



Examining the Moderating Role of Ease of doing Business with Foreign Restrictions on Foreign Direct Investment

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ABSTRACT

Foreign direct investment is crucial for the development through the creation of new jobs. Sometimes, the massive flow of foreign investment creates many challenges if it needs to be properly managed. The present study examines the moderating role of Ease of Doing Business (EDB) with aggregated and disaggregated FDI restrictions on FDI inflows. The panel data from 2003 to 2022 is collected from OECD and WDI databases. The empirical results are estimated using the Panel Quantile regression. It shows that all types of restriction propose an inverted U-shaped relationship to determine the FDI inflows in OECD countries. EDB is used as the moderator, shifting the turning point to the left side of the inverted U-shaped curve. In the case of non-OECD countries, most types of restrictions show a U-shaped relationship to determine the FDI inflows. EDB is also used as the moderator in this case, shifting the tuning point to the right side of the U-shaped curve. Both results show that EDB significantly reduces the FDI restrictions and increases FDI inflows. The countries should pay special attention to increasing the ease of business indicators.

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1. Introduction

In the age of globalization, several countries impose various kinds of restrictions to navigate the complex dynamics of interconnected economies and cultures. These restrictions often emerge as responses to the challenges posed by increased cross-border interactions (Dhingra, Freeman, & Huang, 2023). Several countries impose restrictions to protect the national security, regulate economic activities, or safeguard the public health. Sometimes, trade restrictions help mitigate the threats of terrorism and infectious diseases and address economic challenges (Hamisi, Dai, & Ibrahim, 2023). Several countries manage the flow of goods and services to implement international agreements, trade relationships, and protection of local industries (Mariotti, 2023). Furthermore, some countries also impose restrictions to ensure political stability and protect geographical boundaries. For this purpose, countries establish stringent visa and border control policies to manage the movement of people and address issues related to job markets and social integration (Schultz, Lutz, & Simon, 2021). This study explores the determinants of FDI inflows, including different FDI restrictiveness policies. Usually, the countries impose FDI restrictions to protect their economic and national interest. One key reason for restrictions to safeguard national security concerns is that certain industries like defense and other critical infrastructure are deemed sensitive. The key aim of the countries' governments is to prevent foreign entities from influencing that compromise national security (Yoon & Ko, 2024).

FDI restrictions are also used to protect domestic industries from foreign competition and promote economic efficiency. The countries fear that unrestricted FDI will lead to the dominance of multinational corporations and erode the country's economic autonomy. The countries impose different restrictions in different sectors to maintain the balance, ensuring domestic industries

can contribute to the overall economic development (Zekos, 2023). Several studies highlighted that FDI restrictions decline FDI inflows (Ghosh, Syntetos, & Wang, 2012; Zongo, 2022). Ease of trade between countries is also seen as an essential regulatory aspect. FDI and ease of trade are inextricably connected factors. Ports and airports that provide effective cargo services attract more foreign direct investment. More FDI investment decisions are influenced by a convenient supply chain across many nations and the availability of transportation to carry completed goods across borders (Morris & Aziz, 2011). World Bank (2015) developed the ease of doing business (EDB) indicator to measure the best performance of doing business in each country. Its score ranges between 0 and 100. For example, Armenia's EDB score was 75.79 in 2020, suggesting that Armenia is 24.20 points away from the top regulatory performance countries. Figures 1 and 2 show the score of EDB, and it is observed that in OECD countries, EDB scores an average of 75, showing higher performance, while in non-OECD countries, it is near 50, representing lower performance.

Figure 1: Ease of doing business (EDB) of OECD countries of 2022

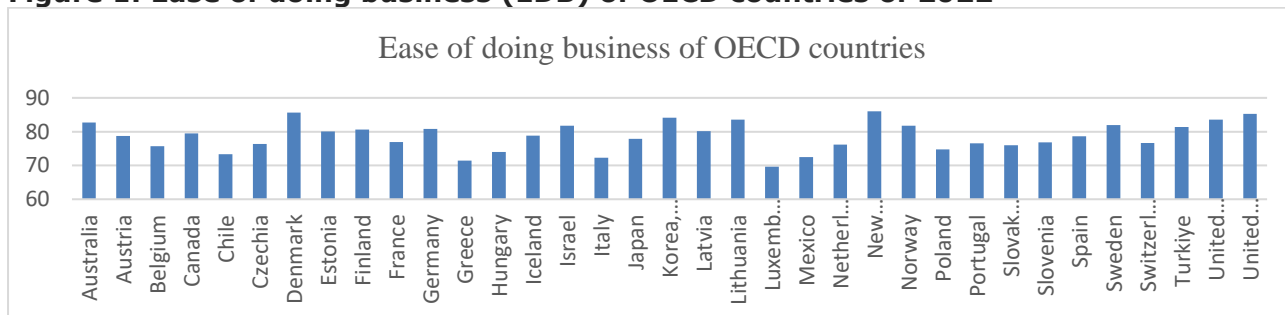
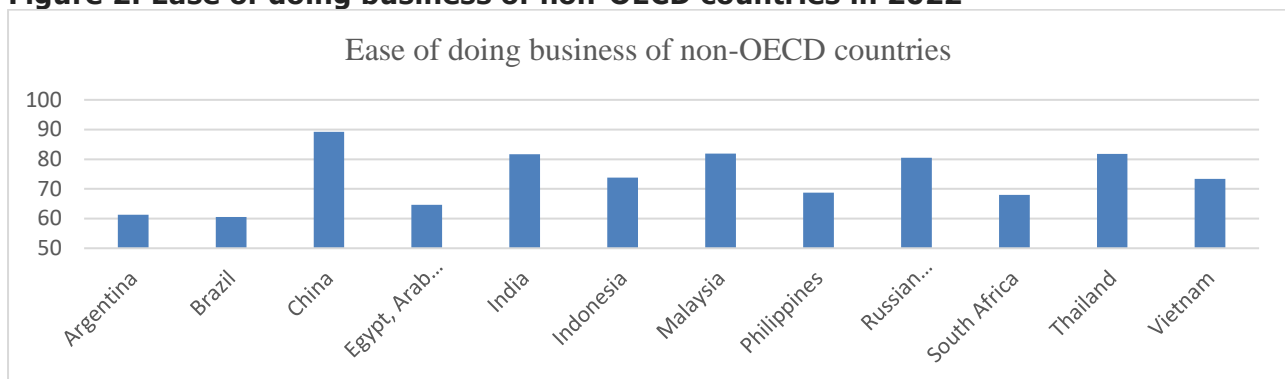


Figure 2: Ease of doing business of non-OECD countries in 2022



EDB significantly increases the FDI inflows (Gizaw et al., 2023; Ijirshar et al., 2023). This study is the extension of Naushahi et al. (2024) study that showed the inverted U-shaped in OECD and a U-shaped in non-OECD countries relationship between FDI restrictions and FDI inflows using the PQR approach. These results show that higher restrictions reduce FDI. To enhance the FDI, this study uses the EDB as the moderator with FDI restrictions to determine the FDI inflows. This study achieves two objectives: firstly, to examine the aggregated and disaggregated FDI restriction on FDI inflows, and secondly, to explore the moderating role of EDB with FDI restriction to determine the FDI inflows.

