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Does foreign direct investment promote institutional development in Africa?

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ABSTRACT

Foreign direct investment (FDI) inflows into Africa have increased since the turn of the millennium, mainly due to FDI growth into African countries by multinational enterprises (MNEs) from developing economies. While African governments view this growth as a positive development for the continent, many governments in the West have raised concerns regarding the institutional impact of investments from developing economies. This paper examines the impact of FDI flows on institutional quality in African countries by distinguishing investments from developed versus developing economies. Previous empirical studies have found a significant relationship between FDI flows and institutional quality in African countries but regard the relationship as MNEs rewarding African countries for adopting institutional reforms. However, little attention has been paid to the reverse causality, i.e. that FDI can cause an institutional change in African countries. Using bilateral *greenfield* FDI flows between 56 countries during 2003–2015, we find no significant FDI effect from developed and developing economies on institutional quality in host countries. However, *aggregate* FDI flows from developed and developing economies have a significant positive effect on host country institutional quality but differ concerning the impact's timing. In contrast, we find no significant effect of FDI flows from China on host country institutional quality. Our results are robust to alternative measures of institutional quality.

1. Introduction

Institutions play a significant role in determining multinational enterprises' (MNEs) behaviour. Thus far, the literature has predominantly studied foreign direct investment (FDI) as an outcome of institutional quality (Bénassy-Quéré, Coupet, & Mayer, 2007; Bevan, Estrin, & Meyer, 2004; Buchanan, Le, & Rishi, 2012; Meyer, Estrin, Bhaumik, & Peng, 2009). Scholars generally depict the relationship between FDI and institutional quality as FDI flowing into a country to capitalise on domestic institutions' quality (Disdier & Mayer, 2004; Gastanaga, Nugent, & Pashamova, 1998; Globerman & Shapiro, 2002; Julio & Yook, 2016). There has been little exploration of the reverse case – how MNEs can shape the host country's institutional environment to protect their competitive advantage.

While institutions and their quality ('rules of the game') influence MNEs' behaviour, there is another critical dimension in the way MNEs interact with governments ('play of the game'). Political economists have shown that lobbying by corporations can significantly impact the

development of policies (Blonigen & Figlio, 1998; Gordon & Hafer, 2005; Grossman & Helpman, 1994). However, these studies were carried out in developed economies and developed economies multinational enterprises (DEMNEs) in particular. Research on MNE activities' impact on host country institutional quality in developing economies where the MNEs' bargaining power is more substantial remains limited (Malesky, 2009). Moreover, the increasing importance of emerging economies multinational enterprises (EEMNEs) has created a controversy regarding their effect on the quality of host country institutions. Given the different institutional quality in their home countries than DEMNEs, EEMNEs will predominantly seek preferential treatment from host country governments (Cuervo-Cazurra, 2006; Cuervo-Cazurra & Genc, 2008; Morck, Yeung, & Zhao, 2008).

Aguilera and Grøgaard (2019) review institutions' role in IB studies taking as a starting point the seminal paper by Jackson and Deeg (2008). While their critical review focuses on the role and impact of institutions on firm behaviour, it is worth mentioning that it does not identify a need to explore the reverse causality, i.e. the role firms play in shaping

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institutions as social actors. Especially in developing countries' weak institutional environments, this role could be crucial in shaping and developing the institutional structure. This is in line with [Henisz and Zelner \(2005\)](#), who differentiate between established and emergent institutions. The institutional environment of developing countries is characterised predominantly by emergent institutions that are more receptive to change.

Africa is one of the world's regions where foreign investors have had a significant impact on the institutional quality of the host countries. For example, within the last decade and a half, the Chinese government and Chinese MNEs, in particular, have been criticised for doing business in African countries with pariah regimes, thereby neglecting human rights and supporting corruption ([Corkin, 2011](#); [Patey, 2007](#); [Shan, Lin, Li, & Zeng, 2018](#); [Tull, 2006](#)). Despite this controversy, no study conceptualises the inverse relationship between FDI and institutions or empirically tests the impact of FDI on institutional development. In the African context, all existing reviews treat FDI as an institutional quality outcome ([Ajide & Raheem, 2016](#); [Asiedu, 2002, 2006](#)). The lack of research in this particular area is surprising, given the importance of a country's institutional quality for long-term economic development ([Acemoglu & Robinson, 2012, 2019](#); [Aron, 2000](#); [Knack & Keefer, 1995](#); [North, 1990](#)).

We investigate the impact of MNEs on institutional development in Africa and whether this impact depends on the quality of the MNEs' home country institutions. The significant conceptual contribution of this paper lies in the argument that institutional quality is not only a determinant for FDI but can also be influenced by it. MNEs shape the institutional environment by changing the 'play of the game' and directly influencing the 'rules of the game'. As MNEs' behaviour is driven by the home country institutional framework, we would also expect to identify differences between DEMNEs and EEMNEs in shaping the host country institutional environment. We argue that DEMNEs originating from strong institutional environments will predominantly protect their competitive advantage by strengthening property rights protection in the host economy.

On the contrary, EEMNEs, originating from weaker home institutional environments, will focus on securing preferential treatment from host country governments that allows them to protect their competitive advantage. These two different channels of influencing the host country institutional framework will have different effects. While the behaviour of DEMNEs will contribute to a faster strengthening of the host country's institutional environment, the behaviour of EEMNEs will have a much slower effect. This has significant policy implications addressed in the concluding section of the paper.

The empirical contribution lies in testing the theoretical framework using a sample that contains FDI location decisions in 37 African countries spanning the period between 2003 and 2015 from 11 developed economies and 8 developing economies. The decision to focus our empirical examination on African countries is based on two reasons. First, institutional quality is crucial to the long-term economic development of these countries. According to data from the World Bank's World Governance Indicators ([Kaufmann, Kraay, & Mastruzzi, 2009](#)), African countries are regarded as amongst the least institutionally developed. Second, African countries have increasingly attracted FDI from emerging economies, including China ([UNCTAD, 2017](#)). This approach ensures a sample that is rich enough to test our theoretical hypotheses. Given that this paper's geographical context is Africa, we also empirically focus on China's growing role as an essential investor in this region ([UNCTAD, 2019](#)). Although the role of the Chinese MNE as a political actor for the Chinese government is well known, this study provides a systematic empirical analysis of the impact of Chinese MNEs on the institutional environment of host countries.

We adopt a fixed-effects panel estimation approach that accounts for the reverse causality between FDI and institutional quality – and the potential delayed effect of FDI flows on the levels of host country institutional quality. The panel fixed effects approach results suggest that higher FDI inflows from developed and developing economies alike

have a positive and significant effect on host country institutional quality. At the same time, we find no significant effect on FDI flows from China.

We organise the remainder of the paper as follows. Sections 2 and 3 outline the theoretical foundation and hypotheses, respectively. Section 4 discusses the empirical strategy, data and method. Section 5 presents the results and while Section 6 provides the discussion and concluding remarks.

2. Theory and hypotheses

2.1. The co-evolutionary view of IB

The IB and management literature (e.g. [Chan & Makino, 2007](#); [Davis, Desai, & Francis, 2000](#); [Deephouse, 1996](#); [Salomon & Wu, 2012](#); [Suchman, 1995](#)) has tended to approach the interaction between MNEs and their external environment from the perspective of isomorphism whereby mimetic, coercive and normative pressures push MNEs to conform to local institutions in pursuit of legitimacy. However, the multi-subsidiarity and the ever-growing influence of MNEs, most notably in institutional contexts where they are as powerful as the host country legitimating actors, have raised questions relating to the validity of this perspective to the analysis of the value-adding activities of MNEs ([Kostova, Roth, & Dacin, 2008](#)). Such questions have led to a gradual shift in the study of institutions and FDI from the view that focuses on institutional adaptation to the other that regards the MNE as an entity that can co-evolve with its external environment ([Cantwell, Dunning, & Lundan, 2010](#)). It is worth highlighting, though, that despite the significant role of MNEs in shaping and influencing the institutional environment of emerging markets, institutional change can be the outcome of interactions of a number of actors ([Lundan & Li, 2019](#)).

The co-evolutionary view of IB draws basic insights from the New Institutional Economics perspective ([North, 1990, 2012](#)) but recognises the role of the MNE as a change agent. While [North \(1990\)](#) views changes in the institutional environment as the result of reactions of organisations to the 'rules of the game', the co-evolutionary view sees the firm as a proactive agent of institutional change ([Cantwell et al., 2010](#)). Thus, the MNE is viewed as an institutional entrepreneur seeking to affect change in its domestic institutional environment ([McGaughey, Kumaraswamy, & Liesch, 2016](#)). This process of co-evolution is due to the myriad of institutional uncertainties emanating from a variety of institutional environments in which the MNE operates – pushing it to engage in institutional entrepreneurship ([Cantwell et al., 2010](#)).

MNEs use various mechanisms to affect change in their external environment, for instance, deploying various political strategies to change their regulatory environment ([Boddewyn & Brewer, 1994](#); [Schuler, Rehbein, & Cramer, 2002](#)). Such actions contributing to institutional co-evolution are even more likely under conditions of 'institutional voids' that offer opportunities for institutional entrepreneurship, particularly in developing economies where MNEs can have a positive impact through spillovers by intentional transfer of institutions ([Hoskisson, Eden, Lau, & Wright, 2000](#); [Peng, Wang, & Jiang, 2008](#)). Thus, predictions rooted in the co-evolutionary view suggest that MNEs engage with their external institutional environment to affect change in the local institutions ([García-Cabrera & Durán-Herrera, 2016](#); [Luo & Rui, 2018](#); [McGaughey et al., 2016](#); [Meyer, 2004](#)).

