

## Lingering effects of foreign resource dependency in Pakistan: Assessing gains from domestic resources

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### Abstract

**Purpose** — This study explores the asymmetric effects of FDI (Foreign Direct Investment) on economic growth in Pakistan.

**Methods** — This paper uses an Asymmetric Effects ARDL (Autoregressive Distributed Lag) model.

**Findings** — The results show that the effects of increasing and decreasing FDI are not equal. The study concludes that reducing FDI is more beneficial for economic growth, particularly in the longer horizon. It mobilizes domestic investment and promotes financial freedom while reducing the reliance on pollution-intensive multinational corporations and taps indigenous knowledge gains.

**Implications** — This study proves that self-reliance is more beneficial for the case of Pakistan.

**Originality** — The researchers and policymakers are unclear about the merits and demerits of FDI as a substitute for domestic investment. Empirical studies are majorly convinced that an increase in FDI generally merits economic growth but weighs in the Pollution Haven Hypothesis and ignores the indigenous knowledge-based domestic resource.

**Keywords** — domestic investment, pollution haven hypothesis, multinational corporations

## Introduction

Developing an economy with low purchasing power like Pakistan tends to lack the capability to save domestically. Further, the immature financial system does not motivate enough to engage people in investing activities. Because of this issue, the capital market equilibrium is stabilized using investment acquired from abroad with expectations that it will fill the domestic investment gap while transferring knowledge abroad. Several empirical studies have pointed at the growth potential of FDI (Asghar, Nasreen, & Rehman, 2011; Atique, Ahmad, Azhar, & Khan, 2004; Hunjra, Raza, & Asif, 2013; Rehman, 2016; Shahbaz, Nasreen, Abbas, & Anis, 2015).

Foreign direct investment plays an essential role in a country's economic growth. However, it is even more critical in developing countries. Foreign direct investment in one country demonstrates the interest and confidence of other countries and investors in the host country, positively related to economic growth and GDP. The country's economic, political, and social

situation is also essential to increase foreign direct investment (Pusterla & Resmini, 2007). The empirical investigation pointed out that FDI is a favorable variable that positively impacts the economy in the short and long run (Iram & Nishat, 2009; Samantha & Haiyun, 2017). Theoretically, it was expected that foreign firms might not invest because of high investment costs and unfamiliar institutional and political regimes. FDI looks for any of the three conditions proposed by Dunning (1981). Any one of these, ownership, internalization, or location conditions, enables them to decide to engage in investment (Asghar et al., 2011).

Considering the presence of theoretical benefits of FDI on growth, still, literature provides mixed or inconclusive empirical results on the effects of FDI on growth (Carkovic & Levine, 2005). Furthermore, not much emphasis has been given to whether the foreign resources are flowing at or being pulled inward by the country. Indeed, attracting FDI will accompany some costs, which country like Pakistan has to pay to sustain to attract external resources. These external resources are generically risk-averse, which means that the developing countries have to offer interest premiums to attract them. This high interest rate will harm the economy in two ways. Firstly, it will crowd out domestic investment which has indigenous knowledge. Secondly, it will increase inflation via the Fisher equation.

Hence under this premise, the foreign investment must provide extraordinary returns to negate the fall in domestic investment-based production and sustain the purchasing power where the domestic investment could have used the advantage of indigenous knowledge tapping the abundant labor resource. The second argument is that pollution-intensive industries find it heaven for countries with immature institutions like Pakistan, leading to a high inflow of FDI and increased exports. However, these industries will exploit the institutions in the longer horizon, evade tax liabilities, and unrestrictedly pollute. As a result, in the longer run, the national standard of living of the people may deteriorate, affecting growth via a fall in labor productivity (Forte & Moura, 2013). The last argument is that if the foreign investment is capital or technology-intensive, it might not create enough jobs compared to the domestic variant of business/investment venture (Jenkins, 2006; Mucuk & Demirsel, 2013).

