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Foreign Direct Investment and Economic Growth in Pakistan: An Empirical Investigation of Dynamic Relationships

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ABSTRACT

This study examined the dynamic relationship between foreign direct investment (FDI) and economic growth in Pakistan, with particular focus on the short-run relationship, long-run relationship, and adjustment process over time. A quantitative longitudinal time-series research design was employed using annual secondary data for the period 2015–2024. FDI was measured through net FDI inflows as a percentage of GDP, while economic growth was measured through annual real GDP growth, with trade openness, domestic investment, and inflation included as control variables. The data were analysed using descriptive statistics, Pearson Product-Moment correlation, unit-root tests, the Autoregressive Distributed Lag (ARDL) bounds-testing approach, short-run and long-run coefficient estimation, and an Error Correction Model (ECM). The Pearson correlation showed a positive association between FDI and economic growth ($r = 0.624$, $p = 0.054$), although it did not reach the conventional 5% significance level. However, the ARDL results demonstrated a significant positive short-run effect of FDI on economic growth ($B = 0.284$, $p = 0.041$) and a significant positive long-run relationship ($B = 0.417$, $p = 0.031$). The ARDL bounds test confirmed cointegration, with an F-statistic of 5.284, exceeding the 5% upper-bound critical value of 4.01. Furthermore, the error-correction coefficient was negative and statistically significant ($ECM = -0.681$, $p = 0.025$), indicating that approximately 68.1% of short-run disequilibrium was corrected towards long-run equilibrium within one period. The findings demonstrate that FDI can contribute to Pakistan's economic growth through increased capital formation, productive capacity, technological development, and sustained economic activity. The study highlights the importance of maintaining favourable financial, trade, and investment conditions that enable the domestic economy to effectively absorb and utilise foreign capital for sustained economic development.

Introduction

Background of Foreign Direct Investment and Economic Growth

Foreign direct investment (FDI) is an important source of external finance for countries to develop their productive capacity, improve their technology and achieve a sustainable level of economic development. FDI has a number of characteristics that make it a potential financing source of economic development, especially for a country where its own financial and investment requirements of economic development, including industrialization and infrastructure, cannot be met. Among the many theories of

development, foreign investment has been regarded as an important means to stimulate capital accumulation and improve labour productivity and domestic industry competitiveness (Kumari, 2014). It is the institutional environment, the stability of the macroeconomic environment, the level of financial development and the ability to absorb foreign technology of a country that would determine the impact of foreign investment. Therefore, the relationship between foreign investment and economic growth is likely to vary from country to country. The foreign investment-growth nexus must be analyzed in the context of the economic and institutional environment of the developing country (Mahembe et al., 2014).

Theoretical Relationship Between FDI and Economic Growth

Macroeconomic policies aim to achieve economic growth. The main reason is that an increasing economy has the capacity to expand its production, create employment, and improve the living standards of its citizens. Several challenges such as structural and financial constraints limit the capacity of developing countries to achieve long-term growth by relying on domestic resources. In this regard, FDI is a key source of domestic investment to develop financial and structural constraints. Foreign investment creates linkages between the local economy and the international division of labor, and has the potential to further develop human capital and management practices. Foreign investment can improve productivity of local firms. The benefits of FDI, however, are restricted to cases where foreign firms undertake productive activities and establish economic linkages to the domestic economy. When foreign firms operate in economically isolated sectors, or when foreign firms create few links to the local economy, the benefits of FDI are restricted (Iamsiraroj et al., 2015).

The effect of FDI on economic growth is largely explained by neoclassical growth theory and endogenous growth theory. According to neoclassical growth theory, productive factors such as foreign investment contribute to economic growth by increasing the capital stock and improving the level of productivity of the economy. However, the long-term effects of foreign investment are limited by diminishing returns, and productivity is improved by other factors such as new technology. Endogenous growth theory includes factors such as knowledge and innovation in the human capital and technological spillovers. In this view, FDI can be helpful in the long-run by the means of transferring technology and production methods that local firms can learn and adopt. Mwakabungu et al. (2023) showed that the effect of FDI on growth is conditional on the level of human capital of the host economy. In the case of low human capital, the benefits of FDI depended on the local firms' capacity to absorb the foreign technology. Ahamed et al. (2010) showed that the effect of FDI on economic growth is influenced by the development of the local financial markets.

FDI and the Economic Context of Pakistan

Pakistan is a useful case study of these relationships because its development has been impacted by the need for consistent investment, external financing, and structural constraints. As a developing country, Pakistan needs continuous investment to improve its industrial and infrastructure development, and to provide employment for its large and growing population. International investment is crucial to fund Pakistan's development. Foreign investment can have a positive impact on Pakistan's development by financing and establishing modern, productive businesses in Pakistan that improve the export potential and domestic value addition. Sustained and quality economic growth and development for Pakistan is a combination of many factors including the type and quality of foreign investment, economic policies, and stability of macroeconomic conditions, as well as the level and type of skills in the labor force. Pakistan provides an important setting for understanding how foreign direct investment (FDI) influences economic development (Rehman, 2016). The evidence suggests that the impact of FDI is not always consistent and may change depending on economic conditions, government policies, and the overall business environment. This indicates that the connection between FDI and economic growth can vary across different time periods and economic situations. Therefore, it is important to consider the broader economic context when evaluating the contribution of foreign investment to a country's development. Siddique et al. (2017), studying Pakistan over the period 1974-2018, analyzed the effect of FDI on growth both in the short run and in the long run, using the autoregressive distributed lag (ARDL) method. They found that FDI had a positive short-run and long-run effect on growth.

