

2022

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Recommended Citation

Njuguna, Angelica E. and Nnadozie, Emmanuel (2022) "Investment Climate and Foreign Direct Investment in Africa: The Role of Ease of Doing Business," *Journal of African Trade*: Vol. 9: Iss. 1, Article 4.

DOI: <https://doi.org/10.1007/s44232-022-00003-x>

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Investment Climate and Foreign Direct Investment in Africa: The Role of Ease of Doing Business

Angelica E. Njuguna¹  · Emmanuel Nnadozie²

Received: 25 May 2019 / Accepted: 22 March 2022 / Published online: 27 July 2022
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Abstract

This paper explores the relationship between the ease of doing business, as one of the investment climate indicators, and foreign direct investment (FDI) inflows in Africa. It uses instrumental variable estimation and the control function approach to correct for possible endogeneity between FDI and the ease of doing business as well as economic growth. The study uncovers evidence that the ease of doing business plays a positive role in attracting FDI. The findings support African countries' attempts to invest in improving their business environment to attract favorable FDI.

Keywords Foreign direct investment · Ease of doing business · Investment climate · Instrumental variable estimation · Control function approach · Africa

JEL Classification C36 · F21 · M48 · O55

1 Introduction

A favorable business environment is believed to be important for both domestic and foreign investment, and more generally in terms of fostering economic growth. Regarding foreign direct investment (FDI), this is supported by a growing consensus in economic literature—that the attractiveness of a given country, as a host to foreign investors, is determined not only by its comparative advantage in international production but also by its domestic investment climate (e.g. Eifert, 2009; Kinda, 2009; Mottaleb & Kalirajan, 2010; Sekkat & Veganzones-Varoudakis, 2007). Moreover, empirical evidence shows that better regulation is essential for reaping the benefits of FDI inflows on growth (see Busse & Groizard, 2008).¹

¹ In this study, “foreign direct investment” (FDI) and “FDI inflows” are used interchangeably unless specified otherwise.

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Given the potential of FDI to contribute positively to economic growth (e.g. Adams, 2009; Alfaro et al., 2004; Balamoune-Lutz, 2004; Oliva & Rivera-Batiz, 2002), governments everywhere strive to improve their investment climate in order to attract these much-needed resources for development. In this regard, many African countries have implemented policy measures to increase their share of FDI inflows, which they view as important for resource mobilization, financial market development, and pro-poor economic growth. FDI is important in Africa since it provides a bridge between domestic savings and investment gaps (Ajayi, 2007). It plays a significant role in Africa's development, particularly by achieving sustainable development goals (SDGs) and broad-based economic transformation (United Nations Conference of Trade and Development [UNCTAD], 2014). The Addis Ababa Action Agenda (United Nations [UN], 2015) on financing for development likewise recognized FDI as a vital complement to national development efforts in Africa.

Several countries have sought to implement policies designed to attract FDI to non-mining or non-extractive sectors, such as services, telecommunication, transport, manufacturing, finance, and food production. For instance, in 2010, Rwanda was ranked as the world leader in Doing Business reforms (World Bank [WB], 2010). According to the 2013/14 Doing Business survey, the sub-Saharan region recorded the highest number of countries that have implemented regulatory reforms and strengthened legal institutions (WB, 2014).² This trend has been consistent: in the 2014/15 Doing Business survey, five of the top ten economies with the most notable improvements in Doing Business indicators were in Africa (WB, 2015).

The World Bank's Doing Business survey was first conducted in 2003, covering 133 countries; this was expanded to 190 countries in 2017 (WB, 2017). The survey involves ranking countries according to the ease of doing business as potential hosts for FDI. The Ease of Doing Business index provides a quantitative measure of regulations affecting various stages of the life of a business. Small and medium enterprises compose the bulk of these businesses.

The survey is undertaken based on the fundamental premise that economic activity requires good rules and regulations (WB, 2010). Doing Business indicators have grown from 5 indicators on efficient regulations to 11 indicators, which include regulatory quality, such as getting credit, and protecting minority investors (WB, 2016). The 11 indicators are as follows: starting a business; dealing with construction permits; getting electricity; registering property; getting credit; protecting minority investors; paying taxes; trading across borders; enforcing contracts; resolving insolvency; and labor market regulations. The definitions are provided in Appendix 1.

In terms of the Ease of Doing Business (EDB) ranking, Mauritius maintained the top position in Africa from 2010 to 2017, followed by South Africa and Rwanda, alternating in the second position. The other countries in the top positions were Tunisia, Botswana, Ghana, and Morocco. Mauritius' most notable reforms include increasingly reliable infrastructure, efficient property registration, and less time dealing with construction permits (WB,). Property registration was made easier by digitizing land records (WB, 2017), and construction permits were facilitated by employing more efficient subcontractors (WB, 2016).

Meanwhile, Rwanda has consistently improved its business environment. It is one of only ten countries that have implemented reforms in all areas of doing business since 2006

² Regulatory reforms here mean reducing the complexity and cost of regulatory processes (WB, 2014).

(WB, 2017). Among others, the efficiency of business registration was enhanced by reducing the number of procedures and days required to start a business (WB, 2015). Contract enforcement was made more efficient through the use of the Integrated Electronic Case Management System installed in city and commercial courts (WB, 2017). Finally, getting credit was made easier by improving both the credit information system and the legal framework for secured transactions (WB, 2016).

For South Africa, providing business-friendly regulations was made possible by the introduction of online procedures. For example, an online portal can be used to search for a company name when starting a business (WB, 2017). In Tunisia, Botswana, Ghana, and Morocco, streamlining various procedures was part of reforming business regulations. Incidentally, South Africa, Tunisia, Morocco, and Ghana are among the top destinations of FDI in Africa. Botswana and Mauritius, on the other hand, are considered success stories with sustained high growth in Africa. In these countries, the ease of doing business played an important role (WB, 2008; Frankel, 2010; Robinson, 2013; Subramanian, 2013).

The foregoing prompts an interesting question: could a favorable investment climate, specifically with regard to the ease of doing business, play a significant role in attracting FDI in Africa generally? Empirical observations have shown that the key factor in determining FDI inflows into Africa is the endowment of natural resources. Most foreign investment inflows in Africa go to resource-rich countries such as the mineral and oil producers, namely South Africa, Angola, Egypt, Nigeria, Libya, Congo, Sudan, Tanzania, and Zambia.³

American FDI flows have been found to be concentrated in the petroleum and minerals sector of many African countries (Nnadozie & Okonkwo-Osili, 2005). However, FDI inflows within the primary extraction sector are capital intensive. These flows have few connections to other sectors of the economy and, in general, they have not spurred pro-poor economic growth.⁴

African countries are investing more of their limited public resources into reforms. They are seeking to improve their business environments, including the ease of doing business, and they are invoking critical mechanisms, such as the African Peer Review Mechanism (APRM) and the OECD Policy Framework for Investment. As they do so, it is important to determine whether they are reaping the expected benefits in terms of increased FDI flows. In other words, if the key driver of FDI inflows to Africa is mineral resource endowment, does it still make sense for African countries to invest in improving their business environment? Some economists have argued that appropriate policies are imperative for governments to attract multinational enterprises (MNEs) and hence FDI (Athukorala, 2009; Dunning, 1973).