2. Literature Review

Golub et al. (2003) initially studied the RRI on actual FDI in 28 OECD countries from 1980 to 2000. The findings revealed that RRI diminished FDI by an average of 10% to 80%, depending on the type of restriction. Ghosh, Syntetos and Wang (2012) investigated this relationship in OECD countries and concluded that higher RRI significantly reduced FDI inflows. In the most recent several researchers also highlighted the role of RRI in different regions. {Zongo, 2022 #46) investigated the global and sectoral barriers to FDI inflows in 49 countries from 2010 to 2019. The restriction level was measured using the RRI from the OECD. The empirical results through the gravity model explored that global RRI insignificantly while restrictions in the service sector significantly reduced FDI inflows. Yoon and Ko (2024) analyzed the role of RRI on FDI in 38 OECD countries using PPML, GLS, and Heckman’s estimators from 2006 to 2021. The study found that aggregated and disaggregated restrictions like screening & approval and operational restrictions significantly reduced FDI, while equity restrictions increased FDI. Several literatures

examine the EDB to determine the FDI. A better-rated business environment attracts larger FDI inflows. In the African region, Morris and Aziz (2011), from 2000 to 2005, and Nketiah and Sarpong (2020), from 2004 to 2018, investigated the different indicators of EDB to determine FDI. These studies revealed that EDB indicators attracted FDI in the African region.

In the most recent, Ijirshar et al. (2023) connected the EDB with local and foreign investment. The study found that EDB and national income attracted investment. At the same time, some EDB indicators like security threats, taxes, and lower credit facilities discouraged the investment. Abille and Mumuni (2023) examined the role of tax incentives and EDB on FDI in the African region from 2015 to 2019 using the GMM system. The study revealed that corporate tax and lower EDB diminished FDI. In contrast, governance indicators positively increased FDI inflows. Gizaw et al. (2023) examined the role of different regulations on FDI in the African region. The study explored that implementing contracts, better access to electricity, higher credit facilities, protecting investors, and lower taxes attracted FDI. Many studies also consider Labor force participation a significant determinant of the FDI. In many countries labor force attracts FDI through the proper policies, training, and maintaining the health of laborers. Nguyen (2021) empirically examined the role of the labor force and FDI in Vietnam from 1995 to 2018. The study concluded that the labor force significantly increased FDI. Hou et al. (2021) criticized the traditional FDI theory, suggesting that lower labor costs and higher market demand attract more FDI. They discussed that higher labor wages increased labor efficiency, which attracted more FDI. Industrialization showed the mixed impact of the FDI inflows. Sinha and Sengupta (2019) examined the industrial productivity of FDI. The GMM approach found that industrial productivity boosted the FDI. In contrast, Ramachandran, Sasidharan and Doytch (2020) analyzed the spatial impact of industrialization on FDI in India from 2006 to 2015. The study explored that the Indian manufacturing sector showed dispersion which declined FDI.

Export diversification has observed a positive impact on FDI inflows. In China, Khan et al. (2021) inspected the positive effect of export diversification on FDI, showing that foreign capital attracts countries with more trade diversification. Gnanngnon (2022) discussed that aid for trade increases FDI inflows, particularly in countries with higher export diversification. Ly-My, Lee and Khan (2022) also explored that aid for trade attracted more FDI in developing countries. Furthermore, trade openness has been identified as factors that positively affect FDI inflows, thereby increasing globalization tendency. Aluko, Chen and Opoku (2023) revealed that in African countries, globalization induced FDI. After reviewing the literature review regarding the RRI, EDB, export diversification, labor force, and industrialization on FDI inflows, several literatures showed that aggregated restrictiveness declined the FDI inflows Ghosh, Syntetos and Wang (2012); Yoon and Ko (2024); Zongo (2022) but there is not any study that empirically explores the impact of disaggregated RRI on FDI inflows. There also several studies that empirically found that EDB boosted FDI inflows (Gizaw et al., 2023; Ijirshar et al., 2023; Morris & Aziz, 2011) but there is scant literature that uses this variable as the moderator. This study is novel because it uses the moderating role of EDB with aggregated and disaggregated RRI to determine the FDI inflows (Ahmed, Azhar, & Mohammad; Dler M Ahmed, Z Azhar, & Aram J Mohammad, 2024; Dler Mousa Ahmed, Zubir Azhar, & Aram Jawhar Mohammad, 2024; Mohammad, 2015a, 2015b; Mohammad & Ahmed, 2017).

3. Data and methodology

Panel data of 36 OECD Economies and 12 non-OECD Economies by the classification of OECD (2023) from 2003 to 2022 are used. The motivation behind selecting these countries because they are paying special attention to liberalizing their economies. Many countries reduce the FDI restrictions and increase the EDB score to attract FDI. FDI inflow is the dependent variable showing the net inflows of investment. It is estimated as the net total foreign investment inflows and GDP ratio. The aggregated and disaggregated FDI restriction is used as the key independent variables. The literature shows that FDI restrictiveness indices reduced FDI inflows (Yoon & Ko, 2024; Zongo, 2022). This study uses the EDB as the moderator term to increase the FDI. It measures how much a country is friendly regulatory environment to start and operate the new business. This index is generated using the WDI (World Development Indicators) and its value lies between 0 and 100. Closer to 0 indicates lower ease of starting a business, while closer to 100 demonstrates more ease of starting a business. Furthermore, industry value added, labor force and exports are used as the control variables, and further details and the data source are listed in Table 1.