Based on the arguments mentioned above, the present study postulates that the increase and decrease in FDI may not have an equal and opposite effect on Pakistan's economic growth. The literature available on FDI through light on its positive role in raising the pace of economic development. Not much literature is available which considers both positive and negative aspects of FDI in developing countries. The present study is an attempt to explore the asymmetric effect of FDI on the economic growth of Pakistan using the data from 1970 to 2019. This study will adhere to several implications: whether the foreign investments are dirty industries based or crowding out domestic investment.

Several studies have explored the link between FDI and GDP. Few of the significant studies are mentioned here. Awan, Khan, and uz Zaman (2011) advocated the growth effects of FDI, but the time taken by the FDI to create an impact depends on the economic conditions and national policies. First, an essential factor is the premium returns which the investor enjoys, and the second factor is that the investor retains managerial/administrative control over the venture.

While discussing the positive effects of FDI on growth, we can find several studies that have provided a causal relationship between FDI and growth (Asghar et al., 2011). However, few studies are available that advocate the insignificant effects of FDI on economic growth (Georgantopoulos & Tsamis, 2012). There is additional evidence for adverse effects in the literature. The results show that there is no strong reason between FDI and economic growth in the case of Pakistan. Pakistan's economic growth attracts foreign direct investment, which confirms the market size hypothesis. It suggests that production and its growth are the determining factors of foreign direct investment. The fact that FDI did not have an apparent positive effect on Pakistani economic development means that previous studies had reduced the positive impact of FDI on economic growth (Ashraf et al., 2019).

A study by Mencinger (2003) for European countries between 1994 – 2001 showed that an increase in FDI harmed GDP. A similar case is evident for 17 Arab countries between 1990 – 2000 (Omran & Bolbol, 2003) and 67 low developed economies (Hermes & Lensink, 2003). Further, a

time-series study related to Pakistan showed adverse effects for data taken between 1980 – 2009. A similar result is evident in the USA (Ford, Rork, & Elmslie, 2008).

The first possible reason for the adverse effects of increasing FDI is the immature institutions in developing countries like Pakistan, which lead to the pollution haven hypothesis. Several studies have confirmed the positive impact of increased FDI on environmental quality deterioration (Asghari, 2013; Shahbaz et al., 2015). Secondly, FDI inflow motivated by premium returns leads to a crowd-out effect. A sector-wise study for Uganda showed that FDI creates crowd-out in several sub-sectors (Ahmed, Ghani, Mohamad, & Derus, 2015). There are other reasons for crowd-out, like superior technology and competitiveness (Agosin & Machado, 2005; De Backer & Sleuwaegen, 2003; Wang, 2010). Lastly, Bao-shuai's (2009) study showed that FDI inflow increases inflation in the short run because of the interest premium. Lastly, Mucuk and Demirsel (2013) study use the FMOLS and DOLS model in seven developing countries. The results show that, for Argentina and Turkey, an increase in FDI increases unemployment.

A country needs FDI because it cannot generate domestic investment. Many factors coin low domestic investment, but literature is convinced that domestic investment positively affects economic growth, as suggested by the Solow Growth Model (Solow, 1956). Several empirical studies have advocated its positive effect (Afridi, 2016; Amjad & Awais, 2016). It creates the multiplier effect as per the Keynesian school of thought. In comparison, there are no leakages of surplus gained from this domestic investment going out of the country.

This study has selected banking sector development as a controlling factor in the model of FDI. This is because a supporting banking sector will promote and mobilize the saving and investment in the economy. It may remove hurdles that discourage domestic or foreign investment by creating ease and security in transactions. There is ample literature advocating the positive supply leading effect of banking sector development on economic growth (Abubakar & Gani, 2013; Hassan & Kalim, 2017).