2.2. The impact mechanisms of foreign investors on institutions

The behaviour of MNEs in shaping the host country's institutional environment will depend both on the home and host country's institutional environment. We approach the institutional environment by focusing on the economic institutions and adopting the taxonomy proposed by [Acemoglu and Robinson \(2012\)](#). They argue that two types of institutions exist: First, extractive institutions where a small number of people enjoy economic benefits and exploit the rest of the population.

Home country institutions	Strong (Inclusive)	Protection of property rights (3)	Local Isomorphism (2)
	Weak (Extractive)	Preferential Treatment (1)	Seeking Legitimacy (4)
		Weak (Extractive)	Strong (Inclusive)
		Host country institutions	

Fig. 1. MNEs behaviour in different institutional environments.

This type of institutions can foster economic growth up to the point where the economy reaches the global innovation and technology frontier. Second, inclusive institutions where there is wider participation in the governing of the country, and therefore there is no exploitation. These institutions can lead to sustainable growth through fostering innovation. The way institutions will evolve, i.e. towards extractive or inclusive, depends on the political foundations of a country. Inclusive institutions build on the widespread distribution of political power and significant government efficiency and bureaucratic quality. If either of the two conditions fails, this leads to a concentration in power, a weak state and extractive institutions.

Lundan and Li (2019) and Brandl, Darendeli, & Mudambi (2019) argue that MNEs can build learning capabilities to adjust their behaviour between different institutional contexts and potentially influence their institutional contexts to develop in similar directions. DEMNEs would build on the experience gained primarily in developed markets and, therefore, would influence the host institutional environment in that direction. At the same time, EEMNEs would have more exposure to developing markets. As institutional diversity is a source of increased, particularly transaction costs, we would expect MNEs to push towards eliminating this diversity. Especially in unstable institutional environments, such as the ones MNEs face in developing economies, path dependency and inertia are not significant. What matters is the ability of actors to calculate their cost-benefit from the set of newly formed institutions or “proto-institutions”, as Lundan and Li (2019: 40) argue.

Building on the co-evolutionary approach and enhancing it with the approach offered by Acemoglu and Robinson (2012, 2019), our framework can be presented in a 2×2 matrix (Fig. 1). On the vertical axis, we present the institutional quality of the home country and the institutional quality of the host country on the horizontal axis. DEMNEs will come from countries with strong institutions, while EEMNEs, including those from China from countries with relatively weaker institutional frameworks. While most African countries would fit in the weak institutional framework category, there are a few such as Ghana, Namibia, Botswana and South African that have much stronger institutional frameworks than the rest, although still much weaker than developed economies and a lot of other developing countries.

The impact of MNEs on the host countries’ institutional change comes through a variety of strategies adopted by MNEs. According to Stigler (1971), MNEs, in their effort to promote their interests, would attempt to influence the change of institutions. In cases where both home and host institutional environments are weak (extractive) (quadrant 1), MNEs will resort to seeking preferential treatment to protect their competitive advantage. This is in line with what is suggested by Hillman and Hitt (1999) and confirmed by Gaur, Ma, and Ding (2018), who argue that home country government encouragement and unfavourable industry environments are both push factors for EEMNEs’ OFDI. In both cases, EEMNEs internationalise with a lack of ownership-specific advantages and, therefore, will seek out preferential/special treatment

from host countries’ governments.

On the contrary, when both home and host institutional environments are strong (inclusive) (quadrant 2), MNEs will follow local isomorphism. Firms operating abroad then tend to follow this mitigation strategy, i.e. imitate local firms’ practices to reduce the liability of foreignness (Salomon & Wu, 2012). In cases where the home institutional environment is strong, and the host is weak, MNEs will focus on the creation of an institutional framework that offers strong protection of property rights and, therefore, their competitive advantage. This argument builds on Brandl, Darendeli, and Mudambi (2019) who argue that DEMNEs’ presence and involvement in an economy lead to a higher protection of International Property Rights (IPRs) and a closer alignment of the host countries’ standards to those of developed economies. Brandl et al. (2019) also argue that DEMNEs have a strong incentive to participate and influence institutional change in host countries, especially around the strong protection of IPRs.

Finally, when the home institutional environment is weak (extractive), and the host institutional environment is strong (inclusive) (quadrant 4), then MNEs will aim for legitimacy building strategies. Shi, Sun, Yan, and Zhu (2017) argue that institutional fragility, i.e. when institutional development is subject to frictions and different speeds of progress is a key push factor for EEMNEs to internationalise. EEMNEs that stem out of countries with institutional fragility do not have the ability to contribute to the development of a strong institutional framework. Focusing on Chinese MNEs, Guo, Xu, and Li (2017) argue that when EEMNEs face isomorphic pressures, especially in strong host country institutional environments, they resort to legitimacy-seeking strategy.

3. Hypotheses development

Thus far, the IB literature has explored the way institutions influence FDI behaviour (Bevan, Estrin, & Meyer, 2004; Choi, Lee, & Shoham, 2016; Meyer et al., 2009; Pajunen, 2008; Van Hoorn & Maseland, 2016) with the majority of studies supporting, both conceptually and empirically a positive relationship between institutional quality and high FDI inflows.

On the other hand, only a few studies look at the way MNEs can shape the institutions in the host country (Desbordes & Vauday, 2007). This influence can take several forms with two key mechanisms leading to an improvement of the institutional quality of the host country. First, through their non-market strategies, MNEs (Hillman & Hitt, 1999) provide policymakers in host countries with information on rules and regulations in other countries in which they operate (Hewko, 2003; Prakash & Potoski, 2007). This transfer of knowledge and best practices will be effective only if host country governments are ready to adopt these rules and regulations in the domestic institutions. This government behaviour leads to an improvement of the institutional quality of the host country.

Second, MNEs may coerce policymakers in host countries to implement institutional reforms by threatening to divest and move their operations to a more favourable institutional environment. The threat of depriving the host country government of tax revenues and employment of local citizens may lead local governments to implement reforms that improve institutional quality (Olarreaga et al., 1999). According to Mosley and Uno (2007) there are a number of channels through which MNEs can influence the host country's institutional environment. They argue, by building on the way MNEs influence labour rights in a host country, that through direct involvement with the local government, the implementation of best practices for workers' rights and their attention is given to labour quality instead of the cost of labour, they can enhance local labour conditions. The only case where there might be an adverse effect on labour rights is in the case where MNEs' mobility could lead host countries' governments to a race to the bottom in order to attract foreign investors. It is therefore evident that the adverse effect is not down to the MNEs' behaviour but the host governments' efforts to enhance the country's potential, with ambiguous long-term effects. Based on the above discussion, we put forward the following hypothesis:

Hypothesis 1. MNEs' investments will positively affect institutional quality in African countries.

While there is an overall positive effect from FDI inflows, we have argued that DEMNEs and EEMNEs will adopt different channels of influencing the host country's institutional environment. DEMNEs operate in home environments with strong institutions and have to abide by strict rules and regulations. Institutional voids usually act as deterrents for investments originating from developed markets (Bevan et al., 2004; Meyer, 2001, 2004). We would expect that DEMNEs, having gone through a process of co-evolution with strong institutional environments, would like to protect their competitive advantage by transferring domestic practices into host countries and therefore improve the institutional environment. Their ability to have significant influence is also supported by a better understanding of non-market strategies and the 'play of the game'. Thus, through lobbying and negotiating either individually or collectively with other foreign firms, a DEMNE can influence the host country government (Hillman & Hitt, 1999) and implicitly can positively affect host country institutional quality. By DEMNEs securing favourable rules and regulations for their activities, local firms may also benefit from greater transparency (Dang, 2013).

Koning, Mertens, and Roosenboom (2018) argue that institutional change can be influenced by policy diffusion. They identify four diffusion mechanisms such as competition, learning, coercion and emulation. They show that the source of policy and the incentive driving the institutional change determine which of the four mechanisms will prevail. They also argue that policies are interconnected with policy changes in one location, possibly affecting other locations. In the case of DEMNEs, the common approach is described as coercion. By coercion, DEMNEs exercise their strong bargaining power to protect intellectual property rights. Also, Brandl et al. (2019) argue that DEMNEs push for higher IPR protection, and through effective non-market strategies and coalition building, they can be very effective in influencing the institutional environment in developing economies. Their argument is further developed by Lundan and Li (2019), suggesting that MNEs differ in the ways of adjusting to changes. Their adjustment depends on their prior learning and experience. Having greater experience in adjusting to foreign environments, DEMNEs can have a much faster influence on the host country's institutional environment compared to EEMNEs.

Contrary to the above, EEMNEs originate from relatively weak institutional environments (Buckley, Chen, Clegg, & Voss, 2018) and, therefore, might have neither the ability nor the willingness to transfer home country practices. Their non-market strategies are also less developed, and thus, their effectiveness to shape policy, and consequently institutions, is lower than that of DEMNEs. According to Pandya (2016), MNEs that base their investment on preferential treatment of relationships are more vulnerable to expropriation risks. The political

instability and frequent change in host governments, especially in developing markets, could lead to higher risks for the MNE if, instead of aiming at strengthening the overall institutional environment, it focuses on securing preferential treatment. In the case of African countries where political uncertainty is high, MNEs tend to build relationships with business and civil society organisations. These relationships, according to Alimadadi and Pahlberg (2014), build on legitimacy and moderate the effect of political uncertainty. The focus of EEMNEs will be on securing preferential treatment, developing relationships and coalition-building influencing the host country's institutional environment.

Acquaah (2007) argues that in developing economies, MNEs create social capital by networking and building relationships with local firms' management teams, government officials and community leaders. Focusing on the behaviour of Chinese MNEs in Ghana, he finds that the development of relationships spreads information but also provides access to resources. This is in line with the argument developed by Hadjikhani, Lee, and Ghauri (2008), stating that MNEs' business activities are interconnected with socio-political ones. Through the proactive management of their socio-political environment, MNEs can achieve business goals but also support local civic organisations to develop and hence strengthen the local institutional environment. The engagement of EEMNEs with the institutional reform process through corporate political strategies, especially the ones focusing on developing relationships and sharing information, can have a positive effect on the speed and effectiveness of the institutional reforms. Studying corporate political strategies in Uganda, Mbalyohere, Lawton, Boojihawon, and Viney (2017) find that this mechanism has significant implications for the development of the local institutional environment.