Table 1: Symbol, Variable, and Data Sources

| Symbol | Variable | Source |
|--------|---------------------------------------|--------------|
| FDI | FDI, net inflows(% of GDP) | (WDI, 2024) |
| ATR | All types of restrictions(0-1) | (OECD, 2024) |
| EQR | Equity restriction(0-1) | (OECD, 2024) |
| RR | Operational restrictions(0-1) | (WDI, 2024) |
| SAR | Screening and approval(0-1) | (OECD, 2024) |
| KFR | Key foreign personnel(0-1) | (OECD, 2024) |
| EDB | Ease of doing business(0-100) | (WDI, 2024) |
| EXPO | Exports of goods & services(% of GDP) | (WDI, 2024) |
| IND | Industry, value added(% of GDP) | (WDI, 2024) |
| LF | Labor force(Total) | (WDI, 2024) |

As highlighted in Figure 3, the aggregated and disaggregated restrictions show a nonlinear trend, and the square term is used (Haans, Pieters, & He, 2016). So quadratic term is used to capture the non-linearity. To shift the turning point of the parabola moderator EDB is used (Rani et al., 2023). In this case, EDB is used as the moderator term, and their mathematical model is contracted as follows:

$$LNFDI_{it} = \beta_1 + \beta_2 ATR_{it} + \beta_3 ATR_{it}^2 + \beta_4 LNEDB_{it} + \beta_5 LNEDB_{it} \times ATR_{it} + \beta_6 LNEDB_{it} \times ATR_{it}^2 + \beta_7 LNIND_{it} + \alpha_3 LNL F_{it} + \alpha_9 LNEXPO_{it} + \varepsilon_{it} \tag{1}$$

$$LNFDI_{it} = \gamma_1 + \gamma_2 EQR_{it} + \gamma_3 EQR_{it}^2 + \gamma_4 LNEDB_{it} + \gamma_5 LNEDB_{it} \times EQR_{it} + \gamma_6 LNEDB_{it} \times EQR_{it}^2 + \gamma_7 LNIND_{it} + \gamma_8 LNL F_{it} + \gamma_9 LNEXPO_{it} + \varepsilon_{it} \tag{2}$$

$$LNFDI_{it} = \delta_1 + \delta_2 KFR_{it} + \delta_3 KFR_{it}^2 + \delta_4 LNEDB_{it} + \delta_5 LNEDB_{it} \times KFR_{it} + \delta_6 LNEDB_{it} \times KFR_{it}^2 + \gamma_7 LNIND_{it} + \gamma_8 LNL F_{it} + \gamma_9 LNEXPO_{it} + \varepsilon_{it} \tag{3}$$

$$LNFDI_{it} = \rho_1 + \rho_2 SAR_{it} + \rho_3 SAR_{it}^2 + \rho_4 LNEDB_{it} + \rho_5 LNEDB_{it} \times SAR_{it} + \rho_6 LNEDB_{it} \times SAR_{it}^2 + \rho_4 LNIND_{it} + \rho_5 LNL F_{it} + \rho_6 LNEXPO_{it} + \varepsilon_{it} \tag{4}$$

$$LNFDI_{it} = \varphi_1 + \varphi_2 RR_{it} + \varphi_3 RR_{it}^2 + \varphi_4 LNEDB_{it} + \varphi_5 LNEDB_{it} \times RR_{it} + \varphi_6 LNEDB_{it} \times RR_{it}^2 + \varphi_7 LNIND_{it} + \varphi_8 LNL F_{it} + \varphi_9 LNEXPO_{it} + \varepsilon_{it} \tag{5}$$

Equations 1 to 5 demonstrate the quadratic moderation effect of EDB with aggregated and disaggregated policies on FDI. It shows the non-linear quadratic association, and its turning point is estimated by the motivation of Amjad and Rehman (2023) and its mathematical derivation is listed as follows:

$$\frac{\delta LNFDI}{\delta ATR} = \beta_2 + 2\beta_3 ATR_{it} + \beta_5 LNEDB_{it} + 2\beta_6 LNEDB_{it} \times ATR_{it} = 0$$

$$ATR^* = \frac{-\beta_2 - \beta_5 LNEDB_{it}}{2(\beta_3 + \beta_6 LNEDB_{it})} \tag{6}$$

$$\frac{\delta LNFDI}{\delta EQR} = \gamma_2 + 2\gamma_3 EQR_{it} + \gamma_5 LNEDB_{it} + 2\gamma_6 LNEDB_{it} \times EQR_{it} = 0$$

$$EQR^* = \frac{-\gamma_2 - \gamma_5 LNEDB_{it}}{2(\gamma_3 + \gamma_6 LNEDB_{it})} \tag{7}$$

$$\frac{\delta LNFDI}{\delta KFR} = \delta_2 + 2\delta_3 KFR_{it} + \delta_5 LNEDB_{it} + 2\delta_6 LNEDB_{it} \times KFR_{it} = 0$$

$$KFR^* = \frac{-\delta_2 - \delta_5 LNEDB_{it}}{2(\delta_3 + \delta_6 LNEDB_{it})} \tag{8}$$

$$\frac{\delta LNFDI}{\delta SAR} = \rho_2 + 2\rho_3 SAR_{it} + \rho_5 LNEDB_{it} + 2\rho_6 LNEDB_{it} \times SAR_{it} = 0$$

$$SAR^* = \frac{-\rho_2 - \rho_5 LNEDB_{it}}{2(\rho_3 + \rho_6 LNEDB_{it})} \tag{9}$$

$$\frac{\delta LNFDI}{\delta RR} = \varphi_2 + 2\varphi_3 RR_{it} + \varphi_5 LNEDB_{it} + 2\varphi_6 LNEDB_{it} \times RR_{it} = 0$$

$$RR^* = \frac{-\varphi_2 - \varphi_5 LNEDB_{it}}{2(\varphi_3 + \varphi_6 LNEDB_{it})} \tag{10}$$

Equations 6-10 show the cut off values of the quadratic equations.

$$\frac{\delta ATR^*}{\delta LNEDB} = \frac{(\beta_2 \beta_6 - \beta_3 \beta_5)}{(\beta_3 + \beta_6 ATR)^2} \tag{11}$$

$$\frac{\delta EQR^*}{\delta LNEDB} = \frac{(\gamma_2 \gamma_6 - \gamma_3 \gamma_5)}{(\gamma_3 + \gamma_6 EQR)^2} \tag{12}$$

$$\frac{\delta KFR^*}{\delta LNEDB} = \frac{(\delta_2 \delta_6 - \delta_3 \delta_5)}{(\delta_3 + \delta_6 KFR)^2} \tag{13}$$

$$\frac{\delta SAR^*}{\delta LNEDB} = \frac{(\rho_2 \rho_6 - \rho_3 \rho_5)}{(\rho_3 + \rho_6 SAR)^2} \tag{14}$$

$$\frac{\delta RR^*}{\delta LNEDB} = \frac{(\varphi_2\varphi_6 - \varphi_3\varphi_5)}{(\varphi_3 + \varphi_6RR)^2} \quad (15)$$

Equations 11-15 show the turning point of the quadratic equations 6-10. The movement of the turning point is based on the numerator values because the denominator values show a positive effect due to its square. If the numerator value is positive, the turning point moves to the left side of the quadratic parabola curve; in contrast, its negative value moves toward the right side. The flatness and steepness are based on the coefficient of the moderator; positive value shows steepness, while negative values present flatness (Amjad, 2023; Rani et al., 2023). This study uses “panel quantile regression (PQR)” at different quantiles (Koenker & Bassett, 1978). This is a superior approach to ordinary regression because it has addressed the outliers and heterogeneous effects of the dependent variable.

