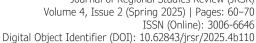
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RESEARCH ARTICLE

Tracing the Joint Effect of FDI and Ease of Doing Business on Pakistan's Industry Value Added

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Abstract: Foreign Direct Investment (FDI) and Ease of Doing Business (EDB) are the integral components to fasten the industrial progress of the developing and developed economies. This study is carried out to find the joint impact of FDI and EDB on the industrial value added of Pakistan. Moreover, the internal factors which are foresighted to distress industrial growth such as domestic credit to private sector and access to electricity are also traced for their imprints on industrial value added. The time series analysis was carried out with the secondary data from 1980 to 2023. The Autoregressive Distributed Lag (ARDL) model is incorporated to find the regression estimates. The results confirm significant and positive long run impacts of these variables on industrial value added of Pakistan. The joint effect of FDI and EDB is signified for long run impacts. The short run findings are evident for negative effect on industry valued added. As a policy norm, the state government needs to in-focus the long run policy initiatives to facilitate FDI and EDB together with a protracted base of credit to private sector in line with accessibility of electricity for narrating a healthier industrial progress.

Keywords: FDI, Ease of Doing Business, Domestic Credit to Private Sector, ARDL, Pakistan

Introduction

FDI and EDB are important for incredible industrial outlook and a progressive economy. Such components are vital as far as the macroeconomic upheavals are concerned. The foreign investments are carried out in the tangible assets of the recipient country including the plant, machinery, and buildings that are responsive components to trigger the industry value added (UNCTAD, 2021). The terms EDB is referred to the simplicity and efficiency of processes and regulations involved at the stages of startup, plant operations, and the growth of the business within the particular state. EDB includes the license obtaining, the access to credit, contract enforcements, tax system, and international trade base.

Pakistan is globally ranked at 46th when considering the nominal GDP (World Bank, 2024). The country with the macroeconomic indicators resting at 232 million of the individuals-ranked at 138th position in terms of GDP at purchasing power parity with a current per capita income of USD5377 and a consumer price index of with a persistent stay in double digits in past years. Moreover, having unemployment rate of 7 percent during 2023 that is the total number of individuals who are jobless amounting to 17.4 million needs a thorough insight of EDB and its impact on the industrial sector which contributes to over 20 percent in the annual GDP.

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When analyzing the factors which influence the business climate in Pakistan, the access to electricity, domestic credit to the private sector, import and export of goods and services are the key factors to be viewed. Furthermore, on the domestic front, political culture, constitutional disputes, democratic setup, and economic challenges shift the challenges of business doing to the unprecedented level of difficulties and policy finalization. Table 1 reports that Pakistan is ranked at 108th number out of 190 world economies in terms of EDB (World Bank, 2024). However, this rank has got improved from 136th which was recorded in 2018. The averaged EDB score has remained at 117.7 since 2008 to 2019. Meanwhile, the statistics of EDB have been partly away from the massive fluctuations of 148th and 85th position in 2015 and 2009, respectively.

Table 1Score of Ease of Doing Business in Pakistan

Year	Ease of Doing Business
2008	88
2009	85
2010	96
2011	105
2012	106
2013	110
2014	136
2015	148
2016	144
2017	147
2018	136
2019	108

Source: The World Bank, 2023

This study is novel because of the dynamics of holding the objective of examining the combined effects of important growth components of industry like FDI and EDB and the domestic credit to private sector along with the availability of electricity. The country who strives to reach a reasonable and sustainable economic growth and is reliant upon an industry as one of the dominant sources of GDP holds a position to be analyzed for any significant affectation of FDI and EDB at the industrial upfront.

This study is organized in a way that Section 1 is allocated for the Introduction of the Study. And Literature Review is given in Section 2. The Methodology is discussed in Section 3. Whereas, Section 4 and Section 5 are rendered for the Results and Discussions and Conclusion and Policy Recommendations, respectively.

Literature Review

The literature highlights the significance of funds' allocation in terms of FDI for the better industrial stance (Obstfeld, 1998; Fischer, 1998; Summers, 2000; Obstfeld & Rogoff, 1994; Coe & Helpman, 1995).