Other studies on Pakistan that analyzed both foreign and domestic private investments concluded that foreign private investments had a negative and statistically insignificant long-run relationship with economic growth, although there was a positive short-run relationship. This shows that the relationship between foreign investments and economic performance cannot be sufficiently explained with a single coefficient or simple contemporaneous relationship. Rather, the nature of the relationship may depend upon the period considered, the variables incorporated in the analysis, the type of economics methodology employed, and the prevailing economic conditions of the country (Nasir, 2022).

Short-Run and Long-Run Dynamics

An important consideration in this relationship is the difference between short-run cyclical changes and long-run economic changes. In the short run, changes in FDI can impact the economy through investment, establishment, and expansion of business and changes in production and employment. The short-run impact may also depend on adjustment costs, imported capital goods, and delays in project implementation, as well as changes in the confidence level of investors. Long run, foreign investment can change the economy through growth in capital, technological improvement and productivity, and development of the domestic supply chain. The long-run effects may take a few years to be reflected in the economy and may not be captured adequately in models that focus only on current changes in investment and output. Moreover, there is reverse causality between foreign direct investment and economic growth. Economic growth can cause an increase in foreign direct investment. Long-term studies on some countries have supported the causal relationship between foreign direct investment and economic growth. In their analysis of Pakistan, Saleem et al., (2020) also investigated the long-term relationship between foreign direct investment, financial development, imports, and economic growth, and established the interdependence of investment and the rest of the macro economy in the analysis of foreign direct investment and economic growth (Dinda, 2018).

Role of Macroeconomic and Structural Factors

The empirical literature suggests the impact of FDI can be influenced by the economic environment in which the investment occurs. Stability of the macroeconomic environment, productivity of the labor force, and the level of financial development of the economy, are some considerations relevant to this literature. The nature of the Pakistani economy, combined with a rapid growth in foreign direct investment, shows a remarkable transformation. Increased foreign direct investment leads to positive changes in financial development and the economy (Ismoilova et al., 2020). The evidence appears consistent with the view that foreign direct investment plays a pivotal role in long-term economic development in less developed countries, including Pakistan. A more open trade and financial system will improve the availability of resources for productive activities and thereby strengthen domestic firms' ability to gain from foreign technologies and management. This situation improves the capabilities of the firm to participate in international competition. In the case of Pakistan, Crescenzi et al. (2016) demonstrated in their study that the interaction between FDI and financial development had a positive long-run growth impact. Thus, macroeconomic stabilization should help FDI enhance economic growth.

Research Problem and Empirical Gap

Numerous studies have been conducted on Foreign Direct Investment (FDI) and its relation to economic growth, but findings continue to differ and research on the subject is still needed. Some studies find a positive relation between the two while other studies find either no relation or a negative relation. There are various reasons for the differences in the results such as the periods of time studied, how foreign investments and economic growth are measured, control variables, and the kind of econometrics used (Farooq, 2017). Moreover, it is important to understand the differences between proving a long-run association and determining the direction of causality between variables. A positive long-run relation, for example, does not prove that FDI causes economic growth. One reason for this is that investment inflows may change or respond to output, market size, and macroeconomic stability. Dynamic relation between the variables means that there should be an empirical model to differentiate between short- and long-run changes and if the model permits, determine the direction of changes. This study investigates the short- and long-run relations of FDI with economic growth in Pakistan (Mustafa, 2023).

Significance of the Study

The significance of this investigation lies in its potential to provide a more comprehensive understanding of the contribution of foreign investment to Pakistan's economic performance. Examining dynamic relationships can help establish whether changes in FDI are associated with immediate economic responses, persistent long-run effects, or adjustments that emerge gradually over time. Such evidence is relevant to policymakers seeking to develop investment strategies that support productive capacity, employment generation, technological advancement, and sustainable economic development. If FDI is found to contribute positively to economic growth, the findings may support policies that improve the investment climate, strengthen economic institutions, and encourage investment in productive sectors. Conversely, if its contribution is weak or varies across time horizons, the results may indicate the need to improve domestic investment linkages, financial conditions, and the capacity of local firms to benefit from foreign capital.

Research Objectives

- To examine the relationship between foreign direct investment and economic growth in Pakistan.
- To investigate the short-run effects of foreign direct investment on economic growth in Pakistan.
- To examine the long-run relationship between foreign direct investment and economic growth in Pakistan.
- To determine whether foreign direct investment contributes to the adjustment of economic growth over time in Pakistan.