Figure 3: OECD countries

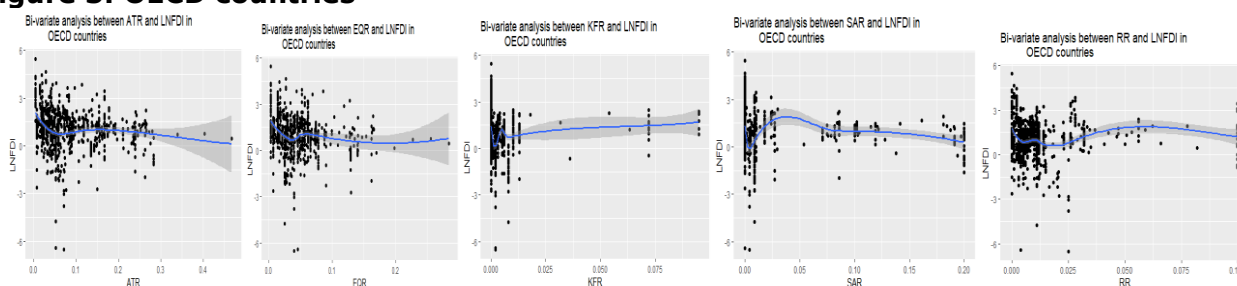
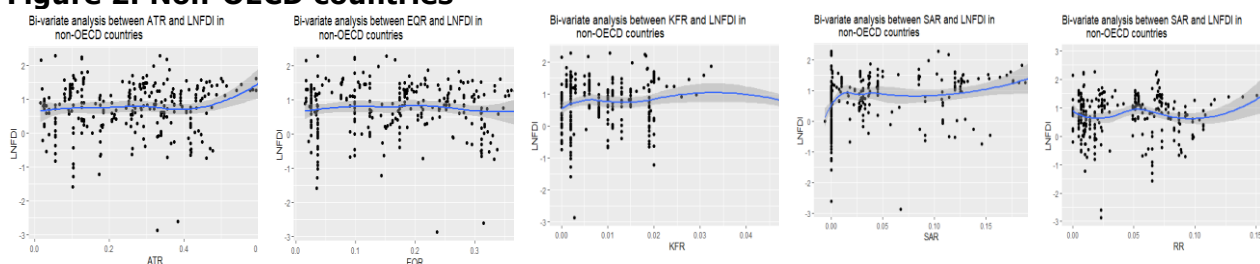


Figure 2: Non-OECD countries



4. Results and Discussions

In Table 2, dependent variable (LNFDI), key independent variables (FDI restrictions indicators), moderator (EDB), and control variables (LNLF, LNIND, LNEXTPO). The mean value of LNFDI of OECD countries (1.05) is greater than the non-OECD countries (0.74) showing that OECD countries have higher FDI inflows than non-OECD nations. Furthermore, the average score of all types of restrictions of OECD economies are less than that of non-OECD economies. The mean score of LNEDB of OECD economies (4.32) is greater than the non-OECD economies (4.05), demonstrating that OECD economies have a more favorable environment to start a business. The lower part of Table 2 shows the description of the control variables (Amjad, Asghar, & Rehman, 2021; Asghar, Amjad, & Rehman, 2023; Asghar et al., 2023).

Table 2: Statistical Description of the Variables

| Variable | OECD Economies | | | | | Non-OECD Economies | | | | |
|----------|----------------|---------|--------|---------|---------|--------------------|---------|--------|---------|---------|
| | Obs | Mean | S.D | Min | Max | Obs | Mean | S.D | Min | Max |
| LNFDI | 801 | 1.0458 | 1.2335 | -6.5237 | 5.4573 | 292 | 0.7438 | 0.7429 | -2.8701 | 2.2725 |
| ATR | 875 | 0.0801 | 0.0703 | 0.0040 | 0.4680 | 300 | 0.2575 | 0.1508 | 0.0150 | 0.6317 |
| EQR | 875 | 0.0444 | 0.0354 | 0.0030 | 0.2843 | 300 | 0.1636 | 0.1070 | 0.0150 | 0.3925 |
| KFR | 875 | 0.0038 | 0.0113 | 0.0000 | 0.0950 | 300 | 0.0158 | 0.0166 | 0.0000 | 0.0500 |
| SAR | 875 | 0.0197 | 0.0470 | 0.0000 | 0.2000 | 300 | 0.0379 | 0.0511 | -0.0060 | 0.2000 |
| RR | 875 | 0.0125 | 0.0183 | 0.0000 | 0.1000 | 300 | 0.0418 | 0.0349 | 0.0000 | 0.1735 |
| LNEDB | 875 | 4.3186 | 0.0911 | 3.8491 | 4.4678 | 300 | 4.0457 | 0.2856 | 2.8309 | 4.4911 |
| LNLF | 875 | 15.6632 | 1.5139 | 11.9793 | 18.9466 | 300 | 17.9213 | 1.2075 | 15.9900 | 20.4771 |
| LNIND | 875 | 3.1878 | 0.2278 | 2.3444 | 3.8854 | 300 | 3.4811 | 0.2326 | 2.9008 | 3.8822 |
| LNEXPO | 875 | 3.7034 | 0.5382 | 2.2012 | 5.3539 | 300 | 3.3929 | 0.6195 | 1.9503 | 4.7984 |

The upper part of Figure 4 depicts the correlation plot of OECD countries, while the lower part shows the correlation plots of the non-OECD countries independently. The lower bubbles between the variables show a lower association between the variables, indicating a weak

multicollinearity issue in both models (Abid et al., 2022; Amjad & Rehman, 2023; Amjad, Rehman, & Asghar, 2023).