This study investigates the importance of the investment climate and the role of government policies and institutions that facilitate the ease of doing business in promoting FDI inflows to Africa. If more business-friendly policies and regulations can attract significant non-resource FDI, then small non-resource-rich countries in Africa, such as Mauritius and Rwanda, should include these policies in their long-term development goals.

Our study differs from previous ones on the subject for Africa, in that we include measures of both the ease of doing business and natural resources as explanatory variables. In a similar study, Corcoran and Gillanders (2015) presented an analysis of the OECD, middle income countries, and sub-Saharan Africa, but they omitted natural resource endowment as

³ This is based on the UNCTAD online database. Figures are presented in Table 1.

⁴ For example, Asiedu (2004) did not find that natural resource availability significantly impacted multinational employment in SSA.

Table 1 Top 20 Destinations of FDI in Africa. Source: Authors' calculation based on UNCTADstat online database

Rank	Country	Average FDI: 2013–2015 (in million USD)	Share in Africa's FDI (%)	Cumulative share (%)
	Africa (total)	54,844.48	100	100
1	South Africa	5281.05	9.63	9.63
2	Egypt	5251.00	9.57	19.20
3	Mozambique	4929.23	8.99	28.19
4	Nigeria	4455.48	8.12	36.31
5	Morocco	3340.45	6.09	42.41
6	Congo	3300.79	6.02	48.42
7	Ghana	3258.54	5.94	54.37
8	Zambia	2219.19	4.05	58.41
9	Tanzania	1889.37	3.44	61.86
10	DR Congo	1871.64	3.41	65.27
11	Ethiopia	1860.30	3.39	68.66
12	Sudan	1558.66	2.84	71.50
13	Angola	1160.87	2.12	73.62
14	Uganda	1070.62	1.95	75.57
15	Tunisia	1060.70	1.93	77.51
16	Kenya	1000.68	1.82	79.33
17	Algeria	870.77	1.59	80.92
18	Gabon	802.13	1.46	82.38
19	Namibia	770.02	1.40	83.79
20	Mauritania	706.96	1.29	85.87

an explanatory variable. For Africa, the regression model is likely misspecified, since the bulk of FDI in the continent tends to flow to countries rich in natural resources. This omission, therefore, might explain why they found that none of the EDB indicators significantly matters to FDI in Africa. A similar study by Asiedu (2006) included the natural resources variable but not EDB indicators.

We also attempted to address the methodological issue of estimating an FDI model where there could be simultaneous effects between the ease of doing business and FDI as well as gross domestic product (GDP) and FDI, thus leading to endogeneity issues. To rectify this concern, the instrumental variable (IV) estimation method in the form of two-stage least squares (2SLS) and the control function approach (CFA) were used instead.

FDI may influence the ease of doing business through the technology and management expertise it brings to the host countries (e.g. Haddad & Harrison, 1993). With large FDI, these factors may easily diffuse into several sectors of the economy, promoting efficiency in both the private and government business environments. Corcoran and Gillanders (2015) also recognized the potential effect of high-level FDI on improving the ease of doing business, but this effect was not accounted for in their model.

On the other hand, a GDP-based economic growth variable often enters FDI models under the premise that higher growth encourages higher investment inflows (e.g. Asiedu, 2002). However, FDI also contributes positively to economic growth (Balioune-Lutz,

2004; Li & Liu, 2004; Oliva & Rivera-Batiz, 2002). Other studies have found that FDI promotes growth when certain characteristics in host countries are met, including broader government regulations (Adams, 2009; Alfaro et al., 2004; Borensztein et al., 1995; Busse & Groizard, 2008).

In summary, the two main contributions of this paper are as follows. First, we offer an exclusive study of Africa using business-friendly environments and the endowment of natural resources together with other control variables as explanatory variables in an FDI model. This addresses potential bias in previous studies that omit these variables. Second, our study addresses the endogeneity of the ease of doing business and GDP with respect to FDI.

The remainder of the paper is structured as follows. Section 2 briefly reviews the empirical literature that links the investment climate and FDI. Section 3 describes the trends, patterns, and important characteristics of FDI inflows to Africa. Section 4 presents the econometric model and identifies data sources. Section 5 conducts the estimation and presents the regression results. Finally, Sect. 6 concludes with policy implications.

2 Empirical Link Between Investment Climate and FDI

2.1 Investment Climate and FDI Inflow in Developing Countries

A growing number of studies have focused on the role of investment climate in promoting FDI inflows to developing countries. According to Athukorala (2009), “investment climate” in a broader sense involves both the foreign investment regime and the general investment environment. The former concerns the rules governing foreign investment and specific incentives for investors, and the latter covers several factors of investment decisions such as political stability, the macroeconomic environment, and the attitudes of host countries towards foreign enterprise participation.

Many have argued that the profit-related incentives to investors (e.g. tax concessions) do not generally work unless they are appropriately combined with other incentives to improve the general investment climate. In other words, specific incentives are relevant for an investment decision only if the general business environment is conducive (Busse & Groizard, 2008). Athukorala (2009) observed that when competing for FDI, governments usually offer a good incentive package to entice MNEs to locate their affiliates in their respective countries. However, such packages are generally balanced out by similar ones offered by other competing countries. Therefore, the study concluded that investment incentives matter only when other conditions are roughly similar among the alternative host countries.

A favorable business environment has been found to increase the chances of developing countries obtaining FDI inflows (Dollar et al., 2006; Kinda, 2009; Mottaleb & Kalirajan, 2010; Sekkat & Veganzones-Varoudakis, 2007). However, different indicators were used in these studies as proxies for the investment climate. Sekkat and Veganzones-Varoudakis (2007) considered infrastructure availability and sound economic and political conditions, while Dollar et al. (2006) augmented these with good financial services and low customs clearance. Kinda (2009) included similar indicators, such as financial development and good institutions, while Tran (2008) complemented the set with the ease of business entry and operations. However, Mottaleb and Kalirajan (2010) focused on rules and regulations relating to investment and business, and on macroeconomic stability. Although these

studies used varying indicators, the general consensus was that investment climate constraints negatively influence FDI inflows.

Kinda (2009) showed that investment climate constraints, such as underdeveloped physical infrastructure and financial markets, restrict FDI in developing countries. These results were based on econometric analysis of firm-level data across 77 developing countries. According to the study, well-developed infrastructure is essential to attract foreign capital. In particular, if FDI is in the manufacturing sector, a good provision of infrastructure reduces transaction costs by allowing entrepreneurs to connect easily with their suppliers and customers. This also applies to well-developed financial services that can facilitate financial transactions between foreign firms and their customers and employees in the host country. The study also found that financing constraints are the most important type of investment climate constraint for firms (both local and foreign), and that foreign firms tend to locate more where financing constraints are low. In terms of specificity to the region, the study found that the effects of these investment constraints to sub-Saharan African countries were not significantly different from those in other developing countries.