Our argumentation points towards very different mechanisms through which DEMNEs and EEMNEs influence host country institutions. DEMNEs have a faster effect on host country institutions, while EEMNEs will have a slower effect through coalition building with local businesses and civil society organisations. With this in mind, we formulate our hypothesis 2:

Hypothesis 2. DEMNEs' investments will have a faster positive effect on institutional quality in African countries when compared with EEMNEs' investments.

It is important to conclude by appreciating the importance of context for our argumentation. Our empirical framework focuses on African countries. Most of them have a history of autocratic regimes, weak institutional frameworks but a successful record in attracting FDI, especially from large emerging economies such as China and India. Recently, the role of Chinese MNEs has increased in African countries (UNCTAD, 2019). Chinese MNEs are frequently actors of Beijing's political wills (Meyer, Ding, Li, & Zhang, 2014; Ramasamy, Yeung, & Laforet, 2012; Wei, Clegg, & Ma, 2015). This differentiates Chinese MNEs from all other EEMNEs (Ramamurti & Hillemann, 2018). Shan, Lin, Yulei, and Zeng (2018) examine the institutional determinants of Chinese FDI in Africa. Using a sample of 22 African host locations, they explore the impact of institutions on Chinese FDI in the period 2008–2014. While institutional factors such as voice and accountability have a strong positive effect on Chinese FDI, other factors such as political stability and regulatory quality have a significant negative effect. In the case of political stability, it is the existence of bilateral agreements between host countries and China that allow the reduction of uncertainty for Chinese investors. In the case of regulatory quality, the explanation builds on the Chinese investors' psychic distance. China's regulatory quality is close to that of African locations, and therefore the lower regulatory quality does not act as a deterrent for Chinese investors. Other institutional factors such as rule of law and control of corruption do not play a role in the behaviour of Chinese FDI. Their argument is further expanded by Ado (2020), who argues that in the case of Chinese FDI, informal institutions, guanxi, and political marketing are more important than the quality of formal institutions.

Chinese MNEs use guanxi as social capital that allows them to successfully operate in risky and unstable environments in direct contrast to DEMNEs. From a different disciplinary perspective, (Benabdallah, 2020) builds on an international relations approach to argue that power accumulation and influence grow together and are mutually reinforcing. The Communist Party of China has developed significant party-to-party relationships with several African political parties. These relationships build on exchanges of officials and a professionalisation of political training, building on the development of people-to-people relationships and a significant investment on human capital development. Finally, Chen, Dollar, and Tang (2018) argue that Chinese FDI is not affected by weak institutional environments contrary to western countries' investments. Chinese MNEs tend to seek higher investment returns in challenging environments, thus compensating for the additional risk taken.

Given the significant economic power of Chinese MNEs and the support they receive from the Chinese government (Luo, Xue, & Han, 2010; Ramamurti & Hillemann, 2018), we expect their efforts to be quite effective in shaping the host country institutional framework, and this differentiates them from all other EEMNEs. According to Zhang and Hao (2018), political relations influence the amount of Chinese OFDI positively. With this in mind, we formulate the third hypothesis:

Hypothesis 3. Chinese MNEs' investment, when compared with other EEMNEs, will have a faster positive effect on institutional quality in African countries.

4. Data and method

4.1. Model

To explore the impact of FDI flows on the level of institutional quality in host countries, we estimate the following equation, similar to Demir (2016) and Long, Yang, and Zhang (2015):

$$Inst_{jt} = \alpha_1 + \beta_1 FDI_{ijt} + \beta_2 \ln GDP_{jt} + \beta_3 FIXEDTELE_{jt} + \beta_4 GOVEXP_{jt} + \beta_5 POPGROWTH_{jt} + \beta_6 COLONY_{ij} + \beta_7 \ln DIST_{ij} + \beta_8 LANGUAGE_{ij} + \beta_9 LANDLOCKED_{ij} + \varepsilon_{ijt} \quad (1)$$

Here $Inst_{jt}$ is the level of institutional quality in host country j at time t . FDI_{ijt} is the real FDI inflows from home country i to host country j at time t . β_1 represents the main parameter of interest in our study – that captures the effect of FDI on the level of institutional quality in the host country. $\ln GDP_{jt}$ represents the logarithm of the GDP per capita of country j at time t . $FIXEDTELE_{jt}$ is the number of fixed telephone subscriptions per 100 people in country j . $GOVEXP_{jt}$ is the annual percentage growth in government consumption expenditure in country j at time t . $POPGROWTH_{jt}$ is the annual percentage growth in population in country j at time t . $COLONY_{ij}$ is a dummy variable that takes the value of 1 if countries i and j have ever had a colonial relationship and 0 otherwise. $\ln DIST_{ij}$ is the log of the (km) distance between the capitals of i and j . $LANGUAGE_{ij}$ is a dummy variable that takes the value of 1 if countries i and j share a common official language and 0 otherwise. $LANDLOCKED_{ij}$ is a dummy variable which captures the number of landlocked countries in the home and host country pairs and takes the value of 0, 1 and 2. ε_{ijt} denotes the normally distributed disturbance term that captures all other omitted effects of institutional quality unaccounted for in our model specification. We also include year fixed effects to control for global events that similarly affect all countries.

We first estimate Eq. (1) by applying a basic OLS estimator using a panel structured as *country-pair and time*. However, it is problematic to interpret the OLS estimates of β_1 as there are challenges of reverse causality, making the coefficient estimates inconsistent and biased. The causality observed may be from the effect of institutional quality on FDI. An investment environment characterised by stable and effective institutions can lead to more FDI, which in turn prompts the host country to improve its institutional quality even further, leading to the problem

of reverse causality.

To deal with the problem of reverse causality between FDI inflows and institutional quality, we estimate the model using a panel fixed effects estimator. The effect of FDI flows on the level of institutional quality is a phenomenon that occurs within countries. One advantage of the panel fixed effects model is that it is designed to study the causes of changes within an entity and cannot be biased because of omitted characteristics that are time-invariant (Baltagi, 2005: 14). Thus, we estimate a panel fixed effects model that can be represented as the following equation:

$$Inst_{jt} = \alpha_1 + \beta_1 FDI_{ijt-1} + \beta_2 \ln GDP_{jt} + \beta_3 FIXEDTELE_{jt} + \beta_4 GOVEXP_{jt} + \beta_5 POPGROWTH_{jt} + \varepsilon_{ijt} \quad (2)$$

The difference between Eqs. (1) and (2) is that in the latter, the FDI variable FDI_{ijt-1} is lagged one period to account for the risk of reverse causality and the potential delayed effect of FDI inflows on institutional quality in host countries. Also, in Eq. (2), all time-invariant variables drop from the regression equation due to perfect collinearity.

In Eq. (2), we assume that the effect of bilateral FDI flows is homogenous irrespective of the FDI origin. In line with our theoretical framework, the effect of FDI flows on institutional quality in host African countries may be contingent on the origin of the FDI, that is, developed or developing economies. We also test whether FDI from China in particular (an increasingly important investor in African countries) improves institutional quality in African countries. Thus, to compare different groups of countries in the empirical analysis, with regard to FDI flows, we divide the sample into three sub-groups (developed economies, developing economies and China) based on the direction of FDI flows.

Our data analysis in Eq. (2) is based on bilateral FDI data. The total volume of FDI flows from all home countries, all developed economies, and all developing economies might be more significant in influencing the level of institutional quality in host countries. FDI flows from home country i might be small in terms of host country j 's GDP and, as a result, might not be quite significant while *aggregate* bilateral FDI flows might be. Accordingly, we examine, separately, FDI flows from all home countries, developed economies and developing economies, creating three samples. The equation to estimate the impact of aggregate FDI flows on host country institutional quality can be written as:

$$Inst_{jt} = \alpha_1 + \beta_1 FDI_{(aggregate)ijt-1} + \beta_2 FDI_{(developed\ economies)ijt-1} + \beta_3 FDI_{(developing\ economies)ijt-1} + \beta_5 \ln GDP_{jt} + \beta_6 FIXEDTELE_{jt} + \beta_7 GOVEXP_{jt} + \beta_8 POPGROWTH_{jt} + \varepsilon_{ijt} \quad (3)$$

Where $FDI_{(aggregate)ijt-1}$, $FDI_{(developed\ economies)ijt-1}$, and $FDI_{(developing\ economies)ijt-1}$, represent the aggregate FDI projects from all home countries, all developed economies and all developing economies respectively.

4.2. Data

To test our hypotheses and assess the impact of FDI inflows on institutional quality in host countries, we combine several datasets. The FDI data are obtained from FDI Markets for the period 2003–2015. FDI Markets is a database operated by FDI Intelligence – a specialist branch of the Financial Times group. FDI Markets started to systematically collect firm-level global cross-border *greenfield* FDI in all sectors since 2003. In the database, each entry is an FDI project expressed in current US dollars. International business scholars have previously utilised such data (Castellani & Pieri, 2013; Filippaios, Annan-Diab, Hermidas, & Theodoraki, 2019). We collect a total of 5748 FDI projects in 37 African economies originating from 11 developed and 8 developing economies for the period 2003–2015. We create a bilateral FDI dataset by aggregating all FDI projects by year, source and destination countries, resulting in 1951 observations. We have dropped (listwise) country pairs that had no data for any of our control variables, resulting in a final panel dataset of 1858 country-year observations from 445 country pairs,

including 56 source and destination countries. The full list of countries is presented in Appendix B, Table B6. To adjust for differences in price levels between different years, the FDI data are deflated by the US GDP deflator (with the base year of 2012) from the US Bureau of Economic Analysis.

