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Institutions and FDI: evidence from developed and developing countries

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Abstract

This study investigates the impact of institutional quality on Foreign Direct Investment (FDI) inflows using panel data for low, lower-middle, upper-middle and high-income countries for the sample period of 1996–2016 using the system Generalized Method of Moments (GMM). The empirical results confirm that institutional quality has a positive impact on FDI in all group of countries. The magnitude of the coefficients of control of corruption, government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability for FDI inflows are greater in developed countries than in developing countries. We conclude that institutional quality is a more important determinant of FDI in developed countries than in developed countries. However, GDP per capita, agriculture value-added as a percentage of GDP, and inflation influence FDI inflows negatively in developed countries, while GDP per capita, trade openness, agriculture value-added as a percentage of GDP, and infrastructure have positive and statistically significant impacts on FDI inflows in developing countries. Trade openness as a percentage of GDP and infrastructure positively affect FDI in developed countries. From our analysis, we infer that institutional quality is a more important determinant of FDI in developed countries than in developing countries.

Keywords: Institutional quality, FDI, Economic development, Panel data

JEL classifications: O1, O4, O43, E62, O57

Introduction

The traditional neoclassical growth model claims that differences in countries' per capita incomes are due to differences in their capital accumulation, which are in turn due to their differing saving rates. Therefore, differences in capital accumulation are due to differences in countries' saving rates (Solow 1956; Koopmans 1965). Furthermore, developing countries are characterized by low per capita income, poverty, unemployment, high population growth and low savings rates. Certainly, low levels of savings and investments create savings-investment gaps that have negative impacts on economic growth and development.

Foreign direct investment (FDI) helps to fill the gap between savings and required level of investment (Sabir and Khan 2018). Globalization increased the importance of FDI worldwide and endogenous growth theories emphasize that FDI is a key determinant of economic growth because it is a source of technological transfer from developed

countries to developing countries (Chenaf-Nicet and Rougier 2016). FDI can directly and indirectly reduce unemployment (Lipsey 2001) and increases productivity by improving the skills and knowledge of workers in the host country.

Since 1990, competition enhanced among developed countries and developing countries to attract FDI inflows in term of reducing taxes and providing subsidies. Many developing countries adopted policies to facilitate FDI inflows and monitor FDI operations (World Bank 2013). Such as financial sector adjustment program, structural adjustment programs, economic recovery programmes and economic partnership agreements (Asamoah et al. 2016). Since 1990, FDI increased in developing countries, including among members of the South Asian Association of Regional Cooperation (SAARC), the Association of Southeast Asian Nations (ASEAN), Sub-Saharan African countries and Central Asian countries. Perhaps these developing countries are benefitting from FDI inflows, such as improved technology, better management skills and increased capital accumulation, exports, employment, higher productivity, and economic growth.

Dunning (1988) proposed the eclectic paradigm theory that decision of a foreign investor to invest in a host country depends on the size of the firm, administration and management systems, labor and transportation costs, government policies, as well as institutions and political stability. Foreign investors may be more concerned about risk and return when they enter the foreign markets (Fedderke and Romm 2006).

The relationship between institutions and economic performance has attracted attention from researchers and policy makers for the last few decades. North and Thomas (1973) emphasize that economic factors such as capital accumulation, per capita income, and innovation are not the only factors that create differences in a country's economic growth and development; systematic differences in institutional quality are also responsible for those differences. For example, North and South Korea have the same economic attributes but differ in their economic outcomes (for example, South Korea has a higher per capita GDP than North Korea does) due to the differences in their institutions (Acemoglu et al. 2006). Indeed, economic institutions are important because they shape the behavior of economic actors and stakeholders (Sabir and Zahid 2012). In countries with secure well-protected property rights, people are incentivized to make domestic and foreign investments that boost economic growth. Otherwise, investment and growth lag behind.

Poor institutions impede FDI and can act like a tax, thus increasing the cost of FDI (Buchanan et al. 2012). Investors are unwilling to invest in countries where institutions encourage corruption, nepotism and red tape because these factors increase the cost of doing business (Mengistu and Adhikary 2011).

Harms and Ursprung (2002) find that foreign investors invest in countries with strong democratic structures, while autocratic societies often experience policy reversal and attract less FDI. Some studies find that institutional quality positively and significantly impacts FDI inflow in Asia and Latin America (Gani 2007), SAARC, Central Asian countries and the ASEAN region (Ullah and Khan 2017). Lucke and Eichler (2016) estimate the impact of institutional and cultural determinants of FDI in developing countries and find a positive association

between institutions and FDI in developing countries and that foreign investors prefer to invest in countries that are politically unstable and have less diverse societies. Peres et al. (2018) analyze the impact of institutional quality on FDI inflows in developed and developing countries using corruption and the rule of law as measures of institutional quality, and find that institutions have an insignificant impact on FDI in developing countries due to the weak structure of institutions. Moreover, institutional quality has a positive and significant impact on FDI in developed countries. Other studies analyze the impact of institutions on FDI inflows at various stages of development. Therefore, good quality institutions in the host country are a precondition for attracting FDI inflows into that country. This study examines the impact of the indicators of institutional quality (such as political stability, control of corruption, rule of law, voice and accountability, regulatory quality and government effectiveness) on inward FDI in developing and developed countries. These are indicators of three important dimensions of institutional quality: 1) political stability, 2) administrative quality, and 3) democratic accountability. We examine the separate effect of each indicator on FDI inflows in low, lower-middle, high, and upper-middle-income countries.

Institutional quality indicators are highly correlated (Globerman and Shapiro 2002; Daude and Stein 2007; Buchanan et al. 2012), and it is not possible to include all indicators in a single equation (Ullah and Khan 2017). Therefore, we construct an institutional quality index using principal component analysis (PCA). The basic purpose of using this technique is to combine the six indicators of institutional quality into a single variable that duplicates the original data with minimal loss of information. The empirical analysis uses panel data of 59 and 89 developing and developed countries, respectively for 1996–2016. To avoid heteroscedasticity, autocorrelation, omitted variable bias and endogeneity problems, we use the system Generalized Method of Moments (GMM).

This paper offers three contributions to the literature. First, the results indicate that the effect of institutions on FDI inflows varies across countries. To analyze the impact of institutions on FDI, we separate developing countries into low and lower-middle-income countries, and developed countries into upper-middle and high-income countries. Second, we examine the impact of each indicator of institutional quality on FDI inflows separately for both developing and developed countries. Third, we construct an institutional quality index to study its impact on FDI.

The remainder of the study proceeds as follows: Section “[Theoretical framework](#)” provides the theoretical background on institutions and foreign direct investment. Section “[Methodology and data](#)” presents the methodology and data. Section “[Results and discussion](#)” discusses the empirical results, and section “[Conclusion](#)” concludes.