Sekkat and Veganzones-Varoudakis (2007) investigated the importance for FDI inflows of investment climate indicators, namely, infrastructure availability and sound economic and political conditions. These indicators were evaluated together with other covariates such as trade openness. Using economic risk and political risk ratings as measures of economic and political conditions, respectively, with a panel of 72 developing countries, the study found evidence that trade openness and investment climate indicators significantly promoted FDI. According to the study, the increase in FDI due to improvements in the business environment was observed to be much higher than that from greater trade openness. The study also argued that Africa and South Asia would have benefited more than other regions from increased openness and an improved investment climate if they had had the same degree of openness and investment climate as in East Asia.

Finally, using a sample of 68 developing countries, Mottaleb and Kalirajan (2010) found that business-friendly environments with appropriate rules and regulations can significantly reduce operational costs and hidden costs, allowing for a well-functioning market. The study argued that socioeconomic and political variables such as regulatory frameworks, bureaucratic hurdles like red tape, regulations around setting up new businesses, judicial transparency, and the extent of corruption in the host country may reduce the inflow of FDI. The study concluded that a business-friendly environment, measured by the days required to start a business, was one of the most important and significant factors in determining FDI inflows to developing countries.

2.2 Improving Investment Climate to Attract FDI Inflow in Africa

African countries have made considerable efforts to improve their investment climate through several economic reforms and by improving regulatory frameworks (Ajayi, 2007; Nnadozie et al., 2007; UNCTAD, 1999). These include fiscal incentives, such as reduced corporate taxes and royalties, tax exemptions and tax holidays, privatizing state-owned enterprises, efforts to stabilize and maintain sound macroeconomic environment, and governance reforms. Progress has also been made in other areas that are important for the FDI climate, such as trade liberalization, the strengthening of the rule of law, and improvements in legal and other institutions, as well as telecommunications and transport infrastructure.

To improve good governance and political reforms, the African Union established the African Peer Review Mechanism (APRM) in March 2003. The mechanism is designed to

promote good governance and institutional change, increase growth, and generate sustainable socioeconomic development and greater regional integration on the continent. The mechanism is voluntary and self-monitoring. Its objective is to strengthen institutions by improving the quality of political, economic, and corporate governance in African countries and thereby promoting socioeconomic development. The five-stage process includes periodic reviews and benchmarking of the policies and practices of participating states. These reviews ascertain progress made towards achieving mutually agreed goals, as well as compliance with adopted political, economic, and corporate governance values, codes, and standards. The APRM's five stages are self-evaluation, external review, report preparation, peer review, and dissemination of findings (see Nnadozie et al., 2007).

Some countries in Africa have made strides in upgrading their business environment through reforms. In 2010, the World Bank's Doing Business survey ranked Rwanda as the world leader in reforms, and in 2016, Kenya was among the countries that made significant reforms (WB, 2017). This remarkable development has helped reduce poverty and inequality, build strong institutions, and improve efficiency in labor and financial markets (Fauconnier et al., 2017). Through the years, considerable progress in the business environments of many African countries has been made, as shown in the annual Doing Business surveys (WB, 2014, 2015).

Empirical studies have shown that a favorable investment climate, or the lack of it, has played a significant role in attracting FDI in Africa. For example, Uganda has been one of the main destinations of FDI in Africa, partly due to its predictable investment climate. Obwona and Egesa (2007) identified three factors that explain the success of Uganda: (1) a predictable and consistent policy and macroeconomic environment; (2) reforms undertaken among incentive schemes and related government agencies to fulfill the criteria for investment promotion; and (3) administrative simplicity. This is consistent with Morisset's (2000) findings that some African countries were able to attract more FDI by improving their business environment.

Mwega and Ngugi (2007) noted that the deterioration of the business environment in Kenya in the 1980s and 1990s was the major deterrent to its FDI inflows. In 2015, however, investor confidence was restored due to the country's improved business climate and operating environment, and Kenya became one of the favored FDI destinations in Africa (Fauconnier et al., 2017; UNCTAD, 2016). Likewise, although infrastructure development helped attract FDI in Cameroon, Khan and Bamou (2007) argued that the country needed to create a more investment-friendly environment to raise its competitiveness.

Finally, Asiedu (2006) used a fixed-effects panel model to establish that institutional variables such as corruption and the rule of law had a significant effect on FDI inflows in Africa. The results suggested that FDI in SSA is not driven by natural resources alone but by improving institutions and the policy environment. Hence, small countries and non-resource-rich countries in Africa can enhance FDI inflows through better policies and stronger institutions.

2.3 Business Regulations and Ease of Doing Business Indicators

Several studies have analyzed the effects of business regulations using EDB indicators specifically in terms of both economic growth and FDI. Studies that relate EDB to FDI include Busse and Groizard (2008), Eifert (2009), Jayasuriya (2011), Morris and Azis (2011), Nnadozie and Njuguna (2011), Bayraktar (2013), and Corcoran and Gillanders (2015). In

general, the results from these studies showed that the ease of doing business and/or some of its components significantly increase FDI inflows.

Busse and Groizard (2008) took five of the ten components of the Doing Business index—namely, starting a business, labor market regulations, contract regulations, creditor rights, and insolvency regulations—to develop their own overall index of regulations.⁵ The index was a weighted average of these five EDB indicators using weights derived from principal component analysis. Based on panel data estimation using a sample of 84 countries, they found that the most regulated countries were the least likely to take advantage of FDI inflows.

Eifert (2009) and Jayasuriya (2011), however, considered the effects of individual EDB components. Eifert (2009) found evidence that in relatively poor and relatively well-governed countries, a lower number of business registration procedures increased investment rates. Meanwhile, Jayasuriya (2011) established that only reductions in the time and cost to enforce contracts were significantly correlated with FDI. However, the study observed that the overall Doing Business ranking significantly increased FDI inflows. Similar results were obtained in Nnadozie and Njuguna (2011) using the overall EDB ranking.

Corcoran and Gillanders (2015) provided evidence that the overall EDB ranking was highly significant in the standard FDI regression model based on their large sample. However, the most significant variable driving FDI was the ease of trading business across borders; without it, the effect of EDB was not significant.

Morris and Azis (2011) and Bayraktar (2013) used correlation coefficients to examine the link between FDI inflows and the overall EDB ranking and its various components. According to Morris and Azis (2011), there is limited evidence showing that the overall EDB ranking is correlated with FDI inflows. A significant relationship existed only for a few years and when applied separately to the whole sample of countries and to the SSA sample. In terms of the relationship between FDI and the different EDB components, registering property and trading across borders were found to be positively correlated to FDI for the whole sample. By contrast, Bayraktar (2013) found strong correlation coefficients between FDI inflows and the various indicators that comprise EDB.

