
Do human capital and institutional environment constrain the impact of foreign direct investment flows on economic growth in Africa?*

Friday Osemenshan Anetor^a and Olusegun Vincent^b

Abstract

This paper investigates the role of human capital and institutional quality in the nexus of foreign direct investment (FDI) and economic growth in 46 African countries between 2002 and 2018. Based on panel data modelling, the empirical findings suggest that FDI in itself does not promote economic growth in Africa; however, we observe that human capital and institutional quality play a supportive role in enhancing the positive spillover effect of FDI on economic growth in upper-middle-income countries in the region. The findings for low-income and lower-middle-income countries are mostly not significant. Given the initial conditions and absorptive capacity constraints in these countries, the positive spillover effects of FDI might be limited. From a policy perspective, the findings call for special attention by policymakers to improving the quality of their human capital and strengthening their institutions to maximize the benefits of FDI.

Keywords: Africa, economic growth, foreign direct investment inflows, human capital, institutions

JEL classification codes: F21, F43, J24, O43, O55

* Received: 22 November 2021 – Revised: 28 July 2022 – Accepted: 15 August 2022

We are grateful to the anonymous reviewers and the editorial review board of *Transnational Corporations* for their useful comments and suggestions.

^a Corresponding author. School of Management and Social Sciences, Pan-Atlantic University, Lagos, Nigeria (fanetor@pau.edu.ng).

^b School of Management and Social Sciences, Pan-Atlantic University, Lagos, Nigeria.

1. Introduction

Foreign direct investment (FDI) plays a critical role in growth in developing countries. It is a source of employment generation, skill acquisition and transfer of technology know-how, and new export potential (Borensztein et al., 1998; Iamsiraroj, 2016; Li and Liu, 2005). Since attracting FDI can contribute to economic growth, developing economies provide various forms of incentives to attract and increase FDI (Alvarado et al., 2017).

Policymakers in African countries, as in other emerging economies, promote FDI attraction through targeted policies. Despite considerable efforts to attract FDI, records show that FDI flows to Africa, compared with other regions, remain low (figure 1).

Figure 1. Foreign direct investment inflows by region, 2000–2021

(Billions of dollars)



Despite the theoretical prescriptions of the positive spillover effect of FDI to host countries, empirical findings at both the micro and macro levels show mixed outcomes. Whereas some studies have found a positive association between FDI and economic growth (e.g. Bekere and Bersisa, 2018; Dinh et al., 2019), others have found a negative or insignificant relationship between FDI and economic growth (e.g. Akinlo, 2004; Ehigiamusoe and Lean, 2019). Studies on the FDI-growth nexus suggest that the mixed findings are attributable to certain characteristics and conditions of the host nations, including the quality of institutions (e.g. Brahim and Rachdi, 2014; Mullings, 2018; Slesman et al., 2015), good governance (e.g. Raza et al., 2019), and human capital development (e.g. Anetor, 2020; Völlmecke et al., 2016), financial development (e.g. Yeboua, 2019).

This study explores the role of institutions and human capital in the FDI-growth nexus in the context of Africa. It aims to examine whether the impact of FDI on economic growth is determined by the quality of institutions and human capital of the host economy. Quality institutions are built to promote equity and fairness in the distribution of resources. Institutions, according to North (1991), are the underlying determinants of economic performance. In the context of his study, institutions are concerned with formal institutions because they are easy to identify, operationalize, analyse and evaluate (Bentkowska, 2021). Human capital, in contrast, is the set of intangible resources embedded in the workforce of a country (Goldin, 2016). Recent studies also suggest that the positive spillover of FDI is contingent on the absorptive capacity of the recipient country. This implies that the growth benefits of FDI in Africa are conditioned on the degree to which the human capital can adopt and implement the technologies made available through FDI (Anetor, 2020).

Studies on the role of institutions in the FDI-growth nexus exist (e.g. Adams and Opoku, 2015; Asamoah et al., 2019). Similarly, some researchers have explored the role of human capital in the relationship between FDI and growth (e.g. Su and Liu, 2016). However, to the best of our knowledge, there are no studies that simultaneously investigate the moderating roles of both institutions and human capital in the FDI-growth nexus in Africa. This study aims to determine whether the economic growth effect of FDI is conditioned on institutions and human capital in 46 African countries, at various income levels.

The rest of the paper is organized as follows: Section 2 presents the literature review. Section 3 presents the model specification. Section 4 describes the data and methodology of the study. Section 5 discusses the empirical findings. Section 6 presents the conclusions and policy implications, as well as some limitations of the study.

2. Literature review and hypotheses

The economic activities contributing to long-term growth have been explained by theories ranging from neoclassical, new growth to endogenous growth theories. Research shows support for the premise that FDI is a driver of economic growth (Bekere and Bersisa, 2018; Dinh et al., 2019; Iamsiraroj and Ulubaşoğlu, 2015), but the literature is not conclusive. FDI intuitively provides the platform through which technological know-how is transferred from developed to developing countries. According to Kinoshita (1998) and Sjöholm (1999), the technological spillover effect of FDI on the economy passes through four major channels: imitation, competition, linkages and training. Hermes and Lensink (2003), however, found that the technology spillover of FDI depends on the absorptive capacity of the recipient country. In other words, the technology spillover of FDI is only possible when human capital in the host country is available and receptive.

According to the institutional FDI fitness theory (Williams and Witter, 1998), the extent to which FDI flows into a host nation largely depends on its institutional idiosyncrasies, policies and their effective implementation capacity. This implies that countries with a strong institutional framework tend to attract more FDI than countries with weak institutions.

This study follows the neoclassical growth models and FDI institutional fitness theory to investigate the moderating roles of human capital and institutional characteristics in attracting FDI. The neoclassical theory assumption of exogenous technical know-how provides a strong basis for the relevance of FDI in galvanizing greater output and productivity of a nation, and the institutional FDI fitness theory argues for the relevance of institutional sagacity, governance and policy implementation capacity.

Empirical studies on the role of institutions in the relationship between FDI and economic growth also exist (e.g. Agbloyor et al., 2016; Asamoah et al., 2019; Brahim and Rachdi, 2014; Hayat, 2019; Shittu et al., 2020; Slesman et al., 2015). Employing panel smooth transition regression modeling, Brahim and Rachdi (2014) studied the FDI–economic growth nexus in 19 countries of the Middle East and North Africa from 1984 to 2011 and confirmed that the influence of FDI on economic growth is contingent on institutional development. Hayat (2019) employed the GMM (generalized method of moments) estimation method for panel data on 104 countries, which comprises low-income, lower-middle-income and upper-middle-income countries, to evaluate the impact of institutional quality in the FDI–growth nexus between 1996 and 2015. The study found that both FDI and institutional quality enhance stronger economic growth in low- and lower-middle-income countries. Shittu et al. (2020) investigated the relationship between FDI, globalization, political governance and economic growth in West Africa between 1996 and 2016 using the autoregressive distributed lag model. The study found that political governance stimulates a positive impact of

FDI on economic growth in a region. Slesman et al. (2015) used panel data on 80 countries, comprising advanced, emerging and developing countries, between 1975 and 2005 to ascertain whether the relationship between FDI and economic growth is conditioned on the quality of institutions in the host country. The study showed that FDI influences growth positively only in those countries with high-quality institutions.

In contrast, Agbloyor et al. (2016) employed GMM with Weidmeijer corrected standard errors and orthogonal deviations to investigate the role of institutions in the relationship between FDI and economic growth in sub-Saharan African countries between 1996 and 2010. The study found no evidence that the quality of institutions enhances the positive impact of FDI on economic growth. In the same vein, Asamoah et al. (2019) studied the role of institutions in the relationship between trade openness, FDI and economic growth in 34 countries in sub-Saharan Africa between 1996 and 2016 using the structural equation modelling estimation technique. The study found no significant effect of institutional quality on FDI, as the effect of FDI increases monotonically without institutions.

Despite the mixed evidence on the role of institutions in the FDI–growth nexus, in light of the FDI institutional fitness theory, which predicts that institutions enhance the effect of FDI in bringing about growth, we test the following alternative hypothesis:

Hypothesis 1: The impact of FDI on economic growth is conditioned on the institutional quality of the host country.

Some studies argue that the effect of FDI on economic growth is conditioned on the human capital of the host economy (Agbola, 2013; Anetor, 2020; Li and Tanna, 2019; Su and Liu, 2016). They concluded that FDI by itself cannot translate into growth, but that economic growth can only be achieved when FDI interacts with the knowledgeable human capital of the host country. Su and Liu (2016) used panel data from 230 cities in China from 1991 to 2010 to determine whether human capital plays a significant role in the relationship between FDI and economic growth. The study noted that the interactive effect of FDI and human capital on economic growth is positive. Anetor (2020) used the system GMM to study the moderating role of human capital in the FDI–growth nexus in 28 sub-Saharan African countries from 1999 to 2017 and found that the human capital plays a complementary role with FDI in propelling economic growth.