However, the impacts of FDI are not unidirectional for always. They are often meek or negative as far as the economic growth is in a question (Haddad & Harrison, 1993; Singh, 1992; Caves, 1974; Agosin & Mayer, 2000). FDI is most effective when the technological innovations are adaptable by the host country (Fauzel et al., 2015; Borensztein et al., 1998; Bengoa & Sanchez-Rob0les, 2003). To Mehmood et al. (2025a; 2025b) and Mehmood (2023), Pakistan relies upon foreign capital in terms of FDI for solving macroeconomic upsets.

Industrial growth and developments are traced by Ali et al. (2024), Adegbite and Ayadi (2011), Sen (2008) as positively effecting industrial stance. In this regard, political stability, law and order, and governance are the crucial sides to alter the FDI led impacts (Suleiman et al., 2015; Mehmood et al., 2021).

The fact is that the EDB is analyzed in varied lens. In the empirical literature foremost relationship of EDB and FDI is found to be under the consideration of the empirics.

The FDI and EDB are evaluated by Rehman et al. (2024). According to the research, the opportunities from the initiatives like China Pakistan Economic Corridor (CPEC) are analyzed alongside the threats from the economic instability and political unrest (The Friedrich Naumann Foundation, 2017; European Commission, 2017). Therefore, to Rehman et al. (2024), FDI and EDB are sensitive to the internal state of position of the host country. Not only the FDI is an independently opted variable, rather Xu et al. (2023) found EDB causing the FDI inflows to be professed in the recipient country.

Hossain et al. (2018) analyzed impact of EDB on inward FDI for 177 countries. The conclusion was drawn that; EDB is positive in its effect on FDI. EDB and FDI remained a source of attention of the empirics such as Morris and Aziz, (2011), Olival (2012), Corcoran and Gillanders (2015), Shahadan et al. (2014), Ani (2015), Akame et al. (2016), and Mahuni and Bonga (2017).

Similarly, Shah (2021) conducted research on 189 world economies. The research revealed the long run relationship among FDI, economic growth, and EDB. Messaoud and Teheni (2014), Divanbeigi and Ramalho (2015) evaluated economic growth-related impacts of EDB. These panel data research concluded long run relationship of the two. Therefore, economic growth is curable at the back of EDB (Hanusch, 2012).

According to the panel data research findings of Xu et al. (2023), EDB does affect FDI however, the developing and developed countries do not record same trend of results of EBD on FDI. Xu et al. (2023) mentioned that EDB rests upon; business start-ups, credit availability, dealing with the contract permits, protection of minority investors, electricity access, tax payables, trading at the borders, contract enforcements, and registration of the properties (Rogge & Archer, 2021).

Industrial growth-related variables are explored by the empirics like Iweama et al. (2021). For better industrial stance and FDI, undisrupted electricity supply is inevitable (Ologundudu, 2015). On the other hand, Gulyani (2001) highlighted transportation as a major factor to affect industrial competitiveness. Meanwhile FDI and EDB are crucial for the industrial progress and FDI rests upon EDB (Iweama et al., 2021). The study concluded transportation, security, and power supply as the dimensions of EDB.

In the recent, Chizema et al. (2025) positioned to locate the EDB led FDI towards the Southeast Asia. The research technique of Fully Modified Ordinary Least Square on the panel of Southeast Asian countries was run. The results indicated substantial correlation between FDI and the constructs of EDB such as contract enforcement, investors' protection, tax compliances, and the GDP per capital. Similar findings were recorded by Mahuni and Bonga (2017), Mendoza et al. (2015), and Narayan (2014).

A precise glance of the past literature encourages to know that; a fewer amount of literature is found in locating the joint effects of FDI and EDB on the industrial value added, particularly in Pakistan. This study, therefore, finds its justification to filling the literature gap through this route of findings.

Methodology

Data and Description of Variables

The objective of this research is to find the effects of FDI and EDB on the industrial value added of Pakistan. For the analyses, secondary time series data is used. The length of the data is of 43 years since 1980 to 2023. The World Bank Development Indicators and Trading Economics are the data domain relied upon for the data collection.