Empirical studies are available in the debate of the positive or negative effects of FDI on economic growth. Still, most of them believe that the negative impact is because of the wrong specification of the model. This study has proposed a few theories that may explain that FDI increase could be harmful to the case of Pakistan. We are opting for the asymmetric effects ARDL model to see the impact of increasing and decreasing the portion of FDI on GDP. Hence the question set by this study is to investigate if there is an asymmetric effect of FDI on GDP in the short-run and long run.

## Methods

### Variables and Data Sources

Table 1 presents the variables used in this study with their units, transformation, and sources. The sample ranges from 1975 to 2019. The data has been collected for the reputed data repository of World Development Indicators (WDI). All the variables are transformed to a natural log to smoothen the data series while estimating the coefficients' elasticities (relative slope) (Benoit, 2011).

**Table 1.** Variables and sources

Variable (Symbol)	Units (Transformation)	Source
Gross Domestic Product (LGDP)	Per capita (Constant USD) (Natural Log)	WDI
Foreign Direct Investment (LFDI)	Inflow % of GDP (Natural Log)	WDI
Gross Capital Formation (LINV)	% of GDP (Natural Log)	WDI
Banking Sector Development (LBS)	Domestic credit to private sector % of GDP (Natural Log)	WDI

### Estimation Equation and Approach

The following equation represents the stochastic equation used by this study. Here, it is assumed that the independent variable changes are proportional to changes in the dependent variable. This proportionality is converted to equality using the constant of proportionality (slope coefficients  $\alpha_i$ ). For the data sets of more than two observations, the constant of proportionality is measured using

regression analysis. However, since the data is long while there is only one cross-section, it is expected that the data might not be fixed in repeated sampling, making variables non-stationary. This study will deploy ADF unit root tests (Dickey & Fuller, 1981) to assess the nature of non-stationarity if all variables are non-stationary at the first difference I(1). In this case, we can use the basic ECM (Engle & Granger, 1987). If they are of mixed order in nature, we will use the ARDL cointegrating bounds-based approach (Pesaran, Shin, & Smith, 2001). Lastly, this study has hypothesized that increasing and decreasing FDI could positively affect a country like Pakistan; hence, this variable is asymmetric. This study has used the asymmetric effects ARDL model (Shin, Yu, & Greenwood-Nimmo, 2014).

$$LGDP_t = \alpha_0 + \alpha_1 LFDI_t^+ + \alpha_2 LFDI_t^- + \alpha_3 LINV_t + \alpha_4 LBS_t + \varepsilon_t \quad (1)$$

Previously, several studies have used this asymmetric ARDL model using FDI and GDP separately (Kalim, Faiz, & Arshed, 2019; Ullah, Apergis, Usman, & Chishti, 2020; Yilanci, Ozgur, & Gorus, 2019). But none of them had assessed the asymmetric effects of FDI on GDP.

## Results and Discussion

Table 2 shows the descriptive statistics of the variables. Other than FDI, all variables have a mean value more significant than the standard deviation, which is under dispersed. Further, the Jarque and Bera (1987) test show that FDI is not normal. This means that for the case of Pakistan, the inflow of FDI is not stable within the selected period.

**Table 2.** Descriptive statistics

	LGDP	LINV	LFDI	LBS
Mean	6.628	2.847	-0.727	3.121
Median	6.686	2.866	-0.550	3.179
Maximum	7.088	3.030	1.299	3.394
Minimum	6.110	2.578	-4.669	2.733
Std. Dev.	0.286	0.103	1.092	0.173
Skewness	-0.312	-0.576	-1.049	-0.708
Kurtosis	2.006	2.652	5.342	2.561
Jarque-Bera	2.810	2.959	20.196	4.486
Probability	0.245	0.227	0.000	0.106
Observations	44	44	44	44

The correlation matrix presented in Table 3 reveals that gross capital formation and banking sector development negatively correlate with GDP while FDI is positively correlated with GDP. Figure 1 shows the line charts of increasing and decreasing components of FDI and GDP.