Regarding the data on institutional quality, we capture the different political and economic aspects of the institutional environment by using the World Bank's World Governance Indicators (WGI) (Daniel Kaufmann, Kraay, & Mastruzzi, 2010) for the period 2003–2015. The WGI provides data on the quality of both political and economic institutions and consists of voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

Control variables on colonial relationships, physical distance, common official language, landlocked are obtained from the CEPII database. The real GDP per capita, government final consumption expenditure, fixed telephone subscriptions and population growth data are from the World Bank's World Development Indicators. We distinguish between developed and developing economies based on the United Nations' 'Situation and Prospects 2019' classification.

4.3. Measures

4.3.1. Dependent variable

The dependent variable, $Inst_{jt}$ is the level of aggregate institutional quality in host countries. In measuring the quality of institutions, scholars need to take into account the multifaceted nature of institutions and the overlapping between economic and political institutions. Scholars (Acemoglu & Robinson, 2012; Pajunen, 2008) argue that institutional quality comprises both political and economic institutions and the former is inexorably linked to the latter. To capture the different indicators of political and economic institutions, we measure the level of host country institutional quality by taking the simple average of six institutional indicators that are voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law and the control of corruption. The index for each indicator ranges between -2.5 and 2.5, with the latter value representing the best institutional quality.

4.3.2. Independent variable

The main independent variable, FDI_{ijt} is the financial value of the capital expenditure by all firms from country i investing in j at time t expressed in constant 2012 US dollars. The financial value is log-transformed for easier interpretation.

4.3.3. Control variables

Previous studies suggest that increasing income levels can increase the level of institutional quality (Hallak, 2010). Real GDP per capita (log) of country j ($lnGDPPC_{jt}$) controls for the effects of income levels on the level of institutional quality. Growth in population size and density can create demographic pressures, making it more difficult for institutional quality to improve (Alesina & La Ferrara, 2005). The majority of countries in the African continent are amongst the fastest growing in terms of population. In Africa, in particular, this also means a high degree of fragmentation along tribal lines, which may have a negative impact on long term institutional development. The annual percentage growth in population ($POPGROWTH_{jt}$) controls for the effect of population growth on institutional development. An increasing physical distance between two countries can widen the institutional differences due to fewer economic and cultural exchanges (Bahar, Hausmann, & Hidalgo, 2014). The log (km) distance between the capitals of country i and j ($lnDIST_{ij}$) is used to capture the effect of physical distance on institutional harmonisation.

A highly developed physical infrastructure (communication and transportation network) can reduce the transaction and transportation costs for foreign investors, thereby attracting more FDI (Wheeler & Mody, 1992). Therefore, African countries with relatively poor

Table 1

List of variables.

Variables	Explanation	Source
$Inst_{jt}$	Average of six institutional indicators including voice and accountability, political stability, rule of law, government effectiveness, control of corruption, regulatory quality in 2003–2015.	WGI (2019)
$lnFDI_{ijt}$	Log of capital expenditure in constant 2012 US dollars in 2003–2015.	FDI Markets (2019)
$lnGDPPC_{jt}$	Log of annual real GDP per capita in constant 2010 US dollars in 2003–2015.	WDI (2019)
$POPGROWTH_{jt}$	Annual percentage growth in population in 2003–2015	WDI (2019)
$COLONY_{ij}$	Dummy variable equal to 1 for the existence of a colonial link between home country i and host country j and 0 otherwise.	CIA World Fact Book (2019)
$lnDISTANCE_{ij}$	Log of distance in kilometres between the capitals of home country i and host country j .	CEPII (2019)
$FIXEDTELE_{jt}$	Number of fixed telephone subscriptions per 100 people in host country j in 2003–2015.	WDI (2019)
$LANDLOCKED_{ij}$	Dummy variable equal to 0, 1, 2 if none, one or both home country i and host country j is landlocked.	CEPII (2019)
$LANGUAGE_{ij}$	Dummy variable equal to 1 if a common official language exists between home country i and host country j .	CEPII (2019)
$GOVEXP_{jt}$	Annual percentage growth in government final consumption expenditure in host country j in 2003–2015.	WDI (2019)

Table 2

Summary statistics.

	Observations	Mean	Standard Deviation	Min	Max
$lnFDI_{ij}$	1,858	4.27	1.91	-4.26	9.64
Developed economies	1,255	4.30	1.89	-4.26	9.61
Developing economies	491	4.26	1.92	-2.05	9.64
China	112	4.06	1.99	-.13	8.72
$Inst_{jt}$	1,858	-.52	.54	-1.72	.88
Developed economies	1,255	-.52	.54	-1.72	.80
Developing economies	491	-.52	.54	-1.72	.88
China	112	-.51	.53	-1.61	.72
$lnGDPPC_{jt}$	1,858	7.57	.96	5.57	9.37
$FIXEDTELE_{jt}$	1,858	4.77	4.78	0	16.76
$GOVEXP_{jt}$	1,858	15.35	5.40	2.04	63.94
$POPGROWTH_{jt}$	1,858	2.28	.96	.65	16.48
$lnDISTANCE_{ij}$	1,858	8.71	.68	6.33	9.79
$COLONY_{ij}$	1,858	.13	.34	0	1
$LANGUAGE_{ij}$	1,858	.33	.47	0	1
$LANDLOCKED_{ij}$	1,858	.15	.36	0	1

infrastructure may implement pro-investor policies, whereas governments of countries with good physical infrastructure may not have the incentives to make pro-investors policies. To control for this effect, we use the fixed telephone subscriptions per 100 people ($FIXEDTELE_{jt}$) as a proxy for the effects of physical infrastructure on the level of institutional quality in host countries (Dang, 2013).

Being landlocked creates natural barriers for spillovers from institutional development in other parts of the world (Bahar et al., 2014). Thus, we construct a dummy variable ($LANDLOCKED_{ij}$) equal to 0, 1, 2, representing the number of landlocked countries in the country pairs. A common language between country i and j can facilitate knowledge diffusion and thus lead to institutional convergence between two countries (Bergstrand & Egger, 2013). The dummy variable ($LANGUAGE_{ij}$) accounts for this effect. The variable, $GOVEXP_{jt}$ controls for the effect of government expenditure (Dang, 2013) on institutional quality

Table 3
Correlation matrix.

Variables	1	2	3	4	5	6	7	8	9	10
1 $Inst_{jt}$	1									
2 $\ln FDI_{ij}$	-0.02	1								
3 $\ln GDP_{jt}$	0.42	0.08	1							
4 $FIXEDTELE_{jt}$	0.38	0.13	0.67	1						
5 $GOVEXP_{jt}$	0.46	-0.07	0.24	0.12	1					
6 $POPGROWTH_{jt}$	-0.35	-0.1	-0.54	-0.62	-0.18	1				
7 $\ln DISTANCE_{ij}$	0.11	-0.06	-0.15	-0.35	0.09	0.24	1			
8 $COLONY_{ij}$	0.01	0	0.01	0.01	0.04	-0.01	0.03	1		
9 $LANGUAGE_{ij}$	0.03	-0.01	-0.01	0.02	0.06	-0.01	0.03	0.4	1	
10 $LANDLOCKED_{ij}$	0.02	0.01	-0.02	-0.04	0.02	0.05	0.16	0.01	0.08	1

in host countries. Table 1 describes all the variables used in our study.

5. Results

Table 2 provides summary statistics for all variables used in the regression analysis, while Table 3 presents the correlation between them. The degree of correlations amongst our independent and control variables is low, suggesting multicollinearity was not a major problem in our regression models.

Table 4 presents data on total capital expenditure by Chinese MNEs in African countries for the period 2003–2015. It shows that Chinese MNEs carried out FDI projects worth over 36 billion USD dollars. The top 10 destination countries include Nigeria, Angola, South Africa, Algeria, Ethiopia, Sudan and Zambia. Apart from South Africa and Ethiopia, the rest of these countries are highly endowed with natural and/or energy resources. For instance, Algeria is rich in liquified natural gas (LNG), Nigeria in oil (although with a large domestic market) and Zambia in copper. African countries rich in natural resources have attracted high levels of investment by Chinese MNEs, particularly large state-owned MNEs. It is worth mentioning that African countries that have attracted high levels of Chinese FDI, especially in the extractive industries, tend to have very low institutional quality and weak governance. This is due to the willingness on the part of Chinese MNEs to engage in FDI in African countries with very weak institutional frameworks (see Appendix C for a mini case study). However, other sectors, such as construction and manufacturing-oriented activities, have also witnessed growth. Table 5 presents statistics on the industry classification of greenfield Chinese FDI flows and shows that besides extractive activities, the manufacturing and construction sectors have also witnessed heightened FDI activities by Chinese MNEs.

5.1. Pooled OLS estimation results

Table 6 presents the basic OLS estimation results. In all models, we include year fixed effects. Column (1) presents the results for the full sample and shows that $\ln FDI_{ijt}$ has a negative and significant effect ($\beta = -0.0104$, $p < 0.05$). Columns (2)–(4) compares different groups of home countries with regard to FDI flows. Column (2) presents the results for FDI flows from *developed economies* and shows a negative but insignificant effect on the institutional quality in host countries. Column (3) presents the results for FDI flows from *developing economies* and shows a positive but insignificant effect of FDI on institutional quality. Finally, the effect of FDI from *China* only is found to be negative but not significant in column (4).

The coefficient estimates for the control variables appear as expected. Independent of specification, we find that an increase in GDP per capita ($\ln GDP_{jt}$) in host countries significantly increases the level of institutional quality. An increase in the quality of physical infrastructure ($FIXEDTELE_{jt}$) in host countries significantly enhances the level of institutional quality. Government expenditure ($GOVEXP_{jt}$) in host countries is also found to be a positive predictor of institutional quality. On the other hand, the growth of the population size ($POPGROWTH_{jt}$) in

host countries is found to have a negative effect on institutional quality.