Theoretical framework

North (1990) defines institutions as human invented constraints consisting of structural, economic, political and social issues. Indeed, institutions represent the formal and informal rules of the game in which different players and economic actors interact and perform actions to maximize their profits and returns.

According to North (1990), good institutions affect economic activities through different channels such as by reducing the transaction, manufacturing and production costs. Moreover, good quality institutions help reduce the cost of doing business, which increases profitability. However markets with poor institutions take up more time and resources for monitoring. When property rights are poorly protected and contract enforcement is difficult, the risk premium is high and economic activity is slower. International investors hesitate to invest in such a risky and uncondusive environment. By contrast, a risk-free environment is a good location for the source country and good institutions also lead to better FDI utilization. Lucas (1993) suggests that in emerging economies, institutional factors, as compared to purely economic factors, play an important role in attracting inward FDI.

In summary, the host country's institutional quality affects profitability, and institutionally strong countries can attract foreign investors by offering high returns. Dunning (1998) expands the concept of locational advantage by adding institutional factors along with economic factors. He argues that foreign investors prefer locations that offer the best economic and institutional facilities. Hence, foreign investors' decisions depend on the rate of return based on sound institutions and other macroeconomic indicators.

Based Dunning's eclectic paradigm theory and North's institutional theory, inward FDI depends on market size, natural and human resources, efficiency seeking and the institutional quality of the host country. We can algebraically write this relationship as

$$FDI = f(\text{Market size}, \text{macroeconomic stability}, \text{Institutions})$$

where FDI is foreign direct investment, market size is an important determinant of FDI in the host country and is proxied with GDP per capita, macroeconomic stability indicates the economic situation of the host country that affects FDI measured by inflation. Inflation indicates the internal economic tension and ability of the central bank and government to control the money supply and balance the budget (Schneider and Frey 1985; Buchanan et al. 2012). Some argue that a higher rate of inflation leads to lower FDI (Bruno 1993; Buchanan et al. 2012). According to the theoretical literature, institutional quality positively impacts economic growth (North 1990; King and Levine 1993; Knack and Keefer 1995; Mauro 1995; Acemoglu and Verdier 1998; Ali et al. 2010). However, some studies examine the effects of institutional quality on FDI with a focus on the rule of law, property rights enforcement, control of corruption, voice and accountability, and government effectiveness. These studies find that weak institutions are negatively associated with FDI (Bénassy-Quéré et al. 2007; Buchanan et al. 2012).

Methodology and data

Econometric model

Based on theoretical background, we use the following empirical model to analyze the impact of institutions on FDI:

$$Y_{it} = \alpha + \beta_i X_{it} + \gamma_i Z_{it} + U_{it} \quad (1)$$

where Y_{it} is the log of FDI inflows, X_{it} are vectors of the variables of interest of country

$i = (1, 2, 3, \dots, N)$ during period $t = (1, 2, 3, \dots, T)$. The variables of interest consist of indicators of political institutional quality, Z_{it} are the vectors of control variables such as inflation, trade openness, GDP per capita, value added share of agriculture as a percentage of GDP, and infrastructure measured as mobile phone subscription per 100 people, and U_{it} is the error term.

FDI is the dependent variable. Prior empirical studies use different proxies of FDI, and in line with other studies, we use FDI inflows, which is the log of net inflow of FDI in current U.S. dollars. We use inflation as a proxy of macroeconomic instability and economic tension, as there is a negative relationship between inflation and FDI.

It is widely believed that the host country's level of development is an important determinant of inward FDI. As the level of development increases, the population's ability to purchase goods and services increases, which motivates foreign investors to invest. GDP per capita captures the level of development. Moreover, trade openness is a vital factor in promoting inward FDI because foreign investors prefer free trade over restricted trade. As the latter increases the cost of doing business, increases which discourages foreign investment. Theoretically, there is a positive relationship between trade openness and FDI (Kravis and Lipsey 1982; Culem 1988; Shah and Khan 2016). We use trade openness as a proxy of market-seeking FDI. Good infrastructure can attract greater FDI because it reduces operational costs (Khadaroo and Seetanah 2010). We use infrastructure as a proxy of efficiency-seeking FDI. We also include the value-added share of agriculture in GDP as an explanatory variable because FDI is an important source of investment in agriculture and can enhance agricultural productivity by introducing new technology (Tondl and Fornero 2010). In line with other studies, we use mobile phone subscriptions per 100 people as a proxy of infrastructure. Theoretically, there is positive relationship between infrastructure and inward FDI. Efficiency-seeking investment targets with relatively low costs of transport and communication (Dunning 2006).

We consider six indicators of institutional quality: control of corruption, political stability, rule of law, regulatory quality, voice and accountability, and government effectiveness (Kaufmann et al. 2007) to examine their impact on FDI inflows in developing and developed countries. Corruption refers to the use of public power for personal gain and covers a broad range of human actions. We use control of corruption as a proxy of institutional quality. Theoretically, there is a positive relationship between control of corruption and inward FDI. Political stability is an important factor that ensures the inflow of FDI. FDI is a long-term investment activity, and every type of threat discourages FDI inflows. Multi-national corporations (MNCs) avoid FDI in cases of political instability due to high risk, and switch to risk-free countries (Meier 2006). By contrast, the rule of law encourages inward FDI. Rules and laws are sets of agreements by which countries implement FDI policies and that protect future returns (Hoff and Stiglitz 2005). The rule of law discourages market-unfriendly policies and minimizes risk. Regulatory quality boosts inward FDI by introducing market-friendly policies such as price controls, government intervention, and free movement of capital (Fazio and Talamo 2008). Regulatory quality captures the government's ability to

formulate and implement sound policies and regulations that promote economic development. Voice and Accountability have positive relations with FDI: through voice and accountability, a country's citizens can enjoy many freedoms such as freedom of expression, freedom of association, and free media. Furthermore, when citizens select their government, they are in a position to reject corrupt governments. Voice and accountability are together responsible for providing a risk-free climate for domestic and foreign investors (Inter-American Development Bank 2001; Saadatmand and Choquette 2012). Government effectiveness captures the quality of public and civil service and the degree of its independence from political pressure (Buchanan et al. 2012).

We examine the impact of each indicator of institutional quality on FDI controlled with other macroeconomic variables. All these measures of institutional quality are highly correlated, so it is inappropriate to use all of them in a single equation (Globerman and Shapiro 2002). Appendix 1 reports the correlation matrix of the six governance indicators, which indicates a high correlation among variables.

Therefore, we use PCA to construct a composite index of institutions. We extract the first principal component of the six proxies of institutional quality using factor analysis (Globerman and Shapiro 2002; Buchanan et al. 2012), which we refer to as the institutional quality index. This index ranges from -0.659 to $+2.48$ for high-income countries, -2.894 to 2.277 for upper-middle-income countries -2.351 to 1.918 for lower-middle-income countries and -0.436 to 0.754 for low-income countries. This index implies that institutions are more developed in developed countries than in developing countries.