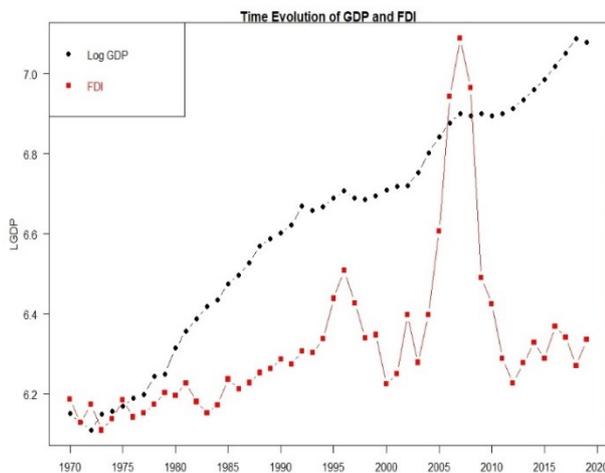
**Table 3.** Correlation matrix

	LGDP	LINV	LFDI	LBS
LGDP	1	-0.036	0.758	-0.449
LINV	-0.036	1	0.267	0.561
LFDI	0.758	0.267	1	0.001
LBS	-0.449	0.561	0.001	1

Figures 1 to 4 provide the pairwise line plots between GDP and independent variables used in the study. Figure 1 finds the time association between GDP and FDI here. We can see that every peak in FDI is associated with an increase in the GDP value as expected in theory. However, for the years after 2010, there is a fall in FDI, but still, GDP is rising. This points to the notion that in recent years FDI is more harmful to Pakistan.

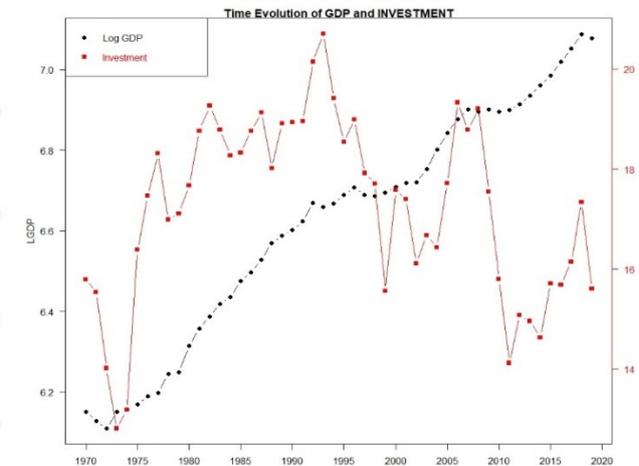
Figure 2 provides a time association between GDP and Domestic Investment. Here we could see positive association till the year 1995 beyond there are mixed patterns. Figure 3 shows a positive association between labor resources and GDP for the case of Pakistan. In Figure 4, we

can observe that the increase in the money supply indicates that banking sector development is coined with an increase in GDP while a decrease in the money supply is matched with the slowing of GDP.