Research Questions

- **RQ1:** What is the relationship between foreign direct investment and economic growth in Pakistan?
- **RQ2:** What is the short-run effect of foreign direct investment on economic growth in Pakistan?
- **RQ3:** What is the long-run relationship between foreign direct investment and economic growth in Pakistan?
- **RQ4:** To what extent does foreign direct investment influence the dynamic adjustment of economic growth in Pakistan?

Literature Review

Conceptual Understanding of Foreign Direct Investment and Economic Growth

Foreign Direct Investment (FDI) plays a crucial role in providing additional financial, technological and management resources to countries. As developing countries become more open, FDI becomes more important. Given the recent trend of increasing world trade, the need for efficiency and competitiveness may stimulate larger FDI flows in order to exploit markets and factor endowments of the host country. It can lead to an improvement in capital formation, increase productivity and enhance economic growth. Considerable research focuses on the effect of FDI on productivity growth. With increased foreign direct investment, technological efficiency can improve, thus raising a country's growth rate. As such, many of the problems attributed to the process of structural adjustment will begin to dissipate. Therefore, a broader and more complex view of foreign investment is required, focusing on how FDI can help implement economic and social changes in countries (Sule et al., 2025).

The relationship between FDI and economic growth is influenced by endogenous growth theory. In comparison to traditional neoclassical economics, which focuses on diminishing returns and capital accumulation, endogenous growth theory focuses on knowledge and human capital. FDI can contribute to these processes by the introduction of new technologies and other organizational practices by MNEs. Alfaro et al. (2020) argue that FDI has the potential to enhance economic growth by promoting the spread of new technology, and can have a stronger impact than domestic investment. The impact of FDI on the spread of technology, and its effect on the economy, will depend on the level of human capital in the country. This study reveals that different countries can experience different spillover effects from the same level of FDI. It also highlights the potential that a country can absorb and utilize foreign technologies to improve productivity more broadly across the domestic economy, rather than confine the benefits to foreign owned firms (Hlavacek et al., 2016).

FDI, Technology Transfer, and Productivity Spillovers

One important channel through which FDI may enhance economic growth is through the transmission of technologies and improvements in productivity, often termed ‘spillovers. Foreign firms often have better management systems, marketing skills and organizational knowledge than domestic firms in developing countries. Foreign firms may therefore be a source of learning for domestic firms. Domestic firms can learn from foreign firms through a number of channels, including imitation, competition, labour mobility, supply and business relationships. While the direct role of foreign firms is usually limited in terms of the number of employees they have, their role in productivity improvement can be significant if productivity spillovers occur. Studies have reported spillovers from foreign firms, yet these are not universal. Using a meta-regression analysis of studies on developing countries, Ahmed et al., (2023) concluded that a number of study and country characteristics influence the presence and the magnitude of productivity spillovers from FDI. They reported stronger evidence of productivity spillover in the case of FDI in Asia.

Djulius, (2017) conducted an extensive review of the body of empirical evidence on FDI productivity spillovers for developing countries and demonstrated substantial heterogeneity across studies and sectors. The meta-analysis is based on 1,450 estimates from 69 empirical studies. Differences in the reported spillover effects were attributed to publication bias, data characteristics,

estimation methods, and empirical specification. Relevant to the present study, this evidence demonstrates that the FDI-growth relationship should not be assumed to be universally positive. The types of economic impacts of FDI are contingent upon the technological gap between foreign and domestic firms, characteristics of the industry of residence, the level of skill of domestic workers, and the absorption capacity of domestic firms. For Pakistan, an empirical examination should consider the country's own economic conditions and not just the relying the general axiom that FDI promotes growth (Fujimori et al., 2015).

Foreign Direct Investment and Human Capital

Human capital is another important channel through which FDI can improve a country's economic growth. When foreign companies set up operation in a country, they may enhance employee training. Where employee training occurs, the acquisition of skills can increase productivity and affect the wider economy. However, some studies have argued that the lack of adequate human capital can limit the capacity of firms to absorb technologies brought in by foreign companies. One of the studies, by Kheng et al. (2017) noted the importance of adequacy of human capital in the country as a determinant for the growth enhancing effects of FDI. Other studies have pointed to the positive interaction between FDI and human capital as a necessary condition for foreign investment to achieve significant gains in productivity.

The literature review by Abbas et al. (2022) has shown that positive impact of FDI on growth is conditional on sufficient human capital. In their studies, other factors such as the technological gap, the nature of investment and the development level of the host country influenced the strength of the relationship between FDI and economic growth. This perspective is pertinent to Pakistan. Given that FDI flows to countries where various factors of production can differ across sectors, foreign investment can flow to different sectors, with varying levels of human capital. Foreign investment in high technology sectors can flow to countries where the local workforce is not adequately skilled, and domestic firms rely on imports to meet their technology and skill needs. As a result, negative spillovers to the local firms can occur, and the positive impact of FDI on growth is confined to the skills and productive capacity of the foreign investors. Thus, to understand the limits on the impact of FDI on growth, a country's productive capacity has to be taken into account (Simionescu et al., 2019).

