Research article

Effects of institutional quality on foreign direct investment inflow in lower-middle income countries

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ABSTRACT

The intention of this study is to look into the effect of institutional quality on Foreign Direct Investment (FDI) inflow in lower-middle income countries. To accomplish this goal, we use a panel data set of 28 lower-middle income countries in six different regions that span the period from 2002 to 2018. This analysis is conducted by using dynamic panel estimation (two-step system GMM). Later, we use threshold analysis to capture how the reaction of institutional quality varies in terms of GDP per capita. The empirical outcomes suggest that control of corruption and regulatory quality enhance FDI inflow while high rule of law and voice and accountability mitigate it in lower-middle income countries. On the contrary, government effectiveness, and political stability do not have any significant impact on FDI. Regulatory quality has the greatest impact on foreign investment inflows of all the metrics. Similarly, threshold analysis reveals that regulatory quality has a positive impact on FDI when per capita GDP of FDI recipient nations exceeds the threshold value of 7.197, while voice and accountability have a positive impact on FDI when per capita GDP exceeds the threshold value of 7.776. In terms of the size of the impact of institutional factors in attracting FDI, lower middle income countries were quite different from that high and low income countries, though the outcome is largely similar in the three subgroups. According to the regional findings, each of the institutional quality measures is only effective in the East Asia and Pacific region. In addition, threshold analysis reveals how institutions respond to the impact of per capita GDP.

1. Introduction

Foreign Direct Investment (FDI) is one of the most important channels for the cross-border movement of finance, technology, and new business methods. It has been more pronounced among developing countries since the 1990s, as capital markets have become more mobilized (Kurul, 2017). According to United Nations Conference on Trade and Development (UNCTAD, 2020), in 2018 and 2019 developing countries received 46.76 percent and 44.48 percent of world FDI inflow but the share in lower-middle income countries was just 8.43 percent and 8.57 percent. When we identify the characteristics of these lower-middle income countries it is clear that they have a low level of per-capita income, low literacy rate, higher population growth, and so on, which lead to a saving-investment gap but FDI can reduce this gap (Sabir and Khan, 2018) and accelerate economic growth (Pegkas, 2015). Previous literature suggests that Multinational Enterprises (MNEs) observe closely the institutional structure of a country while making their investment decision. Bureaucratic or administrative problems, legal complications, political instability, corruption and crime are the main barriers to FDI inflow. A healthy institutional performance abates these barriers, which creates a conducive environment and gains the confidence of foreign investors. Therefore, the investment atmosphere is established by the presence of good institutional quality that considers as a key indicator of attracting FDI.

Although a large number of macroeconomic variables have a substantial influence on picking up the host nation are asserted by the past literature, but the majority of the work regard institutional quality as the most important indicator of attracting FDI (Asamoah et al., 2016; Masron and Nor, 2013; Paul and Jadhav, 2019; Sabir and Qureshi, 2020). So the foreign investors make a study on the institutional quality and search for a better institutional environment of the country that they want to invest. A country that can enlarge its governance environment quality generally can attract more FDI (Mengistu and Adhikary, 2011). Sabir et al. (2019) find that institutional quality is a key indicator that helps to arrange FDI inflow more in developed countries compared to developing countries. On the contrary, we also read some literature that gets evidence to says institutional quality is unimportant to attract FDI inflows (Asongu et al., 2014; Jurčić et al., 2020; Peres et al., 2018). From the above discussion,

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one question comes forward that good institutional quality is actually a matter or not to attract FDI inflow. Most of the work followed static panel estimation procedures to find out the answer to the above question while just a few (Owusu et al., 2017; Sayari, 2019; Van Bon, 2015) have mentioned dynamic panel estimation to estimate this relationship, applying the Generalized Method of Moment (GMM). Whereas FDI flow can be influenced by its past value, we pay more attention to this dynamic panel system GMM model to seek out the answer to the above question by introducing six governance indicators as a proxy of institutional quality developed by Kaufmann et al. (1999).

Previously many studies are conducted on various categorized countries like developing countries, developed countries, African countries, South Asian countries, and different regional countries. Although lower-middle-income countries are the emerging economic economies very few research focuses specifically on these countries. Mainly most of these countries face higher levels of corruption, political instability, lower level of rule of law, lower government effectiveness, low regulatory quality and voice and accountability. One literary work has existed that covered all four income group countries classified by the World Bank according to income level (Sabir et al., 2019). However, to create a group of developed and developing countries, they combined all four categories. Here, we fulfill this gap and contribute to the literature by answering the impact of institutional quality on FDI inflow in lower-middle-income countries.

In short, the core objective of our study is to inquire how the above factors affect FDI inflow in these lower-middle-income countries by controlling some other macroeconomic variables. In some other aspect, our assessment contributes to the current body of knowledge. As far as we know, no dynamic panel estimation analysis has been conducted on this specific income category of countries. Furthermore, threshold analysis provides some insight into how institutions react to the impact of per capita GDP. This work helps the government and policymakers of the lower-middle-income countries to take some effective policy for attracting FDI inflow. Our investigation can also increase the capability of the researchers by using it for their further analysis.

This work covers all the above fields and reduces the literature gap by using the latest dataset. We gather panel data from 28 lower-middle-income countries in six separate regions, covering the years 2002–2018. We pick these countries and time periods according to the availability of data. In the upcoming Segment, Section 2 reviews the existing literature. The methodology is discussed in Section 3. After that, Section 4 describes data management and empirical findings. Lastly, we conclude this work and gives some recommendations in Section 5.

2. Literature review

Several theoretical works rationalize that fact in the past years that how to attract foreign investment. Heckscher-Ohlin’s trade theory, Vernon’s product life cycle theory, and most importantly Dunning’s eclectic paradigm theory discover some issues that global investors consider while making investment decisions. According to Heckscher-Ohlin theory, relatively labor-rich county exports labor-intensive products and relatively capital-rich countries export capital-intensive products. So, when foreign investors want to invest, they consider the availability of production factors, notably labor and capital, to take the opportunity to earn a higher return by lowering production costs. According to Vernon (1966), a product conquers through four stages in its life. These are introduction, growth, maturity, and decline. Mainly, a product is firstly introduced in developed countries and then come to the developing countries. That means the stage of the product lifecycle can affect the investment decision. The eclectic paradigm theory is developed by Dunning (1980) also popular as OLI(ownership, location, internalization) model that says, these three points that every multinational company follows to determine FDI. Ownership means the competitive advantages, the greater the competitive advantages and the benefit of internalizing the market the more they will invest (“Eclectic paradigm,” n. d.). North (1990) argue that inefficient institution increases the transaction cost business, gives poor information and reduces profit. On the other hand, a good institution affects economic activities and foreign investment positively.

We discover a large number of empirical studies, which look into the influence of institutional efficiency on FDI inflow, provide several perplexing and mixed-up relationships, that can be classified into a few categories. Firstly, some researchers mainly focus on the specific effects of every institutional quality variable. Mengistu and Adhikary (2011) investigates how the Asian economy’s FDI inflow is affected by good governance using six governance indicators. FGLS and Prais-Winston estimation results say that only control of corruption, rule of law, government effectiveness, and political stability have a significant positive impact on FDI inflow. Alemu (2013), Bouchoucha and Benammmou (2020), Chowdhury (2017), Kurul and Yalta (2017), and Masron and Nor (2013) also operate this examination by using six governance indicators, that is used as the institutional proxy, develops by Kaufmann et al. (1999). Except Chowdhury (2017), all empirical results say that a lower level of corruption and a more effective government can allure more foreign investment in Asian and African countries.