In effect, the findings about the relationships of EDB, its components, and FDI have not been uniform. There is no clear pattern to suggest that the individual components of EDB when taken separately have an effect on FDI. Likewise, there are mixed results on whether the overall EDB ranking significantly affects FDI.

3 Stylized Facts on FDI Inflows in Africa

FDI inflows promote economic development through structural transformation and rapid economic growth in the developing host countries (Ozawa, 1992; Ozturk, 2007). In many empirical studies, FDI is recognized as being a provider of technology, management expertise, finance, and connection with the world market as well as increasing job opportunities and employment (Aitken & Harrison, 1999; Caves, 1982; Haddad & Harrison, 1993; Hel-leiner, 1989; Ozawa, 1992).

In Africa, FDI usually provides the bridge between domestic savings and investment gaps, since the region's generally low income limits its ability to raise resources

⁵ These indicators were published in the World Bank's Doing Business 2006 report. However, since 2003 the components of the Doing Business indicators have undergone many changes.

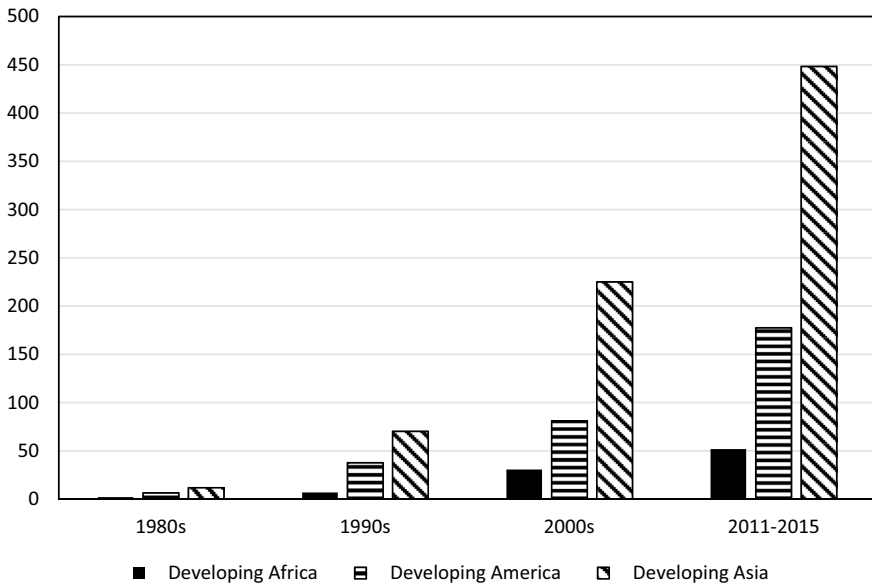


Fig. 1 Trends in FDI inflows in developing countries, in billion USD, 1980–2015. Source: Authors’ calculations based on the UNCTADStat online database

domestically to finance development (Ajayi, 2007). For SDGs, FDI plays an even greater role in the region’s development, as it is seen as crucial for financing the implementation of SDGs. The SDGs necessitate a major escalation in the financing efforts for investment in broad-based economic transformation (UNCTAD, 2014). The Addis Ababa Action Agenda on financing for development recognized FDI and a stable international financial system as vital complements to national development efforts (UN, 2015). The nature of FDI as a relatively stable and long-term capital investment in productive assets makes it suitable for the kind of investment SDGs require. FDI is also resilient to financial and economic crises (UNCTAD, 2014).

The African continent’s share of global FDI has exhibited sluggish growth, as shown in Fig. 1. It remains small and lags behind other developing regions despite yielding the highest rate of return among host regions (UNCTAD, 2013).⁶ On the other hand, FDI inflows in both developing Asia and developing America grew rapidly from the 1980s to 2015. Figure 1 shows that Africa attracted an average of only \$52 billion USD of FDI between 2011 and 2015, compared to \$177 and \$448 billion USD of FDI in developing America and Asia, respectively, in the same period. The FDI in Africa for the period was only about 3.5% of the total world investment inflows, whereas developing Asia and developing America had 30% and 12% shares of the world’s FDI, respectively.

⁶ Developing countries as classified in [Unctadstat.unctad.org](http://unctadstat.unctad.org). From Fig. 1, what is being compared are three developing regions in the world: (1) “developing Africa” (all countries in Africa); (2) “developing Asia” (all countries in Asia, excluding Japan); and (3) “developing America” (all countries in North and South America, excluding the USA and Canada).

Table 2 Population, income classification and sectoral FDI in African top 20 FDI destinations Sources: ^aWorld Bank online database; ^bFantom and Serajuddin (2016); ^ccompiled from KPMG (2016), UNCTAD (2016), and Fauconnier et al. (2017)

Country	Population ^a (in Millions)	Income Classification ^b	Indication of Main Sectoral FDI ^c
1. South Africa	55.01	Upper-middle income	Mining of minerals, manufacturing, services (telecommunications)
2. Egypt	93.8	Lower-middle income	Mining, gas industry, manufacturing (pharmaceutical), services (banking and finance, telecommunications)
3. Mozambique	28.0	Low income	Mining of minerals, gas industry
4. Nigeria	181.1	Lower-middle income	Mining, oil industry, manufacturing (pharmaceutical), services
5. Morocco	34.8	Lower-middle income	Manufacturing (automotive), services (real estate, banking, telecommunication)
6. Congo, Rep	5.0	Lower-middle income	Mining, oil industry
7. Ghana	27.6	Lower-middle income	Gold mining, manufacturing, agriculture (cocoa and other processed agriculture products)
8. Zambia	16.0	Lower-middle income	Copper mining
9. Tanzania	53.9	Low income	Mining of minerals, gas industry
10. D R Congo	76.2	Low income	Mining of minerals, oil and gas industry
11. Ethiopia	99.9	Low income	Manufacturing (textile and garments)
12. Sudan	38.7	Lower-middle income	Mining of minerals, oil industry
13. Angola	27.9	Upper-middle income	Oil and gas industry, manufacturing, services, energy-related infrastructure
14. Uganda	40.1	Low income	Mining, oil industry, manufacturing, services
15. Tunisia	11.2	Upper-middle income	Oil industry, manufacturing, services (banking and telecommunication)
16. Kenya	47.2	Lower-middle income	Oil and gas exploration, manufacturing, services
17. Algeria	39.9	Upper-middle income	Oil and gas industry
18. Gabon	1.9	Upper-middle income	Oil industry
19. Namibia	2.4	Upper-middle income	Mining of minerals (diamonds and uranium)
20. Mauritania	4.2	Lower-middle income	Mining of minerals (iron ore)

3.1 Top Destinations of FDI in Africa

The bulk of FDI inflows in Africa is concentrated in a few countries that are mostly endowed with natural resources.⁷ Based on 2013–2015 3-year averages, over 65% of these inflows went to the top ten African countries, and more than 85% went to the top 20% (Table 1). This implies that the remaining 34 countries in Africa received less than 15% of the resource inflows. Except for Morocco, Ethiopia, and Kenya, all other countries in the group are rich in natural resources such as minerals, oil, and natural gas (Table 2).