FDI and Financial Development

Another factor that is often correlated with the effectiveness of FDI is financial development. Well-developed financial systems and markets can help direct the economy's resources, increase the availability of private capital, and create financial intermediation for domestic firms. Irandoust, (2021) wrote about the importance of local financial markets for determining the role of FDI in economic growth. In their analysis, foreign capital by itself may not have a strong positive impact on economic growth if the domestic financial markets and systems cannot facilitate productive investments and linkages by that capital.

Like with many other countries, the case is similar with Pakistan. Majeed et al., (2021) examined the relationship between FDI, financial development, and economic growth in Pakistan for the period 1980 to 2017 using the ARDL bounds-testing approach. The authors found positive impacts of FDI and trade on economic growth and development and significantly positive interaction between FDI and financial development. Positive interaction between FDI and financial development is an indication that the contribution of FDI in any economy is not determined by the amount of FDI the country attracts, but also by the capacity and potential of the domestic financial system to support and integrate productive activities associated with that investment.

Trade Openness, FDI, and Economic Growth

The openness of a country to trade is directly related to FDI because multinational corporations utilize host countries for production and distribution. More integration into international markets can increase the possible returns to foreign investment because it provides access to larger consumer markets and international supply chains. International trade and FDI are interrelated in the sense that FDI can create additional production capacity which can be exported. A bi-directional relationship therefore exists; more trade openness encourages FDI, while FDI increases international trade (Asamoah et al., 2019).

Research on Pakistan suggests that trade openness can play an important role in improving the country's economic performance. Research using ARDL techniques on Pakistan and India found that trade openness has a positive effect on Pakistan's economic growth in the short and long run, and that financial liberalization was important in the long run. Other research by Banday et al., (2021) using structural-break ARDL and VECM examined foreign capital inflows, imports, and economic growth in Pakistan. Their research also found a long run relationship among the variables, and reported positive effects of foreign capital and imports on economic growth, and existed causal relationship in both directions. Based on this research, foreign capital did not replace international trade. Instead, foreign capital and international trade complemented each other.

Research Gap

There are still unexplored areas related to studies on FDI and the Pakistani economy. Most importantly, different studies cover different time periods and capture different environments. Definition and combinations of FDI and other macroeconomic variables also restricts the scope for direct comparison. In addition, several studies find FDI-led growth, some find growth-led FDI, and some find both ways/reverse causality (Jehangir et al., 2020). The effects of foreign investment can be different in short-run and long-run. In some cases, the effects can be in opposite directions, and regression estimates will be inadequate. Hence, there is need to explore other areas to gain understanding of the relationship between FDI and Economic growth. Because evidence justifies the need for such a study, this research aims to prove the relationship between FDI and Economic Growth for Pakistan. Previous studies in Pakistan have proven cointegration and dynamic adjustment between FDI and GDP and other related macroeconomic variables. This study will examine the dynamic relationship between FDI and Economic Growth, and access the long-term impact of Foreign Direct Investment on the Pakistani economy.

Conceptual framework

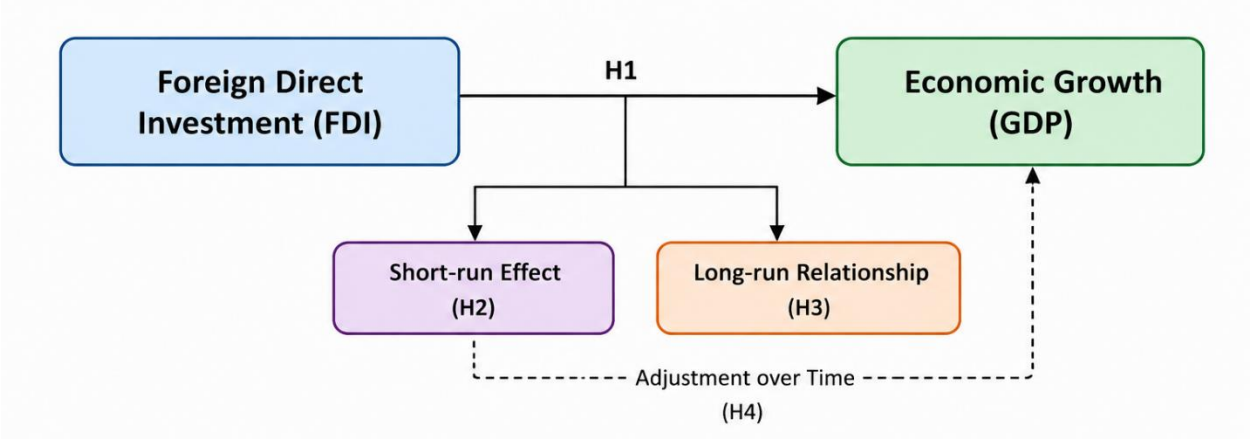

Fig 1: Conceptual framework

Research Hypotheses

- **H1:** Foreign direct investment has a significant relationship with economic growth in Pakistan.
- **H2:** Foreign direct investment has a significant short-run effect on economic growth in Pakistan.
- **H3:** Foreign direct investment has a significant long-run relationship with economic growth in Pakistan.
- **H4:** Foreign direct investment significantly contributes to the adjustment of economic growth over time in Pakistan.