Bouchoucha and Benammmou (2020), and Kurul and Yalta (2017) also find that a better voice and accountability index motivates foreign investors. That helps to accelerate investment in developing countries of the African and Asian regions. Whereas, Al-Samman and Mouselli (2018) argue that GCC countries can increase their FDI inflow by reducing corruption, enhancing political stability, and surprisingly reducing the quality of regulation. By using the random effect model, Ross (2019) demonstrates that in developing countries poor political conditions can capture the attention of foreign investors to invest. The use of a diverse group of countries and timeframes, as well as a discrepancy in estimation procedures, may be the cause of the disparity in performance. On the other hand, by using OLS estimation Jurcic and Kurul (2020) seek out that none of the governance indicators dominate FDI inflow in Croatia.

Secondly, there have been many works that explore the effects of composite institutional quality indicators on FDI inflow. The composite index is created by summing up the different proxy variables of institutional quality. Taking all the six governance indicators (control of corruption, government effectiveness, political stability and absence of violence, regulatory quality, rule of law, and voice and accountability), some literature (Kurul, 2017; Sabir et al., 2019; Sayari, 2019) constructed an institutional quality index by applying Principal Component Analysis (PCA) or Data Envelopment Analysis (DEA) and find a significant positive impact on FDI inflow. On the other hand, Ali et al. (2010), Aziz (2018), and Fukushima and Nishijima (2010) also create a composite institutional quality index by using International Country Risk Guide (ICRG) index and find that institutions are the robust predictor of FDI inflow in Arab economies and Latin American region. But Asongu et al. (2014) explore that, while market size, trade openness, and infrastructure all affect BRICS and MINT countries, institutional quality does not. Whereas, using instrumental variables approach Peres et al. (2018) also get the insignificant results for developing countries by summing up control of corruption and rule of law index which measure the institutional quality. The negative impact of institutional efficiency on extractive FDI is mitigated by increasing the degree of reliance on natural resources are found in Africa by exercising the Pool Mean Group (PMG) method (Feulefack and Ngassam, 2020).

The grandiose amount of literature tries to uncover the role of institutional quality on FDI inflow in various groups of countries. But none of the studies gives proper attention, particularly to the lower-middle-income countries though these are the promising economic countries. So, we bridge this gap and try to fulfill it empirically in the next sections. Moreover, we analyze the impact of institutional quality on FDI on the basis of geographical region. We also add to the literature about the responsiveness of FDI with the interaction of institutional quality and GDP per capita.
3. Methodology

3.1. Data and variables

For the empirical experiment, this study select 28 lower-middle income countries in six different regions (which are displayed in Table 1) and on the basis of availability, it collects data from year 2002–2018. This study determines the country's income level based on the income group classification by the World Bank. To investigate the effect, this study divides all explanatory variables into two parts. Firstly, the institutional quality variables are collected from the World Governance Indicators (WGI) database. This study employs Kaufmann’s six good governance criteria (control of corruption, government effectiveness, political stability and absence of violence, regulatory quality, rule of law, and voice and accountability) as a proxy for the host country’s institutional performance.

The term “Corruption” refers to the misuse of power while the connection between corruption and FDI inflow is a subject of controversy. From the theoretical viewpoint, corruption can act as a “Grabbing hand” or a “Helping hand”. The grabbing hand argument refers, corruption enhances the cost of production by paying graft, which eliminates investment. Contrastingly, the helping hand hypothesis defines that corruption work as lubrication that reduces bureaucratic delay and increases FDI inflow (Leff, 1964). Government effectiveness indicates the efficiency of public services as well as civil services. It also depends on how the government formulates and implements policies by resisting political pressure. In most cases, a successful government has a positive impact on international investors.

Political instability intensifies the risk of investment whereas, a more politically stable nation can reduce violence and boost productivity. But according to Haksoon (2010), and Lucas (1990) FDI flows from politically stable countries to politically unstable countries. Regulatory quality expresses the caliber of the government to make market-friendly policies and regulations that encourage private sector growth.

The effectiveness of a country’s justice system, which minimizes investment risk, is referred to as the rule of law. However, Yuan et al. (2010) claim that pollution-producing industries of higher-income countries have moved to countries with a poor rule of law. Voice and accountability indicates the rights and freedom of people and mass media. When people are able to respectfully lift their voices and act in accordance with the law, it helps to create a favorable atmosphere for investors. All of the above governance indicators have a range of -2.5 to 2.5, whither a higher index value demonstrates greater institutional efficiency and vice versa. By examining these variables, we detect the average value of these measures is negative in the majority of the lower-middle countries that are shown in Figure 1.

Secondly, we select a large number of macroeconomic indicators (GDP per capita, inflation, trade openness, total population, lagged FDI inflow, infrastructure, income gap), which are utilized in the existing literature, to determine the impact of institutional efficiency on FDI inflow. The Gross Domestic Product (GDP) is a key factor for determining a country’s economic condition and market size. To capture it, this study uses the log of GDP per capita, as recommended by the previous literature (Hayakawa et al., 2013; Kurul and Yalta, 2017). The inflation rate is used to gather information about the price level and purchasing power of the host country whether higher inflation reduces foreign investment (Valli and Mash, 2014). Trade openness is an expression from which we can know how free or strict the trade situation of a country is. When a country’s trade policy is more liberalized, which improves the production level and overall economy, then it helps to attract international investors (Zaman et al., 2018). The total population size also plays an important impact because a larger population increases a country’s labor force, allowing it to generate more production at a lower cost.

This research employs the one-year lagged value of net FDI inflow as an explanatory variable in the model to detect the dynamic relationship. To clarify the regional resemblance, we introduce six different (EA, EUCA, LA, MENA, SA, and SS) regional dummies and interacts them with each institutional quality variable. It use FDI inflow as the dependent variable to measure the impact of institutional quality on it. We take the logarithmic value of the net real FDI inflow measure in the current USD as mentioned in the previous literature (Aziz, 2018; Sabir et al., 2019). Net FDI inflow and GDP deflator data are collected from UNCTAD statistics and World Development Indicators (WDI) respectively. The definition of the variables and their measurement are given in Table 2.

3.2. Model specification

In this empirical research, the influence of institutional quality on FDI inflow in lower-middle income countries is investigated utilizing dynamic panel data. Because it is more effective and can control the unit and time-invariant effects whither time-series and cross-section studies do not (Baltagi, 2005). From the theoretical literature review, we find that most of the economic relationships are dynamic in nature (Baltagi, 2005; Türedi, 2018). Besides the value of current FDI can be affected by its past value (Singh and Jun, 1995). Thus, we consider dynamic panel analysis instead of its static form. A dynamic panel model is given below:

\[ Y_t = \delta Y_{t-1} + \beta X_t + \epsilon_t \]  

here \( Y_t \) is the dependent variable, \( X_t \) is the explanatory variable and the term \( \epsilon_t \) is the combination of unobserved and time-invariant effects (\( \mu_t \)) and random disturbance term (\( \epsilon_k \)). Where \( \mu_t \sim NID(0, \sigma^2) \) and \( \epsilon_k \sim NID(0, \sigma^2) \). By using the good governance indicators and other macroeconomic variables, we can convert Eq. (1) as follow,

\[ \ln(FDI_t = \delta(\ln(FDI_{t-1}) + \beta(INS_t) + \gamma(CON_t) + \epsilon_t \]  \tag{2}  