Figure 3: OECD Countries

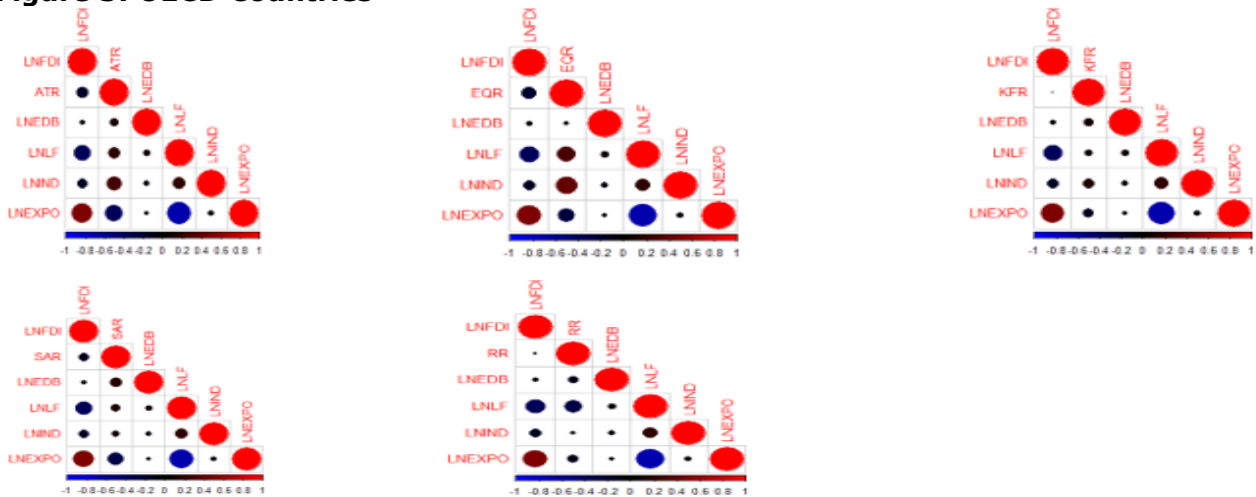


Figure 4: Correlation plot

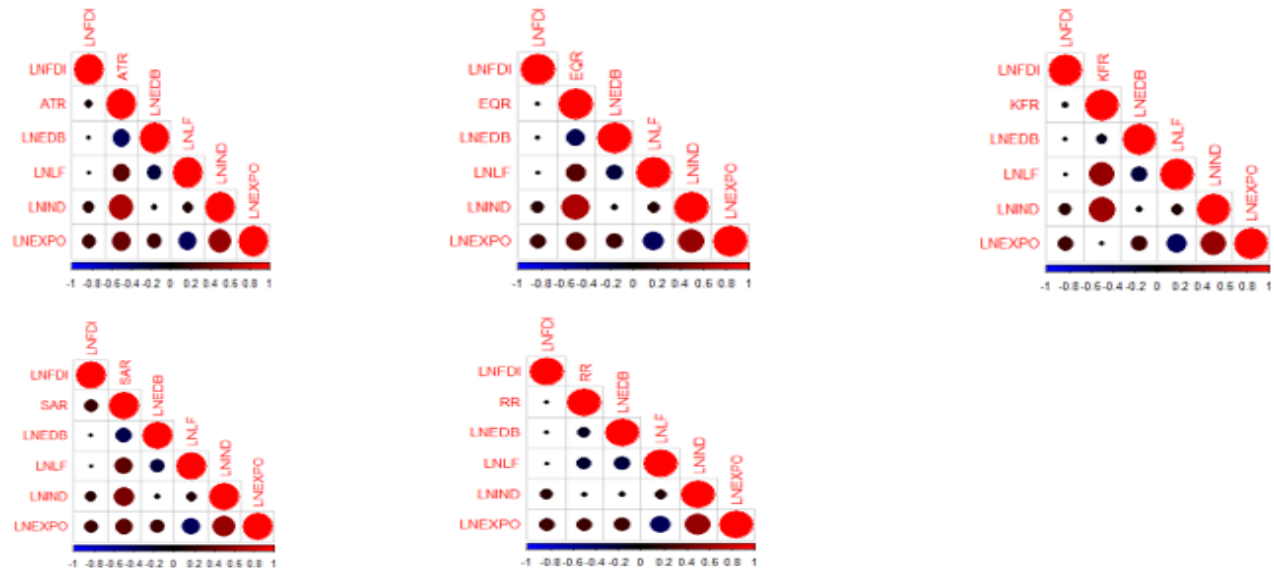


Table 3 displays the Sapiro-Wilk (1965) “W” normality test and Shapiro and Francia (1972) “W’” tests. The significant W and W’ tests suggest rejecting the null hypothesis, showing that all our variables are not normally distributed in both groups.

Table 3: Normality tests

| Variable | OECD Economies | | | | Non-OECD Economies | | | |
|----------|----------------|--------|--------|--------|--------------------|--------|--------|--------|
| | W | Prob>z | W' | Prob>z | W | Prob>z | W' | Prob>z |
| LNFDI | 0.9456 | 0.0000 | 0.9435 | 0.0000 | 0.9407 | 0.0000 | 0.9386 | 0.0000 |
| ATR | 0.8532 | 0.0000 | 0.8580 | 0.0000 | 0.9609 | 0.0000 | 0.9637 | 0.0000 |
| EQR | 0.8617 | 0.0000 | 0.8667 | 0.0000 | 0.9379 | 0.0000 | 0.9434 | 0.0000 |
| KFR | 0.4281 | 0.0000 | 0.4343 | 0.0000 | 0.8221 | 0.0000 | 0.8221 | 0.0000 |
| SAR | 0.6533 | 0.0000 | 0.6614 | 0.0000 | 0.8645 | 0.0000 | 0.8807 | 0.0000 |
| RR | 0.5769 | 0.0000 | 0.5774 | 0.0000 | 0.9024 | 0.0000 | 0.9136 | 0.0000 |
| LNEDB | 0.9340 | 0.0000 | 0.9337 | 0.0000 | 0.9122 | 0.0000 | 0.9120 | 0.0000 |
| LNLF | 0.9739 | 0.0000 | 0.9749 | 0.0000 | 0.9055 | 0.0000 | 0.9085 | 0.0000 |
| LNIND | 0.9708 | 0.0000 | 0.9707 | 0.0000 | 0.9748 | 0.0000 | 0.9774 | 0.0002 |
| LNEXPO | 0.9861 | 0.0000 | 0.9865 | 0.0000 | 0.9659 | 0.0000 | 0.9680 | 0.0000 |

Table 4 shows the cross-sectional dependency (CSD) test of Pesaran (2021). The significant CD-test value shows the CSD of every variable across countries (Abid et al., 2022).