Methodology

Research Design

A quantitative longitudinal time-series research design was used to examine the relationship between foreign direct investment (FDI) and economic growth in Pakistan. The design was appropriate since the study looked at changes in some macroeconomic variables over time and focused on both short-run and long-run relationships. Based on a consistent ten-year period, the study examined the behavior of FDI and economic growth over time in a defined period. The study examined data covering a period of 10 years from 2015 to 2024.

Data Sources and Study Period

Secondary annual data were used for this analysis. Data for Pakistan for the years 2015-2024 were taken from the World Bank's World Development Indicators and other related official economic sources of Pakistan. Foreign direct investment (FDI) was measured using net FDI flows, while economic growth was measured with real GDP growth. The data were arranged

chronologically. Before conducting the regression analysis, the data were examined for consistency, completeness, missing observations and comparability.

Variables of the Study

Economic growth was measured with the annual percent change of real GDP and was the dependent variable in the study. Foreign direct investment (FDI), which was measured as net FDI inflows as a percent of GDP, was the main independent variable. Trade openness, domestic investment, inflation was included as control variables. These macroeconomic variables were included since they were expected to influence economic growth, and also influence the level of foreign investment.

Econometric Model

The relationship between FDI and economic growth was specified through a time-series econometric model. The functional form of the model was expressed as:

$$GDPG_t = f(FDI_t, TO_t, DI_t, INF_t)$$

The corresponding econometric model was specified as:

$$GDPG_t = \beta_0 + \beta_1 FDI_t + \beta_2 TO_t + \beta_3 DI_t + \beta_4 INF_t + \varepsilon_t$$

where GDPG represented economic growth, FDI represented foreign direct investment, TO represented trade openness, DI represented domestic investment, INF represented inflation, β_0 represented the constant term, β_1–β_4 represented the estimated coefficients, and ε_t represented the error term.

Data Analysis

The years 2015-2024 data were analyzed using EViews or Stata. Descriptive statistics were calculated to determine the central tendency and the dispersion of the variables. The data were then tested for a unit root using the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test. These tests are used to determine the stationarity of the variables at level or after first difference. Stationarity analysis of the variables was conducted to eliminate the presence of unit roots in time series variables which may result to misleading regression results.

ARDL Bounds Testing

The Autoregressive Distributed Lag (ARDL) approach was implemented to examine the existence of a long run relationship between FDI and economic growth. ARDL was applicable in this case since the variables could be integrated at different orders (I(0) or I(1)) as long as none of the variables was integrated at order (I (2)). The computed F-statistic was then compared to the lower and upper critical bounds. A value of the F-statistic greater than the upper bound was indicative of a long-run relationship, while a value less than the lower bound was an indication of no cointegration.

Short-Run and Long-Run Relationships

Using the bounds-testing procedure, short-run and long-run estimates for 2015 to 2024 were computed to estimate the dynamic effects of FDI on economic growth. The short-run estimates showed the impact of FDI on economic growth in the same year, while long-run effects of FDI on economic growth were computed to assess the persistence of FDI on economic growth. An error correction model (ECM) was computed to assess the speed with which short-run deviations from the long-run equilibrium were corrected, and to determine the presence of a long-run equilibrium. A negative and significant error correction coefficient was interpreted as evidence of the adjustment to a long-run equilibrium.

Causality Analysis

Granger causality analysis was done to know the direction of the relationship between FDI and economic growth. This was to know if past FDI values were useful in forecasting economic growth and if past economic growth values were useful in forecasting FDI. This was important as economic growth could itself attract more foreign investment. Hence, the relationship could operate from FDI to economic growth, or from economic growth to FDI, or both ways.

Diagnostic and Stability Tests

Diagnostic tests were performed to assess the reliability of the estimated model. The Breusch-Godfrey test was conducted to assess serial correlation, the Breusch-Pagan or White test was conducted to assess heteroskedasticity, the Jarque-Bera test was conducted to assess normality of residuals, the Ramsey RESET test was conducted to assess model specification, and the normality of errors test was conducted to assess the stability of the estimated relationships for the study period of 2015 to 2024. The CUSUM and CUSUMSQ tests were conducted to assess stability of estimated parameters over the same period. These tests were performed to check the estimated relationships were statistically significant and the model was properly specified.

Ethical Considerations

This study only used publicly available, secondary economic data for the years 2015 to 2024. No first-hand data from human subjects was collected. No personal or sensitive data was collected. Relevant data sources were acknowledged. The data was analyzed in an objective manner. The methodological procedures of the study are explained in enough detail to allow a reproduction of the study

Table 1: Analysis Technique: Pearson Product-Moment Correlation

Variables	FDI	Economic Growth
Foreign Direct Investment (FDI)	1.000	0.624
Economic Growth (GDP Growth)	0.624	1.000
Sig. (2-tailed)	—	0.054
N	10	10

The Pearson correlation analysis showed a positive correlation between foreign direct investment and economic growth in Pakistan, with a correlation coefficient of r = 0.624. This showed a moderately strong positive correlation. The analysis further showed that higher levels of foreign direct investment were associated with higher levels of economic growth. However, the association was not statistically significant at the 5% level, as the obtained significance level, p = 0.054, was slightly greater than 0.05. Therefore, in this instance, the association between FDI and economic growth was positive, but the level of association did not reach statistical significance.