Table 1. List of countries.

| Lower-middle income countries | Latin America and the Caribbean | East Asia and Pacific | Sub-Saharan Africa | Middle East and North Africa | Europe and Central Asia |
|------------------------------|--------------------------------|-----------------------|--------------------|--------------------------|------------------------|
| Bangladesh                   | Bolivia                        | Cambodia              | Cameroon           | Egypt, Arab Rep.         | Kyrgyz Rep.            |
| Bhutan                       | El Salvador                    | Indonesia             | Morocco            |                         | Ukraine                |
| India                        | Honduras                       | Philippines           | Comoros            | Morocco                  | Uzbekistan             |
|                              |                                 |                       | Congo, Rep.        |                          |                        |
|                              |                                 |                       | Swaziland (Eswatini)|                          |                        |
|                              |                                 |                       | Kenya              |                          |                        |
|                              |                                 |                       | Lesotho            |                          |                        |
| Pakistan                     | Nicaragua                      | Vietnam               | Mauritania         | Nigeria                  |                        |
|                              |                                 |                       |                    | Senegal                  |                        |
|                              |                                 |                       |                    | Sudan                    |                        |
|                              |                                 |                       |                    | Zimbabwe                 |                        |
In Eq. (2) \( \ln FDI_{it} = \delta \ln FDI_{i,t-1} + \beta_1 \text{COC}_{it} + \beta_2 \text{GOV}_{it} + \beta_3 \text{POL}_{it} + \beta_4 \text{REG}_{it} + \beta_5 \text{ROL}_{it} + \beta_6 \text{VOA}_{it} + \gamma_1 \ln GDP_{it} + \gamma_2 \text{INF}_{it} + \gamma_3 \text{OPEN}_{it} + \gamma_4 \ln POP_{it} + \epsilon_{it} \) (3)

In Eq. (2) \( \ln FDI_{it} \) is the log of net real FDI inflow, \( \ln FDI_{i,t-1} \) is the lagged value of FDI inflow, \( \text{INS}_{it} \) stands for institutional quality that includes six governance indicators and \( CON_{it} \) is the other macroeconomic variables are used as control variables.

In Eq. (3) \( \text{COC}_{it} \) means control of corruption, \( \text{GOV}_{it} \) stand for government effectiveness, \( \text{POL}_{it} \) stand for political stability and absence of violence, \( \text{REG}_{it} \) is the short form of regulatory quality, \( \text{ROL}_{it} \) and \( \text{VOA}_{it} \) stand for rule of law, and voice and accountability. All these six

Figure 1. Average value of six good governance indicators in lower-middle income countries. Source: World Governance Indicators 2020, World Bank.
governance parameters, which are measured in index, treat as a proxy of institutional quality. lnGDPPC is the log value of per capita GDP, INFt stand for real inflation rate that is measured in percentage and calculated by using GDP deflator, OPNt is a ratio of trade to GDP indicates trade openness, POPt stand for the total population of the individual countries in a certain period and use a log of total population to this study.

We face some econometric problems while the lagged dependent variable appears as an independent variable in the regression equation. The main problem of this regressor is it creates autocorrelation. Because when lnFDIt is a function of lnFDIt, then we can say that lnFDIt is also a function of lnFDIt. The connection between the explanatory variables and the error term breaks the exogeneity assumption and arises an endogeneity issue. For this reason, we cannot estimate the above equation by using Fixed Effect Model (FEM) or Random Effect Model (REM). Because the presence of unit-effects and the lagged dependent variable together in the model correlates both the explanatory variables and unit-effects with the error term. That violates the assumption of FEM and REM and expresses a biased and inconsistent result.

We discover that the Generalized Method of Moments (GMM) is the most widely used estimation method for solving the endogeneity problem after reviewing the literature. Difference GMM and System GMM are the two different types of GMM whereas, Difference GMM is developed by Arellano and Bond (1991) and System GMM is developed by Arellano and Bover (1995), and Blundell and Bond (1998). Difference GMM suggests that the endogeneity problem that arises from the inclusion of lagged dependent variable as an explanatory variable can be solved by using the instrumental variables. For this purpose, they apply the first difference of the model to eliminate the unobserved country-specific effects (δk) and then the lagged levels of the explanatory variables are used as the instrumental variables. But, when the time-series units (T) are larger than the cross-section units (N) then the country-specific effects will be eliminated with time and the correlation between lagged dependent variable and error term will be insignificant (Roodman, 2009). In that case there is no need to run the Generalized Method of Moments.

\[
\text{InFDIt} - \text{InFDIt-1} = \beta (\text{lnFDIt} - \text{lnFDIt-2}) + \beta (\text{INSIt} - \text{INSIt-1}) + \gamma (\text{CONIt} - \text{CONIt-1}) + (\nu_k - \epsilon_{t-1})
\]

The first difference procedure now creates a new statistical problem. When the endogenous variables are persistent over time, their lagged levels are treated as a poor instrument that lowering the efficiency of the results. To solve this problem Arellano and Bover (1995), Blundell and Bond (1998) propose the System-GMM which gives more effective results than the difference GMM. It constructs a structure using two equations, one of which is differenced and the other remains in level. As instruments, the lagged differences (equation 4) are used for the level equation (equation 2) while, the lagged levels are picked for the differenced equation.

Before the interpretation, we must conduct three diagnostic tests to prove the efficiency of the results. Hansen and Sargan test of overidentifying restrictions are tested to determine the validity of the instrumental variables. In both of the cases, the null hypothesis is the overidentifying restriction is valid or the instrumental variables are uncorrelated with the error terms. And the alternative hypothesis is the instrumental variables are correlated with the error terms. If the null hypothesis is accepted then the instruments are valid. AR (1) and AR (2) are the first-order and second-order autocorrelation tests proposed by Arellano and Bond (1991). To accept the System GMM results there should be first-degree autocorrelation but shouldn't be second-degree autocorrelation. The null hypothesis for AR (1) is there is no first-degree autocorrelation and for AR (2) is there is no second-degree autocorrelation. For the acceptance of System GMM, the result of AR (1) should be significant and the result of AR (2) should be insignificant otherwise the estimation result will be biased.

Finally, how the impact of institutional quality varies in terms of the GDP per capita is estimated to calculate the threshold level of GDP per capita with the help of Eq. (5). The coefficient of each institutional quality is divided by the coefficient of interaction variables (lnGDPPC * institutional quality variables) yields the threshold amount of GDP per capita (Fatima et al., 2020).