Li and Tanna (2019) used panel data for 51 low- and lower-middle-income countries between 1984 and 2010 to investigate the link between FDI and total factor productivity growth. The study, which applied the system GMM technique of estimation, found that the impact of FDI on productivity growth depends on absorptive capacities. Agbola (2013) examined the Ghanaian economy between 1965 and 2008 to determine whether the impact of FDI on economic growth is contingent on human capital. Employing the fully modified ordinary least squares technique, the study found that human capital enhances the impact of FDI on economic growth.

Contrary to other studies, Gui-Diby (2014) found that the lack of human resources did not constrain the positive impact of FDI on economic growth, using system GMM panel data modelling to study the FDI–nexus in 50 countries in Africa during 1980–2009. Adefabi (2011) investigated the relationship between FDI, human capital and growth in 24 sub-Saharan African countries between 1970 and 2006 using the fixed effects model. The study found a weak complementarity effect of FDI and human capital on economic growth; hence, Adefabi concluded that the positive spillover effect of FDI on growth does not depend on human capital.

Despite the somewhat mixed empirical evidence, this paper tests the hypothesis based on the related literature that human capital plays an important role in the materialization of the positive spillover effect of FDI on economic growth:

Hypothesis 2: The relationship between FDI and economic growth is conditioned on the quality of human capital in the host country.

3. Model specification

Following the theoretical review, the study specifies two econometric models, each aimed at addressing each of the hypotheses. Model 1, which specifies that the impact of FDI on economic growth is conditioned on the institutional quality of the host country, can be expressed as follows:

$$GDPPCG_{it} = \gamma + \theta FDI_{it} + \lambda(FDI_{it} * INS_{it}) + \alpha INS_{it} + \sum_{j=1}^n \Phi_j X_{it} + \mu_{it} \quad (1)$$

Where:

$GDPPCG_{it}$ = growth rate of gross domestic product (GDP) per capita.

FDI_{it} = FDI net inflows measured as a percentage of GDP.

INS_{it} = institutions and is measured by six governance indicators: voice and accountability (VOA), political stability (POS), government effectiveness (GOE), regulatory quality (REQ), rule of law (RUL) and control of corruption (COC).

$FDI_{it} * INS_{it}$ = interaction of FDI with institutional variables. If $\lambda > 0$, it denotes that FDI and institutions are complementary; if $\alpha < 0$, it implies that FDI and institutions are substitutes, indicating that the relationship between FDI and economic growth is not conditioned on the institutional quality of the host country.

X_{it} = vector of control variables comprising trade openness (TOP), government expenditure (GXP), inflation (INF), population growth (PGR), gross capital formation (GCF) and foreign exchange rate (FEX).

μ_{it} = stochastic term.

i = country.

t = year.

Hypothesis 2 proposes that the impact of FDI on economic growth is conditioned on the human capital of the host country. As a result, the study specifies the following model:

$$GDPPCG_{it} = \theta + \beta FDI_{it} + \alpha(FDI_{it} * HCP_{it}) + \lambda HCP_{it} + \sum_{j=1}^n \Phi_j X_{it} + \mu_{it} \quad (2)$$

Where:

$GDPPCG_{it}$ = growth rate of gross domestic product (GDP) per capita.

FDI_{it} = FDI net inflows measured as a percentage of GDP.

HCP_{it} = human capital and it is proxy by secondary school enrolment (SSE), measured as percentage ratio of the people who enrolled for secondary education to the gross enrolment; and government expenditure on education as a percentage of GDP (GXE).

$FDI_{it} * HCP_{it}$ = the interaction of FDI with human capital. If $\alpha > 0$, it indicates that the marginal effect of human capital on FDI exerts a positive impact on economic growth. If $\alpha < 0$, it suggests that the marginal effect of human capital on FDI does not seem to exert a positive impact on economic growth.

X_{it} = vector of control variables comprising trade openness (TOP), government expenditure (GXP), inflation (INF), population growth (PGR), gross capital formation (GCF) and foreign exchange rate (FEX).

μ_{it} = stochastic term.

i = country.

t = year.

4. Data and methodology

The study used panel data from 46 African countries between 2002 and 2018 and analysed the countries based on income level by adopting the World Bank's classifications of low-income, lower-middle-income and upper-middle-income. The classification includes 19 low-income countries, 21 lower-middle-income countries and 6 upper-middle-income countries (appendix table 1). The choice of countries selected is majorly constrained by data availability. The sources of the variables used for the study as well as their measurement are reported in appendix table 2.

The estimation technique adopted in this study is the fixed effect (FE) model because the Hausman test, which indicates whether the fixed or random effect model is more suitable, indicates that the FE model is the appropriate one to deploy for the study. A major advantage of the FE model is that it allows us to control for all time-invariant omitted variables.

5. Empirical results and discussion

Table 1 presents the summary statistics of low-income countries, lower-middle-income countries and upper-middle-income countries in Africa. The descriptive statistics show that the mean score of the growth rate of GDP per capita (*GDPPCG*) in low-income countries was 2.20 percent, whereas the average score in lower-middle-income countries and upper-income countries were 2.10 per cent and 1.83 per cent, respectively, between 2002 and 2018. The average score for voice and accountability (*VOA*) is -0.77, -0.46 and -0.05 for low-income, lower-middle-income and upper-middle-income countries respectively. This suggests that the degree of freedom of expression in Africa is very low and that this is more pronounced in low-income countries.

The mean score for political stability (*POS*) is -0.86 and -0.49 for low-income and lower-middle-income countries, respectively. However, the average score in upper-middle-income countries exhibits a positive value of 0.46, indicating that the political atmosphere is relatively stable. The average score of government effectiveness (*GOE*) is -0.97, -0.64 and -0.06 for low-income, lower-middle-income and upper-middle-income, respectively. The negative mean scores are an indication that the quality of public service, as well as the quality of the institutional framework, is low.

Regulatory quality (*REQ*), which indicates the ability of policymakers to formulate and execute sound economic policies that will engender development of the private sector, is weak: the mean scores are -0.80, -0.65 and -0.01 for low-income, lower-middle-income and upper-middle-income countries, respectively. Rule of law (*RUL*) records an average score of -0.85, -0.64 and -0.07 for low-income, lower-middle-income and upper-middle-income countries, respectively. This suggests that the extent to which the Constitution is considered supreme above all, including government officials, is low. Control of corruption (*COC*), which reflects the ability of the government to fight the use of government funds for private gains, exhibits negative mean scores of -0.81, -0.58 and 0.10 across all countries.

The mean score for secondary school enrolment (*SSE*) is 25.75, 46.44 and 56.61 percent for low-income, lower-middle-income and upper-middle-income countries, respectively. The average score for government expenditure on education as a percentage of GDP (*GXE*) is 12.64, 12.66 and 17.19 for low-income, lower-middle-income and upper-middle-income countries, respectively. These results imply that upper-middle-income countries have a higher level of human capital than low-income and lower-middle-income countries.