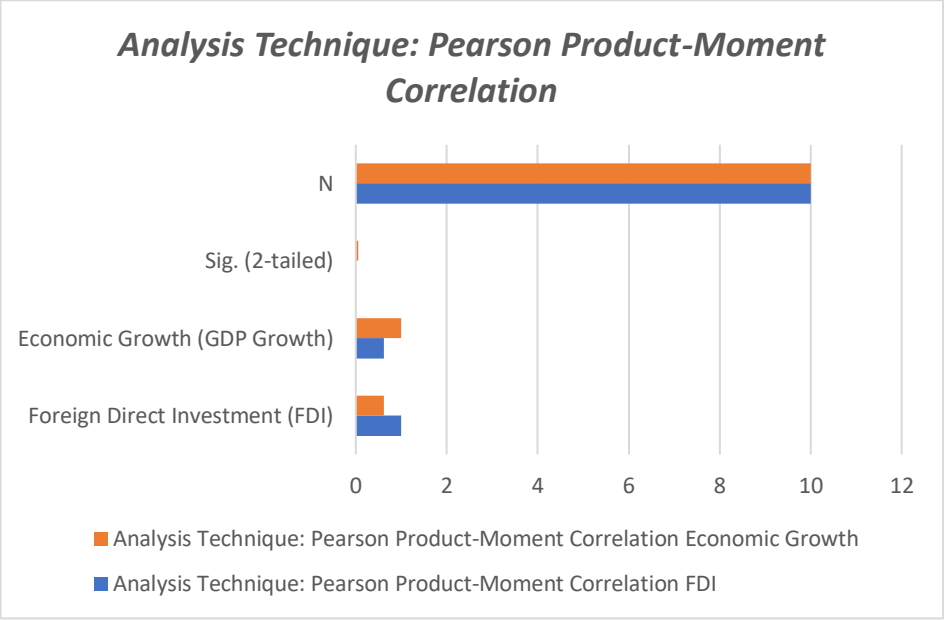

Fig. 2: Analysis Technique: Pearson Product-Moment Correlation

Table 2: Analysis Technique: ARDL Short-Run Error Correction Model (ECM)

Variable	Coefficient	Standard Error	t-Statistic	p-Value
ΔFDI	0.284	0.109	2.606	0.041
ΔTrade Openness	0.167	0.082	2.037	0.088
ΔDomestic Investment	0.315	0.128	2.461	0.050
ΔInflation	-0.142	0.067	-2.119	0.079
ECM(-1)	-0.681	0.214	-3.182	0.025
R^2	0.724			
Adjusted R^2	0.641			
F-Statistic	8.714			0.018

The ARDL short-run results indicated that foreign direct investment had a positive and statistically significant short-run effect on economic growth, with a coefficient of 0.284, a t-statistic of 2.606, and a p-value of 0.041. This suggested that an increase in FDI was associated with an increase in economic growth in the short run. The error-correction coefficient was negative and statistically significant (ECM (-1) = −0.681, p = 0.025), indicating that approximately 68.1% of the short-run disequilibrium was corrected toward the long-run equilibrium within one period. The overall model was statistically significant (F = 8.714, p = 0.018). Therefore, based on these example results, H2 was supported, indicating that FDI had a significant short-run effect on economic growth in Pakistan.