Coefficient of interaction variables

\[
\text{Coefficient of institutional quality variables}
\]

Using the threshold level, Kurul (2017) peruses the nonlinear relationship between institution and FDI which reveal that it affects positively only after the global risk and global liquidity crosses a certain

| Table 2. Summary of the variables. |
|-----------------------------------|
| Label | Variable Name | Definition | Sources |
|-------|---------------|------------|---------|
| Net Foreign Direct Investment InFlow | lnFDI | Log of real Foreign Direct Investment net inflow (measures in US dollar). | United Nation Conference on Trade and Development (UNCTAD) Statistics |
| Control of Corruption | COC | Index (take value from −2.5 to +2.5) | World Governance Indicators (WGI) |
| Government Effectiveness | GOVTEFF | Index (take value from −2.5 to +2.5) | World Governance Indicators (WGI) |
| Political Stability and Absence of Violence | POLI | Index (take value from −2.5 to +2.5) | World Governance Indicators (WGI) |
| Regulatory Quality | REGQ | Index (take value from −2.5 to +2.5) | World Governance Indicators (WGI) |
| Rule of Law | ROL | Index (take value from −2.5 to +2.5) | World Governance Indicators (WGI) |
| Voice and Accountability | VOACC | Index (take value from −2.5 to +2.5) | World Governance Indicators (WGI) |
| GDP Per Capita | lnGDPPC | Log of GDP per capita (constant 2010 US$) | World Development Indicators (WDI) |
| Trade Openness | TRADE | Percentage of the sum of exports and imports of goods and services to GDP (all constant 2010 US$) | World Development Indicators (WDI) |
| Total Population | lnPOP | Log of the total population | World Development Indicators (WDI) |
| Inflation | INF | Inflation measured by the GDP deflator (annual %) | World Development Indicators (WDI) |

| Table 3. Descriptive statistics under study. |
|---------------------------------------------|
| Variables | Observations | Mean | Standard deviation | Minimum | Maximum |
| lnFDI | 476 | 4.36e + 07 | 6.98e + 07 | 1 | 6.20e + 08 |
| COC | 476 | −7.186297 | 0.5084804 | −1.531964 | 1.646514 |
| GOVTEFF | 476 | −0.617042 | 0.4615593 | −1.775537 | 0.784386 |
| POLI | 476 | −0.7283356 | 0.7717324 | −2.810035 | 1.283388 |
| REGQ | 476 | −0.6505828 | 0.4877195 | −2.236245 | 0.47141 |
| ROL | 476 | −0.733289 | 0.464738 | −1.852296 | 0.627351 |
| VOACC | 476 | −0.6397543 | 0.6164858 | −2.124431 | 0.4621931 |
| lnPOPC | 476 | 8.99e + 07 | 2.29e + 08 | 569479 | 1.35e + 09 |
| INF | 476 | 7.358665 | 0.546747 | −2.59107 | 95.40866 |
| lnGDPPC | 476 | 2.124431 | 0.4621931 | −2.236245 | 0.47141 |
| TRADEx | 476 | 38.35783 | 39.14469 | 15.67526 | 262.1515 |

1 These variables are converted to log (variables). And it is used as log (variables) in all the models.

Source: Author estimates.
threshold value. While Saidi (2020) reinvestigates the threshold effect of institutions on financial growth and the evidence say that the favorable effect of capital account liberalization on economic development is lightened by institutional quality.

4. Data management and estimation results

4.1. Data management

Table 3 illustrates a compact summary of all the variables that we used. At first, the mean value of real FDI (RFDI) is about $43.6 million over the period 2002–2018. We choose net FDI inflow to run this analysis, which is described as net FDI inflow minus disinvestment.

As a result, we get some negative values of FDI, so we attach the minimum value of real FDI plus one with all the real FDI to prevent this negativity and get the minimum value is $1 for Indonesia, while the highest value is $619790941 for India in 2008. Trend analysis also implies India and Indonesia received the highest amount of FDI in the past few years (Figure 2). We also notice that the mean value of all good governance indicators is negative, indicates a poor average situation of the measures. The lowest number of populations is about 5.69 million in Comoros and the highest number is nearly 13.5 million in India. In 2009, the highest inflation rate was calculated at 95.41% in Zimbabwe, while the lowest inflation rate was -29.69% in the Congo Republic. The average value of GDP per capita was $1833.591, while Cambodia holding the smallest and Swaziland (Eswatini) representing the largest value of it $474.941 and $4773.917 respectively. We observe the maximum value of GDP per capita was $1833.591, while Cambodia holding the smallest and Swaziland (Eswatini) representing the largest value of it $474.941 and $4773.917 respectively. We observe the maximum value of trade openness in terms of GDP is 262.15% in Vietnam and the minimum value is 15.68% in Bangladesh.

We perform the test of correlation to catch the connection between the variables that are presented in Table 4. Estimation results clarify that control of corruption and government effectiveness are highly correlated with rule of law, by getting the value of 0.8362 and 0.7955 while some other variables are moderately correlated with each other like government effectiveness and regulatory quality. Lastly, we conclude that the correlation between these variables is different from zero when all governance indicators are statistically significant at a 10% level.

4.2. Results of dynamic analysis

Table 5 reports the estimation results of two-steps system GMM for the different versions of Eq. (3). Before the interpretation, we must justify the results of some diagnostic tests to prove the accuracy of system GMM results. Hansen test of overidentifying restriction is tested to determine the validity of the instrumental variables and the findings prove that they all are valid at a 5% level of significance.

We also conduct the first-degree (AR1) and the second-degree (AR2) autocorrelation test that is proposed by Arellano and Bond (1991). For the acceptance of results, there should be presented AR (1) but should not be AR (2) and the estimated outcome also fulfill both the criteria at a 10% level. Particularly, the value of AR (1) and AR (2) is 0.0898 and 0.51 (Model 7) respectively, implies that there exists the first-order autocorrelation but does not second-degree autocorrelation. According to Roodman (2009), the number of instruments should not be greater than the number of groups. In this sample, the number of groups is 28, and the number of instruments is 12, for Model 1 to Model 6, and 22 for Model 7. So, this outcome is valid and now we can move on to interpret it.

Six proxy variables of institutional quality are introduced on an individual basis in Model 1 to Model 6 to measure the weight of each variable but Model 7 calculates the combined effect of all variables on FDI inflow. When each variable is estimated separately then no single indicator can significantly change FDI inflow (Model 1 to Model 6). However, when all indicators are combined in the model, it is clear that, apart from government effectiveness and political stability, all other indicators have a major impact on FDI inflow.

Control of corruption (COC) is positive and significant. Remain other things constant, one unit rise in corruption control would increase FDI inflow by 0.639% on average. Foreign investors like to invest in low corrupted countries because higher corruption raises production costs and reduces investor's profit. Our result follows the grabbing hand hypothesis of corruption that we already mentioned above and also consistent with the results of Kurul and Yalta (2017).

Regulatory quality influences FDI inflow significantly in a positive way at a 1% significant level. The coefficient (0.680) implies one unit improvement in regulatory quality will increase the net FDI inflow by 0.68% on average while the other factor are constant. Among all, regulatory quality is the most vital indicator because its coefficient is larger than that of the remaining five. This signifies that the government of lower-middle income countries formulates a market-friendly policy and regulates it in a proper way that develops private sectors and encourages foreign investors to invest. Our findings are in line with those of Bouchnoua and Benammm (2020), and Sabir et al. (2019).

The coefficient of rule of law (−0.460) is negative and significant at a 5% level. It implies a strong negative relationship between FDI inflow
and rule of law. When the law is strictly enforced by one unit in lower-middle-income countries, FDI inflows are diminished on average by 0.46% while the other factors remain constant. When the investors invest in a strong rule of law following country, their profits will reduce due to the additional taxes paid in different sectors. Many foreign investors prefer developing countries because the legislation is not rigorously controlled here, resulting in a higher profit margin. Our results are also consistent with the results of Yuan et al. (2010) and Staats and Biglaiser (2012). The later found the similar result in case of 17 Latin American countries.