Table 1. Descriptive statistics

| Variable | Low-income countries | | | | Lower-middle-income countries | | | | Upper-middle-income countries | | | |
|------------------------------|------------------------|----------|--------------------|-----------------|-------------------------------|---------|--------------------|-----------------|-------------------------------|---------|--------------------|-----------------|
| | Number of observations | Mean | Standard deviation | Minimum Maximum | Number of observations | Mean | Standard deviation | Minimum Maximum | Number of observations | Mean | Standard deviation | Minimum Maximum |
| GDPPCG | 323 | 2.200 | 5.120 | -36.560 28.680 | 357 | 2.100 | 3.590 | -18.490 18.070 | 102 | 1.83 | 5.72 | -12.98 32.17 |
| FDI | 323 | 4.210 | 5.820 | -4.850 46.490 | 357 | 4.070 | 6.230 | -6.370 50.000 | 102 | 4.01 | 4.1 | -4.02 27.76 |
| Institutional variable (INS) | | | | | | | | | | | | |
| VOA | 323 | -0.770 | 0.530 | -1.840 0.340 | 357 | -0.460 | 0.620 | -1.670 1.000 | 102 | -0.050 | 0.980 | -2.000 0.940 |
| POS | 323 | -0.860 | 0.810 | -2.700 0.830 | 357 | -0.490 | 0.720 | -2.260 1.040 | 102 | 0.460 | 0.490 | -0.520 1.200 |
| GOE | 323 | -0.970 | 0.440 | -1.850 0.270 | 357 | -0.640 | 0.470 | -1.780 0.640 | 102 | -0.060 | 0.830 | -1.700 1.060 |
| REQ | 323 | -0.800 | 0.420 | -1.860 0.250 | 357 | -0.650 | 0.480 | -2.240 0.340 | 102 | -0.010 | 0.780 | -1.560 1.130 |
| RUL | 323 | -0.850 | 0.510 | -1.820 0.150 | 357 | -0.640 | 0.630 | -1.850 1.080 | 102 | -0.070 | 0.450 | -0.940 0.730 |
| COG | 323 | -0.810 | 0.430 | -1.560 0.760 | 357 | -0.580 | 0.530 | -1.440 0.950 | 102 | -0.100 | 0.860 | -1.830 1.220 |
| Human capital variable (HCP) | | | | | | | | | | | | |
| SSE | 323 | 25.750 | 16.260 | 0.000 61.850 | 357 | 46.440 | 26.470 | 0 99.61 | 102 | 56.610 | 40.020 | 0.000 109.440 |
| GXE | 323 | 4.030 | 4.000 | 0.000 17.670 | 357 | 10.750 | 10.360 | 0 51.37 | 102 | 11.530 | 12.690 | 0.000 40.600 |
| Control variable | | | | | | | | | | | | |
| TOP | 323 | 57.810 | 24.660 | 0.000 138.900 | 357 | 68.460 | 34.830 | 0.000 165.650 | 102 | 90.520 | 26.420 | 0.000 144.670 |
| GXP | 323 | 12.640 | 4.850 | 0.000 28.680 | 357 | 12.660 | 7.460 | 0.000 41.890 | 102 | 17.190 | 5.690 | 0.000 28.010 |
| INF | 323 | 6.730 | 8.310 | -27.790 63.290 | 357 | 6.560 | 9.120 | -60.500 98.220 | 102 | 4.790 | 2.790 | -1.410 12.700 |
| PGR | 323 | 2.790 | 0.610 | 0.260 4.630 | 357 | 2.210 | 0.840 | -0.620 3.710 | 102 | 2.090 | 1.300 | 0.050 4.650 |
| GCF | 323 | 21.020 | 9.400 | 0.000 60.160 | 357 | 21.770 | 1.990 | 0.000 50.780 | 102 | 24.510 | 7.600 | 0.000 41.410 |
| FEX | 323 | 1 055.58 | 1 643.35 | 2 020 9 088.32 | 357 | 274.080 | 620.180 | 0.000 9 686.77 | 102 | 186.600 | 247.450 | 4 690 693.710 |

Source: Authors' estimations using data from World Bank (2021a).

5.1 Moderating role of institutions in the FDI–growth nexus in low-income countries

Table 2 depicts the regression results of the impact of FDI mediated by institutional variables on economic growth in low-income countries (LICs). Looking across the models, the sign of the coefficients of FDI are generally negative and non-significant, or negative and significant, which seems to indicate that FDI flows into LICs tend to have either a non-discernible or adverse effect on economic growth (e.g. Bekere and Bersisa, 2018; Dinh et al., 2019; Iamsiraroj and Ulubaşođlu, 2015; Sunde; 2017; Zekarias, 2016). Nevertheless, the finding lends credence to studies that found that FDI does not enhance economic growth (Alvarado et al., 2017; Makiela and Ouattara, 2018; Sokhanvar, 2019). A plausible explanation for the outcome is that FDI flows to Africa – and especially LICs in Africa – are mostly resource-seeking; that is, motivated by the natural resource endowments of the host country to complement their operations (Makoni, 2019).

The coefficients for the interaction terms between FDI and GOE, RUL, and COC are negative and statistically significant. Although our findings differ from most previous studies (e.g. Brahim and Rachdi, 2014; Slesman et al., 2015), they are in line with some others (e.g. Asamoah et al., 2019) showing that institutional quality does not play a significant role in enhancing the impact of FDI on economic growth.

The regression estimates of the control variables are also presented in the table. It is important to mention that the regression estimates of all the control variables are similar across all the models. The coefficients of trade openness (*TOP*) in columns 1–6 are positive and statistically significant, suggesting that the more LICs reduce the various forms of trade restrictions, the stronger the growth of the economy. The results also show that the coefficients of population growth variable (*PGR*), as reported in columns 1–6, are all positive and statistically significant at the 1 per cent level. Multinational corporations (*MNCs*) usually prefer countries with large population sizes as investment destinations, not just because of the potential demand for their goods and services, but because they offer an opportunity to access labour more easily.

Table 2. Moderating role of institutions in the FDI–economic growth nexus in low-income countries

| Variable | Fixed effect | | | | | |
|------------------------|-------------------|----------------------|--------------------|----------------------|----------------------|----------------------|
| | GDPPCG [1] | GDPPCG [2] | GDPPCG [3] | GDPPCG [4] | GDPPCG [5] | GDPPCG [6] |
| FDI | -0.05 (-0.50) | -0.03 (-0.40) | -0.32* (-1.74) | -0.09 (-0.56) | -0.36** (-2.03) | -0.32* (-1.87) |
| FDI*VOA | -0.06 (-0.49) | - | - | - | - | - |
| VOA | 4.77*** (3.49) | - | - | - | - | - |
| FDI*POS | - | -0.03 (-0.50) | - | - | - | - |
| POS | - | 0.87 (1.27) | - | - | - | - |
| FDI*GOE | - | - | -0.33* (-1.81) | - | - | - |
| GOE | - | - | 1.24 (0.75) | - | - | - |
| FDI*REQ | - | - | - | -0.11 (-0.54) | - | - |
| REQ | - | - | - | 1.12 (0.64) | - | - |
| FDI*RUL | - | - | - | - | -0.36** (-2.19) | - |
| RUL | - | - | - | - | -1.01 (-0.65) | - |
| FDI*COC | - | - | - | - | - | -0.34** (-1.96) |
| COC | - | - | - | - | - | 0.56 (0.35) |
| TOP | 0.05* (1.73) | 0.06** (2.07) | 0.05* (1.82) | 0.55* (1.94) | 0.06** (2.18) | 0.05* (1.95) |
| GXP | -0.06 (-0.58) | 0.01 (0.10) | 0.03 (0.31) | 0.01 (1.12) | -0.04 (-0.41) | 0.01 (0.08) |
| INF | -0.06 (-1.43) | -0.05 (-1.23) | -0.05 (-1.28) | -0.05 (-1.18) | -0.05 (-1.15) | -0.05 (-1.31) |
| PGR | 2.99*** (3.68) | 3.52*** (4.30) | 3.68*** (4.53) | 3.64*** (4.50) | 3.71*** (4.65) | 3.64*** (4.50) |
| GCF | 0.05 (1.12) | 0.03 (0.68) | 0.04 (0.81) | 0.03 (0.69) | 0.05 (1.03) | 0.04 (0.85) |
| FEX | -0.001 (-1.34) | -0.0004 (-1.08) | -0.0004 (-0.95) | -0.0003 (-0.90) | -0.0004 (-1.02) | -0.0004 (-0.80) |
| Intercept | -4.64 (-1.43) | -10.20*** (-3.60) | -10.2*** (-3.1) | -10.30*** (-3.20) | -12.10*** (-3.90) | -10.70*** (-3.00) |
| R ² within | 0.144 | 0.113 | 0.118 | 0.110 | 0.127 | 0.120 |
| R ² between | 0.053 | 0.024 | 0.006 | 0.011 | 0.001 | 0.013 |
| R ² overall | 0.008 | 0.013 | 0.023 | 0.017 | 0.025 | 0.020 |
| Number of observations | 323 | 323 | 323 | 323 | 323 | 323 |

Source: Authors' estimations using data from World Bank (2021a and 2021b).

Note: () represent t-statistics; *, **, ***, indicate significance at 10 per cent, 5 per cent and 1 per cent levels, respectively.

5.2 Moderating role of institutions in the FDI–growth nexus in lower-middle-income countries

Table 3 shows the regression results of the impact of the interaction of FDI and institutional variables on economic growth in lower-middle-income countries (LMICs). The sign of all the coefficients of FDI are positive, but they are mainly not statistically significant, implying inconclusive evidence on the contribution of FDI to economic growth in LMCs. All the signs of the coefficients of the interaction between FDI and the various institutional indicators are positive but again not statistically significant. This finding is in line with Agbloyor et al. (2016) and Anetor et al. (2021).