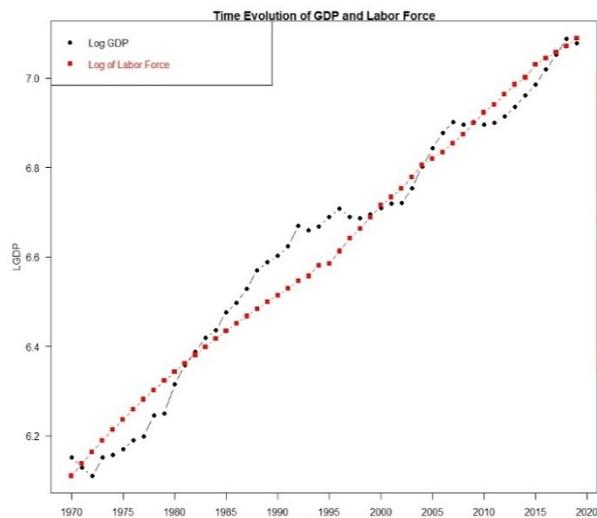
Source: Self Constructed using WDI data

Figure 1. GDP and FDI Line Chart



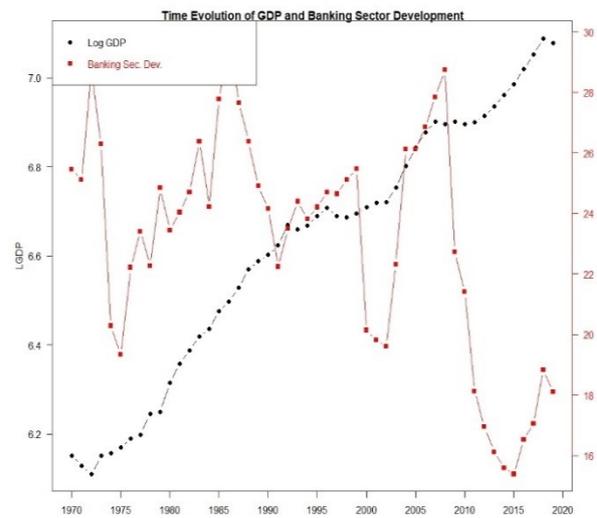
Source: Self Constructed using WDI data

Figure 2. GDP and Domestic Investment Line Chart



Source: Self Constructed using WDI data

Figure 3. GDP and Labor Force Line Chart



Source: Self Constructed using WDI data

Figure 4. GDP and Banking Development Line Chart

Table 4. Time-series: ADF Unit Root Tests

	In-Level		At-First difference	
	Test	Prob	Test	Prob
LGDP	-1.043	0.730	-5.502	0.000
LFDI	-3.241	0.024	-13.027	0.000
LINV	-2.185	0.214	-6.068	0.000
LBS	-1.709	0.421	-5.884	0.000

Table 4 provides the unit root test results. The specification of the unit root tests is determined using the line chart of the series. It can be seen that other than the FDI, all variables are non-stationary in-level, making them I(1), while the series of FDI is I(0). This ADF test confirms that the variables are in a mixed order of integration, for which estimation ARDL cointegrating bounds is necessary. In the overall unrestricted ARDL model, the proposed variables

explain 99% of the variation in the dependent variable. Further, the lag specification for LGDP, LFDI\_POS, LFDI\_NEG, LINV, and LBS are 3, 0, 4, 3, and 1, respectively.

**Table 5.** ARDL Bound Test

F Bounds Statistic	6.957	
Upper bound critical values		
	5%	4.01
	2.5%	4.49
	1%	5.06

Table 5 reports the ARDL bounds test. The test value is 6.957, higher than the upper bound critical value of 5.06 at a 1% level. This confirms a significant level of Cointegration between the dependent and independent variables in which FDI is asymmetric.

Table 6 reports the long-run and short-run coefficients of the model. Firstly, the Cointegration(-1) is negative and significant, which means that the model is converging (Banerjee et al., 1998). If there is a 1% deviation in the long-run equilibrium, the model's dependent variable will adjust to 0.37% each period.

Thus, restoring to a new equilibrium takes 2.7 years. This confirms that we can use this model for policy intervention. Further, in the short run, banking sector development, increasing FDI, and domestic investment have a positive effect on GDP. Since the increasing FDI is significant in the short run while decreasing FDI is insignificant, there is a hint of asymmetry in the short run.