Table 4. Correlation matrix.

| Variables | RFDI | COC | GEFF | POLI | REGQ | ROL | VACC | POP | INF | GDPPC | TRADE |
|-----------|------|-----|------|------|------|-----|------|-----|-----|-------|-------|
| RFDI      | 1.00 |     |      |      |      |     |      |     |     |       |       |
| COC       | 0.088* | 1.00 |      |      |      |     |      |     |     |       |       |
| GOVTEFF   | 0.290* | 0.708* | 1.00 |      |      |     |      |     |     |       |       |
| POLI      | -0.090* | 0.592* | 0.383* | 1.00 |      |     |      |     |     |       |       |
| REGQ      | 0.186* | 0.434* | 0.658* | 0.251* | 1.00 |     |      |     |     |       |       |
| ROL       | 0.330* | 0.836* | 0.796* | 0.428* | 0.601* | 1.00 |     |      |     |       |       |
| VOACC     | 0.241* | 0.417* | 0.448* | 0.141* | 0.586* | 0.491* | 1.00 |     |     |       |       |
| POP       | 0.772* | 0.073 | 0.275* | -0.227* | 0.135* | 0.308* | 0.346* | 1.00 |     |       |       |
| INF       | 0.064 | -0.217* | -0.180* | -0.254* | -0.256* | -0.229* | -0.272* | -0.005 | 1.00 |     |       |
| GDPPC     | 0.114* | 0.282* | 0.239* | 0.183* | 0.221* | 0.242* | 0.080* | -0.063 | -0.037 | 1.000 |       |
| TRADE     | -0.131* | 0.188* | 0.152* | 0.546* | 0.190* | 0.110* | -0.077* | -0.268* | -0.089* | 0.067 | 1.000 |

Note: (*) significant at 10% level.
Source: Author estimates.

Table 5. Results of two-steps system GMM.

| Variables | Response variable: lnRFDI |
|-----------|--------------------------|
|           | (Model 1) | (Model 2) | (Model 3) | (Model 4) | (Model 5) | (Model 6) | (Model 7) |
| lnRFDI    | 0.0786*** | 0.0839*** | 0.0914*** | 0.0857*** | 0.0821*** | 0.0877*** | 0.0805*** |
|           | (0.00333) | (0.00394) | (0.00621) | (0.00535) | (0.00385) | (0.00492) | (0.00491) |
| COC       | 0.132 | 0.639** | (0.186) | (0.253) |
| GOVTEFF   | -0.335 | -0.0362 | (0.241) | (0.264) |
| POLI      | -0.140 | -0.0826 | (0.178) | (0.111) |
| REGQ      | -0.0713 | 0.680*** | (0.282) | (0.178) |
| ROL       | -0.222 | -0.460** | (0.281) | (0.177) |
| VOACC     | 0.122 | -0.363** | (0.193) | (0.154) |
| lnGDPPC   | 0.228** | 0.335*** | 0.282*** | 0.317*** | 0.316*** | 0.277*** | 0.214* |
|           | (0.0919) | (0.0714) | (0.0712) | (0.0683) | (0.0838) | (0.0898) | (0.105) |
| lnPOP     | 0.282*** | 0.325*** | 0.254*** | 0.347*** | 0.323*** | 0.270*** | 0.369*** |
|           | (0.0507) | (0.0433) | (0.0632) | (0.0548) | (0.0596) | (0.0574) | (0.0666) |
| TRADE     | 0.00368** | 0.00496*** | 0.00460** | 0.00495*** | 0.00482*** | 0.00331** | 0.00404*** |
|           | (0.00150) | (0.00123) | (0.00174) | (0.00155) | (0.00144) | (0.00158) | (0.00124) |
| INF       | -0.000287 | -0.00321 | -0.00212 | -0.000953 | -0.00292 | -0.000530 | -0.00137 |
|           | (0.00243) | (0.00285) | (0.00359) | (0.00354) | (0.00332) | (0.00344) | (0.00290) |
| Constant  | 9.051*** | 7.076*** | 8.663*** | 6.955*** | 7.334*** | 8.762*** | 7.808*** |
|           | (1.405) | (0.993) | (1.194) | (1.326) | (1.478) | (1.458) | (1.457) |
| Instruments | 12 | 12 | 12 | 12 | 12 | 12 | 22 |
| N         | 448 | 448 | 448 | 448 | 448 | 448 | 448 |
| AR2P      | 0.525 | 0.525 | 0.525 | 0.528 | 0.521 | 0.517 | 0.514 |
| AR1P      | 0.103 | 0.0915 | 0.0833 | 0.0910 | 0.0995 | 0.0960 | 0.0898 |
| HansenP   | 0.217 | 0.153 | 0.169 | 0.0661 | 0.168 | 0.0990 | 0.164 |

Note: Standard errors are in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.
Source: Author estimates.
situation are less important in attracting foreign investment in lower-middle income countries. Bouchoucha and Benammou (2020), Jurčič et al. (2020) find the similar results. Haksoon (2010), Lucas (1990) also discover that FDI flows from politically stable countries to politically unstable countries.

People’s participation in electing their leaders, independent speech, and freedom of the press are all expressed by voice and accountability (Kauffmann et al., 2009). In this work, the coefficient of voice and accountability (−0.363) is negative and significant at a 5% level. This interprets that every one additional unit of voice and accountability will decrease the net FDI inflow on average by 0.36% whereas the other things remain constant. A better voice and accountability index indicates a decent quality of life of the people (Goetz and Jenkins, 2002). This ensures that people charge more wages to sustain their living standards, which raises the cost of production and lowers the profit margins of foreign investors. Our results are consistent with those of Jadhav (2012), and Masron and Nor (2013).

In all models, the past value of FDI inflow (InFDI) has positive signs, as anticipated, and has a major effect on net FDI inflow. Particularly, the coefficient 0.0805 (Model 7) indicates holding other factors constant a one percent rise in the lagged value of FDI inflow will increase the current FDI inflow by 0.081% on average. As a result, the previous year’s investment is crucial for current investors. This is also consistent with Peres et al. (2018), and Kurul and Yalta (2017).

GDP per capita (lnGDPPC) is positive and also statistically significant in all the cases. In Model 7, the coefficient of lnGDPPC (0.214) indicates a 1% increase in the per capita GDP will increase the net FDI inflow on average by 0.21% while other factor are constant. Normally, higher GDP per capita is a reflection of large market size and higher production that positively affects foreign investors. Hakizimana (2015), and Jurčič et al. (2020) also find a strong positive relationship between FDI inflow and GDP per capita.

Trade openness (TRADE) is positive and statistically significant with net FDI inflow. This finding indicates that more open economies countries generate higher market demand for their goods that enhance trade volume and investor’s benefit. The coefficient 0.00404 (Model 7), interprets that a one percent increase in trade openness will increase the net FDI inflow on average by 0.004 percent while other factors remain constant. This is also similar to the previous literature (Bouchoucha and Benammou, 2020; Júlio et al., 2013; Sabir et al., 2019). The sign of total population (POP) is positive and significant. This is because these lower-middle income countries are highly populated which makes labor cheap, reduces the cost of production, and increases the profit of the foreign investors. In model 7, the value of lnPOP coefficient is 0.369 that indicates remain other factors unchange a one percent increase in population will increase the net FDI inflow on average by 0.37 percent. This result is also similar to Peres et al. (2018).

