01	-2.43	0.0333
D(GFDI(-2))	-0.01	0.01	-2.22	0.0482
D(GGFCF)	0.03	0.04	0.70	0.5010
D(GGFCF(-1))	0.14	0.04	3.00	0.0120
D(GGFCF(-2))	0.11	0.04	2.64	0.0222
D(GLF)	0.02	0.02	0.98	0.3488
D(GLF(-3))	-0.05	0.02	-2.01	0.0688
D(GTO)	-0.01	0.07	-0.07	0.9465
D(GTO(-1))	-0.13	0.07	-1.90	0.0831
ECM(-1)	**-0.86**	0.28	-3.05	0.0110

Source: Author's own calculation.

The estimated coefficient of the error correction term (ECM = –0.86) is negative and statistically significant, indicating that roughly 86 percent of the imbalance from the preceding year is adjusted within the current period. This outcome provides evidence of a stable adjustment process and confirms the presence of both short-run and long-run relationship among the variables.

Diagnostic Tests

Table 4.6: Breusch-Godfrey Serial Correlation LM Test

Test	Statistic	Probability
F-statistic	0.2978	0.5972
Obs*R^2	0.9543	0.3286

Table 4.7: Harvey Test of Heteroskedasticity

Test	Statistic	Probability
F-statistic	0.7741	0.7053
Obs*R^2	1.6823	0.5415

Source: Author's own calculation.

Both diagnostic tests indicates that the empirical model used in this study is free from serial correlation and heteroskedasticity which confirms the reliability of the ARDL estimates.

DISCUSSION OF FINDINGS

The discussion shows that the impact of foreign direct investment (FDI) on the economic growth of Pakistan is strong and healthy. The inflows of FDI in augmented forms are coupled with increased productivity in industries, growth of jobs, and increased government revenues as a result of an increased intensity in business. These findings are in line with earlier findings, including the ones by Rahman (2014) and Gul et al. (2015) that also highlight the confounding factor of FDI in the economic growth of developing nations.

On the other side , the empirical results also suggest that gross fixed capital formation (GFCF) also has a negative relationship to the economic growth. This observation indicates that domestic investment is yet to play a full role in enhancing productivity or long-term growth. Such factors as uncertainty in policies, poor infrastructure and lack of good governance may have undermined the efficiency of domestic capital formation.

However, trade openness has a positive effect on growth, suggesting that more integration in global markets promotes competitiveness and expands export opportunities.

The findings also highlight the central role that the labor force plays, which presupposes the fact that the development of human capital and the involvement of the labor force is one of the core drivers of GDP growth.

One can compile the facts and thereafter demonstrate the short-run and long-run relationships between GDP and its principal factors. Although all three factors (FDI, trade openness, and the labor force) have a positive impact on the economic growth, the low level of efficiency of the domestic investment is an indicator of the constraint of the structure of the economy. The diagnostic tests also support the assumption that the approximated model is stable and statistically valid.

The results propose that it is essential to create a more favorable investment climate in Pakistan, strengthen the effect of trade-related reforms, and focus on the development of skills and education to extract the full advantage of FDI to achieve sustainable economic growth.

CONCLUSION

The analysis confirms that foreign direct investment (FDI) has a strong and positive influence on Pakistan's economic growth. The inflow of foreign capital contributes to industrial expansion, job creation, and improved government revenues through enhanced business activity. These results are consistent with previous studies, such as those by Rahman (2014) and Gul et al. (2015), which also emphasize the positive role of FDI in promoting economic progress in developing economies.

In contrast, the negative association between gross fixed capital formation (GFCF) and economic growth reflects weaknesses in domestic investment performance. Uncertain policies, inadequate infrastructure, and weak institutional frameworks may have limited the productivity and effectiveness of domestic capital formation.

The findings further reveal that trade openness supports economic growth by fostering competition, expanding export markets, and encouraging efficiency within industries. Moreover, the labor force continues to play a vital role, as human capital development and active participation in the workforce remain essential drivers of GDP growth.

Overall, the study establishes both short-run and long-run linkages between GDP and its key determinants. While FDI, trade openness, and the labor force exert positive effects on economic growth, the underperformance of domestic investment highlights structural and policy-related constraints within the economy.

To achieve sustainable growth, Pakistan needs to build a more stable and investor-friendly environment, reinforce trade and industrial reforms, and invest in education and skills development. These measures would not only enhance the long-term benefits of FDI but also strengthen the foundations for inclusive and resilient economic progress.

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