**Table 6.** Short Run Model Estimation

(Dependent Variables:  $\Delta$ LGDP; Lag order: 3, 0, 4, 3, 1; Observations 45)

Variable	Coefficient	Prob.
$\Delta$ LGDP -1	-0.204	0.198
$\Delta$ LGDP -2	-0.237	0.134
$\Delta$ LFDI_POS	0.014*	0.082
$\Delta$ LFDI_NEG	-0.006	0.448
$\Delta$ LFDI_NEG -1	0.025**	0.024
$\Delta$ LFDI_NEG -2	-0.027**	0.023
$\Delta$ LFDI_NEG-3	0.031***	0.002
$\Delta$ INV	0.200***	0.001
$\Delta$ INV -1	0.042	0.377
$\Delta$ INV -2	-0.099***	0.009
$\Delta$ LBS	0.063*	0.067
Cointegration Eq. -1	-0.375***	0.000

**Table 7.** Long-Run Model Estimation

(Dependent Variables: LGDP)

Variable	Coefficient	Prob.
LFDI_POS	0.038**	0.030
LFDI_NEG	-0.080***	0.002
LINV	0.497***	0.000
LBS	0.029	0.733
Constant	4.313***	0.000

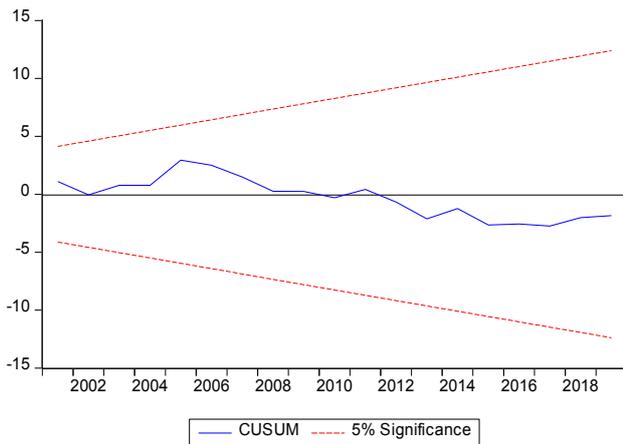
\*\*\*, \*\*, \* denote significance at 1%, 5%, and 10%, respectively.

In the long-run estimation result, shown in Table 7, if there is a 1% increase in domestic investment, there is a 0.497% increase in GDP on average. In comparison, the effect of banking sector development is insignificant. For the case of increased FDI, a 1% increase will lead to a 0.037% increase in GDP. For decreasing FDI, a 1% increase will lead to a 0.08% decrease in GDP. The coefficients are not opposed to each other, which hints long run asymmetry.

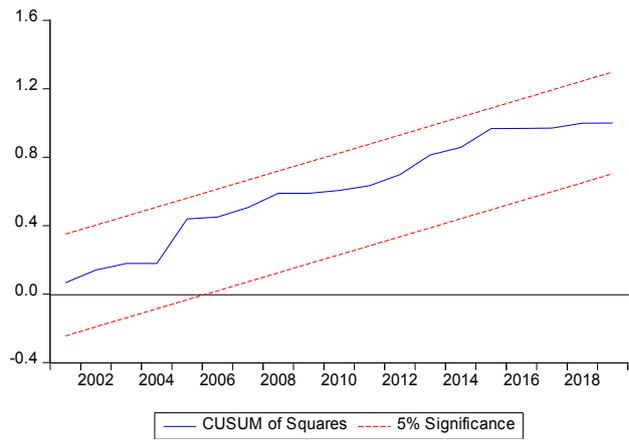
Table 8 provides the diagnostic tests. Since all tests are insignificant, it confirms that the model is normally distributed, independent, homoscedastic, linear, and stable. Figures 5 and 6 demonstrate that the coefficients generated from this specification are robust to any known or unknown structural break within the selected period.