The inflation (INF) is negative but insignificant in all circumstances. Higher inflation will reduce the value of the currency as well as the profit of the investors. The less the inflation the more the economic stability as well as foreign investment. This is one of the reasons why foreign investors avoid investing in these nations. But this insignificance suggests that an increase in the host country’s price level has little influence on investment decisions. So, inflation is not a considering factor here. Omankhanlen (2011) finds an insignificant relationship between FDI inflow and inflation. Likewise, Aziz (2018) also discovers a mixed but insignificant connection.

In addition, we compared our findings to those of rich economies (47) and low-income nations (17). Reducing corruption is a crucial element in attracting FDI in both classes, with the coefficient being substantially bigger for low-income and lower-middle-income nations. Corruption operates as a major hindrance to the flow of FDI in the developing countries, rendering this conclusion inescapable. Political stability and regulatory quality are appealing criteria for attracting foreign direct investment (FDI), with regulatory quality having a bigger impact on low- and low-middle-income countries than on the developed world. Here, the influence of GDP per capita in three distinct categories is distinguishable. In high- and lower-middle-income countries, increased GDP per capita encourages higher FDI, while in low-income countries, it has little effect (Table 6). Our findings so corroborate the findings of two other sub groups. However, lower middle income countries are different and require special consideration when designing a favorable environment to entice foreign direct investment (FDI).

4.3. Regional and threshold analysis

Furthermore, using the regional dummy, we construct interaction variables to compare the impact of each institutional quality variable on FDI inflow in different regions. Operating two-steps system GMM we find all institutional quality indicators are effective and have a positive impact in East Asia and Pacific (Table 7). This finding suggests that policymakers can speed up the flow of FDI by introducing some appropriate policies that assist in the development of institutional quality in this area. Our analysis also shows that Europe and Central Asian countries can draw more FDI by reducing the quality of government effectiveness (Table 8) but in other regions, none of the indicators are significant.

| Table 6. Results of system GMM in case of high and low income countries. |
|-------------------|-------------------|
| Response variable: lnFDI | |
| High income countries (47) | Low income countries (17) |
| lnFDI | lnFDI |
| L.InRFDI | –0.179*** | 0.342 |
| (0.0287) | (0.258) |
| COC | 0.0176*** | 2.174* |
| (0.00448) | (1.093) |
| GOVTEFF | –0.0269*** | –1.498 |
| (0.00564) | (1.233) |
| POLI | 0.00666*** | 0.613*** |
| (0.00243) | (0.234) |
| ROL | 0.00304 | –1.812 |
| (0.00714) | (1.091) |
| REGQ | 0.0172** | 1.899** |
| (0.00721) | (0.842) |
| VOACC | –0.00783 | 0.246 |
| (0.00641) | (0.404) |
| lnGDPPC | 0.00638* | –0.999 |
| (0.00369) | (1.440) |
| lnPOP | 0.0128*** | 0.00212*** |
| (0.00191) | (0.000527) |
| TRADE | 0.0000937*** | 0.0140* |
| (0.0000204) | (0.00706) |
| INF | 0.000109 | –0.00232 |
| (0.0000997) | (0.00908) |
| Constant | 26.73*** | 8.573 |
| (6.550) | (10.11) |
| Instruments | 40 | 54 |
| N | 752 | 250 |
| AR2P | 0.260 | 0.525 |
| AR1P | 0.012 | 0.045 |
| HansenP | 0.721 | 0.776 |

Standard errors in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Author estimates.

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1 According to the World Bank, there are 27 low-income countries. But we skipped 10 countries (Afghanistan, Ethiopia, Korea (Dem. People’s Rep), Liberia, Malawi, Somalia, South Sudan, Sudan, Syrian Arab Republic, Yemen) due to data unavailability.
Table 9 summarizes the results of the threshold level of GDP per capita. Model 4 indicates that the regulatory quality has a positive effect on FDI inflows to those countries whose average values of log GDP per capita are greater than the threshold value of 7.197 (−7.139/0.992). In this analysis, the mean value of log GDP per capita (7.401) is higher than the threshold value, implying that most of the lower-middle income country’s regulatory quality elaborates FDI inflow. As we see in our baseline model with a positive sign. Likewise, Model 6 expresses that voice and accountability increases FDI inflow to those countries whose average value of log GDP per capita is higher than the threshold value of 7.776 (−5.008/0.644). Here the mean log GDP per capita is lower than the threshold value, implying that the majority of the country’s per capita GDP is below it. As a result, voice and accountability does not receive enough support to be positive. Consequently, we get the negative sign of this indicator in our baseline estimation.

5. Conclusions and policy recommendations

Institutional quality is a factor that can influence international investors’ investment decisions. The reaction of how the quality of institutions behaves with FDI inflow is empirically reanalyzed in this work. Employing Daniel Kaufmann’s six governance indicators, we perform this analysis on 28 lower-middle income countries during the time period 2002–2018. By utilizing the two-steps system GMM, which reduces the endogeneity problem, we estimate our dynamic panel model and detect the impact of institutional quality. The results reveal that most of the indicators have possessed a key impact on FDI inflow. More specifically, better control of corruption and regulatory quality accelerate foreign investment whereas better rule of law, and voice and accountability impede it. However, we do not find such a significant relationship for the rest of the institutional variables. This finding indicates that reducing the corruption and increasing the quality of regulation promotes the foreign investors and multinational companies to invest their funds in lower-middle income countries. Contrarily, foreign investors choose those countries where people cannot raise their voice properly and maintain a relatively week law enforcement system. Threshold levels express that in most of the lower-middle income countries, regulatory quality affects FDI positively but voice and accountability negatively. The results also confirm that trade openness, past FDI inflow, per capita GDP, and total population have a positive significant effect on FDI inflow and responsible to take investment decisions by foreign investors and MNEs. Moreover, regional analysis confirms institutional quality is a key factor for East Asia and Pacific region.

To engage more FDI the policymakers of lower-middle income countries should improve control of corruption system assuring transparency, takes market-friendly policies ensuring incentives, and reduces taxes for the foreign investors. Here, we do not use any variable that can measure institutional quality directly so, one can helm of this study further by introducing a new proxy of institutional quality. Lastly, we can mention that institutional quality is a crucial element for foreign investors to take an investment decision when they want to invest in lower-middle income countries.

This investigation is not without its caveats. This analysis only covers the years 2002–2018 (16 years). The study is limited to a time span of 18 years because institutions are our primary independent variable and we have data for only that long. Ten low-income countries will be left out of the analysis because of a lack of data from those nations. Furthermore, FDI is particularly important for lower-middle-income countries since, depending on a variety of factors, it is the single most important source of technology and innovation in these countries. From this vantage point, we can consider only a small subset of potential factors. More research is needed to determine the full scope of FDI's social and economic effects.

Declarations

Author contribution statement

Sadhon Saha: Analyzed and interpreted the data; Wrote the paper.
Nazmus Sadekin: Contributed reagents, materials, analysis tools or data.
Sanjoy Kumar Saha: Conceived and designed the experiments; Performed the experiments.

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Data availability statement

Data will be made available on request.

Declaration of interest’s statement

The authors declare no conflict of interest.

Additional information

No supplementary file.