To examine the impact of institutions on inward FDI, this paper used panel data of 20 low-income, 39 lower-middle-income, 44 upper-middle-income countries and 45 high-income countries for 1996 to 2016. We include low-income and lower-middle-income countries within the category of developing countries, and upper-middle income and higher-income countries within the set of developed countries. We select the countries and sample period according to the data¹ availability.

The main sources of data are the World Development Indicators (WDI) and the World Governance Indicators (WGI). Data on inflation, trade openness, mobile phone subscriptions per 100 people, GDP per capita, and value-added share of agriculture as a percentage of GDP were obtained from the WDI.

We obtained data on the institutional variables control of corruption, voice and accountability, government effectiveness, political stability, rule and law, and regulatory quality from WGI.²

Estimation methods

To investigate the impact of institutions on FDI, we estimate the following regression:

$$Y_{it} = \alpha + \alpha_i Y_{it-1} + \beta_i X_{it} + \gamma_i Z_{it} + U_{it} \quad (2)$$

where α , β and γ are the parameters we estimate. We cannot estimate this fixed effect regression using the least square dummy variable (LSDV) method if linear regression assumptions are not satisfied; for example, the means of the random term (U) should be zero and the covariance between U and X should be zero $\text{cov}(X_{it}, U_{it}) = 0$.

However, the literature on institutions and FDI indicates an issue with endogeneity in the institutional variable (Ali et al. 2010; Peres et al. 2018). Using LSDV method will

result in biased and inconsistent estimators. We therefore address this problem by using system GMM, or instrumental variable method (Arellano and Bond 1991; Blundell and Bond 1998). The dynamic equation is

$$\Delta y_{it} = \alpha_0 + \omega \Delta \ln y_{i,t-1} + \beta \ln X_{it} + \gamma \ln Z_{it} + \eta_i + v_i \quad (3)$$

System GMM is a combination of level and difference dynamic equations that improves on difference-GMM because it both supplements the equation in the first differences with the equation in levels and allows for the correction of measurement errors in the other regressors (Blundell and Bond 1998). The prerequisite for system GMM are that the autocorrelation at the first order autoregressive AR(1) process should be significant and autocorrelation at the second order autoregressive AR(2) should be insignificant.

Legal origin is the significant determinant of institutional quality and size of the financial market (Buchanan et al. 2012). For example, legal enforcement can secure property rights and quality enforcement of legal rights attracts FDI. Moreover, these rules vary across countries by legal origin, depending on whether the origin is English, French, Scandinavian, or German. However, the primary legal systems consist mainly of French civil law and English common law (David and Brierley 1985). Some argue that countries with institutions based on French civil law tend to offer protection to the fragile investor and have smaller capital markets, whereas common law countries offer strong protection and have larger capital markets (La Porta et al. 1997). We use legal origin as an instrument for institutional variables, lagged values of explanatory variables as instruments for the difference equation, and explanatory variables with lagged difference as instruments for the level equation. We use a maximum of five lags of the explanatory variables as instruments until the results pass the Sargan test.

Results and discussion

Estimation results for developing countries

Table 1 reports the empirical results for low and lower-middle income countries. First, we estimate our fixed effect model by employing the LSDV method and use the Wu Hausman test to check for endogeneity in the institutional variable, trade openness, lnGDP per capita, and all other explanatory variables.

The results show that trade openness positively and significantly impacts FDI inflows in both low and lower-middle-income countries. Moreover, holding all other factors constant, a one-percentage-point increase in trade openness leads to a 3.7% increase in FDI inflows in low-income countries and a 2.1% increase in lower-middle-income countries. These findings are in line with results by Furceri and Borelli (2008), Asiedu (2002), and Liargovas and Skandalis (2012). This implies that the more-open economies encourage more inflows of foreign capital than do the less-open economies. Similarly, the number of mobile phone users, and lnGDP per capita are positively and statistically significantly associated with FDI in both groups of developing countries. However, inflation impacts FDI negatively but it is statistically insignificantly. It is interesting that agricultural value-added as a percentage of GDP has a positive and statistically significant impact on FDI inflows in lower-middle-income countries, but it is statistically insignificant for low-income countries.

Table 1 Estimation Results for Developing Countries

Variables	Low Income Countries		Lower Middle income Countries	
	FEM	GMM	FEM	GMM
lnFDI(t-1)		0.471 ^a (0.000)		0.596 ^a (0.000)
Trade	0.005 (0.927)	0.037 ^b (0.020)	0.074 ^a (0.000)	0.021 ^a (0.000)
lnMobile	0.306 (0.285)	0.384 ^c (0.060)	0.078 (0.449)	0.096 ^c (0.101)
LnGDP per capita	10.776 (0.191)	15.527 ^b (0.023)	0.841 ^b (0.047)	8.603 ^b (0.048)
Inflation	-0.0002 (0.087)	-0.003 (0.977)	-0.017 (0.343)	-0.008 (0.567)
Agriculture value added	0.466 ^b (0.011)	0.043 (0.248)	0.101 ^b (0.031)	0.009 ^a (0.001)
Institutional Index	0.354 ^b (0.816)	2.027 ^b (0.022)	0.471 ^b (0.339)	2.580 ^b (0.021)
Constant	45.263 ^b (0.039)	17.879 ^b (0.044)	6.254 ^b (0.048)	7.658 ^b (0.018)
AR(1)		0.000		0.000
AR(2)		0.120		0.117
Sargan		0.234		0.721

Note: ^a, ^b and ^c denote significance at the 1%, 5% and 10% levels, respectively. Parentheses show *P*-values

The institutional quality index has a positive and statistically significant effect on FDI in both group of countries. A one-standard-deviation improvement in the political institutional index leads to a 7.5-fold increase in FDI in low-income countries and a 13.20-fold increase in lower-middle-income countries. This finding implies that institutions in developing countries are improving gradually, which is attracting enormous amounts of FDI inflows.

Estimation results of developed countries

The results in Table 2 show that all control variables are significant and maintain their anticipated signs for high and upper-middle-income countries. Trade openness has a positive and statistically significant influence on FDI inflows, implying that more open countries have incentives to attract more market-seeking FDI in both groups. These findings are consistent with the previous literature (Asiedu 2002; Egger and Winner 2005; Busse and Hefeker 2007; Buchanan et al. 2012). The estimated coefficient of lnGDP per capita is negative and statistically significant in both high and upper-middle-income countries. This finding suggests that inward FDI does not have better prospects in developed countries with higher GDP per capita. One reason could be that foreign investors do not consider the level of development as a sufficient indicator when deciding whether to invest capital in developed countries because they may choose to invest in these countries due to the presence of high-quality institutions. The other reason could be that as living standard increases, the cost of doing business also increases (Buchanan et al. 2012). The coefficient of the mobile phone subscription rate is positive and statistically significant, which shows that quick dissemination of information can attract more FDI. These findings are consistent with the study of Campos and Kinoshita (2008).