Although reserves of minerals and other natural resources evidently attract FDI in Africa, other factors are said to have contributed to the inflows in most recent years: (1) a perception that Africa has become politically mature and that its legal systems have improved, (2) increasing population leading to a rise in consumption, and (3) lower growth expectations for the developed economies (KPMG, 2016). Furthermore, the Rand Merchant Bank (RMB) in-house survey respondents specified that the nature of a country's operating environment is a greater determinant in shaping a firm's decision on whether to invest in a particular country in Africa (Fauconnier et al., 2017). The three most important determinants are macroeconomic and political stability, economic growth, and ease of doing business.

Consequently, improvements in these determinants would have led to a more diversified investment portfolio on the continent, benefitting other sectors of the economy, particularly manufacturing and services. As shown in Table 2, many countries that are favorite FDI destinations also received inflows into the manufacturing and services sectors, including pharmaceuticals, automotive, banking and finance, and telecommunications. The UNCTAD's, 2014 World Investment Report indicates that the share of the primary sector in greenfield projects in Africa has declined from 53% in 2004 to 11% in 2013, while that of the services sector has increased significantly from 13% to 63%.⁸

Table 2 shows that the top destinations of FDI in Africa are middle income countries, albeit mostly lower-middle income countries, consistent with the observation by Mottaleb and Kalirajan (2010) that lower-middle income countries, among developing countries, are the preferred destination of FDI. They argued that these countries have large domestic markets, they are highly linked with the global market through international trade, and they offer a more business-friendly environment to investors. While this might be applicable to developing Asian countries, it is not entirely true of middle-income countries in Africa.

Aside from Egypt, Nigeria, Democratic Republic of Congo (DR Congo), and Ethiopia, the other countries' main FDI destinations have relatively small populations. Moreover, most of these countries have better ratings on the EDB index compared to the overall average rating in Africa, as shown in Appendix 2. In contrast with developing Asian countries, however, where most of the FDI is largely market-seeking and efficiency-seeking investments directed towards vertically integrated high-tech industries (Athukorala, 2009), African FDI is mostly resource-seeking investment (see Table 2).

⁷ The FDI inflows are partly driven by FDI in extractive industries, but investment in consumer-oriented manufacturing and service industries is also expanding (UNCTAD, 2013).

⁸ A greenfield investment is related to the acquisition of new assets (Calderon et al., 2004).

4 Empirical Model and Data

4.1 Empirical Model

The empirical model used in the study was based on an eclectic theory of international production that provides a holistic framework to identify and evaluate factors that may significantly influence foreign production by enterprises. The theory suggests that production financed by FDI and undertaken by MNEs is determined by three sets of factors, namely, ownership, locational, and internalization (OLI) advantages (Dunning, 1981, 1988, 2001).

Ownership advantage is the competitiveness of firms in supplying any particular market or set of markets. These advantages may arise either from the firm's privileged ownership of, or access to, a set of income-generating assets, or from their ability to coordinate these assets with other assets across national boundaries for a competitive advantage. On the other hand, locational advantage is the extent to which enterprises find it profitable to produce outside their home countries and depends on attractions of location-specific endowments. Finally, internalization advantage is the extent to which firms perceive it to be in their best interests to internalize markets for the generation and/or use of these assets and, by so doing, add value to them.

The eclectic paradigm claims that the significance of each of these advantages has specific contexts that may vary across industries, regions, or countries, and among firms. Moreover, the three sets of factors may not be independent of each other. For example, a firm's response to its locational variables might itself influence its ownership advantages, including its ability and willingness to internalize markets (Dunning, 2001). Furthermore, the paradigm allows for a relationship of OLI to structural and contextual variables, which include the role of government (Dunning, 1988).

The explanatory variables included in our empirical model fall into broad categories of OLI and, as already indicated, one variable might be linked to more than one advantage. Our particular interest was motivated by Dunning (1981) as an essential locational characteristic for all kinds of FDI, that is, a congenial investment climate and an adequate legal and commercial framework for business. Here, investment climate is a combination of sound economic conditions, as well as policy and institutional variables; the latter two are very well captured in the country's overall EDB index.

Thus, by placing the relationship of FDI with various factors into context, the econometric model may be written as

$$FDI_i = \alpha + x_i' \beta + \delta EDB_i + \varepsilon_i, \quad (1)$$

where FDI_i is the value of the dependent variable for country i ($i=1, 2, \dots, N$; N is the number of countries), which depends on the vector of explanatory variables, $x_i = (x_{1i}, x_{2i}, \dots, x_{ki})'$, and the i th country's EDB rating; α , β , and δ are unknown parameters to be estimated; and ε_i is the unobserved random error.

The vector of explanatory variables (x_i) in Eq. (1) consists of (1) economic variables such as natural resource endowments, host economy/market size, and population; and (2) policy outcome variables: inflation, infrastructure development, and trade openness. All of these, except market size and population, are considered locational variables. Market size represented by GDP and population are considered structural variables (Dunning, 1981). Institutional variables such as corruption are thought to have been captured in the components of the EDB index, since, according to Busse and Groizard (2008), a well-designed institution is likely to have good regulations.

Presence of government policies and institutions that facilitate EDB is likely to increase a country's potential to draw more foreign investment. The inclusion of natural resource endowments in the model has been discussed widely in the literature. Natural resources are perceived to have been the main determining factor in attracting FDI to Africa. A country with a large deposit of natural resource is most likely to be favored with FDI. The size of the economy (GDP) or market size, on the other hand, may be crucial to foreign investors. A large economy can potentially increase the viability of investments, as it offers economies of scale and the likelihood that products will mostly sell in the host economy in the case of market-seeking investments. Population would have similar effects on FDI, especially in an economy where consumers have high purchasing power.

Inflation is a policy outcome indicating the macroeconomic condition in an economy. Relatively low inflation suggests a stable macroeconomic environment, which is conducive for business and investments. Trade openness is another policy variable showing how a country is well integrated in the world economy. Having established connections to the rest of the world eases market access to foreign companies engaged in the production of goods and services intended for the external market.

Finally, every business endeavor needs digital connectivity in the modern world. Hence, this type of infrastructure development is essential for doing business. The digital economy, which is characterized by the application of internet-based technologies to production and trade, is becoming a crucial part of the global economy (UNCTAD, 2017). According to World Investment Report in 2017, a digital economy can enhance competitiveness, new business opportunities, access to foreign markets, and participation in global value chains. Our study captures this type of infrastructure by mobile telephone penetration, measured by an internet connection variable.