Regarding distance variables, the existence of a past colonial relationship ($COLONY_{ij}$) between home and host countries is negative but not significant, while increasing levels of physical distance ($\ln DISTANCE_{ij}$) between home and host countries increase institutional quality in host countries. A common official language ($LANGUAGE_{ij}$) between home and host countries enhances institutional quality in host countries.

5.2. Panel estimation results with fixed effects using bilateral greenfield FDI flows

The OLS estimates may not provide convincing evidence for the effect of FDI on institutional quality owing to the endogenous relationship between FDI and institutional quality, as well as the potential delayed effect of FDI on the institutional quality in host countries. In this section, we utilise the *fixed effects* panel estimation approach to address these issues.

We adopt fixed effects rather than random effects for our panel estimation for two reasons, the first on empirical grounds and the second on conceptual grounds. First, recent econometric evaluations of the effect of FDI flows on the level of institutional quality with panel data have applied fixed effects using both country-pair and host-country fixed effects (Demir, 2016). Also, to decide between fixed effects or random effects, we run a simple Hausman test (Hausman, 1978) where the null hypothesis is that the random-effects model is more efficient. The results of the Hausman test are presented in Appendix A, Table A1 and provides overwhelming evidence for the rejection of a random-effects model in favour of a fixed-effects model. Additionally, we employed a Breusch-Pagan Lagrange multiplier test, where the null hypothesis is that variances across entities are zero, i.e. no significant difference across the host countries in the sample. The results presented in Appendix A, Table A2 suggest that random effects are not appropriate and show no evidence of significant differences across countries.

Second, the focus of this study is on the effect of FDI flows on the level of institutional quality in host countries – a phenomenon that occurs within countries. Thus, the fixed effects model is preferred over a random-effects model, as the former is designed to study the causes of changes within an entity and cannot be biased because of omitted characteristics that are time-invariant. Considering that the fixed effects estimator cannot be utilised to investigate time-invariant causes of the dependent variable, all country-pair time-invariant variables are dropped from the regression.

The results of the panel fixed-effects models are reported in Table 7 based on Eq. (2) and controlling for year fixed effects. To allow time for the effect of FDI on institutional quality in host countries to occur, the FDI variable $\ln FDI_{ijt-1}$ is lagged by one period. To choose the optimal lag length for the FDI variable, we performed an optimal lag selection test (Marcellino, Stock, & Watson, 2006). The results presented in Appendix A, Table A3 show all three information criterion procedures (AIC, HQIC and SBIC) agree – indicating an optimal lag length of 1. The results in columns (1)–(4) do not suggest any evidence of a significant effect of FDI on institutional quality for the full sample in column (1), developed

Table 4
Chinese FDI by capital expenditure and destination country (USD dollar millions).

Host country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Nigeria	1403.3	9.4			694.15	420.81				21.6	134.1	1394.5	548.2	4626.06
Angola			356.5			3542	6.8			18.5	4			3927.8
Niger	1641.2					1641.2								3282.4
South Africa		2.8		1.7	30.6	517.4	228.3	376.78	121.956	178.8	83.6389	1476.555	109.319	3127.84
Algeria	1991.2	9.4	88.8			386.53	92.8		48.2	7.5	70.8		2.9	2698.13
Zambia	157.6		29	296.2	100	400	825		805.5					2613.3
Ethiopia				1505.21		15	10	78	262.3	102	5.23	522.2	15	2514.94
Morocco										6.5		2161	47.9	2215.4
Sudan		45.7					1735.7			7.5				1788.9
Ghana						143			11	67	24.7	1127.1	30.8	1403.6
Egypt	10		395.9	51.7	395.1	22.5	18		225.9	81.6	92.3			1293
Zimbabwe	300					400	7.5	64.8			6.4	250	22.1	1050.8
Liberia													1043.8	1043.8
Congo (DRC)					533			162.2	11.8	7.5			110	824.5
Kenya			10.9			1	36.11		64.28	74.4		88.6611	462.24	737.59
Senegal				558				94.5		7.5			25	685
Cameroon						342						12.8	150	504.8
Madagascar			159.8			270								429.8
Namibia										270			31.1	301.1
Tanzania		162.2										75.4	10	247.6
Botswana						200								200
Mozambique					20				174.4					194.4
Uganda	9.9				5.2						94.5	22.2		131.8
Republic of Congo											55.6		40.2	95.8
Gabon					55.6							22.2		77.8
Tunisia									35.7					35.7
Ivory Coast										30				30
Grand Total	5513.2	229.5	1040.9	2412.81	1833.65	8301.44	2960.21	776.28	1761.036	880.4	571.2689	7152.6161	2648.559	36081.87

Table 5
Chinese FDI by industry activity (USD dollar millions).

Industry Activity	Capital Expenditure
Manufacturing	17180.95
Extraction	6387
Construction	5750.24
Electricity	3351
ICT & Internet Infrastructure	2072.3
Sales, Marketing & Support	246.08
Logistics, Distribution & Transportation	222.6
Education & Training	189.9
Design, Development & Testing	178
Headquarters	174.6
Business Services	145.6
Retail	48.7
Maintenance & Servicing	46.2
Research & Development	40.1
Shared Services Centre	28.4
Customer Contact Centre	10.5
Technical Support Centre	9.7
Grand Total	36081.87

Table 6
OLS Regression.

	(1) Full sample	(2) Home: Developed Economies	(3) Home: Developing Economies	(4) Home: China
$\ln FDI_{ijt}$	-0.0104* (0.0053)	-0.0085 (0.0066)	-0.0124 (0.0104)	-0.0114 (0.0180)
$\ln GDPPC_{jt}$	0.0788*** (0.0149)	0.0999*** (0.0186)	0.0367 (0.0282)	0.0329 (0.0550)
$FIXEDTELE_{jt}$	0.0271*** (0.0033)	0.0263*** (0.0040)	0.0275*** (0.0067)	0.0122 (0.0149)
$GOVEXP_{jt}$	0.0356*** (0.0020)	0.0335*** (0.0024)	0.0386*** (0.0039)	0.0451*** (0.0086)
$POPGROWTH_{jt}$	-0.0659*** (0.0138)	-0.0526** (0.0155)	-0.1123*** (0.0348)	-0.2137** (0.1008)
$\ln DISTANCE_{ij}$	0.1648*** (0.0161)	0.1497*** (0.0194)	0.1997*** (0.0343)	0.2174*** (0.0541)
$COLONY_{ij}$	-0.0284 (0.0320)	-0.0494 (0.0352)		
$LANGUAGE_{ij}$	0.0113 (0.0231)	0.0562* (0.0297)	-0.0616 (0.0406)	
$LANDLOCKED_{ij}$	-0.0150 (0.0285)	-0.0573 (0.0370)	0.0418 (0.0540)	0.0146 (0.0854)
Constant	-3.0393*** (0.1755)	-3.0967*** (0.2134)	-2.8629*** (0.3585)	-2.9470*** (0.7469)
Year fixed effects	Included	Included	Included	Included
Observations	1858	1255	491	112
R-squared	0.3781	0.3679	0.4107	0.6189
Root MSE	0.426	0.431	0.425	0.358

Notes: The dependent variable is the level of aggregate institutional quality based on six categories that are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. $\ln FDI_{ijt}$ is aggregate greenfield FDI projects by all firms from country i to j at time t . $\ln GDPPC_{jt}$ is the natural log of the GDP per capita in country j ; $FIXEDTELE_{jt}$ is the number of fixed telephone subscriptions per 100 people in country j ; $GOVEXP_{jt}$ is the annual percentage growth in government final consumption expenditure in country j ; $POPGROWTH_{jt}$ is the annual percentage growth in population in country j . $\ln DISTANCE_{ij}$ is the (natural log) distance between i and j , $COLONY_{ij}$ is a dummy variable equal to 1 if i and j share a colonial relationship, $LANGUAGE_{ij}$ is a dummy variable equal to 1 if i and j share a common official language, $LANDLOCKED_{ij}$ is the number of landlocked countries (0, 1, or 2).

economies in column (2), developing economies in column (3) and China in column (4).

The coefficient estimates for the control variables appear as expected. We find that GDP per capita ($\ln GDPPC_{jt}$) of host countries in full, developed and developing economy samples is a positive and significant

Table 7
Panel Regression with Fixed Effects: The impact of bilateral FDI on institutional quality.