Poor infrastructure in the form of less dissemination of information increases transaction costs and restrains access to both local and global markets, ultimately impeding foreign investment (Khadaroo and Seetanah 2010). The coefficient of

Table 2 Estimation Results for Developed Countries

	High Income Countries		Upper Middle Income Countries	
	FE	GMM	FE	GMM
lnFDI(t-1)		0.581 ^a (0.001)		0.387 ^a (0.000)
Trade openness	0.042 (0.344)	0.640 ^b (0.014)	0.133 ^a (0.000)	0.221 ^a (0.000)
lnMobile	2.949 ^b (0.022)	0.120 ^b (0.016)	0.869 ^a (0.000)	0.003 ^b (0.022)
lnGDP per capita	-6.580 (0.443)	-4.981 ^c (0.108)	-9.227 ^a (0.000)	-8.355 ^c (0.074)
Inflation	-0.346 (0.252)	-0.230 ^c (0.071)	0.0002 (0.966)	-0.021 (0.269)
Agriculture value added	-0.379 (0.290)	-0.369 (0.241)	-0.142 (0.132)	-0.120 (0.115)
Institutional Index	5.774 (0.141)	4.853 ^b (0.019)	0.911 ^b (0.033)	2.693 ^b (0.055)
Constant	5.674 ^b (0.036)	10.270 ^a (0.000)	7.512 ^a (0.000)	21.726 ^a (0.002)
	0.218		0.388	0.000
AR(1)		0.041		0.342
AR(2)		0.222		0.262
Sargan		0.357		0.371

Note: ^a, ^b and ^c denote significance at the 1%, 5% and 10% levels, respectively. Parentheses show *P*-values

inflation is negative but has an insignificant impact on FDI. This result is consistent with Egger and Winner (2005). Agriculture value-added as a percentage of GDP has a negative and statistically insignificant relationship with FDI in high and upper-middle-income countries.

The coefficient of the political institutional index is positive and statistically significant for group of countries. Therefore, our results stand out in showing that quality political institutions can attract massive FDI inflows in developed countries. The magnitude of the coefficient of the political institution index of high-income countries is greater than that of upper-middle-income countries. Overall, the magnitudes of the coefficients of the political institutional index for the groups of developed countries are higher than those for groups of developing countries.

Political institutions are a more important and significant determinant of inward FDI in developed countries than in developing countries. This could be because high-quality institutions reduce transaction and information costs, which encourages foreign investors and hence contributes to economic growth. Moreover, political stability in the country in the form of democracy also motivates investors to invest more capital in these countries.

Impact of the institutional quality indicators on FDI in developing and developed countries

We also estimate the impact of each indicator of institutional quality on FDI for low-income and lower-middle-income countries separately. We report the results in Appendix 3. The effect of the control of corruption on FDI is positive in low and lower-middle-income countries, suggesting that the presence of strong institutions in the form of control of corruption in developing countries encourages investment, which increases economic growth.

Similarly, government effectiveness and regulatory quality have a positive and statistically significant impact on FDI in low and lower-middle-income countries implying that government in the form of public and civil services, which are

independent of political pressure, encourages investment by entrepreneurs and investors. Government effectiveness in terms of the quality of public and civil services is the same in low and lower-middle-income countries. Moreover, political stability also positively affects FDI in these countries because foreign investors do not have to fear sudden policy reversal. This implies that foreign investors prefer to invest capital in host countries with stable governments, even under policy uncertainty (Alesina et al. 1996).

However, the coefficients of regulatory quality, rule of law, and voice and accountability are insignificant in both groups of developing countries. This finding implies that these indicators are weak and do not impact FDI in these host countries. Therefore, other factors determine FDI in developing countries.

Tables 10, 11, 12, 13, 14 and 15 in Appendix 3 show that institutional indicators such as control of corruption, government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability have positive and statistically significant impacts on FDI in high and upper-middle-income countries. It is worth emphasizing that institutions in developed countries are stronger than in developing countries. Control of corruption has a positive and statistically significant effect on FDI in developed countries. The coefficient for this variable has a larger impact on FDI inflows in developed countries than in developing countries, suggesting that good quality institutions for controlling corruption enhance inward FDI, which leads to economic growth. Government effectiveness has a positive and statistically significant impact on attracting FDI for both groups of high-income and upper-middle-income countries. Holland and Pain (1998a, b) identify privatization (a determinant of government effectiveness) as one key determinants of FDI; as privatization increases, FDI increases.

Political stability has a positive influence on inward FDI for developed countries. In politically unstable economies, foreign investors are hesitant to invest due to fears of sudden policy reversals, while politically stable economies are ideal for foreign investors (Brada et al. 2006). Therefore, host countries should maintain a level of political stability that will boost confidence among foreign investors.

Regulatory quality plays a positive and significant role in attracting FDI in developed countries, but regulatory quality does not influence inward FDI in developing countries. This finding implies that developed countries have adopted market-friendly policies that significantly attract FDI. Moreover, the empirical results show that the rule of law also positively and statistically significantly impacts FDI in both groups of developed countries. The implication is that developed countries adopted a transparent legal system to protect property and individual rights. Therefore, stable public institutions encourage foreign and domestic investors to make long-term sustainable investments. Voice and accountability has a positive effect on FDI in developed countries but an insignificant effect in developing countries. Hence, FDI flows to democratic countries with secure freedom of speech rights and independent media.

Our overall finding is that institutional indicators have different impacts on FDI in low, middle, upper-middle, and high-income countries. Our results suggest that good-quality institutions appear to be an important factor in FDI determination in developed countries, while they have a minor effect on inward FDI in developing countries. Moreover, we find that the level of development, trade openness and other

macroeconomic variables significantly contribute to FDI in developing countries. However, the level of development has a negative impact on FDI in developed countries, while trade openness and infrastructure positively affect FDI in these countries.