4.2 Data

The FDI model in Eq. (1) was estimated using 2 years of observations from a cross-section of 45 African countries in 2010 and 2011, for a total of 90 panel observations. The choice of these 2 years was based on EDB data consistency, a point that is further discussed below. All data series used in the study were taken from the World Bank's World Development Indicators Online, although the FDI series is also available in the UNCTAD online database. FDI and GDP data are in current USD in millions, since the constant values of the former are not available. Inflation, natural resources, and trade openness are given in percentages. Specifically, natural resources and trade openness are expressed as percent of GDP. Population is in millions, and mobile telephone subscriptions are measured per 100 people. The definitions of each variable are shown in Appendix 3.

The EDB is an index that provides a quantitative measure of regulations affecting the various stages of the life of a business. By construction, the lower the numerical value of the EDB index (EDBI) means that the regulatory environment is more conducive to business operations. Each year, the World Bank's Doing Business survey tends to increase the number of countries in the survey; at the same time, the components of the EDB index change often.⁹ The data for 2010 and 2011 are consistent in their coverage and composition,

⁹ In 2012, there were 183 countries included in the survey; 185 in 2013; and 189 in 2014 (WB, 2017). The 2010 and 2011 data points were published in the Doing Business 2012 report, where the index for 2011 was back-calculated to 2010 (WB, 2012). See also the various publications of the World Bank's Ease of Doing Business on how the components of the index have changed over time.

Table 3 Pairwise correlation matrix between all variables in the study

Variable	FDI	EDBI	RES	INF	GDP	POP	OPEN	Mobile
FDI	1.00							
EDBI	-0.23**	1.00						
RES	0.08	0.41***	1.00					
INF	0.14	-0.09	0.13	1.00				
GDP	0.67***	-0.27**	-0.003	0.14	1.00			
POP	0.64***	-0.15	-0.04	0.39***	0.76***	1.00		
OPEN	0.05	-0.01	0.56***	-0.12	-0.04	-0.23**	1.00	
Mobile	0.21**	-0.45***	0.02	-0.19	0.30***	-0.05	0.46***	1.00

See Appendix 3 for definitions of variables and data sources

Significant at 5%; *significant at 1%

Table 4 Descriptive statistics

Variable	Mean	Standard deviation	Minimum	Maximum
FDI	937.669	1621.337	-3227.211	8841.953
EDBI	131.900	43.236	21	183
RES	17.054	15.876	0.005	69.977
INF	6.55	5.759	-3.700	33.220
GDP	41,932.700	87,194.440	543.376	413,541.500
POP	20.727	28.920	0.488	164.193
OPEN	34.306	18.447	8.917	90.957
Mobile	62.019	30.922	7.870	148.693

See Appendix 3 for definitions of variables and data sources

EDBI Ease of Doing Business index, *FDI* foreign direct investment, *GDP* gross domestic product, *INF* inflation, *OPEN* trade openness, *POP* population, *RES* resources

however (see WB, 2012), making the choice of these 2 years the most appropriate for our empirical analysis. In the 2010 and 2011 EDBI data, the countries were ranked from 1 to 183. The overall EDBI is used, since the individual EDB indicators tend to be insignificant when used in the FDI model (e.g. Eifert, 2009; Jayasuriya, 2011) and because we are interested in the overall indicator of the business environment.

Table 3 shows the pairwise correlation matrix between all the variables used in the study. The purpose is to provide a feel for the data. For example, from among the regressors, the correlations between population and GDP, and between natural resources and trade openness, are relatively high compared to other pairs of variables. That is, countries that are more populous tend to have a higher GDP, and more resource-intensive countries show greater openness. EDBI was found to be positively correlated with resources (RES). Since higher values of the EDBI mean a poorer EDB ranking, the correlation suggests that African countries endowed with more natural resources are more likely to have a restrictive business environment. Finally, the correlation between FDI and EDBI variables is negative. This value indicates that FDI tends to be higher for countries with a greater ease of doing business. The correlation coefficient between FDI and EDBI is negative, since lower values of EDBI indicate a more conducive business environment.

Table 4 presents the descriptive statistics for all the variables. The highest FDI in the dataset is at \$8.8 billion USD, received by Nigeria in 2011, compared to −\$3.2 billion dis-investments in Angola in 2010. The lowest non-negative investment value is observed for Burundi, amounting to \$781,000 USD in 2010. The highest value of the EDBI is 183, for Central African Republic in 2010, such that this country is considered the worst in terms of the ease of doing business. In contrast, the best EDBI of 21 is for Mauritius in 2010. Africa’s EDBI mean of 131 is quite high, indicating the relatively poor performance of African countries in terms of the ease of doing business.

5 Estimation Methods and Results

Considering both the cross-section and time series components of the data, Eq. (1) can be written more accurately as

$$FDI_{it} = \alpha + x'_{it}\beta + \delta EDB_{it} + \varepsilon_{it}, \quad (2)$$

where the time index, $t = 1, 2, \dots, T$, is added as a subscript.

The dataset has a cross-section of $N=45$ countries and $T=2$ time periods. If the coefficients α , β , and δ are assumed as constants for the entire cross-section of countries, Eq. (2) is a pooled panel model. The model was estimated using three methods, namely, pooled panel ordinary least squares (OLS), the instrumental variable (IV) method using two-stage least squares (2SLS), and the control function approach (CFA).¹⁰

For pooled panel OLS estimation, the coefficients of the model were obtained by stacking data over i and t into one long regression with NT observations (Cameron & Trivedi, 2005). The pooled panel estimation was preferred over other estimators which assume variable intercepts (α_i), such as fixed and random effects estimators, especially given that the two periods are so close and given the likely presence of endogeneity. The variable-intercept models transform observations into deviations from the mean and may be inappropriate for this study. The EDB variable is highly correlated with its past values, and since the number of observations in each cross-section is very small, the transformed variables leave little within-variation to exploit (Corcoran & Gillanders, 2015).

However, the pooled panel OLS is limited in that it does not consider the unobserved heterogeneity that might be present in the dataset. Nonetheless, if the assumption of uncorrelated regressors and error terms holds, then the pooled OLS estimation is consistent. In any case, the estimates of fixed effect parameters are inconsistent in short panels (Cameron & Trivedi, 2005).

¹⁰ When there are more instruments than the number of the explanatory variables (exogenous plus endogenous), the 2SLS method solves the problem of how to use all the instruments available (Greene, 2018 Chapter 8). It is argued that simply choosing a subset of the available instrumental variables wastes sample information. Therefore, it is preferable to use all the instruments available, both internal and external. In the case of the GDP variable, two external instruments were used—namely, household and government consumption. For EDB, the perception of political stability representing an institutional variable was used as an external instrument. In the case of the CFA, a control function is a constructed variable that is added to a model to “control for” the correlation between an endogenous variable and the unobservable elements. In the presence of the control function, the endogenous variable becomes exogenous (Greene, 2018 Chapter 8).