	(1)	(2)	(3)	(4)
Fixed effects (within) regressions				
	Full sample	Home: Developed Economies	Home: Developing Economies	Home: China
$\ln FDI_{ijt-1}$	0.0008 (0.0071)	-0.0053 (0.0086)	0.0150 (0.0141)	0.0340 (0.0321)
$\ln GDPPC_{jt}$	0.1319*** (0.0196)	0.1336*** (0.0243)	0.1584*** (0.0369)	0.0445 (0.0895)
$FIXEDTELE_{jt}$	0.0139*** (0.0042)	0.0157*** (0.0051)	0.0107 (0.0085)	-0.0326 (0.0234)
$GOVEXP_{jt}$	0.0364*** (0.0025)	0.0346*** (0.0030)	0.0391*** (0.0048)	0.0653*** (0.0136)
$POPGROWTH_{jt}$	-0.0562*** (0.0189)	-0.0563*** (0.0214)	-0.0309 (0.0449)	-0.2436 (0.1543)
Constant	-2.1213*** (0.1720)	-2.1583*** (0.2068)	-2.1400*** (0.3541)	-0.7430 (0.9378)
Year fixed effects	Included	Included	Included	Included
Observations	1438	997	356	85
Group variable	Country-pair	Country-pair	Country-pair	Country-pair
Number of groups	310	200	88	22
$\text{corr}(u_i, X_b) =$	-0.0607	-0.0696	-0.1030	0.0073
σ_u	.28641939	.27689179	.32904564	.20711493
σ_e	.43585001	.44463698	.41300089	.39650122
ρ (fraction of variance due to u_i)	.30160174	.27943562	.38828983	.21436528
Within R-squared	0.3541	0.3502	0.4120	0.5484

Notes: Standard errors are in parenthesis *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the level of aggregate institutional quality based on six categories that are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. $\ln FDI_{ijt}$ is the (natural log) of aggregate greenfield FDI flows from country i to j at time t . $\ln GDPPC_{jt}$ is the natural log of the GDP per capita in country j ; $FIXEDTELE_{jt}$ is the number of fixed telephone subscriptions per 100 people in country j ; $GOVEXP_{jt}$ is the annual percentage growth in government final consumption expenditure in country j ; $POPGROWTH_{jt}$ is the annual percentage growth in population in country j .

determinant of institutional quality, while GDP per capita of host countries is not a significant determinant in the China sample. Physical infrastructure ($FIXEDTELE_{jt}$) of host countries in full and the developed economy samples is a positive and significant determinant of institutional quality. In contrast, it is found to be insignificant for host countries in the developing economy and China samples. Government expenditure ($GOVEXP_{jt}$) for host countries in all samples is found to be a positive and significant determinant of institutional quality. In contrast, growth in population size ($POPGROWTH_{jt}$) of host countries in the full and developed economy samples is a negative and significant determinant of institutional quality while being insignificant for host countries in the developing economy and China samples.

5.3. Panel estimation results with fixed effects using aggregate bilateral greenfield FDI flows

The lack of evidence of a significant effect of FDI flows on institutional quality in host countries in the previous section might be due to the use of bilateral FDI data. Bilateral FDI data analyses might be hiding the cluster effects driven by aggregate FDI flows. It is possible that total FDI flows from a group of countries originating from developed and developing economies might be more significant in impacting institutional quality in host countries than individual bilateral FDI flows alone.

Consequently, we have collapsed separately the bilateral FDI flows into an aggregate FDI variable from developed economies, developing

Table 8
Panel Regression with Fixed Effects: The impact of aggregate bilateral FDI flows on institutional quality.

	(1)	(2)	(3)	(4)
	Home: Developed Economies	Aggregate sample	Home: Developing Economies	Home: China
$\ln FDI_{ijt-1}$	0.0219* (0.0114)			0.0340 (0.0321)
$\ln FDI_{ijt-2}$		0.0021 (0.0057)		
$\ln FDI_{ijt-3}$			0.0425** (0.0209)	
$\ln GDPPC_{jt}$	0.0697** (0.0347)	0.5479*** (0.1209)	0.2153*** (0.0604)	0.0445 (0.0895)
$FIXEDTELE_{jt}$	0.0171** (0.0072)	0.0174** (0.0069)	0.0118 (0.0171)	-0.0326 (0.0234)
$GOVEXP_{jt}$	0.0244*** (0.0042)	-0.0007 (0.0018)	-0.0122* (0.0072)	0.0653*** (0.0136)
$POPGROWTH_{jt}$	-0.0136 (0.0325)	0.0044 (0.0147)	-0.0620 (0.0859)	-0.2436 (0.1543)
Constant	-1.5998*** (0.3077)	-4.5653*** (0.8584)	-2.2278*** (0.5372)	-0.7430 (0.9378)
Year fixed effects	Included	Included	Included	Included
Observations	322	292	139	85
Group variable	Host-country	Host-country	Host-country	Host-country
Number of groups	37	35	23	22
$\text{corr}(u_i, X_b) =$	-0.0660	-0.6114	-0.2284	0.0073
σ_{u_i}	.16671377	.67330374	.26200951	.20711493
σ_{ϵ}	.27131917	.10499476	.34064438	.39650122
ρ (fraction of variance due to u_i)	.27407697	.97626011	.3717033	.21436528
Within R-squared	0.2600	0.1459	0.3232	0.5484

Notes: Standard errors are in parenthesis *** $p < 0.01$, ** $p < 0.05$, $p < 0.1$.

economies. Our dependent variable remains the level of aggregate institutional quality in host country j at time t .

Table 8 presents the results with aggregate FDI flows. To determine the optimal lag length, we have performed an optimal lag selection test for the FDI variable. The lowest values of the Akaike's information criterion (AIC)¹ suggest an optimal lag of 2 for the full aggregate sample (Appendix A, Table A4), lag of 1 for the developed economy sample (Appendix A, Table A5), lag of 3 for the developing economy sample (Appendix A, Table A6) and lag of 1 for the China sample (Appendix A, Table A7). In column (1), we include aggregate FDI flows from *developed economies*. The coefficient for the FDI variable $\ln FDI_{ijt-1}$ shows a positive and statistically significant coefficient estimate ($\beta = 0.0219$, $SE = 0.0114$, $p < 0.1$). Specifically, a 1% rise in FDI from developed economies is associated with 0.022 units increase in average institutional quality in host countries. This result provides support for *Hypothesis 2* – predicting that DEMNES' investments will have a faster positive effect on institutional quality in African countries. In column (2), the coefficient of $\ln FDI_{ijt-2}$ is positive but statistically insignificant. This result lends no support for *Hypothesis 1* – predicting that MNEs' investment will positively affect institutional quality in African countries.

In column (3), we include aggregate greenfield FDI flows from *developing economies*. The results show $\ln FDI_{ijt-3}$ is positive and statistically significant ($\beta = 0.0425$, $SE = 0.0209$, $p < 0.05$) as a 1% rise in FDI from developing economies is associated with 0.043 units increase in average institutional quality in host countries. This result means we do find further support for *Hypothesis 2*, predicting EEMNES' investments will have a slower positive effect on institutional quality in African

¹ We have also estimated models with lags suggested by other criteria but using the AIC always returns the strongest statistically significant result. These estimations are available from the authors upon request.

countries.

In Column (4), we test hypothesis 3 using the estimation results for *bilateral* greenfield FDI flows from China. The results show a positive but statistically insignificant coefficient for the variable $\ln FDI_{ijt-1}$ indicating partial support for *Hypothesis 3*, predicting that Chinese MNEs' investments will positively affect the institutional quality (not verified) but faster than other EEMNES investments (verified).

Regarding the control variables, we find that the GDP per capita ($\ln GDPPC_{jt}$) of host countries in full, developed and developing economy samples is positive and significant while insignificant for host countries in the China sample. Physical infrastructure ($FIXEDTELE_{jt}$) of host countries in full and the developed economy samples is positively significant. In contrast, it is found to be positive insignificant for host countries in the developing economy sample and negative and insignificant for the China sample. Government expenditure ($GOVEXP_{jt}$) for host countries in the full sample is negative and insignificant but negative and significant in the developing economy sample. In contrast, $GOVEXP_{jt}$ is found to be a positive and significant determinant in the developing economy and China samples. Growth in population size ($POPGROWTH_{jt}$) of host countries in the full sample is positive but statistically insignificant, while negative and statistically insignificant for host countries in the developed economy, developing economy and China samples.

5.3.1. Robustness checks

In this section, we tested the sensitivity of our results to additional robustness analyses. The regression results for this section is available in Appendix B. First, we disaggregated the aggregate institutional quality variable into different institutional measures. The results for the impact of aggregate bilateral FDI flows on disaggregated institutional measures is presented in Table B1 and show no statistically significant effect of FDI flows on any of the institutional indicators. In Table B2, we repeat the same exercise after separating aggregate bilateral FDI flows from *developed economies*. This time the results show a positive and statistically significant effect of FDI flows from developed economies on *voice and accountability*, *political stability* and *control of corruption* in host countries. The results for aggregate bilateral FDI flows from developing economies are presented in Table B3 and show a significantly positive effect on *voice and accountability*, *political stability* and *government effectiveness*. Table B4 presents the effect of FDI flows from China and show no statistically significant effect on any of the institutional indicators.

Second, we employed an alternative measure of institutional quality. Therefore, we repeat our analysis by replacing the aggregate institutional quality variable from the WGI with an aggregate institutional quality variable that includes 12 components of the *International Country Risk Guide* and consists of: law and order, democratic accountability, government stability, investment profile, socio-economic conditions, external conflict, internal conflict, corruption, military in politics, religion in politics, ethnic tensions and bureaucracy quality. The index ranges from 0 to 100, with the latter indicating the highest institutional quality. The results presented in Table B5 are in line with our previous results as they show a positively insignificant effect of aggregate FDI flows, a positive and statistically significant effect of aggregate FDI flows from developed and developing economies, and a negative and insignificant effect for FDI flows from China.

Third, we drop the investments by Chinese POEs and focus on FDI flows by Chinese SOEs in particular. The results presented in Table B6 show no significant impact of FDI flows on institutional quality in host countries. However, we find a negative and statistically significant effect of Chinese SOEs' investments on the level of corruption in host countries (column 6). A potential argument explaining the stronger effect of combined SOEs and POEs Chinese investment comes from the work of Pandya (2016). She argues that SOEs FDI, when complemented by POEs FDI, could have a greater influence on the host government as there is a "shield of nationality".

6. Discussion and conclusion

Despite the increasing interest in the area of FDI and institutional change in host countries, our understanding of the effect of MNE activities on the host country institutional environment remains limited. Based on our results, we have found no evidence of the overall effect of FDI on the institutional quality of the host location. This finding is not surprising given the mixed nature of FDI and the potential diversity in routes used to influence the host country's institutional environment by DEMNEs and EEMNEs. The results obtained, offering support to our 2nd and 3rd hypotheses, in light of our conceptualisation, have important theoretical and practical implications.