Conclusion

This study investigated the impact of institutional quality on FDI inflows by controlling the effects of inflation, GDP per capita, trade openness as a percentage of GDP, infrastructure, and agriculture value-added as a percentage of GDP in developed and developing countries. We separated developing countries segregated into low and lower-middle-income countries, and developed countries into upper-middle and high-income countries for the sample period of 1996 to 2016. We used six governance indicators as a measure of institutional quality to examine their impact on FDI. We observed high correlation among the institutional indicators, and thus constructed an institutional quality index using PCA and adopted the system GMM to address the endogeneity problem in the institutional index and other variables. We find that indicators of institutional quality such as control of corruption, government effectiveness and political stability have positive and significant impacts on FDI inflow in developing countries but that other indicators of institutional quality have positive but insignificant impacts on FDI in these countries. Moreover, all indicators of institutional quality positively and significantly affect FDI in developed countries. Our results establish that institutional quality has a greater impact on FDI in developed countries than in developing countries. We also estimated the impact of the institutional quality index on FDI in developing and developed countries. The institutional quality index has a positive impact on FDI for all groups of countries, but the magnitudes of the coefficients is larger for developed countries than for developing countries. However, lnGDP per capita, trade openness as percentage of GDP, agriculture value added as a percentage of GDP and infrastructure have positive impacts on FDI in developing countries while inflation impacts FDI negatively in these countries. Variables such as infrastructure and trade openness have a positive impact on FDI inflows in developed countries. The value-added share of agriculture as a percentage of GDP, GDP per capita and inflation all negatively impact FDI in developed countries.

Finally, compared with other relevant policy variables, institutional reform appears to be an important determinant for attracting FDI in all countries. Undeniably, institutional quality appears to be as important as macro-economy. More specifically, macroeconomic stability in terms of a low inflation rate, efficient markets in terms of institutions, trade openness, GDP per capita and better infrastructure are important determinants of FDI. Governments in developing countries can significantly promote FDI by introducing appropriate institutional reforms and macroeconomic policies.

Further we will extend this study by including economic institutions to examine their on FDI inflows in developing countries.

Endnotes

¹Lists of countries provided in Appendix 2

²Table of variables and data sources is provided in Appendix 2

Appendix 1

Table 3 Correlation Matrix of Low income countries

	InFDI	trade	Mobile	InGDPp	Un	Inflation	Agriculture	CC	GE	PS	RQ	RL	VA
InFDI	1.000												
Trade	0.335	1.000											
Mobile	0.421	0.193	1.000										
InGDPp	0.326	0.069	0.388	1.000									
Un	0.257	0.204	0.023	-0.011	1.000								
Inflation	-0.003	0.035	-0.030	0.049	-0.001	1.000							
Agriculture	-0.333	0.041	-0.213	-0.440	-0.163	-0.061	1.000						
CC	0.074	-0.078	0.070	0.211	0.105	-0.082	-0.355	1.000					
GE	0.156	-0.156	-0.009	0.381	0.161	-0.046	-0.521	0.781	1.000				
PS	0.261	0.088	0.126	0.366	0.251	-0.030	-0.364	0.568	0.622	1.000			
RQ	0.240	-0.168	0.086	0.287	0.136	-0.150	-0.344	0.739	0.812	0.616	1.000		
RL	0.227	-0.067	0.094	0.330	0.079	-0.104	-0.413	0.773	0.844	0.720	0.880	1.000	
VA	0.216	0.091	0.184	0.280	0.217	-0.096	-0.250	0.547	0.612	0.745	0.649	0.757	1.000

Descriptive Statistics of Low income Countries					
	Obs.	Mean	Std. Dev.	Min.	Max.
InFDI	420	18.017	2.358	4.605	22.625
Trade	420	61.464	31.303	20.964	311.360
Mobile	420	23.441	29.562	0.000	149.070
InGDPp	420	6.197	0.399	4.811	7.206
Inflation	420	75.360	1192.571	-35.837	24.411
Agriculture	420	36.512	12.986	10.094	93.977
Index	420	-0.520	0.547	-0.436	0.754

Table 4 Correlation Matrix of Lower middle income countries

	InFDI	Trade	Mobile	InGDPp	Inflation	Agriculture	CC	GE	PS	RQ	RL	VA
InFDI	1.000											
Trade	-0.186	1.000										
Mobile	0.438	0.178	1.000									
InGDPp	0.175	0.300	0.489	1.000								
Inflation	-0.048	-0.130	-0.173	-0.284	1.000							
Agriculture	-0.212	-0.347	-0.388	-0.661	0.378	1.000						
CC	-0.299	0.335	0.079	0.431	-0.204	-0.322	1.000					
GE	-0.023	0.177	0.129	0.351	-0.185	-0.296	0.727	1.000				
PS	-0.367	0.448	-0.013	0.256	-0.150	-0.086	0.574	0.445	1.000			
RQ	0.107	0.272	0.237	0.417	-0.212	-0.416	0.449	0.709	0.287	1.000		
RL	-0.131	0.268	0.066	0.395	-0.200	-0.322	0.859	0.746	0.545	0.549	1.000	
VA	-0.031	0.194	0.105	0.245	-0.149	-0.239	0.507	0.448	0.441	0.473	0.602	1.000

Descriptive Statistics of Lower Middle Income Countries					
	Obs.	Mean	Std. Dev.	Min.	Max.
InFDI	819	19.536	1.946	11.795	24.518
Trade	819	81.252	64.355	0.167	170.407
Mobile	819	42.225	44.130	0.000	196.311
InGDPp	819	7.393	0.545	5.556	8.358
Inflation	819	8.328	10.416	-18.110	132.824
Agriculture	819	19.870	11.134	2.273	57.239
Index	819	-0.455	0.761	-2.351	1.918

Appendix 2

Table 5 Correlation Matrix of Upper middle income countries

	InFDI	Trade	Mobile	InGDPp	Inflation	Agriculture	CC	GE	PS	RQ	RL	VA
InFDI	1.000											
trade	-0.261	1.000										
Mobile	0.353	-0.062	1.000									
InGDPp	0.401	-0.090	0.498	1.000								
inflation	-0.022	-0.042	-0.118	-0.072	1.000							
Agriculture	-0.394	0.076	-0.305	-0.636	0.095	1.000						
CC	-0.108	0.022	0.075	0.186	-0.083	-0.142	1.000					
GE	0.135	0.008	0.211	0.311	-0.096	-0.156	0.812	1.000				
PS	-0.322	0.225	0.030	0.134	-0.048	-0.080	0.550	0.431	1.000			
RQ	0.179	-0.016	0.159	0.306	-0.145	-0.160	0.703	0.825	0.340	1.000		
RL	-0.208	0.069	0.077	0.205	-0.113	-0.073	0.857	0.821	0.656	0.747	1.000	
VA	-0.222	-0.015	0.047	0.139	-0.086	0.030	0.742	0.672	0.504	0.730	0.775	1.000

Descriptive Statistics of Upper Middle Income Countries

	Obs.	Mean	Std. Dev.	Min.	Max.
InFDI	924	20.438	2.448	6.908	26.396
Trade	924	86.638	46.561	0.027	531.737
Mobile	924	58.694	49.111	0.000	185.822
InGDPp	924	8.592	0.473	7.106	9.920
Inflation	924	11.108	39.948	-16.117	1058.374
Agriculture	924	9.769	6.367	0.892	41.491
Index	924	-0.472	1.152	-3.894	2.277