Table 3. Moderating role of institutions in the FDI–economic growth nexus in lower-middle-income countries

| Variable | Fixed effect | | | | | |
|----------|--------------------|--------------------|--------------------|--------------------|-------------------|---------------------|
| | GDPPCG [1] | GDPPCG [2] | GDPPCG [3] | GDPPCG [4] | GDPPCG [5] | GDPPCG [6] |
| FDI | 0.04 (0.62) | 0.02 (0.50) | 0.19* (1.81) | 0.12 (1.15) | 0.07 (1.29) | 0.09 (1.11) |
| FDI*VOA | -0.01 (-0.10) | - | - | - | - | - |
| VOA | 0.00 (0.00) | - | - | - | - | - |
| FDI*POS | - | -0.05 (-0.64) | - | - | - | - |
| POS | - | 2.03*** (2.97) | - | - | - | - |
| FDI*GOE | - | - | 0.17 (1.56) | - | - | - |
| GOE | - | - | 0.86 (0.65) | - | - | - |
| FDI*REQ | - | - | - | 0.08 (0.85) | - | - |
| REQ | - | - | - | 1.68 (1.38) | - | - |
| FDI*RUL | - | - | - | - | 0.04 (0.71) | - |
| RUL | - | - | - | - | -0.997 (-0.79) | - |
| FDI*COC | - | - | - | - | - | 0.04 (0.57) |
| COC | - | - | - | - | - | 2.20 (1.62) |
| TOP | 0.01 (0.44) | 0.01 (0.79) | 0.01 (0.89) | 0.01 (0.90) | 0.00 (0.33) | 0.01 (0.96) |
| GXP | -0.13** (-2.11) | -0.12** (-2.09) | -0.14** (-2.33) | -0.15** (-2.48) | -0.11* (-1.78) | -0.16*** (-2.58) |
| INF | -0.01 (-0.62) | -0.01 (-0.22) | -0.01 (-0.60) | -0.01 (-0.55) | -0.02 (-0.70) | -0.01 (-0.58) |

/...

Table 3. Moderating role of institutions in the FDI–economic growth nexus in lower-middle-income countries (Concluded)

| Variable | Fixed effect | | | | | |
|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | GDPPCG [1] | GDPPCG [2] | GDPPCG [3] | GDPPCG [4] | GDPPCG [5] | GDPPCG [6] |
| PGR | 3.28*** (3.68) | 3.15*** (3.64) | 3.45*** (3.87) | 3.24*** (3.74) | 3.28*** (3.78) | 3.25*** (3.69) |
| GCF | 0.03 (1.10) | 0.02 (0.79) | 0.03 (0.90) | 0.03 (1.20) | 0.03 (0.95) | 0.03 (1.16) |
| FEX | -0.001* (-1.73) | -0.001* (-1.68) | -0.001* (-1.79) | -0.001* (-1.75) | -0.001* (-1.71) | -0.001* (-1.87) |
| Intercept | -4.55** (-2.32) | -3.49* (-1.84) | -4.76** (-2.51) | -3.68* (-1.87) | -5.25** (-2.45) | -3.42* (-1.74) |
| R ² within | 0.058 | 0.084 | 0.071 | 0.071 | 0.061 | 0.068 |
| R ² between | 0.007 | 0.013 | 0.030 | 0.057 | 0.007 | 0.034 |
| R ² overall | 0.007 | 0.014 | 0.015 | 0.019 | 0.008 | 0.016 |
| Number of observations | 357 | 357 | 357 | 357 | 357 | 357 |

Source: Authors' estimations using data from World Bank (2021a and 2021b).

Note: () represent t-statistics; *, **, ***, indicate significance at 10 per cent, 5 per cent and 1 per cent levels, respectively.

5.3 Moderating role of institutions in the FDI–growth nexus in upper-middle-income countries

Table 4 presents the regression results of the impact of the interaction of FDI and institutional variables on economic growth in upper-middle-income countries. The coefficients of FDI are negative but are not statistically significant; but in column 2, the coefficient is both negative and statistically significant, which seems to indicate that FDI flows into UMICs tend to have mainly an indiscernible, but in certain cases adverse effect on economic growth. This result is in line with the outcome of previous studies (e.g. Bermejo et al., 2018; Sokhanvar, 2019) that found an inverse relationship between FDI and economic growth. It implies that FDI flows to Africa, in some cases, have not been beneficial, and that resource-seeking investments can, in some cases, hinder the economic development of host nations (Asamoah et al., 2019).

The results also show that all the signs of the coefficients of the interactions between FDI and institutional variables (except for political stability) are positive and statistically significant. This result, unlike those for low-income and lower-middle-income countries, indicates that the relatively strong institutional quality in upper-middle-income countries effectively works in tandem with FDI inflows in enhancing economic growth. This outcome is consistent with prior studies (e.g. Raza et al., 2019). One interpretation of the result – and of the contrast with the results for LICs and LMICs – is that a country with relatively high institutional quality would create a more viable environment for conducting business and more easily attract MNCs.

This would invariably provide the host nation with latent and overt benefits necessary to enhance growth. In a nutshell, we conclude that institutional quality strengthens the association between FDI and economic growth in upper-middle-income countries. As a result, the hypothesis that the relationship between FDI and economic growth is conditioned on the quality of institutions is valid for upper-middle-income countries.

Table 4. Moderating role of institutions in the FDI–economic growth nexus in upper-middle-income countries

| Variable | Fixed effect | | | | | |
|----------|---------------------|---------------------|----------------------|--------------------|---------------------|---------------------|
| | GDPPCG [1] | GDPPCG [2] | GDPPCG [3] | GDPPCG [4] | GDPPCG [5] | GDPPCG [6] |
| FDI | -0.07 (-0.36) | -0.51*** (-3.35) | -0.08 (-0.39) | -0.06 (-0.30) | -0.04 (-0.20) | -0.06 (0.33) |
| FDI*VOA | 0.30** (2.60) | - | - | - | - | - |
| VOA | 9.29** (2.40) | - | - | - | - | - |
| FDI*POS | - | 0.32 (1.08) | - | - | - | - |
| POS | - | 1.03 (0.38) | - | - | - | - |
| FDI*GOE | - | - | 0.34** (2.20) | - | - | - |
| GOE | - | - | 2.78 (0.77) | - | - | - |
| FDI*REQ | - | - | - | 0.38** (2.31) | - | - |
| REQ | - | - | - | 0.15 (0.06) | - | - |
| FDI*RUL | - | - | - | - | 0.72*** (2.86) | - |
| RUL | - | - | - | - | -4.66 (-1.27) | - |
| FDI*COC | - | - | - | - | - | 0.34** (2.46) |
| COC | - | - | - | - | - | 1.64 (0.61) |
| TOP | -0.10** (-2.20) | -0.09*** (-2.60) | -0.06* (-1.98) | -0.08** (-2.60) | -0.09*** (-2.71) | -0.08** (-2.60) |
| GXP | -1.2*** (-10.20) | -1.24*** (-9.10) | -1.27*** (-10.30) | -1.3*** (-9.74) | -1.25*** (-9.43) | -1.20*** (-2.70) |
| INF | -0.13 (-0.76) | 0.01 (0.06) | -0.06 (-0.37) | -0.03 (-0.14) | -0.03 (-0.20) | -0.09 (-0.51) |
| PGR | -0.12 (-0.08) | -0.37 (-0.24) | 0.46 (0.29) | 0.21 (0.13) | -0.84 (-0.53) | -0.31 (-0.21) |
| GCF | 0.01 (0.13) | 0.04 (0.41) | 0.02 (0.26) | 0.03 (1.20) | 0.04 (0.40) | 0.01 (1.16) |
| FEX | -0.010 (-1.15) | -0.003 (-0.22) | -0.01 (-0.69) | -0.004 (-0.30) | -0.010 (-0.53) | -0.010 (-0.90) |

Table 4. Moderating role of institutions in the FDI–economic growth nexus in upper-middle-income countries (Concluded)

| Variable | Fixed effect | | | | | |
|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | GDPPCG [1] | GDPPCG [2] | GDPPCG [3] | GDPPCG [4] | GDPPCG [5] | GDPPCG [6] |
| Intercept | 33.30*** (6.20) | 32.03*** (5.60) | 30.85*** (5.52) | 31.05*** (5.20) | 33.80*** (6.06) | 34.40*** (6.10) |
| R ² within | 0.683 | 0.642 | 0.663 | 0.657 | 0.664 | 0.660 |
| R ² between | 0.329 | 0.018 | 0.087 | 0.046 | 0.021 | 0.162 |
| R ² overall | 0.184 | 0.312 | 0.391 | 0.308 | 0.310 | 0.421 |
| Number of observations | 102 | 102 | 102 | 102 | 102 | 102 |

Source: Authors' estimations using data from World Bank (2021a and 2021b).

Note: () represent t-statistics; *, **, ***, indicate significance at 10 per cent, 5 per cent and 1 per cent levels, respectively.

5.4 Moderating role of human capital in the FDI-growth nexus in low-income, lower-middle-income and upper-middle-income countries

Table 5 reports the regression results of the impact of the interaction of FDI and human capital (proxied by secondary school enrolment (SSE) and government expenditure on education (GXE)) on economic growth in low-income-countries (LICs), lower-middle-income countries (LMICs) and upper-middle-income countries (UMICs), using the FE model.