Table 4: Cross-sectional dependency tests

| Variable | OECD | | | | Non-OECD | | | |
|----------|---------|--------|--------|-----------|----------|--------|--------|-----------|
| | CD-test | P | corr | abs(corr) | CD-test | p | corr | abs(corr) |
| LNFDI | 51.77 | 0.0000 | 0.5510 | 0.5510 | 19.38 | 0.0000 | 0.3320 | 0.3690 |
| ATR | 84.85 | 0.0000 | 0.9050 | 0.9050 | 50.36 | 0.0000 | 0.8610 | 0.8610 |
| EQR | 87.02 | 0.0000 | 0.9270 | 0.9270 | 55.12 | 0.0000 | 0.9430 | 0.9430 |
| KFR | 58.05 | 0.0000 | 0.6280 | 0.6300 | 55.08 | 0.0000 | 0.9420 | 0.9420 |
| SAR | 83.20 | 0.0000 | 0.8870 | 0.8870 | 44.83 | 0.0000 | 0.7660 | 0.7660 |
| RR | 79.570 | 0.0000 | 0.8480 | 0.8480 | 35.63 | 0.0000 | 0.6080 | 0.6130 |
| LNEDB | 84.340 | 0.0000 | 0.8230 | 0.8230 | 39.96 | 0.0000 | 0.6660 | 0.6700 |
| LNLF | 102.30 | 0.0000 | 0.9980 | 0.9980 | 59.89 | 0.0000 | 0.9980 | 0.9980 |
| LNIND | 96.11 | 0.0000 | 0.9380 | 0.9380 | 56.45 | 0.0000 | 0.9410 | 0.9410 |
| LNEXPO | 97.06 | 0.0000 | 0.9470 | 0.9470 | 54.50 | 0.0000 | 0.9080 | 0.9080 |

Table 5 depicts the results of the Pedroni co-integration of the moderating role of EDB with aggregated and disaggregated FDI restrictions to determine the FDI inflows of OECD and non-OECD countries (Pedroni, 2004). In the Pedroni co-integration tests, four tests are applied: modified Dickey-Fuller t (MDF) test, Dickey Fuller t test (DF), Augmented Dickey-Fuller t test (ADF), and unadjusted MDF (UMDF) test. The empirical Pedroni tests are statistically significant in both groups, showing the presence of long run co-integration in the model. The result shows that moderating of role of EDB with aggregated and disaggregated FDI restrictions has long run co-integrated to determine the FDI inflows (Abbas et al., 2024; Asghar et al., 2022, 2023; Aslam et al., 2024; Rafique et al., 2023).

Table 5: Pedroni test for co-integration

| Models | Tests | OECD | | Non-OECD | |
|-----------------------------------------|-------|------------|---------|------------|---------|
| | | Statistics | p-value | Statistics | p-value |
| LNFDI ATR ATR ² LNEDB | MDF | -6.5762 | 0.0000 | 4.9719 | 0.0000 |
| LNEDB×ATR LNEDB×ATR ² LNLF | DF | -10.4898 | 0.0000 | 5.8896 | 0.0000 |
| LNIND LNEXPO | ADF | -5.7800 | 0.0000 | 7.0566 | 0.0000 |
| | UMDF | -31.0337 | 0.0000 | -9.7280 | 0.0000 |
| | UDF | -18.6527 | 0.0000 | -10.2250 | 0.0000 |
| LNFDI EQR EQR ² LNEDB | MDF | -7.0284 | 0.0000 | 4.9034 | 0.0000 |
| LNEDB×EQR LNEDB×EQR ² LNLF | DF | -10.8576 | 0.0000 | 5.5808 | 0.0000 |
| LNIND LNEXPO | ADF | -6.8838 | 0.0000 | 6.2117 | 0.0000 |
| | UMDF | -31.2141 | 0.0000 | -9.5692 | 0.0000 |
| | UDF | -18.7364 | 0.0000 | -10.2013 | 0.0000 |
| LNFDI KFR KFR ² LNEDB | MDF | -6.5688 | 0.0000 | 5.0372 | 0.0000 |
| LNEDB×KFR LNEDB×KFR ² LNLF | DF | -10.7026 | 0.0000 | 6.0483 | 0.0000 |
| LNIND LNEXPO | ADF | -5.8363 | 0.0000 | 6.9514 | 0.0000 |
| | UMDF | -32.1419 | 0.0000 | -9.5735 | 0.0000 |
| | UDF | -19.2737 | 0.0000 | -10.5709 | 0.0000 |
| LNFDI SAR SAR ² LNEDB | MDF | -5.8088 | 0.0000 | 4.9309 | 0.0000 |
| LNEDB×SAR LNEDB×SAR ² LNLF | DF | -9.7360 | 0.0000 | 5.6583 | 0.0000 |
| LNIND LNEXPO | ADF | -4.9619 | 0.0000 | 6.9304 | 0.0000 |
| | UMDF | -30.7167 | 0.0000 | -9.4586 | 0.0000 |
| | UDF | -18.3742 | 0.0000 | -10.2455 | 0.0000 |
| LNFDI RR RR ² LNEDB LNEDB×RR | MDF | -6.6077 | 0.0000 | -5.7293 | 0.0000 |
| LNEDB×RR ² LNLF LNIND LNEXPO | DF | -10.3583 | 0.0000 | . | . |
| | ADF | -5.2174 | 0.0000 | . | . |
| | UMDF | -30.6621 | 0.0000 | -10.3476 | 0.0000 |
| | UDF | -18.3453 | 0.0000 | -11.1868 | 0.0000 |

Table 6 shows the PQR approach results at the central quantile of the five selected models in the OECD countries. The first model shows the aggregated FDI restrictions using all types of restrictions (ATR) and propose the inverted U-shaped. These results show that a higher level of restriction diminishes the FDI inflows (Yoon & Ko, 2024; Zongo, 2022). Higher FDI restrictions give a signal to foreign investors that a country needs to be more favorable about business investment. This reduced confidence deters foreign investors from committing significant capital. The natural logarithm of EDB significantly increases the FDI inflows (Gizaw et al., 2023). Our analysis uses the EDB as the moderator to enhance the FDI inflows. So, the LNEDB is multiplied with linear and quadratic ATR. The interaction between LNEDB and ATR adversely impacts the FDI, while the interaction between LNEDB and ATR² increases the FDI inflows in OECD economies.