Table 6 Correlation Matrix of High income countries

	InFDI	Trade	Mobile	InGDPp	Inflation	Agriculture	CC	GE	PS	RQ	RL	VA
InFDI	1.000											
Trade	0.106	1.000										
Mobile	0.293	0.274	1.000									
InGDPp	0.394	0.115	0.249	1.000								
Inflation	-0.194	-0.068	-0.180	-0.380	1.000							
Agriculture	-0.343	-0.303	-0.287	-0.514	0.393	1.000						
CC	0.373	0.121	0.034	0.619	-0.192	-0.109	1.000					
GE	0.453	0.185	0.084	0.631	-0.275	-0.209	0.904	1.000				
PS	-0.010	0.258	-0.087	0.316	-0.073	0.032	0.524	0.507	1.000			
RQ	0.483	0.296	0.109	0.466	-0.218	-0.157	0.795	0.863	0.445	1.000		
RL	0.448	0.112	0.088	0.642	-0.260	-0.152	0.919	0.920	0.524	0.379	1.000	
VA	0.269	-0.114	-0.034	0.176	-0.034	0.169	0.569	0.606	0.379	0.586	0.662	1.000

Descriptive Statistics of High Income Countries

	Obs.	Mean	Std. Dev.	Min.	Max.
InFDI	945	22.231	2.184	14.509	27.322
Trade	945	107.483	76.220	18.349	442.620
Mobile	945	86.838	46.890	0.533	235.612
InGDPp	945	10.266	0.621	8.579	11.626
Inflation	945	2.775	3.224	-4.863	28.342
Agriculture	945	2.625	2.140	0.035	12.876
Index	945	0.716	0.681	-0.659	2.488

Appendix 3

Table 7 Description of the variables

Variables Description	Definition of Variables	Source
Control of corruption	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Political stability	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Rule and Law	Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Voice and accountability	Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Regulatory quality	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Government effectiveness	Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Trade Openness GDP per capita	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2005 U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.	WDI
Inflation (CPI)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.	WDI
Mobile Phone	Mobile cellular and telephone subscriptions are subscriptions to a public mobile telephone service that provide access to the PSTN using cellular technology. The indicator includes (and is split into) the number of post-paid subscriptions, and the number of active prepaid accounts (i.e. that have been used during the last three months). The indicator applies to all mobile cellular subscriptions that offer voice communications. It excludes subscriptions via data cards or USB modems, subscriptions to public mobile data services, private trunked mobile radio, tele point, radio paging and telemetry services.	WDI
Agriculture share	Value added share of agriculture as a percentage of GDP	WDI

Table 8 List of developing countries

Low Income Countries		Lower Middle income countries			
1	Benin	1	Armenia	21	Mauritania
2	Burkina Faso	2	Bangladesh	22	Moldova
3	Burundi	3	Bhutan	23	Mongolia
4	Central African Republic	4	Bolivia	24	Morocco
5	Chad	5	Cabo Verde	25	Myanmar
6	Congo, Dem. Rep.	6	Cambodia	26	Nicaragua
7	Guinea-Bissau	7	Cameroon	27	Nigeria
8	Liberia	8	Congo, Rep.	28	Pakistan
9	Madagascar	9	Egypt, Arab Rep.	29	Philippines
10	Malawi	10	El Salvador	30	Solomon Islands
11	Mali	11	Georgia	31	Sri Lanka
12	Mozambique	12	Ghana	32	Sudan
13	Nepal	13	Guatemala	33	Swaziland
14	Rwanda	14	Honduras	34	Tunisia
15	Senegal	15	India	35	Ukraine
16	Sierra Leone	16	Jordan	36	Vanuatu
17	Tanzania	17	Kenya	37	West Bank and Gaza
18	Togo	18	Kyrgyz Republic	38	Yemen, Rep.
19	Uganda	19	Lao PDR	39	Zambia
20	Zimbabwe	20	Lesotho		

Table 9 List of developed countries

High Income Countries		Upper Middle Income Countries					
1	Australia	24	Kuwait	1	Albania	23	Jamaica
2	Austria	25	Latvia	2	Belize	24	Kazakhstan
3	Bahamas, The	26	Lithuania	3	Bulgaria	25	Macedonia, FYR
4	Barbados	27	Luxembourg	4	Colombia	26	Malaysia
5	Belgium	28	Malta	5	Iran, Islamic Rep.	27	Mauritius
6	Brunei Darussalam	29	Netherlands	6	Algeria	28	Mexico
7	Canada	30	New Zealand	7	Argentina	29	Namibia
8	Chile	31	Norway	8	Azerbaijan	30	Panama
9	Cyprus	32	Poland	9	Belarus	31	Paraguay
10	Czech Republic	33	Portugal	10	Bosnia and Herzegovina	32	Peru
11	Denmark	34	Qatar	11	Botswana	33	Romania
12	Estonia	35	Saudi Arabia	12	Brazil	34	Russian Federation
13	Finland	36	Singapore	13	China	35	Samoa
14	France	37	Slovak Republic	14	Costa Rica	36	Serbia
15	Germany	38	Slovenia	15	Croatia	37	South Africa
16	Greece	39	Spain	16	Dominican Republic	38	St. Lucia
17	Hong Kong SAR, China	40	Sweden	17	Ecuador	39	St. Vincent and the Grenadines
18	Hungary	41	Switzerland	18	Equatorial Guinea	40	Suriname
19	Iceland	42	Trinidad and Tobago	19	Fiji	41	Thailand
20	Ireland	43	United Kingdom	20	Gabon	42	Tonga
21	Israel	44	United States	21	Guyana	43	Turkey
22	Italy	45	Uruguay	22	Iraq	44	Turkmenistan
23	Korea, Rep.						

Table 10 Control of corruption and FDI

Variables	Low Income Countries		Lower Middle income Countries		High Income Countries		Upper middle income countries	
	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM
$(\ln FDI)_{t-1}$		0.479 ^a (0.000)		0.619 ^a (0.000)		0.313 ^a (0.000)		0.604 ^a (0.001)
Trade	0.010 (0.850)	0.050 ^a (0.002)	0.075 ^a (0.000)	0.023 ^a (0.000)	0.134 ^a (0.000)	0.019 ^a (0.000)	0.037 (0.403)	0.047 ^a (0.010)
InMobile	-0.437 (0.217)	0.364 ^c (0.075)	0.069 (0.511)	0.092 (0.279)	0.815 ^a (0.000)	0.037 (0.761)	3.151 ^b (0.014)	-0.051 (0.899)
LnGDP per capita	12.734 (0.217)	14.232 ^b (0.032)	-0.634 (0.599)	12.563 ^a (0.002)	-8.873 (0.120)	3.445 (0.110)	9.145 (0.289)	4.606 (0.233)
Inflation	0.0001 ^c (0.065)	0.0001 (0.920)	0.017 (0.341)	-0.060 ^b (0.017)	0.000 (0.954)	-0.032 (0.115)	0.350 (0.244)	-0.298 ^c (0.065)
Agriculture value added	-0.506 ^b (0.015)	0.046 (0.242)	-0.096 ^b (0.042)	-0.021 (0.406)	-0.166 (0.179)	-0.086 (0.157)	0.017 (0.990)	0.128 (0.560)
Control over Corruption	3.584 (0.293)	0.011 ^c (0.083)	0.471 (0.537)	0.076 ^c (0.096)	0.439 (0.629)	5.611 ^b (0.017)	2.295 ^b (0.013)	4.438 ^c (0.103)
Constant	58.560 (0.291)	18.653 ^b (0.038)	4.058 (0.669)	2.407 ^c (0.105)	8.574 ^a (0.000)	13.125 ^c (0.081)	7.295 (0.408)	9.540 ^b (0.046)
AR(1)		0.000		0.000	0.385	0.000		0.040
AR(2)		0.635		0.341		0.359		0.215
Sargan		0.102		0.428		0.175		0.13