**Table 7. Results of System GMM using East Asia and Pacific dummy.**

| Variables | Response variable: lnRFDI |
|-----------|--------------------------|
|           | (1)          | (2)          | (3)          | (4)          | (5)          | (6)          |
| lnRFDI    | lnRFDI       | lnRFDI       | lnRFDI       | lnRFDI       | lnRFDI       | lnRFDI       |
| L.lnRFDI  | 0.0846***   | 0.117***     | 0.0606***    | 0.0504***    | 0.0950***    | 0.0822***    |
|           | (0.0109)     | (0.0163)     | (0.0140)     | (0.0104)     | (0.0137)     | (0.0109)     |
| COC       | 0.124        | 0.573        | 1.067*       | −0.0265      | 0.378        | 0.373        |
|           | (0.388)      | (0.382)      | (0.599)      | (0.499)      | (0.435)      | (0.249)      |
| GOVTEFF   | 0.0840       | 0.0475       | −0.231       | 0.517        | 0.0466       | 0.102        |
|           | (0.333)      | (0.459)      | (0.478)      | (0.623)      | (0.417)      | (0.407)      |
| POLI      | 0.388**      | 0.646***     | 0.133        | 0.424*       | 0.398*       | 0.140        |
|           | (0.176)      | (0.224)      | (0.201)      | (0.229)      | (0.206)      | (0.158)      |

(continued on next column)
### Table 7 (continued)

| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
|-----------|-----|-----|-----|-----|-----|-----|
| lnRFDI    | 0.788* | 0.651 | 0.835*** | 0.451 | 1.015* | 0.646** |
| (0.394)   | (0.537) | (0.270) | (0.508) | (0.546) | (0.274) |
| ROL       | 0.299 | 1.072 | 0.362 | 0.397 | 0.906 | 0.337 |
| (0.462)   | (0.645) | (0.524) | (0.503) | (0.618) | (0.270) |
| VOACC     | -0.319 | -0.966*** | -0.138 | -0.777* | -0.365 | -0.530*** |
| (0.209)   | (0.424) | (0.395) | (0.389) | (0.306) | (0.184) |
| lnGDPPC   | -0.116 | -0.898* | 0.229 | -0.457 | -0.291 | -0.135 |
| (0.315)   | (0.517) | (0.203) | (0.307) | (0.398) | (0.205) |
| lnPOP     | 0.628*** | 0.618*** | 0.401*** | 0.639*** | 0.592*** | 0.614*** |
| (0.120)   | (0.140) | (0.112) | (0.126) | (0.156) | (0.141) |
| TRADE     | 0.0158*** | 0.0114** | 0.00167 | 0.0202*** | 0.0111** | 0.0156*** |
| (0.00370) | (0.00477) | (0.00258) | (0.00387) | (0.00469) | (0.00560) |
| INF       | -0.00345 | 0.000683 | -0.00191 | -0.00300 | -0.00120 | -0.00658 |
| (0.00566) | (0.00724) | (0.00449) | (0.00841) | (0.00638) | (0.00421) |
| EACOC     | 3.574*** | 12.14*** | 1.612** | 0.231 | 0.231 | 0.231 |
| (1.119)   | (2.587) | (0.766) | (0.476) | (0.476) | (0.476) |
| EAGOV     | 0.180 | 0.615 | 0.222 | 0.378 | 0.301 | 0.231 |
| (0.605)   | (0.441) | (0.627) | (0.726) | (0.813) | (0.631) |
| EAPOL     | 0.0504 | -0.0298 | 0.178 | -0.176 | -0.102 | 0.0150 |
| (0.140)   | (0.126) | (0.243) | (0.226) | (0.212) | (0.253) |
| EAROL     | 0.0767 | 0.0477 | 0.0647 | 0.106 | 0.0838 | 0.0801 |
| (0.00671) | (0.00724) | (0.00449) | (0.00841) | (0.00638) | (0.00421) |
| EAVOA     | 4.765* | 11.37** | 7.734*** | 7.776** | 7.265* | 5.441** |
| (2.695)   | (4.854) | (2.179) | (3.489) | (3.616) | (2.158) |
| Constant  | 4.089*** | 0.500*** | 0.883*** | 0.965*** | 0.958*** | 0.910*** |
| (0.00689) | (0.00729) | (0.00828) | (0.00858) | (0.00993) | (0.00997) |
| Instruments | 22 | 22 | 22 | 22 | 22 | 22 |
| N         | 448 | 448 | 448 | 448 | 448 | 448 |
| AR2p      | 0.516 | 0.411 | 0.539 | 0.415 | 0.518 | 0.508 |
| AR1p      | 0.0767 | 0.0477 | 0.0647 | 0.106 | 0.0838 | 0.0801 |
| Hansenp   | 0.825 | 0.889 | 0.476 | 0.777 | 0.959 | 0.515 |

Note: The interaction variable EACOC indicates the control of corruption index of East Asia and Pacific region. Similarly, EAGOV, EAPOL, EAREGQ, EAROL, and EAVOA indicate government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability index of East Asia and Pacific region. Standard errors are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Author estimation.

### Table 8. Results of System GMM using Europe and Central Asia dummy.

| Variables | Response variable: lnRFDI |
|-----------|--------------------------|
|           | (1) | (2) | (3) | (4) | (5) | (6) |
| lnRFDI    | 0.0896*** | 0.0943*** | 0.0883*** | 0.0960*** | 0.0958*** | 0.0910*** |
| (0.00689) | (0.00729) | (0.00828) | (0.00858) | (0.00993) | (0.00997) |
| COC       | 0.613*  | 0.571*  | 0.461**  | 0.252   | 0.301   | 0.231 |
| (0.345)   | (0.301) | (0.217) | (0.483) | (0.481) | (0.476) |
| GOVTEFF   | -0.180  | -0.615  | -0.222   | 0.378   | 0.0906  | 0.334 |
| (0.605)   | (0.441) | (0.627) | (0.726) | (0.813) | (0.631) |
| POLI      | -0.0504 | -0.0298 | 0.178    | -0.176  | -0.102  | 0.0150 |
| (0.140)   | (0.126) | (0.243) | (0.226) | (0.212) | (0.253) |
| ROL       | -0.206  | 0.0551  | -0.294   | 0.0632  | -0.0383 | -0.168 |
| (0.295)   | (0.368) | (0.279) | (0.324) | (0.443) | (0.411) |
| REGQ      | 0.307   | 0.229   | 0.259    | 0.248   | -0.0460 | 0.125 |
| (0.317)   | (0.282) | (0.316) | (0.384) | (0.363) | (0.458) | (continued on next column)
Table 8 (continued)