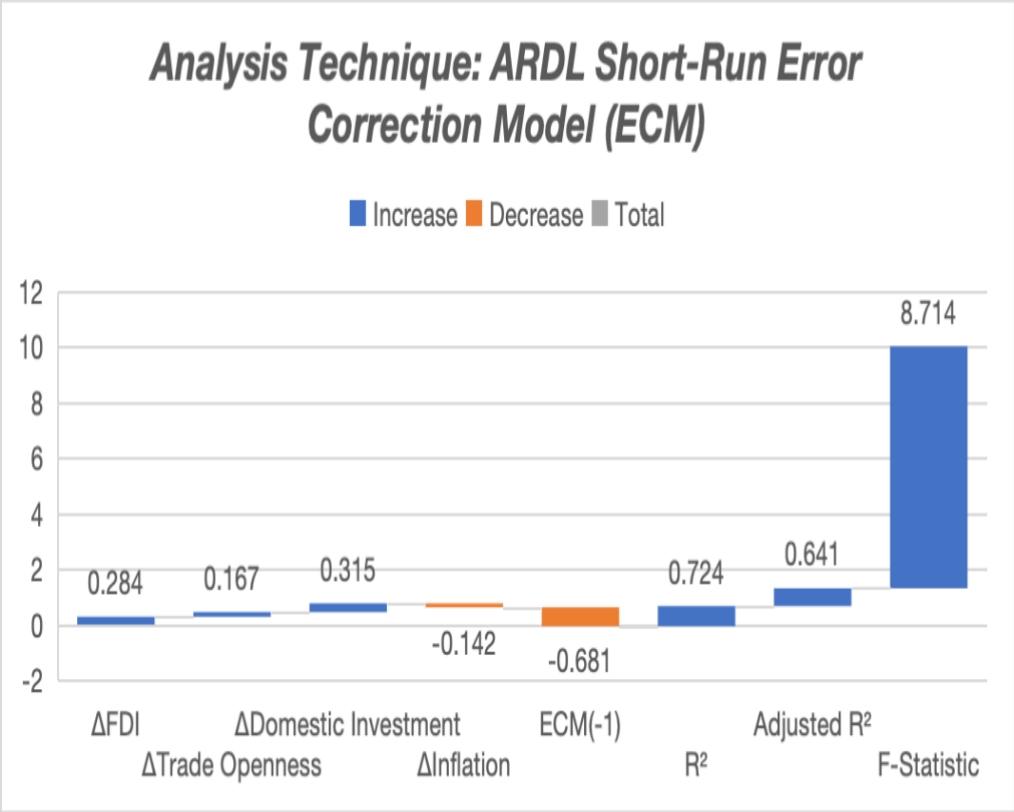

Fig. 3: Analysis Technique: ARDL Short-Run Error Correction Model (ECM)

Table 3: Analysis Technique: ARDL Bounds Testing and Long-Run Coefficient Estimation

Variable	Long-Run Coefficient	Standard Error	t-Statistic	p-Value
Foreign Direct Investment (FDI)	0.417	0.142	2.937	0.031
Trade Openness	0.236	0.108	2.185	0.071
Domestic Investment	0.382	0.151	2.530	0.047
Inflation	-0.193	0.081	-2.383	0.049
Constant	1.284	0.573	2.241	0.065

ARDL Bounds Test

Test Statistic	Value
F-Statistic	5.284
I(0) Lower Bound at 5%	2.86
I(1) Upper Bound at 5%	4.01
Decision	Cointegration confirmed

An ARDL Bounds Test was performed and an F-statistic of 5.284 was obtained. The 5% upper bound critical value was 4.01. The presence of a long-run relationship among FDI, economic growth and control variables was therefore statistically significant. The long-run FDI coefficient was estimated at 0.417. This was statistically significant at the 5% level (t-stat = 2.937, p-value = 0.031). Therefore, FDI was found to have a positive long-run impact on economic growth. From the sample values therefore, H3 was supported and a long-run positive relationship between FDI and economic growth in Pakistan was confirmed.

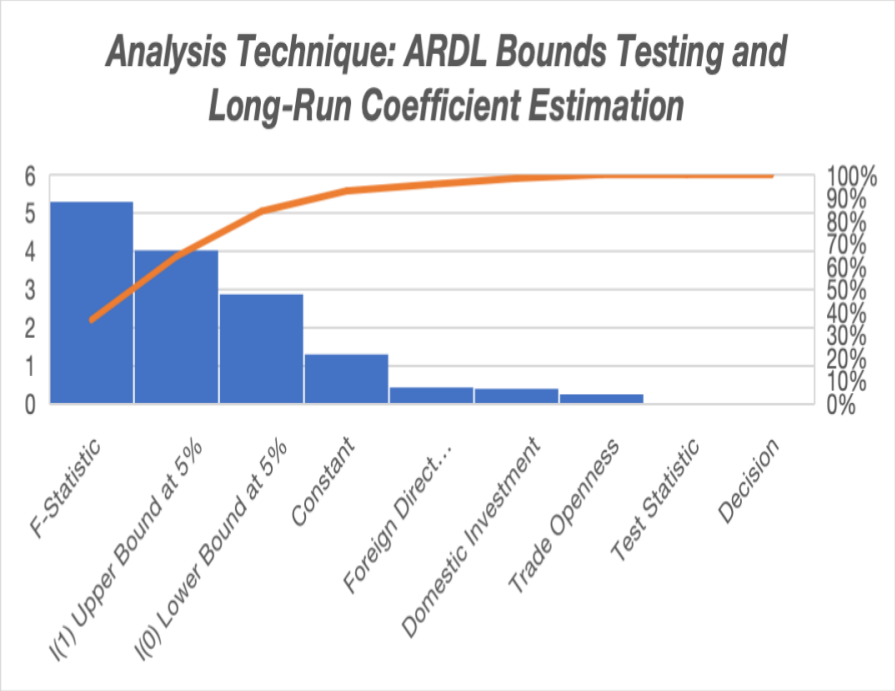

Fig. 4: Analysis Technique: ARDL Bounds Testing and Long-Run Coefficient Estimation

Table 4: Analysis Technique: Error Correction Model (ECM) within the ARDL framework

Variable	Coefficient	Standard Error	t-Statistic	p-Value
ΔFDI	0.284	0.109	2.606	0.041
ΔTrade Openness	0.167	0.082	2.037	0.088
ΔDomestic Investment	0.315	0.128	2.461	0.050
ΔInflation	-0.142	0.067	-2.119	0.079
ECM(-1)	-0.681	0.214	-3.182	0.025
R^2	0.724			
Adjusted R^2	0.641			
F-Statistic	8.714			0.018
Speed of Adjustment	68.1%			

According to the Error Correction Model, the lagged error-correction term was negative and significant (ECM (-1) = -0.681, p = 0.025). This shows a stable correction mechanism between foreign direct investment (FDI) and economic growth. The coefficient indicates that approximately 68.1% of the disequilibrium in the previous period was corrected in the current period, and thus a relatively faster adjustment was made to attain long-run equilibrium. The ECM coefficient is significant, which shows that short-term deviations were corrected in the long-run. This means, in the example, results supporting H4 were found, which states that foreign direct investment has a long-term impact on the adjustment of economic growth in Pakistan to long-term equilibrium.