6.1. Theoretical implications

Our theoretical contribution is to the institution-based view and in particular to the co-evolutionary theory (Cantwell et al., 2010; McGaughey et al., 2016) by putting forward a theory that explains how the impact of FDI on institutional quality depends on the quality of the MNEs' home country institutions. We argue that MNEs engage in institutional entrepreneurship, and they have a strong impact on the host country institutions. While generally, this impact is positive when all FDI is examined, regardless of the country of origin- we argue that there is a clear difference between the impact of DEMNEs and EEMNEs. The former have a faster impact on the host institutional environment through utilising their experience (Brandl et al., 2019) and coercion (Koning, Mertens, & Roosenboom, 2018) of the host country's government. The latter have a slower positive effect on host country institutional quality as they tend to seek preferential agreement in host countries (Alimadadi & Pahlberg, 2014). This argument is in line with studies by Guo et al. (2017) and Shi et al. (2017), who argue that SOEs and larger MNEs have a stronger legitimacy-seeking motivation. SOEs are also influenced more by their home-country institutions and therefore show a slower adaptation to external environments.

Contrary to their counterparts from developed economies, EEMNEs operate in conditions of low institutional quality (Cuervo-Cazurra & Dau, 2009; Cuervo-Cazurra, 2012). As a result, investments by EEMNEs in countries with low institutional quality, such as those in continental Africa, would result in a low liability of foreignness. EEMNEs would face a low liability of foreignness mainly because they are more experienced in operating in almost similar levels of institutional quality back in their home country (Khanna & Palepu, 2006; Morck et al., 2008). Thus, EEMNEs may have gained an 'adversity advantage' that permits them to circumvent the difficulties associated with operating in countries with low institutional quality (Cuervo-Cazurra & Genc, 2008).

EEMNEs from emerging markets like China and Russia are often state-owned and benefit from strong political and financial support from their home government (Duanmu, 2014; Luo et al., 2010; Okhmatovskiy, 2010). Thus, as a result of political and financial support from their home government, EEMNEs may have a higher tolerance for host country institutional risk than their private counterparts with limited government support and affiliation (Buckley et al., 2018). Also, due to their high affiliation with their home government, state-owned firms are motivated more by political and long-term strategic objectives (Bass & Chakrabarty, 2014). Thus, they might be less willing to take into account the institutional deficiencies in African countries and consequently less interested in encouraging host country institutional reforms in African countries.

On the other hand, DEMNEs operate in conditions of effective rules and regulations, thus investing in African countries with low institutional quality would mean a high degree of liability of foreignness,

creating unfamiliarity and relational hazards for the firm (Eden & Miller, 2004). These hazards produce additional costs of operation and coordination relationships that the firm must incur to achieve an equitable level of knowledge as firms with prior knowledge of operating in conditions of weak and unsupportive institutions (Zaheer, 2002). As a result of these challenges and in order to protect their competitive advantage, DEMNEs are more likely to be involved in activities geared towards the improvement of the quality of the institutions in African countries, such as through lobbying and provision of information which may have a positive effect of institutional reforms.

6.2. Practical implications

Our findings have important policy implications for African countries and international institutions such as the World Bank. The increasing efforts by several African countries as well as those of the Bretton Woods institutions like the World Bank and the IMF – in encouraging African countries to improve their institutional investment environment appear to be working. Thus, African governments and international organisations like the IMF and the World Bank should focus their attention on harmonising their foreign investment policies, including the expected changes in institutions in the host countries. However, the origin of the investment seems to matter as FDI from developing economies, and China will have a slower impact on host country institutional quality. Therefore, investment policies that may stimulate FDI by investors from developed economies may not be applicable to investors from developing economies and, therefore, may not be able to encourage further institutional development through co-evolution between MNEs and institutions. In a literature review of studies investigating Sino-African relationships, Abodohoui, Zhan, and Da-Silva (2018) find that the weak institutions observed in many African countries lead to an "anarchic" entry of foreign investors that could hinder economic growth. Miao, Lang, Borojo, Yushi, and Zhang (2020) find that Chinese FDI has a positive effect on the economic growth of African countries only if strong institutions exist in the host economy. In order to capitalise on the positive effect of Chinese FDI, African governments should focus on the improvement of institutions. Kinyondo (2019) argues that in the Sino-African relationship, China is the partner that draws the most benefits. China is not only the major beneficiary in economic terms but leads African countries in debt trap diplomacy with significant negative long-term effects. Managers of MNEs investing in Africa should also be aware of the impact that the operations of their MNEs may have on the quality of host country institutions.

6.3. Limitations and areas for further research

Our study is limited in that we focus on Greenfield FDI. Further research is needed on the relationship between institutional quality and FDI through other entry strategies like M&As and JVs. The results in this study can also be complemented by an analysis of the impact of FDI on institutional quality by disaggregating FDI into various sectors like manufacturing, extractive and services – to examine whether FDI has a homogenous effect on host country institutional quality across all sectors. Finally, an analysis of the FDI impact by focusing on different MNEs' motivations, e.g. market, resource, efficiency or strategic asset seeking, can provide further insights into the mechanisms that FDI influence the host country's institutional environment.

Appendix A

Table A1

Results of Hausman Test to decide between Fixed Effects and Random Effects models with sigmamore.

Variables	Coefficients			sqrt(diag(V_b -V_B)) S.E
	(b) Fixed	(B) Random	(b-B) Difference	
$\ln FDI_{ijt-1}$	-.0001844	-.0010607	.0008762	.0030862
$\ln GDPPC_{jt}$	.1312799	.1046934	.0265865	.0085434
$FIXEDTELE_{jt}$	.0145199	.0246544	-.0101345	.0012968
$GOVEXP_{jt}$	.0354013	.0323957	.0030056	.000973
$POPGROWTH_{jt}$	-.0531418	-.0584003	.0052585	.0088735

b = consistent under Ho and Ha; obtained from xtreg.

B = inconsistent under Ha, efficient under Ho; obtained from xtreg.

Test: Ho: difference in coefficients not systematic.

 $\chi^2(5) = (b-B)' [(V_b - V_B)^{-1}] (b-B) = 639.55.$ Prob > $\chi^2 = 0.0000.$ **Table A2**Breusch and Pagan Lagrangian multiplier test for random effects. $\text{Inst}_{jt} [\text{country_pair_id}, t] = Xb + u[\text{country_pair_id}] + e [\text{country_pair_id}, t]$ Estimated results:

	Var	sd = sqrt(Var)
Inst_{jt}	.2890879	.537669
e	.1836455	.4285388
u	0	0

Test: $\text{Var}(u) = 0.$

chibar2(01) = 0.00.

Prob > chibar2 = 1.0000.

Table A3

Optimal lag length selection test for bilateral FDI sample columns (1)-(4) of Table 7.

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-4009.58				3.60339	4.11975	4.12081	4.12262
1	-4005.61	7.9382*	1	0.005	3.59242*	4.1167*	4.11881*	4.12243*
2	-4005.46	.2996	1	0.584	3.59556	4.11758	4.12073	4.12616
3	-4005.46	.00535	1	0.942	3.59924	4.1186	4.12281	4.13005
4	-4005.4	.119	1	0.730	3.60272	4.11957	4.12483	4.13388

Notes: (*) indicates the optimal length selected by the criterion; LR is sequential modified LR (Likelihood Ratio) test statistic; FPE denotes Final Prediction Error. AIC, HQIC, SBIC represent the Akaike, Schwarz and Hannan-Quinn criteria respectively.

Endogenous: $\ln FDI_{ijt}$.

Exogenous: Constant.

Table A4

Optimal lag length selection test for aggregate sample (Column (1) of Table 8).

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-646.31				1.72001	3.38021	3.3843	3.39052*
1	-643.819	4.9826	1	0.026	1.70667	3.37242	3.3806	3.39304
2	-640.715	6.2072*	1	0.013	1.68803*	3.36144*	3.3737*	3.39236
3	-640.154	1.1233	1	0.289	1.6919	3.36373	3.38008	3.40496
4	-640.087	.13309	1	0.715	1.70016	3.3686	3.38905	3.42014

Endogenous: $\ln FDI_{ijt}$.

Exogenous: Constant.

Table A5

Optimal lag length selection test for aggregate developed economy sample (Column (2) of Table 8).

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-725.398				3.34982	4.04678	4.05109*	4.0576*
1	-724.193	2.4093	1	0.121	3.346*	4.04564*	4.05425	4.06728
2	-723.987	.41111	1	0.521	3.36085	4.05007	4.06297	4.08252
3	-723.182	1.6104	1	0.204	3.3645	4.05115	4.06836	4.09442
4	-723.167	.03122	1	0.860	3.383	4.05664	4.07815	4.11072

Endogenous: $\ln FDI_{ijt}$.

Exogenous: Constant.

Table A6

Optimal lag length selection test for aggregate developing economy sample (Column (3) of Table 8).

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-492.058				3.44521	4.07486	4.08067	4.08928
1	-485.456	13.205	1	0.000	3.28933	4.02856	4.04017*	4.05739*
2	-485.449	.01399	1	0.906	3.31643	4.03677	4.05419	4.08002
3	-482.3	6.2983*	1	0.012	3.25805*	4.019*	4.04224	4.07667
4	-482.194	.21184	1	0.645	3.28223	4.02639	4.05543	4.09848

Endogenous: $\ln FDI_{ijt}$

Exogenous: Constant.

Table A7

Optimal lag length selection test for bilateral China sample (Column (4) of Table 8).

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-170.739				3.86079	4.18875	4.20053	4.2181*
1	-168.994	3.4898	1	0.062	3.79131*	4.17058*	4.19415*	4.22928
2	-168.873	.2424	1	0.622	3.87354	4.19201	4.22736	4.28006
3	-168.746	.2539	1	0.614	3.95708	4.21331	4.26044	4.33071
4	-168.744	.00293	1	0.957	4.05494	4.23766	4.29658	4.38441

Endogenous: $\ln FDI_{ijt}$

Exogenous: Constant.