Note: ^a, ^b and ^c denote significance at 1%, 5% and 10% level respectively. Parenthesis show *P*-values

Table 11 Government effectiveness and FDI

Variables	Low Income Countries		Lower Middle Income Countries		High Income Countries		Upper Middle Income Countries	
	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM
$(\ln FDI)_{t-1}$		0.250 ^a (0.000)		0.645 ^a (0.000)		0.305 ^a (0.000)		0.605 ^a (0.001)
Trade	0.007 (0.891)	0.083 ^a (0.000)	0.073 ^a (0.000)	0.131 ^a (0.000)	0.019 ^a (0.000)	0.020 ^a (0.000)	0.040 (0.362)	0.048 ^a (0.007)
InMobile	-0.406 (0.214)	0.498 ^b (0.015)	0.120 (0.255)	0.820 ^a (0.000)	0.066 (0.409)	0.027 (0.816)	2.875 ^b (0.026)	-0.192 (0.562)
LnGDP per capita	11.889 (0.212)	25.597 ^a (0.001)	-1.333 (0.270)	-9.318 ^a (0.000)	4.311 (0.348)	4.228 (0.120)	6.774 (0.456)	7.261 (0.309)
Inflation	0.0001 ^c (0.067)	0.000 (0.850)	0.017 (0.331)	-0.005 (0.911)	-0.014 (0.439)	-0.023 (0.167)	0.369 (0.221)	0.211 ^c (0.091)
Agriculture value added	0.490 ^a (0.007)	0.111 ^b (0.013)	0.106 ^b (0.025)	0.155 ^c (0.097)	0.004 (0.898)	-0.120 (0.106)	0.254 (0.849)	0.268 (0.155)
Government effectiveness	-2.216 (0.566)	0.110 ^b (0.022)	1.263 (0.110)	0.155 ^b (0.044)	-0.737 ^c (0.105)	1.182 ^c (0.065)	0.046 (0.992)	6.371 ^b (0.012)
Constant	53.075 (0.357)	35.489 ^a (0.001)	10.454 (0.280)	7.680 ^a (0.000)	0.870 (0.850)	19.750 ^a (0.008)	9.583 (0.501)	4.752 ^b (0.035)
AR(1)		0.000		0.000		0.000		0.055
AR(2)		0.176		0.118		0.216		0.212
Sargan		0.334		0.664		0.385		0.326

Note: ^a, ^b and ^c denote significance at 1%, 5% and 10% level respectively. Parenthesis show *P*-values

Table 12 Political stability and FDI

Variables	Low Income Countries		Lower Middle income Countries		High income countries		Upper Middle Income Countries	
	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM
$(\ln FDI)_{t-1}$		0.257 ^a (0.000)		0.634 ^a (0.000)		0.361 ^a (0.000)		0.594 ^a (0.003)
trade	0.007 ^a (0.004)	0.080 ^a (0.000)	0.072 ^a (0.000)	0.023 ^a (0.000)	0.134 ^a (0.000)	0.011 ^b (0.020)	0.040 (0.364)	0.044 ^b (0.038)
lnMobile	0.356 ^b (0.023)	0.420 ^b (0.036)	0.135 (0.227)	0.012 (0.893)	0.816 ^a (0.000)	0.053 (0.649)	2.866 ^b (0.028)	0.003 (0.992)
LnGDP per capita	11.900 ^a (0.002)	8.534 ^a (0.000)	-1.252 (0.303)	2.343 ^a (0.010)	-8.908 ^a (0.000)	3.623 ^a (0.000)	6.739 (0.438)	2.890 ^c (0.105)
inflation	0.0001 ^c (0.084)	-0.001 (0.971)	0.021 (0.252)	-0.015 (0.396)	-0.002 (0.963)	-0.037 ^c (0.051)	0.368 (0.229)	-0.216 ^c (0.104)
agriculture	-0.499 ^b (0.013)	0.102 ^c (0.014)	-0.099 ^b (0.034)	0.009 ^c (0.100)	-0.171 ^c (0.068)	-0.052 (0.229)	0.262 (0.844)	0.028 (0.916)
Political stability	1.281 ^b (0.038)	3.390 ^c (0.081)	0.563 (0.212)	1.798 ^b (0.042)	0.197 (0.745)	4.025 ^a (0.000)	0.190 (0.960)	2.668 ^c (0.076)
Constant	51.835 (0.307)	32.388 ^a (0.002)	9.363 (0.322)	0.305 ^b (0.020)	8.770 ^c (0.000)	9.519 ^b (0.018)	9.354 (0.488)	12.316 ^b (0.040)
AR(1)		0.000		0.000	0.385	0.000		0.002
AR(2)		0.118		0.128		0.197		0.220
Sargan		442.000		0.301		0.167		0.116

Note: ^a, ^b and ^c denote significance at 1%, 5% and 10% level respectively. Parenthesis show *P*-values