Table 2Descriptions of the Variables

Variables	Notation	Description	Source of Data
Foreign Direct Investment	FDI	Foreign direct investment, net inflows (% of GDP)	World Bank Development Indictors
Ease of Doing Business	EDB	Ease of Doing Business is based upon; access to electricity, domestic credit to private sector, imports and exports of goods and services.	Index (Principal Component Analysis)
Access to Electricity	AET	Access to electricity as a % of total population	Trading Economics
Domestic Credit to Private Sector	DCPS	Domestic credit to private sector by banks (% of GDP)	World Bank Development Indictors
Exports of Goods & Services	EGS	Exports of goods and services (current LCU)	World Bank Development Indictors
Imports of Goods & Services	IGS	Imports of goods and services (current LCU)	World Bank Development Indictors
Industry Value Added	IND	Industry (including construction), value added (annual % growth)	World Bank Development Indictors

Model Specification

The linear form of the model to meet the objective of the study is given in Eq. [1]

$$IN_{t} = \beta_{0} + \beta_{1}FDI_{t} \times EDB_{t} + \beta_{2}AET_{t} + \beta_{3}DCPS_{t} + \beta_{4}EGS_{t} + \beta_{5}IGS_{t} + \mu_{t}$$
[1]

Where β_0 is the intercept of the model and μ_i is the error term.

The requirement for the application of the ARDL model is that; series must be stationary at I (0), I (1), or a combination of but not of I (2). The ARDL technique is suitable due to its applicability on the series of varied states of stationarity. Moreover, ARDL is advantageous over conventional regression techniques of Johansen Cointegration and Engle and Granger (Mehmood et al., 2025a, 2025b).

The unrestricted, long run, and short run ARDL models are shown in Eq. [2], Eq. [3], and Eq. [4], respectively.

$$\begin{split} \Delta IN_i &= \beta_0 + \beta_1 IN_{t-1} + \beta_2 FDI_{t-1} \times EDB_{t-1} + \beta_3 AET_{t-1} + \beta_4 DCPS_{t-1} + \beta_5 EGS_{t-1} + \beta_6 IGS_{t-1} + \\ \sum_{i=1}^p \partial_1 \Delta IN_{t-i} + \sum_{i=1}^q \partial_2 \Delta FDI_{t-i} \times EDB_{t-i} + \sum_{i=1}^q \partial_3 \Delta AET_{t-i} + \sum_{i=1}^q \partial_4 \Delta DCPS_{t-i} + \sum_{i=1}^q \partial_5 \Delta EGS_{t-i} + \\ \sum_{i=1}^q \partial_6 \Delta IGS_{t-i} + \mu_t \end{split}$$

Where Δ signifies the difference operator, the $\beta's$ are the model's intercept and the coefficients of variables in unrestricted ARDL model. The p and q are the lag orders of ARDL. The ∂_i are the coefficients of short run.

The long run coefficient estimation is given below in Eq. [3]

$$\Delta IN_i = \beta_0 + \beta_1 IN_{t-i} + \beta_2 FDI_{t-i} \times EDB_{t-i} + \beta_3 AET_{t-i} + \beta_4 DCPS_{t-i} + \beta_5 EGS_{t-i} + \beta_6 IGS_{t-i} + \mu_t$$
 [3] The error correction form of ARDL is specified in Eq. [4].

$$\Delta IN_{i} = \sum_{i=1}^{p} \partial_{1} \Delta IN_{t-i} + \sum_{i=1}^{q} \partial_{2} \Delta FDI_{t-i} \times EDB_{t-i} + \sum_{i=1}^{q} \partial_{3} \Delta AET_{t-i} + \sum_{i=1}^{q} \partial_{4} \Delta DCPS_{t-i} + \sum_{i=1}^{q} \partial_{5} \Delta EGS_{t-i} + \sum_{i=1}^{q} \partial_{6} \Delta IGS_{t-i} + \partial ECM_{t-1} + \mu_{t}$$
 [4]

The ∂ is a representation of a speed of adjustment for a specific residual of ECM. The long run relationships exists if a coefficient of ECM is significant and negative in sign.

Diagnostic Checks

The diagnostics are performed to discover the stability and legitimacy of the estimates. The diagnostics are performed for Breusch-Godfrey serial correlation (LM Test). In this test, if the chi-square value is greater than 0.05, it confirms that there's no serial correlation and vice versa.