The IV method and CFA were considered given that FDI is likely to have simultaneous relationships with EDB and GDP, as argued above. In theory, the 2SLS and CFA methods are equivalent given specific conditions. However, one advantage of the CFA is that can directly test whether a given variable is exogenous or endogenous through the inclusion of control residuals in the model (Wooldridge, 2010, Ch. 6). Assuming that EDB and GDP are endogenous explanatory variables (EEVs), Eq. (2) may be written for convenience as

$$\text{FDI} = w_1' \phi_1 + \theta_1 \text{EDB} + \theta_2 \text{GDP} + e_1 \quad (3)$$

where w_1 is a strict subset of w consisting of all exogenous variables in Eq. (2); and w is a vector of exogenous variables, including the external instruments. Here, the perception of political stability/instability representing the institutional variable is used as an external instrument for EDB, while household consumption and government consumption are used as external instruments for GDP. These instruments were found to be correlated with EEVs.¹¹ The error term, e_1 , is unlikely to be correlated with external instruments, since no feedback effects are expected between FDI and the perception of political stability/instability, nor between FDI and consumption variables.¹² The variations in EDB and GDP will be induced by the instruments only, and therefore it is now possible to measure the “causal effect” of each variable on FDI (Greene, 2018).

The EDB and GDP can be expressed in their reduced forms with error terms (u_1 and u_2) as

$$\text{EDB} = w' \pi_1 + u_1 \quad (4)$$

$$\text{GDP} = w' \pi_2 + u_2 \quad (5)$$

where by definition, $E(wu_1) = 0$ and $E(wu_2) = 0$.

Replacing the values of the EEVs in Eq. (3) with their predicted values from Eqs. (4) and (5), respectively, gives the 2SLS result. It can be shown that the estimated coefficients ϕ_1 , θ_1 , and θ_2 in Eq. (3) coincide in the OLS regression of the following CFA equation (Arellano, 2008):

$$\text{FDI} = w_1' \phi_1 + \theta_1 \text{EDB} + \theta_2 \text{GDP} + \alpha_1 \hat{u}_1 + \alpha_2 \hat{u}_2 + v, \quad (6)$$

where \hat{u}_1 and \hat{u}_2 are OLS residuals from the first-stage regressions of EDB and GDP on w . Endogeneity is found if the null hypothesis of exogeneity is rejected based on the computed t-statistics on the coefficients of residuals. In the estimation, all models were corrected for arbitrary heteroskedasticity and serial correlation. In particular, for a panel model estimated by pooled OLS, the error terms are likely to be serially correlated due to the presence of unobserved effects for each time period. Incidentally, the unrestricted variance may also allow for arbitrary heteroskedasticity. We used the robust variance matrix estimator suggested by Wooldridge (2010) to rectify these problems.¹³

¹¹ The external instruments should be correlated with the EEVs but uncorrelated with the error term in the main equation (Cameron and Trivedi, 2005). From the dataset, the calculated correlation coefficients between the instruments and EEVs are found to be high and significant.

¹² The calculated correlation coefficients between the estimated residuals from the pooled OLS model (Eq. 3) and the external instruments are found to be close to zero and insignificant.

¹³ The robust variance matrix estimator is discussed by Wooldridge (2010 Chapter 7, pp. 171–172 and Chapter 10, p. 291).

Table 5 Estimation results

Variable	Pooled OLS coefficient (<i>t</i> values)	2SLS coefficient (<i>t</i> values)	CFA coefficient (<i>t</i> values)
Ease of doing business ^a	−2.270*** (−2.932)	−9.684*** (−4.426)	−5.914*** (−2.933)
Resources	7.559*** (2.972)	16.273*** (5.124)	11.789*** (2.948)
Inflation	−10.351* (−1.723)	−29.226*** (−3.025)	−13.015* (−1.872)
Host economy/market size (GDP)	0.007*** (12.030)	0.004*** (4.309)	0.007*** (10.890)
Population	20.313*** (9.798)	28.540*** (9.587)	23.312*** (9.420)
Trade openness	7.048*** (7.429)	1.387 (0.906)	4.128** (2.352)
Infrastructure	1.336* (1.924)	0.759 (0.569)	−0.763 (−0.616)
EDB residuals	−	−	3.542** (1.995)
GDP residuals	−	−	0.012** (2.145)
Constant	62.682 (0.412)	1293.193*** (3.277)	692.162** (1.995)
<i>R</i> ²	0.96	0.93	0.91
Number of observations	90	90	90

The numbers in parentheses are *t* values derived using robust variance and standard errors

*Significant at 10%; **significant at 5%; ***significant at 1%

^aThe ease of doing business variable is represented by the overall ease of doing business index (EDBI). By construction, a lower EDBI value means that the regulatory environment is more conducive to business operations (see Appendix 3)

The three sets of results shown in Table 5 are fairly robust for most variables. The estimated coefficients for EDB, resource endowments, market size, and population are highly significant in all models and have the expected signs. The inflation coefficient is highly significant in the 2SLS model but weakly significant in the pooled and CFA models. The trade openness coefficient is also significant in both the pooled and CFA models, whereas the infrastructure variable is only significant in the pooled model. The estimated coefficients for the 2SLS and CFA are different because of the robust variance estimation. From the CFA model, the coefficients of both the EDB and GDP residuals are significant, rejecting the null hypothesis of exogeneity. This indicates evidence of the presence of endogeneity in the FDI model. These results further suggest that FDI has a simultaneous relationship with respect to EDB and to GDP individually, hence justifying the use of IV estimation. Finally, since both EDB and GDP are considered endogenous, the results from the 2SLS and CFA estimations are substantially different from those of the pooled panel, except for the GDP coefficients.

Most importantly, the results show that the ease of doing business has a significant effect on attracting FDI, reiterating that a more business-friendly environment promotes investment. Specifically, a regulatory environment that is more conducive to business operations draws FDI. Note that the negative sign of the estimated coefficient is due to the way the measure of EDB was constructed, represented by EDBI (see the notes for Table 5).

The significant relationship between EDB and FDI is encouraging for non-resource-rich countries in Africa. It supports their reform efforts to make satisfactory progress toward an improved business environment.

The results also echo that resource endowment remains a key factor in generating FDI and that it is one of the main motivations for FDI in Africa, alongside the market size of the host economy and its population. On the other hand, the results indicate that the effect of inflation is not as strong as other variables, yet it asserts a negative influence on FDI. It is noted that to reduce costs, foreign investors look for price stability and low inflation when deciding to invest in another country. Many African countries are characterized by high and volatile inflation, and as such these countries have not attracted the optimal level of FDI (see Njuguna, 2008). Furthermore, the results lend evidence that trade openness also facilitates FDI. In the model estimation, trade openness was best represented by total exports over GDP. Finally, the inclusion of digital infrastructure in the model did not exhibit a strong influence in attracting FDI.