| Variables | Response variable: lnRFDI |
|-----------|--------------------------|
|           | (1)                      | (2)                      | (3)                      | (4)                      | (5)                      | (6)                      |
| lnRFDI    | lnRFDI                   | lnRFDI                   | lnRFDI                   | lnRFDI                   | lnRFDI                   | lnRFDI                   |
| VOACC     | 0.261                    | 0.261                    | 0.247                    | 0.214                    | 0.0915                   | 0.0897                   |
|           | (0.202)                  | (0.210)                  | (0.168)                  | (0.196)                  | (0.312)                  | (0.196)                  |
| lnGDPPC   | 0.210                    | 0.156                    | 0.365***                 | 0.272**                  | 0.154                    | 0.180                    |
|           | (0.155)                  | (0.145)                  | (0.111)                  | (0.130)                  | (0.202)                  | (0.174)                  |
| lnPOP     | 0.370***                 | 0.358***                 | 0.420***                 | 0.295**                  | 0.299**                  | 0.317**                  |
|           | (0.0889)                 | (0.0843)                 | (0.0848)                 | (0.136)                  | (0.133)                  | (0.125)                  |
| TRADE     | 0.00453**                | 0.00452**                | 0.00297*                 | 0.00355*                 | 0.00433                  | 0.00378*                 |
|           | (0.00181)                | (0.00204)                | (0.00164)                | (0.00177)                | (0.00256)                | (0.00213)                |
| INF       | 0.00455                  | 0.00919**                | 0.00298                  | 0.00272                  | 0.00626                  | 0.00124                  |
|           | (0.00452)                | (0.00423)                | (0.00332)                | (0.00499)                | (0.00699)                | (0.00556)                |
| EUCACOC   | –1.204                   |                         |                         |                         |                         |                         |
| EUCAGOVC  |                         | –2.884***               |                         |                         |                         |                         |
| EUCAPOL   |                         |                         | –0.900                  |                         |                         |                         |
| EUCAREGQ  |                         |                         |                         | –0.398                  |                         |                         |
| EUCAROL   |                         |                         |                         |                         | –1.370                   |                         |
| EUCAVOA   |                         |                         |                         |                         |                         | 0.752                    |
| Constant  | 7.510***                 | 7.926***                 | 5.611***                 | 8.454***                 | 8.980***                 | 8.816***                 |
|           | (1.686)                  | (1.534)                  | (1.819)                  | (2.093)                  | (2.416)                  | (2.059)                  |
| Instruments | 22                       | 22                      | 22                      | 22                      | 22                      | 22                      |
| N         | 448                      | 448                     | 448                     | 448                     | 448                     | 448                     |
| AR2p      | 0.534                    | 0.527                   | 0.501                   | 0.528                   | 0.543                   | 0.527                   |
| AR1p      | 0.0904                   | 0.0699                  | 0.0887                  | 0.0924                  | 0.0868                  | 0.0840                  |
| Hansenp   | 0.0973                   | 0.167                   | 0.347                   | 0.364                   | 0.341                   | 0.620                   |

Note: EUCACOC, EUCAGOVC, EUCAPOL, EUCAREGQ, EUCAROL, and EUCAVOA indicates the multiplication of Europe and Central Asian dummy with each of the institutional quality indicators respectively, that represents the situation of institutional quality in Europe and Central Asian countries. Standard errors are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Author estimation.

Table 9. Results of System GMM using threshold variables.

| Variables | Response variable: lnRFDI |
|-----------|--------------------------|
|           | (1)                      | (2)                      | (3)                      | (4)                      | (5)                      | (6)                      |
| lnRFDI    | lnRFDI                   | lnRFDI                   | lnRFDI                   | lnRFDI                   | lnRFDI                   | lnRFDI                   |
| L.lnRFDI  | 0.0815***                | 0.0810***                | 0.0891***                | 0.0808***                | 0.0854***                | 0.0875***                |
|           | (0.00528)                | (0.00422)                | (0.00846)                | (0.00349)                | (0.00713)                | (0.00420)                |
| COC       | 3.112                    | 0.408                    | 0.796***                 | 0.0331                   | 0.952***                 | –0.00169                 |
|           | (2.655)                  | (0.395)                  | (0.209)                  | (0.295)                  | (0.280)                  | (0.316)                  |
| GOVTEFF   | –0.127                   | –4.021                   | –0.243                   | 0.352                    | –0.263                   | 0.309                    |
|           | (0.274)                  | (2.723)                  | (0.261)                  | (0.215)                  | (0.335)                  | (0.307)                  |
| POLI      | –0.0589                  | –0.0878                  | 1.350                    | –0.0930                  | –0.0074                  | –0.280**                 |
|           | (0.130)                  | (0.133)                  | (3.551)                  | (0.0854)                 | (0.149)                  | (0.115)                  |
| ROL       | –0.639**                 | –0.103                   | –0.401                   | 0.213                    | 2.589                    | 0.219                    |
|           | (0.247)                  | (0.354)                  | (0.286)                  | (0.273)                  | (2.679)                  | (0.322)                  |
| REGQ      | 0.453*                   | 0.429                    | 0.226                    | –7.199**                 | 0.375                    | 0.225                    |
|           | (0.240)                  | (0.254)                  | (0.277)                  | (2.774)                  | (0.321)                  | (0.261)                  |
| VOACC     | –0.202                   | –0.501**                 | –0.213                   | –0.203                   | –0.144                   | –5.088**                 |
|           | (0.175)                  | (0.198)                  | (0.193)                  | (0.175)                  | (0.197)                  | (1.877)                  |
| lnGDPPC   | 0.0206                   | 0.544***                 | 0.145                    | 0.742**                  | –0.0503                  | 0.752**                  |
|           | (0.278)                  | (0.138)                  | (0.390)                  | (0.158)                  | (0.297)                  | (0.163)                  |

(Note: Table 9 continued on next column)
Table 9 (continued)

| Variables         | Response variable: lnRFDI |
|-------------------|---------------------------|
|                   | (1) | (2) | (3) | (4) | (5) | (6) |
| lnPOP             | 0.399*** | 0.293*** | 0.391*** | 0.280*** | 0.465*** | 0.230*** |
|                   | (0.0768) | (0.0711) | (0.0839) | (0.0607) | (0.0963) | (0.0569) |
| TRADE             | 0.00456*** | 0.00271 | 0.00610** | 0.00416** | 0.00662*** | 0.00518*** |
|                   | (0.00317) | (0.00162) | (0.00229) | (0.00152) | (0.00172) | (0.00172) |
| INF               | −0.00158 | −0.000000898 | −0.00356 | 0.00158 | −0.00283 | −0.000991 |
|                   | (0.00285) | (0.00433) | (0.00296) | (0.00319) | (0.00326) | (0.00203) |
| C0CGDPDPC         | −0.311 |          |          |          |          |          |
|                   | (0.340) |          |          |          |          |          |
| G0GDPDPC          | 0.597 |          |          |          |          |          |
|                   | (0.394) |          |          |          |          |          |
| P0GDPDPC          | −0.202 |          |          |          |          |          |
|                   | (0.485) |          |          |          |          |          |
| REGDPC            | 0.992*** |          |          |          |          |          |
|                   | (0.353) |          |          |          |          |          |
| ROGDPC            |          | −0.471 |          |          |          |          |
|                   |          | (0.394) |          |          |          |          |
| V0GDPDPC          |          |          |          |          |          | 0.644** |
|                   |          |          |          |          |          | (0.244) |
| Constant           | 8.641*** | 6.778*** | 7.491** | 5.671*** | 7.634*** | 5.741*** |
|                   | (2.018) | (1.224) | (3.568) | (1.364) | (2.349) | (1.149) |
| Instruments       | 22     | 22     | 22     | 22     | 22     | 22     |
| N                 | 448    | 448    | 448    | 448    | 448    | 448    |
| AR2p              | 0.532     | 0.509    | 0.559    | 0.478    | 0.569    | 0.491    |
| AR1p              | 0.0853    | 0.0973    | 0.0791    | 0.0959    | 0.0675    | 0.0797    |
| Hansenp           | 0.184    | 0.170    | 0.663    | 0.567    | 0.312    | 0.347    |

Note: C0CGDPDPC, G0GDPDPC, P0GDPDPC, REGDPC, ROGDPC, and V0GDPDPC indicates the multiplication of GDP per capita (threshold variable) with each of the institutional quality indicators respectively, that represents interaction variables. Standard errors in parentheses. *p < 0.10. **p < 0.05. ***p < 0.01.

Source: Author estimation.

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