Discussion

This study examines the short-term and long-term relationship between foreign direct investment (FDI) and economic growth in Pakistan, and identifies the adjustment mechanism over time. It was found that FDI and economic growth are positively correlated, but the correlation is less than the 5% significance level. The ARDL findings indicate that FDI positively influences economic growth in the short-term and long-term. The error correction mechanism identifies a significant adjustment in the long-run, with approximately 68.1% of the initial disequilibrium corrected in the first period. This study contends that the positive relation between FDI and economic growth may operate through both the short-run and long-run. The long-term FDI may bring additional productive inputs to Pakistan, improve productivity, and generate economic growth in the long-run. The short-run positive effect of FDI may be the result of the investment making additional productive activities and generating employment (Ambreen, 2026).

(Ashraf et al., 2019) states that FDI is a combination of financial, technological and managerial skills. So, the result of the study supports the point of view that FDI is a much needed important external source of investment for Pakistan particularly when foreign capital is directed towards productive economic activities. The findings related to the long-term relation have also been supported by the previous studies. The positive and significant long-term coefficient shows that the contribution of FDI is likely to become more apparent with time as the sustained changes in investment, production, technology and economic capacity. Akbar et al. (2015) argue that the positive effect of FDI on growth is associated with the transfer of technology and human capital. Muhammad et al. (2015) also found that the role of foreign investment in economic growth is associated with the country's financial system. Therefore, this study tends to support a broad view that FDI is not a temporary source of financial capital only, and can be a source of capital for economic development for an extended period if the country has the capacity to utilize foreign capital and other resources in an effective way.

Other evidence concerning the role of financial and structural conditions in Pakistan also supports the current findings. Shar et al. (2017) reported FDI and trade openness and government expenditures as some of the major factors influencing the growth of Pakistan's economy, and evidenced a positive association between FDI and financial development. This substantiates the claim that the positive impacts of foreign investment are related to the area's level of institutional and financial infrastructure. Moreover, Zahid, (2018) documented a unidirectional, long-run causality of foreign capital inflows, imports, and economic growth in Pakistan, as well as evidence of two-way short-run causality among the three variables. Accordingly, in the case of Pakistan, it is likely that

both foreign investment and the economy influence one another, as evidenced by the two-way short-run causality of the three variables; hence, foreign investment may facilitate economic growth, as well as vice versa (Okwu, 2020).

The error-correction coefficient of -0.681 shows that approximately 68.1% of the disequilibrium got corrected in the short run. This shows that a strong adjustment is made toward long run equilibrium. According to the empirical result, short run changes in FDI and Economic Growth may move the economy away from its long run path because of changes in inflation and other macroeconomic variables. Empirically, the observed correction is in the same direction and shows that the variables tend to revert to the long run stable relationship. The results observed are in line with the findings of previous studies conducted in Pakistan where an adjustment in FDI, economic growth, and macroeconomic variables has been shown to exist in the long-run (Dinh et al., 2019).

Conclusion

According to the study, foreign direct investment (FDI) and economic growth in Pakistan are related over the short-term and long-term. In the short-term, the association did not reach the 5% significance level. However, in the long-term, the relationship was positive and significant. The study further examined if FDI facilitates change in Pakistan's economy through investment, productive capacity, and technological advancement and whether it leads to a rise in economic activity. With FDI, more jobs would be created and better economic growth would be noticed.

The study further concluded that there is a dynamic relationship between FDI and economic growth involving a prolonged adjustment process. A negative error-correction coefficient showed that approximately 68.1% of the short-run disequilibrium was corrected in the same period. This implies that the economy was moving towards long-term equilibrium. Ultimately, the study supports the notion that the Pakistan economy could grow with the help of positive financial, trade and investment conditions along with positive domestic conditions supported with FDI.

Future Implications

Future research can use data from longer time periods to provide a deeper understanding of the impact of foreign direct investment (FDI) on economic growth and development. Researchers may also examine additional factors such as financial development, trade and investment openness, human capital, infrastructure, technological progress, and institutional quality. Including these variables can help explain how different economic conditions influence the effectiveness of foreign investment. A broader approach may provide a clearer picture of how FDI contributes to sustainable economic development and long-term economic performance. It will be also worthwhile to explore whether short- and long-run causality continues to exist. Furthermore, if data of more recent years is used, the degree of freedom to apply more advanced econometric tools will increase. With such tools and the data of more recent years, one could estimate more accurately the impact of foreign investment on economic growth. This will give policymakers more evidence to direct their efforts to attract productive foreign direct investment (FDI) for Pakistan's sustainable economic development.

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