For LICs, the sign of the coefficient of FDI is positive but not statistically significant, providing no significant evidence affirming the positive influence of FDI on economic growth in Africa, contrary to the findings of previous studies (such as Bekere and Bersisa, 2018; Dinh et al., 2019). The result is in line with other prior studies (e.g. Ehigiamusoe and Lean, 2019; Makiela and Ouattara, 2018) that concluded that there is a negative or no significant association between FDI and economic growth. It can be seen from the results that the coefficient of the sign of the interactive terms of FDI and human capital (proxied by secondary school enrolment) on the one hand, and the coefficient of the interaction of FDI and human capital (proxied by government expenditure on education), on the other hand, is negative and statistically insignificant (columns 1–2). This is contrary to expectation, as human capital is supposed to support FDI in driving economic growth. Although the result is contrary to previous studies (e.g. Völlmecke et al., 2016), interestingly, it is line with some research (e.g. Gui-Diby, 2014) noting that the effect of FDI on growth is not contingent on human capital. A possible explanation for this is that the low level of human capital and its absorptive capacity in LICs precludes the ability to benefit from the positive spillover benefits of FDI (such as technology). In the same vein, the interactive term of FDI and human capital is statistically insignificant in LMICs, even though the sign of the coefficient of the interactive term is positive

(columns 3–4). For UMICs the sign of the coefficient of the interactive term of FDI and human capital (measured by secondary school enrollment) and the coefficient of the interaction of FDI and human capital (proxied by government expenditure on education) is positive and statistically significant at the 5 per cent level (columns 5–6). This presupposes that the conditioning effect of FDI on economic growth depends on human capital. In other words, human capital plays a supportive role in enhancing the positive spillover effect on economic growth in UMICs. This result conforms to the a priori expectation and supports prior studies (e.g. Anetor, 2020) that concluded that the impact of FDI on growth is contingent on human capital. An explanation is that the absorptive capacity of human capital in UMICs is relatively higher than in LICs and LMICs because the average percentage of government expenditure on education and the average rate of enrolment in schools are relatively higher in UMICs than in LICs and LMICs (table 1).

In conclusion, the role of human capital in the FDI–growth relationship is significant and critical in upper-middle-income countries, but less evident in low-income countries and lower-middle-income countries. Consequently, the hypothesis that the relationship between FDI and economic growth is conditioned on the quality of human capital is verified for only upper-middle-income countries.

Table 5. Moderating role of human capital in the FDI–economic growth nexus in low-income, lower-middle-income and upper-middle-income countries

| Variable | Fixed effect | | | | | |
|----------|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|
| | GDPPCG (1) | GDPPCG (2) | GDPPCG (3) | GDPPCG (4) | GDPPCG (5) | GDPPCG (6) |
| FDI | 0.018 (0.14) | 0.042 (0.51) | -0.009 (-0.08) | 0.004 (0.07) | -0.534*** (-3.91) | -0.501*** (-3.80) |
| FDI*SSE | -0.001 (-0.23) | - | 0.001 (0.48) | - | 0.008** (2.39) | - |
| SSE | 0.004 (0.15) | - | -0.032* (-1.71) | - | 0.002 (0.04) | - |
| FDI*GXE | - | -0.015 (-0.99) | - | 0.005 (0.83) | - | 0.038** (2.26) |
| GXE | - | 0.048 (0.34) | - | -0.083 (-1.63) | - | -0.131* (-1.98) |
| TOP | 0.056* (1.89) | 0.057** (1.97) | 0.002 (0.17) | -0.0001 (-0.01) | -0.08** (-2.52) | -0.072** (-2.30) |
| GXP | 0.017 (0.18) | 0.032 (0.33) | -0.115* (-1.95) | -0.112* (-1.87) | -1.190*** (-9.52) | -1.213*** (-9.92) |
| INF | -0.052 (-1.25) | -0.015 (-1.23) | -0.017 (-0.65) | -0.012 (-0.48) | -0.05 (-0.27) | -0.023 (-0.14) |
| PGR | 3.709*** (4.50) | 3.729*** (4.65) | 3.414*** (3.92) | 3.694*** (3.90) | -0.222 (-0.15) | 0.132 (0.09) |
| GCF | 0.029 (0.61) | 0.026 (0.54) | 0.040 (1.38) | 0.041 (1.37) | 0.020 (0.21) | 0.004 (0.04) |

/...

Table 5. Moderating role of human capital in the FDI–economic growth nexus in low-income, lower-middle-income and upper-middle-income countries (Concluded)

| Variable | Fixed effect | | | | | |
|------------------------|-----------------------|----------------------|-------------------|---------------------|--------------------|--------------------|
| | GDPPCG (1) | GDPPCG (2) | GDPPCG (3) | GDPPCG (4) | GDPPCG (5) | GDPPCG (6) |
| FEX | -0.0003 (-0.87) | -0.0003 (-0.86) | -0.001 (-1.62) | -0.001* (-1.73) | -0.02 (-1.05) | -0.009 (-0.69) |
| Intercept | -11.544*** (-4.23) | -11.844** (-4.41) | -3.46* (-1.75) | -4.615** (-2.35) | 33.32*** (5.61) | 32.93*** (5.77) |
| R ² within | 0.108 | 0.111 | 0.067 | 0.066 | 0.655 | 0.654 |
| R ² between | 0.014 | 0.016 | 0.011 | 0.008 | 0.222 | 0.025 |
| R ² overall | 0.016 | 0.016 | 0.008 | 0.007 | 0.436 | 0.345 |
| Number of observations | 323 | 323 | 357 | 357 | 102 | 102 |

Source: Authors' estimations using data from World Bank (2021a and 2021b).

Note: () represent t-statistics; *, **, ***, indicate significance at 10 per cent, 5 per cent and 1 per cent levels, respectively.

6. Conclusions and policy implications

This study investigated the role of human capital and institutional quality in the FDI–economic growth nexus in 46 African countries between 2002 and 2018 by employing an FE model. The results do not unambiguously support evidence from previous studies that FDI enhances economic growth in low-income countries and lower-middle-income countries in the region.

Our study also sought to examine the role of the quality of institutions in enhancing the impact of inward FDI on economic growth. We find that institutional quality plays a complementary role in facilitating positive spillover effects of FDI on economic growth in upper-middle-income countries in Africa. In contrast, we find no significant effects of the quality of institutions, at the margin, on the economic growth impact of FDI in the low-income and lower-middle-income countries. It is possible that institutional frameworks in these countries are below a certain “threshold” of quality, limiting their ability to provide a suitable platform for the types of FDI with potentially higher spillover and growth impact, e.g. non-resource-seeking FDI.

We also investigated the role of human capital in the relationship between FDI and economic growth. We find that human capital plays a crucial role in supporting the positive spillover effect of FDI on economic growth in upper-middle-income countries of Africa. However, again, we find no significant effects of human capital, at the margin, on the economic growth impact of FDI. The same “quality threshold” explanation may apply. The low level of human capital in these countries can be adduced to the twin problem of low budgetary allocation to education and low

average rate of school enrolment by the citizenry, as evident in the descriptive statistics. As a result, their absorptive capacity is low and the economy is unable to capture the positive spillover effects of FDI.

From a policy perspective, the findings call for special attention by policymakers to improving the quality of human capital by increasing their budgetary allocation to education to a minimum of 26 per cent, as recommended by UNESCO, and by granting scholarships to indigent students and providing free education at both the primary and secondary levels. Policymakers should strengthen their institutional framework by promoting citizen participation, accountability, transparency and an enabling legal framework.

It is not a misplaced result to have human capital and institutional factors facilitating the positive spillover effect of FDI on growth in upper-middle-income countries. This is because they are countries leading the pack in the Human Development Index and GDP per capita in the entire African region. There is no doubt that a well-developed workforce requires significant investment in capacity development and education, while institutions too require human capacity. Both human capital and strong institutions contemporaneously help to attract FDI, which in turn brings forth economic growth.

The governments of lower-middle-income and low-income countries must embark on social reforms that will bring about a social safety net for out-of-school children and encourage basic education. There is a need to expedite institutional reforms conducive to FDI attraction, including those related to trade and investment facilitation and promotion, as well as to review legal trade and investment frameworks.