By using equation 11, the numerator term $(\beta_2\beta_6 - \beta_3\beta_5)$ is "-3.9871", which shifts the turning point to the left side of the inverted U-shaped curve (Rani et al., 2023). Furthermore, the moderator term is positive, showing the steepness of the inverted U-shaped curve. In the remaining models, the disaggregated FDI restrictive policies are under-considered. The positive linear and negative square coefficient of equity restrictions (EQR) propose the inverted U-shaped relationship. The LNEBD positively impacts the FDI inflows (Abille & Mumuni, 2023). The interaction between LNEBD and EQR is negative, and the interaction between LNEBD and EQR² positively impacts the FDI inflows. Using equation 12, the numerator term $(\gamma_2\gamma_6 - \gamma_3\gamma_5)$ have inverse sign value which shows the turning-point shift its left side. The left side shows the positive slope, demonstrating that higher EDB with EQR increases the FDI inflows.

In Model 3, the key independent variable is the key foreign personnel restriction (KFR) which shows the inverted U-shaped. LNEBD increases the FDI inflows. The interaction between LNEBD and KFR adversely while the interaction between LNEBD and KFR positively impacts the FDI inflows. Following the numerator term of equation 13, $(\delta_2\delta_6 - \delta_3\delta_5) = -0.8543$, showing that the turning point moves toward its left side and further steepens. Model 4 uses the Screening and approval restriction (SAR) as the key independent variable and propose the inverted U-shaped relationship. Furthermore, the LNEBD positively impacts the FDI, but their interaction terms are insignificant. In this model, the moderator term has no role in boosting the FDI inflows. In model 5, operation restrictions (RR) are under-considered and demonstrates the U-shaped association. Additionally, LNEBD positively impacts the FDI inflows (Ijirshar et al., 2023). The linear and quadratic RR interaction with LNEBD significantly negatively impacts the FDI inflows in the OECD countries. To check the turning point, the numerator of the equation $(\varphi_2\varphi_6 - \varphi_3\varphi_5 = 3.444)$ displays the shift of the turning point to its right side. The right side of the U-shaped curve is positively sloped, which shows that the moderator term plays a significant role in increasing the FDI.

Table 6: Results of the Panel quantile regression of OECD Economies

| Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|-----------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|
| ATR 1.3780* (0.2907) | EQR 2.0783*** (0.3529) | KFR 0.4940** (0.0520) | SAR 1.5881** (0.1897) | RR -0.9680* (0.0645) |
| ATR ² -3.0586* (0.8835) | EQR ² -1.7230* (0.0260) | KFR ² -2.5060* (0.7378) | SAR ² -2.8675* (0.8913) | RR ² 2.2500* (0.5750) |
| LNEBD 2.2579** (1.1003) | LNEBD 3.0060* (1.2773) | LNEBD 1.6201*** (0.4862) | LNEBD 1.2892* (0.5459) | LNEBD 2.6050* (0.7187) |
| LNEBDx ATR -1.3125* (0.0970) | LNEBDx EQR -0.0524*** (0.0003) | LNEBDx KFR -0.5256* (0.0639) | LNEBDx SAR -2.9509 (30.8074) | LNEBDx RR -1.5698* (0.3593) |
| LNEBDx ATR ² 0.0198**** (0.006) | LNEBDx EQR ² 0.0291* (0.0002) | LNEBDx KFR ² 0.9369* (0.0430) | LNEBDx SAR ² -0.5201 (0.9692) | LNEBDx RR ² -0.0910* (0.0030) |
| LNLf -0.0285 (0.0368) | LNLf -0.0298 (0.0357) | LNLf -0.0437 (0.0345) | LNLf -0.0468 (0.0396) | LNLf -0.0363 (0.0382) |
| LNIND -0.6254** (0.1859) | LNIND -0.4370** (0.1938) | LNIND -0.5749** (0.1691) | LNIND -0.6589** (0.1904) | LNIND -0.7073** (0.1644) |
| LNEXPO 1.0154* (0.1110) | LNEXPO 0.9300* (0.1056) | LNEXPO 0.9543* (0.0994) | LNEXPO 0.9253* (0.1128) | LNEXPO 0.9036* (0.1019) |
| CONS 9.3849 (4.7181) | CONS 12.4290** (5.4255) | CONS 7.0900* (2.3119) | CONS 6.0849* (2.4220) | CONS 11.6949 (3.2846) |

Table 7 shows the outcome of PQR at the middle quantile of non-OECD Economies. In model 1, the aggregated FDI restriction is used as the key independent variable. ATR's display the U-shaped relationship. EDB is the moderator term, which significantly positively impacts the FDI. The interaction of linear and quadratic ATR with LNEBD captures the moderation effect. To check the turning point equation 11, demonstrate that the turning point shifts the right-side of the U-shaped curve and further steepness. The non-OCED countries have imposed higher FDI restrictions to protect their domestic industries and lower EDB scores. Still, their EDB plays a significant role in enhancing the FDI inflows. In the subsequent models, disaggregated restrictions are used. In model 2, the positive linear and negative quadratic coefficients of EQR propose the inverted U-shaped relationship. It shows that a higher level of equity restriction reduces FDI inflows. LNEBD significantly increases the FDI that serves as the moderator. The interaction between LNEBD and EQR negatively while LNEBD and EQR² positively impacts the FDI. The decision of the turning point shows that LNEBD moves the turning point to the right side of the inverted U-shaped curve and further steepness. The right side of the inverted U-shaped curve shows the negatively sloped curve, showing that LNEBD does not adequately play a significant role in increasing FDI.

Model 3 introduces the concept of the U-shaped relationship due to linear negative and quadratic coefficients of KFR to determine FDI. The rationale behind this phenomenon is that

non-OECD nations have enforced stricter foreign employment regulations due to concerns regarding national security. The effect of LNEDB on FDI is portrayed positively, with its interaction term exhibiting a varied impact on FDI inflows. The moderator term plays a vital role in identifying the inflection point on the right side of the U-shaped curve, leading to a positively sloped curve. These findings underscore the significant role of LNEDB in enhancing FDI inflows within non-OECD countries. In model 4, the Screening and Approval (SAR) process, moderator, and all interaction terms exhibit statistically insignificant effects on FDI. This indicates that the moderator term remains unaffected under these circumstances. Within model 5, the positive magnitude and negative quadratic coefficient of operational restriction (RR) suggest a curvilinear relationship, known as an inverted U-shaped relationship, in determining the FDI inflows. It presents that higher operational restrictions reduce FDI inflows. The moderator term and interaction terms show mixed evidence of FDI inflows. Haans, Pieters and He (2016) mathematical derivation suggests that the turning point shifts the left side of the inverted U-shaped curve.