Similarly, for a heteroskedasticity inspection, the probability of chi-square value must be higher than 0.05 and if vice versa, the series is said to be homoscedastic (Wang et al., 2021). Also, Cumulative Sum of Recursive Residuals (CUSUM) and CUSUM squared are explored for the stability of the results. If the series diagram shows the trend line to remain within the boundaries at 5 percent significance level, the parameters are said to be according to the requirement and are stable in structure and otherwise true (Zaman et al., 2022). The Ramsay RESET Test and Jarque Bera Test of correctly specified model and the issue of abnormality of residuals are checked for proving reliability of regression results.

Results and Discussions

The results are discussed in this section. At the prelim, descriptive statistics are discussed in Table 3.

Table 3 *Descriptive Statistics*

Variables	IN	FDI	EDB	AET	DCPS	EGS	IGS
Mean	55.6	0.79	1.12	73.7	20.7	14007	248252
Maximum	17.2	3.04	5.07	95.2	29.7	702613	1499186
Minimum	-5.8	0.10	-2.29	49.4	13.8	2948.5	5457.8
Std. Dev.	3.1	0.65	1.89	14.5	4.55	165574	335452.9
Skewness	-0.28	2.15	0.77	-0.04	-0.09	1.41	1.78
Kurtosis	4.9	7.41	2.61	1.72	1.74	4.60	6.11
Jarque-Bera	6.4	68.2	4.5	2.92	2.89	18.97	40.24
Probability	0.04	0.00	0.10	0.23	0.23	0.000076	0.0000

The descriptive statistics ascertain IN, AET, EGS, IGS, and DCPS to having a wider dispersion from the mean value. However, FDI is quite consistent in flow thus the mean value is less different from that of the standard deviation. In case of EDB, the index value range is also similar in pose like that of FDI. Moreover, EGS, EDB, and IGS are positively skewed and IN, EGS, IGS, and FDI are leptokurtic distribution, having heavier tails, and a sharper peak compared to a normal distribution. This means the data has a greater tendency to produce extreme values.

The stationarity analyses are represented by Table 4. The findings confirm that the series are integrated of order I (0) or I (1). Therefore, usage of ARDL is justifiable (Mehmood, 2025a, 2025b).

Table 4 *Stationarity Test Results*

Variables	Test Statistics (At 5% level of significance)	Augmented Dickey Fuller test statistic (At Level)	Augmented Dickey Fuller test statistic (At 1st Difference)
IN	-2.935001	0.0001	0.0000
FDI	-2.935001	0.0012	0.0409
EDB	-2.935001	1.0000	0.0286
AET	-2.935001	0.6972	0.0000
DCPS	-3.596616	0.0442	0.0000
EGS	-3.544284	0.0342	0.0063
IGS	-3.004861	0.0542	0.0082

The Bound Test results are given in Table 5.

Table 5 *Bound Test*

Test Statistic			F-statistic	
Value			5.720742	
k			5	
Significance	10%	5%	2.5%	1%
I (0) Bound	2.08	2.39	2.7	3.06
I (1) Bound	3	3.38	3.73	4.15

The findings of Bound Test authenticate the existence of cointegration on the unrestricted ARDL model, given in Eq. [2]. Computed F-statistic is significant at 5 percent and is greater than the table value at I (1). The long run coefficient is measured with ARDL model run at Eq. [3]. The results are published in Table 6.

Table 6 *Lona Run ARDL Results*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI×EDB	4.233418	0.938379	4.511417	0.0002
AET	0.054055	0.060229	0.897484	0.3792
DCPS	0.255786	0.148360	1.724091	0.0987
EGS	-0.001448	0.001919	-0.754530	0.4585
IGS	-0.001917	0.000955	-2.006960	0.0572
С	1.924983	5.821938	0.330643	0.7440

Long run results conclude that FDI together with EDB cause to swell IND at a significant level. The one unit rise in FDI×EDB increases industrial value added by 4.23 units thus go in line with the theorists and empirics (McKinnon, 1973; Solow, 1956; Shaw, 1973; Fischer, 1998; Mehmood, 2023). Though FDI alone can cause to deteriorate development aspect of local firms, as portrayed by Caves (1974), Haddad and Harrison (1993), and Agosin and Mayer (2000) but the significance of EDB as highlighted by Chizema et al. (2025), Iwema et al. (2021), Xu et al. (2023), and Rehman et al. (2024) when analyzed for the combined effect with FDI cause industrial value added to boost up. The coefficient of DCPS is also significant and positive. Consequently, it is settled that release of credit to private sector expressly for the expansion of production, technology updating, and the location of a high scale of operation boosts the industrial growth. Access to credit is a vital driver for an industry which allows the manufacturers to mitigate the financial restraints and hasten in the race of industrial evolution.