6 Conclusions and Policy Recommendations

This study examined the relationship between investment climate and FDI in Africa with a particular focus on whether the ease of doing business plays a role in promoting FDI. We found evidence that the ease of doing business—which captures government policies on business rules and regulations and a friendly environment—matters in Africa. Our results indicate that the ease of doing business encourages FDI, as do many of the control variables, including natural resource endowment, market size, population, and trade openness. In terms of methodological concerns, the empirical findings justified the use of the instrumental variable method and the control function approach. The findings established that both the ease of doing business and GDP are endogenous variables and have simultaneous relationships with FDI.

Further, the empirical findings support the move by African countries to invest in improving their business environment. The ease of doing business pertains to both the efficiency and quality of regulations. Reforms should include best practices demonstrated by those African countries with higher ease of doing business rankings. Promoting efficiency should include streamlining various procedures and reducing the time and cost of compliance with various government regulations. Creating an efficient, secure, and integrated online or digital information system to deal with many required business tasks will enhance both efficiency and the quality of service. Finally, efforts should be made to make government service infrastructure more reliable.

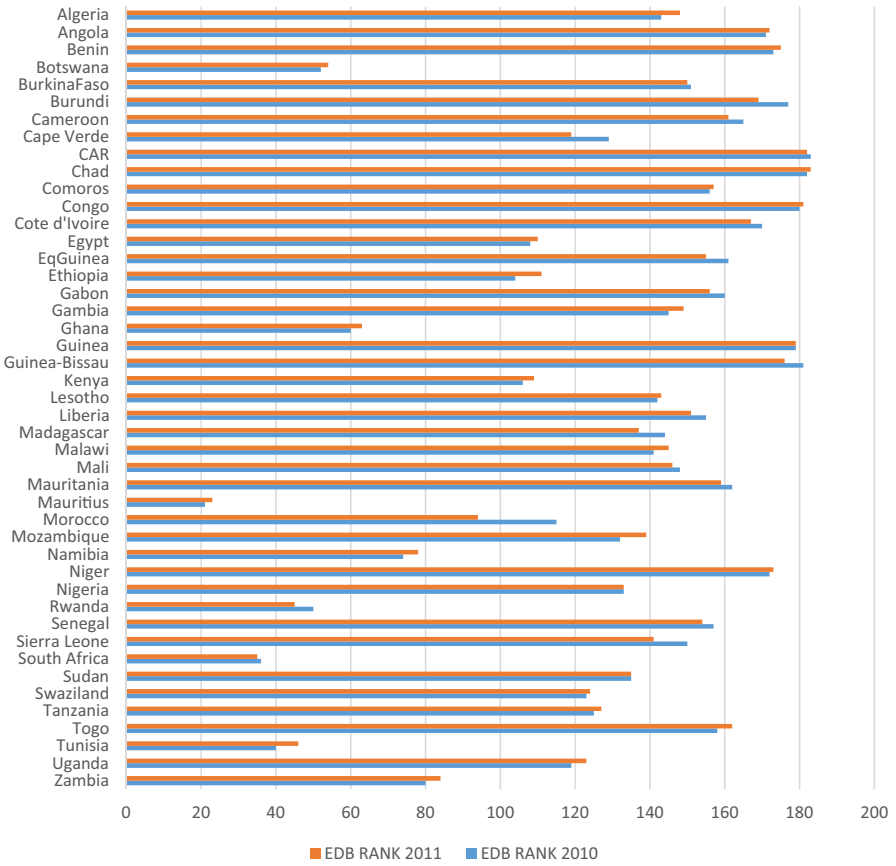
For small, non-resource-rich African countries, promoting the ease of doing business may provide an opportunity to attract FDI in various sectors, such as manufacturing, banking and finance, telecommunications, and services. There are already indications that FDI has been increasing in these sectors in Africa in recent years. For resource-rich African countries, by contrast, improving the investment climate may provide an opportunity to diversify FDI into other sectors of the economy to reduce dependence on oil and mineral exports, which are often subjected to shocks. It is worth emphasizing that countries with a better record of the ease of doing business draw more foreign investment. Reforms and satisfactory progress in terms of the ease of doing business in developing countries can be effective at obtaining higher FDI inflows for broad-based development.

Appendix 1: Definitions of components of ease of doing business indicators

Source: World Bank (2016)

Indicator set	Description
Starting a business	Procedures, time, cost, and paid-in minimum capital to start a limited liability company
Dealing with construction permits	Procedures, time, and cost to complete all formalities to build a warehouse, and the quality control and safety mechanisms in the construction permit system
Getting electricity	Procedures, time, and cost to get connected to the electrical grid, the reliability of the electricity supply, and the cost of electricity consumption
Registering property	Procedures, time, and cost to transfer a property and the quality of the land administration system
Getting credit	Movable collateral laws and credit information systems
Protecting minority investors	Minority shareholder rights in related-party transactions and in corporate governance
Paying taxes	Payments, time, and total tax rate for a firm to comply with all tax regulations
Trading across borders	Time and cost to export a product of comparative advantage and import auto parts
Enforcing contracts	Time and cost to resolve a commercial dispute and the quality of judicial processes
Resolving insolvency	Time, cost, outcome, and recovery rate for a commercial insolvency, and the strength of the legal framework for insolvency
Labor market regulations	Flexibility in employment regulation, and aspects of job quality

Appendix 2: Ease of doing business ranking, 2010 and 2011



Source: World Bank (2012).

Appendix 3: Definitions of variables

Source: World Development Indicators, World Bank Online Database

Ease of Doing Business index (EDBI)	<p>Ranking expressed in an index that provides a quantitative measure of regulations affecting the various stages of the life of a business (World Bank, 2010)</p> <p>In 2010 and 2011, the economies were ranked from 1 to 183 based on the averages of the country's percentile rankings on ten topics covered in the World Bank's Doing Business report: namely, getting electricity, dealing with construction permits, trading across borders, paying taxes, protecting investors, registering property, getting credit, resolving insolvency, enforcing contracts, and starting a business</p> <p>A low numerical rank means that the regulatory environment is conducive to business operations</p>
Foreign direct investment (FDI)	The net inflows in the reporting economy, specifically the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital, as shown in the balance of payments. Data are in current USD (in millions)
Gross domestic product (GDP)	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. Data are in current USD (in millions)
Inflation (INF)	Measured using a consumer price index that reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services (in percentages)
Mobile	Refers to mobile cellular telephone subscriptions that offer voice communications (per 100 people)
Resources (RES)	Sum of natural resource rents as a proportion of GDP, including oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents (in percentages)
Population (POP)	Counts all residents regardless of legal status or citizenship. The values shown are mid-year estimates (in millions)
Trade openness (OPEN)	Two measures were considered: (1) exports as a proportion of GDP; and (2) the sum of imports and exports as a percentage of GDP. The former gives more robust results (in percentages)

Acknowledgements The authors would like to thank the Editor-in-Chief and the two referees for their valuable comments and suggestions, which helped improve the quality of this paper.

Author contributions AEN is the principal author.

Funding The authors received no funding for this work.

Data availability The data are available upon request.

Declarations

Conflict of interest The authors declare they have no conflict of interest.

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