References

- Acquah, Abraham Mensah, and Muazu Ibrahim (2020). "Foreign direct investment, economic growth and financial sector development in Africa" *Journal of Sustainable Finance & Investment*, 10(4), pp. 315–334.
- Adams, Samuel, and Eric Evans Osei Opoku (2015). "Foreign direct investment, regulations and growth in sub-Saharan Africa", *Economic Analysis and Policy*, 47, pp. 48–56.
- Adefabi, Rasak Adetunji (2011). "Effects of FDI and human capital on economic growth in Sub-Saharan Africa", *Pakistan Journal of Social Sciences*, 8(1), pp. 32–38.
- Agbloyor, Elikplimi Komla, Agyapomaa Gyeke-Dako, Ransome Kuipo and Joshua Yindenaba Abor (2016). "Foreign direct investment and economic growth in SSA: The role of institutions", *Thunderbird International Business Review*, 58(5), pp. 479–497.
- Agbola, Frank Wogbe (2013). "Does human capital constrain the impact of foreign direct investment and remittances on economic growth in Ghana?", *Applied Economics*, 45(19), pp. 2853–2862.
- Akinlo, A. Enisan (2004). "Foreign direct investment and growth in Nigeria: An empirical investigation", *Journal of Policy Modeling*, 26(5), pp. 627–639.
- Alvarado, Rafael, Maria Iñiguez and Pablo Ponce (2017). "Foreign direct investment and economic growth in Latin America", *Economic Analysis and Policy*, 56, pp. 176–187.
- Anetor, Friday Osemenshan (2020). "Human capital threshold, foreign direct investment and economic growth: Evidence from sub-Saharan Africa", *International Journal of Development Issues*, 19(3), pp. 323–333.
- Anetor, Friday Osemenshan, Simeon Oludiran Akinleye and Folorunso Sunday Ayadi (2021). "Private capital inflows, institutions and economic growth in Africa", *Journal of Transnational Management*, 26(4), pp. 247–268.
- Asamoah, Lawrence Adu, Emmanuel Kwasi Mensah and Eric Amoo Bondzie (2019). "Trade openness, FDI and economic growth in sub-Saharan Africa: Do institutions matter?", *Transnational Corporations Review*, 11(1), pp. 65–79.
- Bekere, Biratu, and Mekonnen Bersisa (2018). "Impact of foreign direct investment on economic growth in eastern Africa", in Almas Heshmati, ed., *Determinants of Economic Growth in Africa* (Cham, Switzerland: Springer Nature), pp. 95–124.
- Bentkowska, Katarzyna (2021). "Response to governmental COVID-19 restrictions: The role of informal institutions", *Journal of Institutional Economics*, 17(5), pp. 729–745.
- Bermejo Carbonell, Jorge, and Richard A. Werner (2018). "Does foreign direct investment generate economic growth? A new empirical approach applied to Spain", *Economic Geography*, 94(4), pp. 425–456.
- Borensztein, Eduardo, Jose De Gregorio and Jong-Wha Lee (1998). "How does foreign direct investment affect economic growth?", *Journal of International Economics* 45(1), pp. 115–135.
- Brahim, Mariem, and Housseem Rachdi (2014). "Foreign direct investment, institutions and economic growth: Evidence from the MENA region", *Journal of Reviews on Global Economics*, 3, pp. 328–339.

- Dinh, Trang Thi-Huyen, Duc Hong Vo, Anh The Vo and Thang Cong Nguyen (2019). "Foreign direct investment and economic growth in the short run and long run: Empirical evidence from developing countries", *Journal of Risk and Financial Management*, 12(4), pp. 1–11.
- Ehigiamusoe, Kizito Uyi, and Hooi Hooi Lean (2019). "Foreign capital inflows and economic growth in Nigeria: any nexus?", *Journal of African Business*, 20(4), pp. 455–471.
- Goldin, Claudia (2016). "Human capital" in Claude Diebolt and Michael Hauptert, eds., *Handbook of Cliometrics* (Heidelberg: Springer Verlag), pp. 55–86.
- Gui-Diby, Steve Loris (2014). "Impact of foreign direct investments on economic growth in Africa: Evidence from three decades of panel data analyses", *Research in Economics*, 68(3), pp. 248–256.
- Hayat, Arshad (2019). "Foreign direct investments, institutional quality, and economic growth", *The Journal of International Trade & Economic Development*, 28(5), pp. 561–579.
- Hermes, Niels, and Robert Lensink (2003). "Foreign direct investment, financial development and economic growth", *The Journal of Development Studies* 40(1), pp. 142–163.
- Iamsiraroj, Sasi (2016). "The foreign direct investment–economic growth nexus", *International Review of Economics & Finance*, 42, pp. 116–133.
- Iamsiraroj, Sasi, and Mehmet Ali Ulubaşoğlu (2015). "Foreign direct investment and economic growth: A real relationship or wishful thinking?", *Economic Modelling*, 51, pp. 200–213.
- Kinoshita, Yuko (2001). "R&D and technology spillovers through FDI: Innovation and absorptive capacity", *International Trade and Transition Economics*, No. 2775 (London: Centre for Economic Policy Research).
- Li, Chengchun, and Sailesh Tanna (2019). "The impact of foreign direct investment on productivity: New evidence for developing countries", *Economic Modelling*, 80, pp. 453–466.
- Li, Xiaoying, and Xiaming Liu (2005). "Foreign direct investment and economic growth: An increasingly endogenous relationship", *World Development* 33(3), pp. 393–407.
- Makiela, Kamil, and Bazoumana Ouattara (2018). "Foreign direct investment and economic growth: Exploring the transmission channels", *Economic Modelling*, 72, pp. 296–305.
- Makoni, Patricia Lindelwa Rudo (2019). "Foreign direct investment in Africa – Does human capital development matter?", *Euro Economica*, 38(2), pp. 33–42.
- Mullings, Robert (2018). "Do institutions moderate globalization's effect on growth?", *Journal of Institutional Economics*, 14(1), pp. 71–102.
- North, Douglass C. (1991). "Institution", *Journal of Economic Perspectives*, 5(1), pp. 97–112.
- Raza, Syed Ali, Nida Shah and Imtiaz Arif (2019). "Relationship between FDI and economic growth in the presence of good governance system: Evidence from OECD countries", *Global Business Review*, pp. 1–19.
- Sen, Kunal, and Chaitali Sinha (2017). "The location choice of US foreign direct investment: How do institutions matter?", *Journal of Institutional Economics*, 13(2), pp. 401–420.
- Shittu, Waliu Olawale, Hammed Agboola Yusuf, Abdallah El Moctar El Houssein and Sallahuddin Hassan (2020). "The impacts of foreign direct investment and globalisation

- on economic growth in West Africa: examining the role of political governance”, *Journal of Economic Studies* 47(7), pp. 1733–1755.
- Sjöholm, Fredrik (1999). “Technology gap, competition and spillovers from direct foreign investment: Evidence from establishment data”, *Journal of Development Studies*, 36(1), pp. 53–73.
- Slesman, Ly, Ahmad Zubaidi Baharumshah and Mark E. Wohar (2015). “Capital inflows and economic growth: Does the role of institutions matter?”, *International Journal of Finance & Economics*, 20(3), pp. 253–275.
- Sokhanvar, Amin (2019). “Does foreign direct investment accelerate tourism and economic growth within Europe?”, *Tourism Management Perspectives*, 29, pp. 86–96.
- Solow, Robert M. (1956). “A contribution to the theory of economic growth”, *The Quarterly Journal of Economics*, 70(1), pp. 65–94.
- Su, Yaqin, and Zhiqiang Liu (2016). “The impact of foreign direct investment and human capital on economic growth: Evidence from Chinese cities”, *China Economic Review*, 37, pp. 97–109.
- Sunde, Tafirenyika (2017). “Foreign direct investment, exports and economic growth: ADRL and causality analysis for South Africa”, *Research in International Business and Finance*, 41, pp. 434–444.
- Swan, Trevor W. (1956). “Economic growth and capital accumulation”, *Economic Record*, 32(2), pp. 334–361.
- Ulaşan, Bülent (2015). “Trade openness and economic growth: panel evidence”, *Applied Economics Letters*, 22(2), pp. 163–167.
- UNCTAD (United Nations Conference on Trade and Development) (2022). “Foreign direct investment: Inward and outward flows and stock, annual”, UNCTADstat database. <https://unctadstat.unctad.org/wds/TableView/tableView.aspx?ReportId=96740> (accessed 16 October 2022).
- Völlmecke, Dominik, Björn Jindra, and Philipp Marek (2016). “FDI, human capital and income convergence—Evidence for European regions”, *Economic Systems*, 40(2), pp. 288–307.
- World Bank (2021a). World Development Indicators. <https://databank.worldbank.org/source/world-development-indicators> (accessed 1 March 2021).
- _____ (2021b). World Governance Indicators. <https://info.worldbank.org/governance/wgi> (accessed 1 March 2021).
- Yeboua, Kouassi (2019). “Foreign direct investment, financial development and economic growth in Africa: Evidence from threshold modeling”, *Transnational Corporations Review* 11(3), pp. 179–189.
- Zekarias, Seiko Minota (2016). “The impact of foreign direct investment (FDI) on economic growth in eastern Africa: Evidence from panel data analysis”, *Applied Economics and Finance*, 3(1), pp. 145–160.