Table 7: Results of the Panel quantile regression of non-OECD Economies

| Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | | | | | |
|----------------------------|----------------------|----------------------------|----------------------|----------------------------|----------------------|----------------------------|-----------------------|---------------------------|----------------------|
| ATR | -6.8011* (1.9479) | EQR | 1.8726* (0.8850) | KFR | 4.0667** (1.7069) | SAR | -7.4831 (42.8308) | RR | 3.1096* (0.1298) |
| ATR ² | 3.4983* (0.6725) | EQR ² | -2.2653* (1.0075) | KFR ² | 0.4610** (0.0356) | SAR ² | 99.3298 (246.1534) | RR ² | - (0.3390) |
| LNEDB | 2.9827* (0.7345) | LNEDB | 4.3058* (0.7852) | LNEDB | 0.5806** (0.2484) | LNEDB | -0.0286 (0.3142) | LNEDB | 0.9653* (0.3986) |
| LNEDB× ATR | 1.4888* (0.2124) | LNEDB× EQR | -2.0651* (0.8567) | LNEDB× KFR | 1.9195** (0.6551) | LNEDB× SAR | 2.2074 (10.6622) | LNEDB× RR | -2.9181* (0.2364) |
| LNEDB× ATR ² | -1.1302* (0.0196) | LNEDB× EQR ² | 5.9461* (1.1649) | LNEDB× KFR ² | - (0.5628) | LNEDB× SAR ² | -23.4588 (62.3830) | LNEDB× RR ² | - (0.0180) |
| LNLF | 0.1500* (0.0441) | LNLF | 0.1825* (0.0479) | LNLF | 0.0045 (0.0491) | LNLF | 0.0103 (0.0497) | LNLF | 1.0282* (0.0437) |
| LNIND | 0.4242 (0.2661) | LNIND | 0.8083* (0.3062) | LNIND | -0.3178 (0.3833) | LNIND | -0.1006 (0.2867) | LNIND | 0.1547 (0.2877) |
| LNEXPO | 0.6546* (0.1056) | LNEXPO | 0.5894* (0.1097) | LNEXPO | 0.4446* (0.1212) | LNEXPO | 0.2991 (0.1326) | LNEXPO | 0.2796** (0.1225) |
| CONS | 7.3246** (3.1013) | CONS | 11.2586* (3.4095) | CONS | 2.6377 (2.0022) | CONS | 0.0360 (1.6998) | CONS | -1.2351 (1.9204) |

Apart from the aggregated and disaggregated FDI restrictions, labor force participation, industrialization, and export sector. In OECD countries, labor force participation (LNLF) insignificantly impacts FDI. In non-OECD economies, the LNLF significantly positively impacts FDI inflows in different models. In the literature, Nguyen (2021) estimated that the labor force increased FDI in Vietnam. Furthermore, Hou et al. (2021) explored that higher labor wages increased the efficiency of the laborers and attracted more FDI. Industrialization (LNIND) observed a mixed impact on FDI. In OECD countries, LNIND significantly negatively impacts FDI. In the literature, Ramachandran, Sasidharan and Doytch (2020) explored that the industrial sector declined in FDI inflows. As OECD countries progress in their industrial development, the cost of production increases. Higher wages, tighter labor regulations, and rising operational costs reduce cost competitiveness compared to developing countries. Investors seeking a lower cost of production divert their FDI to countries where the cost of doing business is relatively low, which could reduce industrial FDI in OECD countries. In contrast, the LNIND positively impacts FDI in non-OECD countries. Sinha and Sengupta (2019) explored that industrial productivity increased FDI. Non-OECD countries mostly observe emerging economies, which become attractive to foreign investors due to their substantial growth potential. A growing industrial base creates opportunities for investors to access new and dynamic markets, providing higher returns on investment than in more mature economies. This growth potential becomes an important driver for FDI, as investors are attracted to the possibilities of these non-OECD countries participating in industrialization and economic development. In both models, exports (LNEXPO) significantly increase the FDI inflows. In the literature, Khan et al. (2021) explored the positive effect of export diversification on FDI in China. Gnanngnon (2022) discussed that aid for trade increases FDI inflows, particularly in countries with higher export diversification. In global countries, export diversification signals lower risk for investors. The countries have a variety of export sectors and become less vulnerable to international adverse shocks in the specific industry.

5. Conclusion and policy recommendations

To achieve the key objectives, examine the moderating role of EDB with aggregated and disaggregated FDI restrictions on FDI inflows. The panel data from 2003 to 2022 of 36 OECD and 12 non-OECD Economies are chosen. The empirical results were estimated using the Pedroni co-integration and panel quantile regression. This study examines the aggregated restriction as all types of restrictions index and disaggregated restriction includes equity, screen and approval, key foreign employment, and operational restrictions. Their data are extracted from (OECD, 2023). Furthermore, EDB is used as the moderator in this study. The restrictions show the non-linear trend using the bi-variate analysis, so the quadratic term is under-considered. The Pedroni co-integration shows the long-run co-integration of all independent variables with dependent variables. The Panel quantile regression results in OECD countries, the aggregated restrictions propose the inverted U-shaped relationship to determine the FDI inflows. The EDB moves the turning point to the left side of the inverted U-shaped curve. Additionally, equity restrictions, key foreign employment, and operational restrictions also propose the inverted U-shaped curve, and the EDB shifts the turning point to the left side of the inverted U-shaped curve. In non-OECD countries, the aggregated restriction shows the U-shaped curve, and the EDB shifts the turning point to the right side of the U-shaped curve. In disaggregated restrictions, the equity and operational restriction propose the inverted U-shaped curve and the EDB moves the turning to the left side of the inverted U-shaped curve. The foreign employment restriction proposes the inverted U-shaped curve, and the EDB shifts the turning point to the right side of the U-shaped curve. Comprehensively, the EDB plays a significant role in both OECD and non-OECD countries to diminish the FDI barriers and improve the FDI inflows. This study recommends that the countries should decline the barriers to FDI inflows and promote the ease of business in all countries. The countries should make simple and streamline their regulatory framework to make it more transparent and accessible for foreign investment. The countries should reduce the bureaucratic hurdles and ensure the investors with greater ease.

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