**Table 8.** ARDL Diagnostic Tests

Diagnostic Tests	Test Statistic	Probability
Jarque-Bera	0.898	0.638
Breusch-Godfrey Serial Correlation	0.337	0.716
Breusch-Pagan-Godfrey Heteroscedasticity	0.680	0.782
Ramsey RESET	5.625	0.524

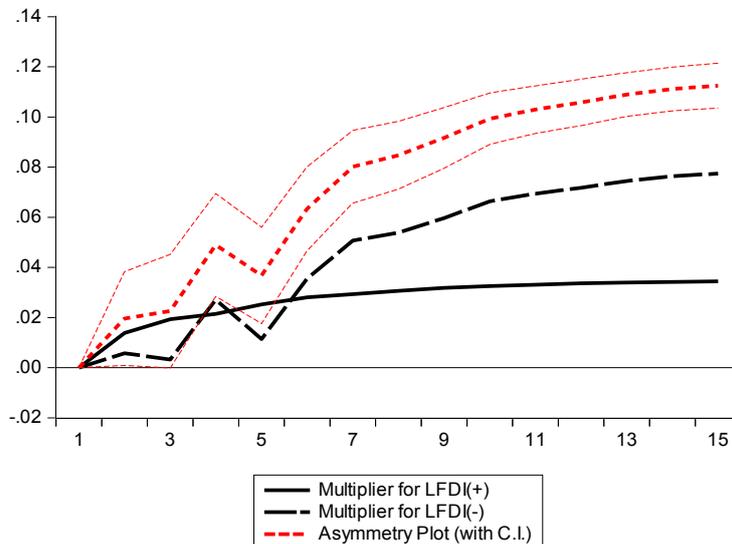


**Figure 5.** CUSUM



**Figure 6.** CUSUM Squared

Figure 7 reports the degree of asymmetry in the model. It shows that there is an increase in GDP for the case 1% shock from increasing FDI. However, that positive effect does not increase more than 0.03%. For 1% shock from decreasing FDI, there is an increase in GDP. This effect grows over time to about 0.07% of GDP. The red line shows the degree of asymmetry. Here we can see that with time lags, the asymmetry is increasing. This chart confirms the hypothesis proposed by this study that both the increasing and decreasing FDI have a positive effect on the case of Pakistan. And since FDI exploits the Pakistani economy, reducing FDI, although volatile initially, tend to have a higher positive effect on the economy.



**Figure 7.** Asymmetric Effects Graph

## Conclusion

The inflow of foreign capital in the form of FDI can be a friend or a foe. Most of the studies related the FDI inflow to an increase in technology, skills, and growth. Still, they are referring to standard macroeconomic theories that are related to developed economies. This study postulated that although FDI increases can be beneficial, the positive effect's size depends on many factors. Countries like Pakistan must ensure that these factors are in their favor; otherwise, decreasing FDI may benefit them.

According to this study, some countries conveniently resort to debt or foreign resources rather than raising their domestic resources from savings. Further, their immature institutions and unstable economy pave the way for FDI tagged with high premium and exploiting the pollution haven hypothesis. This, in return, concludes that the surplus from FDI in the form of better technology, employment, and exports is reduced because of the crowding-out effect, inflation, and deteriorated environment quality. Now the net positive effect depends on how clean, efficient, and cost-effective the FDI venture is.

This study has used the asymmetric effects ARDL model to assess the differences in the effect of increasing and decreasing FDI on GDP for the case of Pakistan. The data was collected from 1970 to 2019. The post regression diagnostics and the CUSUM/CUSUMsq graphs show that the model is stable in response to unknown structural shocks and free of any assumption violation-related issues for this time frame. The estimates showed undoubtedly a positive effect of increasing FDI, but this positive effect stops rising after seven years. While for the case of decreasing FDI, we have a volatile/cyclic movement of positive effects till seven years where the economy is by force resorting to national resources. After seven years, we can see an increasingly positive impact which is more than the increasing FDI. This asymmetry points out that for a developing economy like Pakistan, FDI inflow was because of the higher interest premium and the loopholes in the regulations they can exploit. We must develop indigenous resources to increase our financial freedom and reap a higher surplus from the national investment ventures.

Other developing economies can use this model to assess if the current inflow of FDI is beneficial or a burden for their economy. Policymakers must find new insights via this model to align their policies in managing exploitive foreign resources.

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