Appendix table 1. List of African countries included in the sample

| Low-income countries (19) | Lower-middle-income countries (21) | Upper-middle-income countries (6) |
|-----------------------------------|---|--|
| Burkina Faso | Angola | Botswana |
| Central African Republic | Algeria | Equatorial Guinea |
| Chad | Benin | Gabon |
| Congo, Democratic Republic of the | Cameroon | Mauritius |
| Ethiopia | Cabo Verde | Namibia |
| Gambia, The | Comoros | South Africa |
| Guinea | Congo | |
| Guinea-Bissau | Côte d'Ivoire | |
| Liberia | Egypt | |
| Madagascar | Ghana | |
| Malawi | Kenya | |
| Mali | Lesotho | |
| Mozambique | Mauritania | |
| Niger | Morocco | |
| Rwanda | Nigeria | |
| Sierra Leone | São Tomé and Príncipe | |
| Sudan | Senegal | |
| Togo | Tanzania, United Republic of | |
| Uganda | Tunisia | |
| | Zambia | |
| | Zimbabwe | |

Source: Authors' compilation, based on World Bank (2021a) classification according to income level.

Appendix table 2. Data sources and measurement of variables

| Variable | Description | Growth rate of GDP per capita | Source |
|-------------------------------------|-------------------------------------|---|--------------------|
| GDPPCG | Economic growth | Growth rate of GDP per capita | World Bank (2021a) |
| FDI | Foreign direct investment | Percentage ratio of FDI net inflows (i.e. new investment inflows less disinvestment) in the reporting economy to GDP | World Bank (2021a) |
| Institutional variable (INS) | | | |
| VOA | Voice and accountability | Perception as to how much citizens can participate in the selection of their government. It also measures the degree of freedom of expression and freedom of association, ranging between -2.5 and 2.5 (weak to strong governance performance). | World Bank (2021b) |
| POS | Political stability | Perception of the likelihood of political instability, politically motivated violence, and terrorism. It ranges between -2.5 and 2.5 (weak to strong governance performance). | World Bank (2021b) |
| GOE | Government effectiveness | Perception of the quality of public services, the quality of policy formulation, and the credibility of the government's commitment to such policies. It ranges between -2.5 and 2.5 (weak to strong governance performance). | World Bank (2021b) |
| REQ | Regulatory quality | Perception of the ability of policymakers to formulate and execute sound economic policies that will engender the development of the private sector. It ranges between -2.5 to 2.5 (weak to strong governance performance). | World Bank (2021b) |
| RUL | Rule of law | Perception of the extent to which citizens have confidence in and abide by the rule of the country. It ranges between -2.5 to 2.5 (weak to strong governance performance). | World Bank (2021b) |
| COC | Control of corruption | Perception of the degree to which public power is used for private gain. It ranges between -2.5 to 2.5 (weak to strong governance performance). | World Bank (2021b) |
| Human capital variable (HCP) | | | |
| SSE | Secondary school enrolment | Percentage ratio of secondary enrolment to gross enrolment | World Bank (2021a) |
| GXE | Government expenditure on education | Percentage ratio of government expenditure on education to GDP | World Bank (2021a) |

/...

Appendix table 2. Data sources and measurement of variables (Concluded)

| Variable | Description | Growth rate of GDP per capita | Source |
|-------------------------|---|---|--------------------|
| Control variable | | | |
| TOP | Trade openness | Percentage ratio of the sum of exports plus imports of goods to total output | World Bank (2021a) |
| GXP | Government consumption expenditure (per cent GDP) | Total expenses and net acquisition of non-financial assets | World Bank (2021a) |
| INF | Inflation | Consumer price index, reflecting annual percentage change in cost to average consumer of acquiring a basket of goods and services | World Bank (2021a) |
| PGR | Population growth | Annual growth rate | World Bank (2021a) |
| GCF | Gross capital formation | Percentage ratio of gross capital formation to GDP | World Bank (2021a) |
| FEX | Foreign exchange rate | Annual average based on monthly average (local currency units relative to the United States dollar) | World Bank (2021a) |

Source: Authors' compilation.

Appendix table 3. Moderating role of institutions in the FDI–economic growth nexus in low-income countries

| Variable | Random effect | | | | | |
|------------------------|-------------------|-------------------|--------------------|-------------------|--------------------|--------------------|
| | GDPPCG [7] | GDPPCG [8] | GDPPCG [9] | GDPPCG [10] | GDPPCG [11] | GDPPCG [12] |
| FDI | -0.03 [-0.35] | 0.01 [0.14] | -0.28* [-1.70] | -0.08 [-0.57] | -0.35** [-2.05] | -0.27* [-1.73] |
| FDI*VOA | -0.12 [-0.98] | - | - | - | - | - |
| VOA | 0.95 [1.03] | - | - | - | - | - |
| FDI*POS | - | -0.04 [-0.62] | - | - | - | - |
| POS | - | 0.21 [0.41] | - | - | - | - |
| FDI*GOE | - | - | -0.36** [-2.04] | - | - | - |
| GOE | - | - | 2.30** [2.32] | - | - | - |
| FDI*REQ | - | - | - | -0.18 [-0.94] | - | - |
| REQ | - | - | - | 0.43 [0.37] | - | - |
| FDI*RUL | - | - | - | - | -0.37** [-2.51] | - |
| RUL | - | - | - | - | 0.57 [0.63] | - |
| FDI*COC | - | - | - | - | - | -0.37** [-2.21] |
| COC | - | - | - | - | - | 2.07** [2.13] |
| TOP | -0.01 [-0.77] | -0.01 [-0.59] | -0.01* [-0.62] | -0.01 [-0.66] | -0.02 [-1.08] | -0.01 [-0.87] |
| GXP | -0.04 [-0.51] | -0.02 [-0.32] | -0.06 [-0.78] | -0.02 [-0.21] | -0.05 [-0.68] | -0.05 [-0.68] |
| INF | -0.02 [-0.60] | -0.02 [-0.66] | -0.02 [-0.59] | -0.03 [-0.67] | -0.01 [-0.40] | -0.02 [-0.50] |
| PGR | 1.63*** [2.60] | 1.84*** [3.02] | 1.14** [2.10] | 1.81*** [3.00] | 1.73*** [3.08] | 1.42*** [2.63] |
| GCF | 0.08 [1.86] | 0.07* [1.68] | 0.09** [2.1] | 0.08* [1.80] | 0.08* [1.90] | 0.08** [1.96] |
| FEX | 0.000 [0.21] | 0.000 [0.28] | 0.00 [0.11] | 0.00 [0.21] | 0.000 [0.48] | 0.0001 [0.41] |
| Intercept | -2.17 [-0.86] | -3.50 [-1.56] | 0.65 [0.30] | -3.30 [-1.30] | -2.10 [-1.01] | -0.40 [-0.19] |
| R ² within | 0.085 | 0.079 | 0.062 | 0.076 | 0.076 | 0.069 |
| R ² between | 0.048 | 0.062 | 0.256 | 0.080 | 0.220 | 0.204 |
| R ² overall | 0.053 | 0.053 | 0.082 | 0.056 | 0.086 | 0.081 |
| Number of observations | 323 | 323 | 323 | 323 | 323 | 323 |

Source: Authors' estimations using data from World Bank (2021a and 2021b).

Note: [] represent z-statistics; *, ** and *** indicate significance at 10 per cent, 5 per cent and 1 per cent levels, respectively.