Table 13 Regulatory Quality and FDI

Variables	Low Income Countries		Lower Middle income Countries		High Income Countries		Upper Middle income Countries	
	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM
$(\ln FDI)_{t-1}$		0.576 ^a (0.000)		0.638 ^a (0.000)		0.331 ^a (0.000)		0.623 ^a (0.000)
Trade	0.007 ^a (0.001)	0.035 ^b (0.029)	0.072 ^a (0.000)	0.020 ^a (0.000)	0.133 ^a (0.000)	0.017 ^a (0.000)	0.041 (0.358)	0.049 ^a (0.003)
lnMobile	-0.368 ^b (0.032)	0.326 (0.120)	0.123 (0.237)	0.023 (0.774)	0.875 ^a (0.000)	0.196 ^c (0.109)	2.905 ^b (0.027)	0.455 ^c (0.107)
LnGDP per capita	11.794 ^b (0.023)	3.399 ^a (0.000)	-1.307 (0.269)	7.374 ^a (0.000)	-9.379 (0.650)	4.168 (0.150)	7.136 (0.432)	10.658 (0.113)
Inflation	0.000 ^b (0.026)	0.000 (0.723)	0.018 (0.304)	-0.015 (0.383)	0.006 (0.898)	-0.033 (0.088)	0.367 (0.224)	-0.215 ^c (0.105)
Agriculture value added	-0.490 ^b (0.028)	0.036 (0.355)	-0.093 ^b (0.045)	0.015 (0.502)	-0.137 (0.149)	-0.035 (0.417)	0.249 (0.850)	0.522 ^b (0.038)
Regulatory Quality	-1.727 (0.654)	5.859 (0.188)	1.517 (0.219)	0.195 (0.114)	1.575 ^c (0.053)	3.130 ^a (0.009)	0.543 (0.909)	0.605 ^c (0.064)
Constant	51.803 ^b (0.036)	15.552 ^c (0.094)	10.090 (0.272)	-2.127 ^a (0.000)	7.613 ^a (0.000)	2.833 ^c (0.079)	6.424 (0.471)	13.969 ^b (0.029)
AR(1)		0.000		0.000	0.387	0.000		0.046
AR(2)		0.335		0.112		0.194		0.226
Sargan		0.256		0.611		0.367		0.275

Note: ^a, ^b and ^c denote significance at 1%, 5% and 10% level respectively. Parenthesis show *P*-values

Table 14 Rule of Law and FDI

Variables	Low Income Countries		Lower Middle income Countries		High income countries		Upper middle income countries	
	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM
$(\ln FDI)_{t-1}$		0.575 ^a (0.000)		0.657 ^a (0.000)		0.304 ^a (0.000)		0.607 ^a (0.000)
Trade	0.010 ^a (0.003)	0.031 ^c (0.052)	0.073 ^a (0.000)	0.018 ^a (0.002)	0.133 ^a (0.000)	0.017 ^a (0.001)	0.027 (0.534)	0.045 ^b (0.014)
lnMobile	0.397 ^b (0.022)	0.338 ^c (0.106)	0.108 (0.300)	0.038 (0.693)	0.909 ^a (0.000)	0.041 (0.786)	3.698 ^a (0.005)	0.294 (0.356)
LnGDP per capita	12.320 ^b (0.021)	7.620 ^a (0.001)	-1.170 (0.326)	3.384 ^b (0.038)	9.628 ^a (0.000)	3.319 ^a (0.000)	7.257 ^c (0.059)	5.116 ^b (0.043)
Inflation	0.000 ^c (0.063)	0.000 (0.787)	-0.018 (0.302)	-0.014 (0.425)	0.000 (0.930)	-0.005 (0.830)	0.345 (0.250)	-0.095 ^a (0.003)
Agriculture value added	-0.498 ^b (0.014)	0.037 (0.355)	-0.101 ^b (0.031)	0.008 (0.725)	-0.149 (0.112)	-0.062 (0.282)	-0.145 (0.912)	0.067 (0.872)
Rule of law	-2.368 (0.508)	5.171 (0.172)	1.132 (0.147)	6.451 ^c (0.105)	2.685 ^a (0.007)	3.893 ^b (0.030)	6.818 ^a (0.001)	4.719 ^a (0.002)
Constant	5.536 (0.341)	17.812 ^c (0.055)	9.084 (0.329)	2.075 ^c (0.069)	7.307 ^a (0.000)	10.143 ^b (0.034)	14.791 ^c (0.100)	18.301 ^b (0.042)
AR(1)		0.000		0.000	0.390	0.000		0.0450
AR(2)		0.394		0.114		0.481		0.2240
Sargan		0.210		0.382		0.526		0.1830

Note: ^a, ^b and ^c denote significance at 1%, 5% and 10% level respectively. Parenthesis show *P*-values

Table 15 Voice and Accountability and FDI

Variables	Low Income Countries		Lower Middle income Countries		High Income countries		Upper Middle income countries	
	FEM	GMM	FEM	GMM	FEM	GMM	FEM	GMM
$(\ln FDI)_{t-1}$		0.568 ^a (0.000)		0.682 ^a (0.000)		0.302 ^a (0.000)		0.606 ^a (0.001)
Trade	0.010 (0.200)	0.310 ^c (0.053)	0.073 ^a (0.000)	0.019 ^a (0.003)	0.134 ^a (0.000)	0.019 ^a (0.000)	0.360 (0.411)	0.051 ^a (0.002)
lnMobile	0.397 (0.228)	0.334 ^c (0.107)	0.044 (0.669)	0.130 (0.212)	0.813 ^a (0.000)	0.154 (0.318)	3.176 ^b (0.015)	0.492 (0.135)
LnGDP per capita	12.321 (0.211)	7.917 ^a (0.001)	0.377 (0.748)	2.199 ^a (0.001)	-8.834 (0.210)	5.303 (0.120)	8.467 (0.331)	12.889 (0.112)
Inflation	-0.002 ^c (0.063)	0.000 (0.868)	-0.018 (0.317)	-0.070 ^b (0.045)	0.000 (0.946)	-0.002 (0.930)	0.375 (0.214)	-0.149 ^b (0.044)
Agriculture value added	-0.498 ^b (0.014)	0.038 (0.316)	-0.100 ^b (0.032)	0.065 ^c (0.072)	-0.169 ^c (0.072)	-0.017 (0.778)	0.116 (0.930)	0.012 (0.959)
Voice and accountability	2.267 (0.508)	3.128 (0.274)	-1.910 (0.107)	5.839 (0.116)	0.275 (0.739)	5.950 ^a (0.006)	1.458 ^b (0.040)	2.763 ^b (0.037)
Constant	55.536 (0.341)	18.696 ^b (0.040)	1.821 (0.842)	11.202 ^b (0.024)	8.148 ^a (0.000)	5.236 ^b (0.023)	8.319 (0.423)	7.347 (0.695)
AR(1)		0.000		0.000	0.385	0.000		0.000
AR(2)		0.340		0.093		0.389		0.224
Sargan		0.333		0.345		0.257		0.119

Note: ^a, ^b and ^c denote significance at 1%, 5% and 10% level respectively. Parenthesis show *P*-values

Abbreviations

AR(1): First order autoregressive; AR(2): Second order autoregressive; FDI: Foreign direct investment; FEM: Fixed effect model; GDP: Gross domestic product; GMM: Generalized Method of Moment; LSDV: Least square dummy variable; MNCs: Multinational corporations; WDI: World Development Indicators; WGI: World Governance Indicators

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Authors' contributions

SS has done introduction, methodology, and results and discussion sections while AR has worked on literature review and theoretical framework. KA has revised the methodology section. All authors read and approved the final manuscript.

Competing interests

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