The coefficient of IGS is negative however, the impact is very minute. Table 7 renders the information about the short run coefficients' estimation. The impact of IN at first difference is significant and positive. Most of the effects are traced in-negatively towards the industry value added. This signifies that the positive state of being are recordable in long run time. Impact of AET, EGS are negative too. However, mixed effects are traced in case of IGS. As far as the coefficient of ECM is concerned. It is significant, correctly signed, but lesser than the designated range thus show oscillatory convergence (Mehmood et al., 2024).

Table 7Short Run ARDL Results

Dependent Variable (IN)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IN (-1))	0.418605	0.162029	2.583525	0.0170
D(FDI×EDB)	-1.243379	1.625284	-0.765023	0.4524
D(FDI×EDB (-1))	-3.622342	1.477724	-2.451298	0.0226
D(FDI×EDB (-2))	-2.854637	1.531365	-1.864113	0.0757
D(AET)	-0.665400	0.326960	-2.035113	0.0541
D(AET (-1))	-0.444869	0.295465	-1.505657	0.1464
D(AET (-2))	-0.912519	0.318230	-2.867486	0.0089
D(DCPS)	0.337275	0.259451	1.299957	0.2071
D(EGS)	-0.016297	0.004684	-3.478847	0.0021
D(IGS)	0.009438	0.001677	5.629166	0.0000
D(IGS (-1))	0.003039	0.002225	1.365974	0.1857
D(IGS (-2))	0.008053	0.001904	4.229637	0.0003
ECM (-1)	-1.696461	0.245632	-6.906523	0.0000

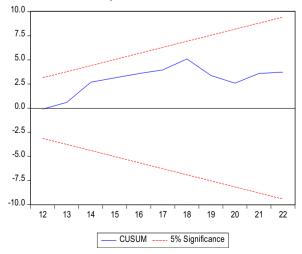
The sensitivity analyses are run to assure the authenticity of ARDL estimates. The results are given in Table 8.

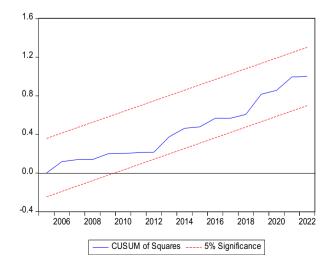
Table 9 *Diagnostic Analyses*

Test	Statistics (Prob. Chi-Square)	Conclusion
Breusch-Godfrey Serial Correlation LM Test	0.11	No serial correlation
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.66	No issue of heteroskedasticity
Ramsey RESET Test	0.31	Model is correctly specified
Jarque-Bera	0.11	Residuals are normally distributed

Finally, the CUSUM and CUSUM squared results are represented in Figure 1. The analyses conclude the stable regression estimates with structural stability.

Figure 1 *CUSUM-CUSUM Squared*





Conclusions and Policy Suggestions

This study was initiated to trace out the joint effect of FDI and EDB on the industry value added of Pakistan. For the analyses, the secondary time series data was gathered for the year 1980 to 2023. The methodology of ARDL gave the results that the joint effect of FDI and EDB is significant and positive on the industrial value added of Pakistan. Therefore, the long-term policy making by the stake holders can focus upon these two variables for a fruitful industrial output at the back of FDI and EDB. Such significant effects can erase the short-lived negative effects of FDI and EDB on the industry since the policy options are looked towards the long-term impact but not the short run. As a policy option, the government of Pakistan needs to host the policies at the external and internal front altogether. Meaning that the former is to be designed to cater the weighty flow of foreign capital in terms of FDI and the later in respect of taking care of the variables like domestic credit to private sector, exports, imports, and access to electricity which are the construct of EDB in this study. Doing that so can assist industrial growth to be reckoned without any rebuke.

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