Appendix table 4. Moderating role of institutions in the FDI-economic growth nexus in lower-middle-income countries

| Variable | Random effect | | | | | |
|------------------------|-------------------|-------------------|-------------------|-------------------|--------------------|-------------------|
| | GDPPCG [1] | GDPPCG [2] | GDPPCG [3] | GDPPCG [4] | GDPPCG [5] | GDPPCG [6] |
| FDI | 0.05 [1.07] | 0.02 [0.55] | 0.12 [1.45] | 0.10 [1.20] | 0.05 [1.02] | 0.05 [0.76] |
| FDI*VOA | 0.04 [0.75] | - | - | - | - | - |
| VOA | 0.23 [0.53] | - | - | - | - | - |
| FDI*POS | - | 0.01 [0.20] | - | - | - | - |
| POS | - | 0.56 [1.48] | - | - | - | - |
| FDI*GOE | - | - | 0.11 [1.24] | - | - | - |
| GOE | - | - | 0.82 [1.44] | - | - | - |
| FDI*REQ | - | - | - | 0.08 [0.96] | - | - |
| REQ | - | - | - | 0.98** [2.02] | - | - |
| FDI*RUL | - | - | - | - | 0.02 [0.42] | - |
| RUL | - | - | - | - | -0.46 [-1.02] | - |
| FDI*COC | - | - | - | - | - | 0.03 [0.52] |
| COC | - | - | - | - | - | 0.64 [1.10] |
| TOP | -0.01 [-0.99] | -0.01 [-1.26] | -0.01 [-1.16] | -0.01 [-1.07] | -0.01 [-1.28] | -0.01 [-1.18] |
| GXP | 0.00 [0.01] | 0.00 [0.10] | 0.01 [0.36] | 0.01 [0.13] | -0.00 [-0.09] | 0.01 [0.15] |
| INF | 0.01 [0.54] | 0.02 [0.75] | 0.01 [0.66] | 0.01 [0.62] | 0.01 [0.35] | 0.01 [0.64] |
| PGR | 0.34 [1.22] | 0.36 [1.27] | 0.60** [2.08] | 0.35 [1.34] | 0.31 [1.08] | 0.52* [1.70] |
| GCF | 0.03 [1.27] | 0.03 [1.27] | 0.01 [0.39] | 0.01 [0.59] | 0.03 [1.40] | 0.02 [0.93] |
| FEX | -0.000 [-1.55] | -0.000 [-1.56] | -0.000 [-1.26] | -0.000 [-1.18] | -0.000* [-1.76] | -0.000 [-1.42] |
| Intercept | 1.29 [1.44] | 1.57 [1.72] | 1.30 [1.46] | 1.96** [2.14] | 1.09 [1.16] | 1.31 [1.47] |
| R ² within | 0.017 | 0.032 | 0.026 | 0.027 | 0.020 | 0.025 |
| R ² between | 0.232 | 0.170 | 0.341 | 0.400 | 0.147 | 0.222 |
| R ² overall | 0.035 | 0.040 | 0.052 | 0.057 | 0.031 | 0.039 |
| Number of observations | 357 | 357 | 357 | 357 | 357 | 357 |

Source: Authors' estimations using data from World Bank (2021a and 2021b).

Note: [] represent z-statistics; *, ** and *** indicate significance at 10 per cent, 5 per cent and 1 per cent levels, respectively.

Appendix table 5. Moderating role of institutions in the FDI–economic growth nexus in upper-middle-income countries

| Variable | Random effect | | | | | |
|------------------------|----------------------|----------------------|----------------------|---------------------|---------------------|---------------------|
| | GDPPCG [1] | GDPPCG [2] | GDPPCG [3] | GDPPCG [4] | GDPPCG [5] | GDPPCG [6] |
| FDI | 0.46*** [2.70] | 0.15 [-0.99] | 0.51*** [2.92] | 0.46** [2.52] | 0.44** [0.01] | 0.38** [2.15] |
| FDI*VOA | 0.47*** [3.81] | - | - | - | - | - |
| VOA | 1.61 [0.69] | - | - | - | - | - |
| FDI*POS | - | 0.08 [0.30] | - | - | - | - |
| POS | - | 3.86** [2.56] | - | - | - | - |
| FDI*GOE | - | - | 0.61*** [3.90] | - | - | - |
| GOE | - | - | -3.10 [-1.15] | - | - | - |
| FDI*REQ | - | - | - | 0.58*** [3.37] | - | - |
| REQ | - | - | - | -3.41 [-1.50] | - | - |
| FDI*RUL | - | - | - | - | 0.88*** [3.30] | - |
| RUL | - | - | - | - | -0.44 [-0.21] | - |
| FDI*COC | - | - | - | - | - | 0.46*** [3.13] |
| COC | - | - | - | - | - | 1.71 [1.15] |
| TOP | -0.03 [-1.06] | -0.06** [-2.54] | -0.05** [-1.90] | -0.05** [-2.29] | -0.04* [-1.71] | -0.02 [-0.97] |
| GXP | -0.95*** [-9.50] | -0.78*** [-7.50] | -0.90*** [-9.40] | -0.95*** [-8.70] | -0.98*** [-8.70] | -0.90*** [-9.20] |
| INF | -0.17 [-0.95] | -0.07 [-0.35] | -0.16 [-0.86] | -0.14 [-0.77] | -0.18 [-0.96] | -0.22 [-1.20] |
| PGR | 3.38*** [2.70] | 2.20*** [3.20] | 1.37 [0.99] | 1.12 [0.96] | 1.90*** [2.90] | 0.29*** [3.70] |
| GCF | -0.14* [-1.66] | -0.13* [-1.70] | -0.06 [-0.69] | -0.06 [-0.66] | -0.11 [-1.45] | -0.19** [-2.20] |
| FEX | -0.020*** [-3.70] | -0.020*** [-4.60] | -0.030*** [-5.50] | -0.02*** [-5.60] | -0.02*** [-4.80] | -0.02*** [-4.20] |
| Intercept | 20.30*** [5.10] | 21.70*** [7.30] | 25.10*** [6.00] | 26.40*** [6.51] | 24.90*** [8.80] | 22.90*** [8.30] |
| R ² within | 0.592 | 0.569 | 0.587 | 0.581 | 0.583 | 0.588 |
| R ² between | 0.491 | 5645.000 | 0.497 | 0.441 | 0.440 | 0.523 |
| R ² overall | 0.575 | 0.539 | 0.564 | 0.546 | 0.551 | 0.568 |
| Number of observations | 102 | 102 | 102 | 102 | 102 | 102 |

Source: Authors' estimations using data from World Bank (2021a and 2021b).

Note: [] represent z-statistics; *, ** and *** indicate significance at 10 per cent, 5 per cent and 1 per cent levels, respectively.

Appendix table 6. Moderating role of human capital in the FDI-economic growth nexus in low-income, lower-middle-income and upper-middle-income countries

| Variable | Random Effect | | | | | |
|------------------------|----------------------|---------------------|-------------------------------|--------------------|-------------------------------|----------------------|
| | Low-income countries | | Lower-middle-income countries | | Upper-middle-income countries | |
| | GDPPCG [1] | GDPPCG [2] | GDPPCG [3] | GDPPCG [4] | GDPPCG [5] | GDPPCG [6] |
| FDI | 0.028 [0.21] | 0.089 [1.08] | -0.050 [-0.50] | 0.039 [0.73] | -0.384*** [-2.68] | -0.181 [-1.29] |
| FDI*SSE | 0.001 [0.15] | - | 0.002 [0.89] | - | 0.014*** [3.93] | - |
| SSE | 0.011 [0.43] | - | -0.018 [-1.46] | - | -0.091*** [-2.65] | - |
| FDI*GXE | - | -0.009 [-0.65] | - | -0.001 [-0.20] | - | 0.051*** [2.69] |
| GXE | - | 0.205* [1.85] | - | -0.010 [-0.34] | - | -0.160** [-2.35] |
| TOP | -0.016 [-0.94] | -0.006 [-0.32] | -0.011 [-1.57] | -0.009 [-1.20] | -0.062*** [-2.90] | -0.040 [-1.63] |
| GXP | -0.032 [-0.42] | -0.020 [-0.25] | 0.000 [0.01] | -0.004 [-0.11] | -0.936*** [-9.73] | -0.859*** [-8.54] |
| INF | -0.024 [-0.64] | -0.040 [-1.04] | 0.018 [0.76] | 0.009 [0.38] | -0.137 [-0.75] | -0.092 [-0.48] |
| PGR | 1.853*** [3.19] | 2.090*** [3.51] | 0.084 [0.27] | 0.234 [0.76] | 1.267* [1.74] | 1.835** [2.43] |
| GCF | 0.075* [1.75] | 0.043 [0.94] | 0.036* [1.70] | 0.031 [1.38] | -0.057 [0.78] | -0.084 [-1.10] |
| FEX | 0.0001 [0.35] | 0.000 [0.04] | -0.001* [-1.84] | -0.001* [-1.73] | -0.028*** [-5.36] | -0.023*** [-5.62] |
| Intercept | -3.606* [-1.81] | -4.730** [-2.32] | 2.622** [2.31] | 1.684* [1.77] | 32.451*** [6.61] | 23.710*** [7.82] |
| R ² within | 0.069 | 0.081 | 0.015 | 0.018 | 0.589 | 0.591 |
| R ² between | 0.111 | 0.106 | 0.258 | 0.141 | 0.611 | 0.371 |
| R ² overall | 0.058 | 0.066 | 0.035 | 0.028 | 0.582 | 0.530 |
| Number of observations | 323 | 323 | 357 | 357 | 102 | 102 |

Source: Authors' estimations using data from World Bank (2021a and 2021b).

Note: [] represent z-statistics; *, ** and *** indicate significance at 10 per cent, 5 per cent and 1 per cent levels, respectively.