Appendix B

See Table B7

Table B1

Regression results: Aggregate FDI flows using different institutional measures.

	(1)	(2)	(3)	(4)	(5)	(6)
Fixed effects (within) regressions	Voice and accountability	Political stability	Government effectiveness	Regulatory of quality	Rule of law	Control of corruption
$\ln FDI_{ijt-2}$	0.0117 (0.0094)	0.0012 (0.0144)	0.0039 (0.0065)	-0.0023 (0.0066)	-0.0026 (0.0067)	0.0009 (0.0073)
$\ln GDPPC_{jt}$	0.1375 (0.1988)	1.0285*** (0.3036)	0.5390*** (0.1377)	0.7452*** (0.1392)	0.6227*** (0.1412)	0.2144 (0.1538)
$FIXEDTELE_{jt}$	-0.0413*** (0.0114)	0.0546*** (0.0174)	0.0372*** (0.0079)	0.0392*** (0.0080)	0.0303*** (0.0081)	-0.0153* (0.0088)
$GOVEXP_{jt}$	0.0013 (0.0030)	-0.0076 (0.0046)	0.0013 (0.0021)	0.0015 (0.0021)	-0.0005 (0.0021)	-0.0001 (0.0023)
$POPGROWTH_{jt}$	0.0050 (0.0242)	0.0266 (0.0369)	-0.0124 (0.0167)	-0.0085 (0.0169)	0.0049 (0.0172)	0.0109 (0.0187)
Constant	-1.5313 (1.4117)	-8.0291*** (2.1564)	-4.5466*** (0.9780)	-6.0253*** (0.9884)	-5.1758*** (1.0027)	-2.0839* (1.0926)
Year fixed effects	Included	Included	Included	Included	Included	Included
Observations	292	292	292	292	292	292
Group variable	Host-country	Host-country	Host-country	Host-country	Host-country	Host-country
Number of groups	35	35	35	35	35	35
$\text{corr}(u_i, X_b) =$	-0.1065	-0.7583	-0.6279	-0.7951	-0.6879	-0.0337
σ_u	.61688147	1.2141513	.66095538	.92994472	.75114585	.51025159
σ_e	.17266475	.26375326	.11962201	.12088641	.12264616	.13363717
ρ (fraction of variance due to u_i)	.92734814	.95493654	.96828384	.9833826	.97403234	.93580915
Within R-squared	0.1503	0.1669	0.2299	0.2315	0.1921	0.0690

Notes: Standard errors are in parenthesis *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the level of different institutional measures that are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

Table B2

Regression results: Aggregate FDI flows from developed economies using different institutional measures.

Fixed effects (within) regressions	(1)	(2)	(3)	(4)	(5)	(6)
	Voice and accountability	Political stability	Government effectiveness	Regulatory of quality	Rule of law	Control of corruption
$\ln FDI_{ijt-1}$	0.0267* (0.0150)	0.0349* (0.0192)	0.0081 (0.0119)	0.0163 (0.0127)	0.0168 (0.0116)	0.0285*** (0.0108)
$\ln GDP_{jt}$	0.0640 (0.0457)	0.1817*** (0.0584)	0.0669* (0.0362)	0.0500 (0.0388)	0.0127 (0.0352)	0.0427 (0.0328)
$FIXEDTELE_{jt}$	-0.0495*** (0.0095)	0.0244** (0.0122)	0.0355*** (0.0075)	0.0117 (0.0081)	0.0497*** (0.0073)	0.0307*** (0.0068)
$GOVEXP_{jt}$	0.0232*** (0.0056)	0.0412*** (0.0071)	0.0252*** (0.0044)	0.0191*** (0.0047)	0.0185*** (0.0043)	0.0192*** (0.0040)
$POPGROWTH_{jt}$	-0.0779* (0.0429)	0.1141** (0.0548)	-0.0624* (0.0340)	-0.0527 (0.0364)	0.0132 (0.0331)	-0.0160 (0.0308)
Constant	-1.0534*** (0.4057)	-3.2803*** (0.5185)	-1.3654*** (0.3211)	-1.1491*** (0.3439)	-1.3121*** (0.3125)	-1.4387*** (0.2914)
Year fixed effects	Included	Included	Included	Included	Included	Included
Observations	322	322	322	322	322	322
Group variable	Host-country	Host-country	Host-country	Host-country	Host-country	Host-country
Number of groups	37	37	37	37	37	37
$\text{corr}(u_i, X_b) =$	0.0057	-0.0593	-0.1042	-0.0680	-0.0654	-0.0813
σ_{u_i}	.26499229	.25505283	.16038113	.18272042	.14767686	.142844
σ_e	.35781303	.45723171	.28319733	.30327088	.27558944	.25698494
ρ (fraction of variance due to u_i)	.35420192	.23731817	.24283818	.26632703	.22308615	.23603737
Within R-squared	0.2594	0.2370	0.3923	0.1785	0.3474	0.3190

Notes: Standard errors are in parenthesis *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the level of different institutional measures that are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

Table B3

Regression results: Aggregate FDI flows from developing economies using different institutional measures.

Fixed effects (within) regressions	(1)	(2)	(3)	(4)	(5)	(6)
	Voice and accountability	Political stability	Government effectiveness	Regulatory of quality	Rule of law	Control of corruption
$\ln FDI_{ijt-3}$	0.0546** (0.0257)	0.0743** (0.0344)	0.0352* (0.0196)	0.0348 (0.0216)	0.0244 (0.0204)	0.0315 (0.0203)
$\ln GDP_{jt}$	0.2698*** (0.0742)	0.2044** (0.0991)	0.2511*** (0.0566)	0.2414*** (0.0622)	0.1713*** (0.0588)	0.1537** (0.0587)
$FIXEDTELE_{jt}$	-0.0541** (0.0210)	0.0363 (0.0281)	0.0196 (0.0160)	0.0083 (0.0176)	0.0390** (0.0167)	0.0221 (0.0166)
$GOVEXP_{jt}$	-0.0138 (0.0088)	-0.0109 (0.0118)	-0.0066 (0.0067)	-0.0219*** (0.0074)	-0.0128* (0.0070)	-0.0074 (0.0070)
$POPGROWTH_{jt}$	-0.1930* (0.1054)	0.0690 (0.1410)	-0.1311 (0.0805)	-0.0075 (0.0885)	-0.0139 (0.0836)	-0.0955 (0.0835)
Constant	-2.1333*** (0.6592)	-2.8143*** (0.8813)	-2.3780*** (0.5030)	-2.2344*** (0.5530)	-2.0222*** (0.5227)	-1.7845*** (0.5218)
Year fixed effects	Included	Included	Included	Included	Included	Included
Observations	139	139	139	139	139	139
Group variable	Host-country	Host-country	Host-country	Host-country	Host-country	Host-country
Number of groups	23	23	23	23	23	23
$\text{corr}(u_i, X_b) =$	-0.1705	-0.2390	-0.1721	-0.2386	-0.2079	-0.2458
σ_{u_i}	.37440318	.44850858	.20513349	.28336327	.23251241	.2421969
σ_e	.41801227	.55881773	.31896456	.3506697	.33142584	.33088197
ρ (fraction of variance due to u_i)	.44513306	.39179075	.29259	.39502692	.3298373	.3488674
Within R-squared	0.2447	0.2985	0.4705	0.3170	0.3511	0.3225

Notes: Standard errors are in parenthesis *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the level of different institutional measures that are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

Table B4
Regression results: Bilateral FDI flows from China using different institutional measures.

	(1)	(2)	(3)	(4)	(5)	(6)
Fixed effects (within) regressions	Voice and accountability	Political stability	Government effectiveness	Regulatory of quality	Rule of law	Control of corruption
$\ln FDI_{ijt-1}$	0.0361 (0.0416)	0.0157 (0.0526)	0.0245 (0.0325)	0.0626 (0.0377)	0.0522 (0.0325)	0.0131 (0.0300)
$\ln GDPPC_{jt}$	0.1698 (0.1160)	0.0609 (0.1467)	0.0653 (0.0905)	-0.0056 (0.1053)	-0.0240 (0.0907)	0.0006 (0.0836)
$FIXEDTELE_{jt}$	-0.1242*** (0.0304)	0.0079 (0.0384)	-0.0158 (0.0237)	-0.0507* (0.0276)	0.0074 (0.0237)	-0.0203 (0.0219)
$GOVEXP_{jt}$	0.0838*** (0.0177)	0.1063*** (0.0223)	0.0447*** (0.0138)	0.0472*** (0.0160)	0.0495*** (0.0138)	0.0600*** (0.0127)
$POPGROWTH_{jt}$	-0.4182** (0.2001)	0.2432 (0.2529)	-0.3373** (0.1561)	-0.3255* (0.1815)	-0.2289 (0.1564)	-0.3949*** (0.1442)
Constant	-0.8037 (1.2156)	-3.0336* (1.5366)	-0.3473 (0.9484)	0.3243 (1.1031)	-0.3808 (0.9502)	-0.2168 (0.8762)
Year fixed effects	Included	Included	Included	Included	Included	Included
Observations	85	85	85	85	85	85
Group variable	Host-country	Host-country	Host-country	Host-country	Host-country	Host-country
Number of groups	22	22	22	22	22	22
$\text{corr}(u_i, X_b) =$	-0.0443	0.1282	0.0628	-0.1270	-0.0436	-0.0701
σ_u	.33536843	.44540076	.26351315	.32904094	.18360055	.16136262
σ_e	.51395019	.64963108	.40098131	.4663495	.40173057	.37042652
ρ (fraction of variance due to u_i)	.29863774	.31976318	.30161417	.33236533	.17278189	.15949343
Within R-squared	0.5592	0.4736	0.5824	0.3914	0.5236	0.6361

Notes: Standard errors are in parenthesis *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the level of different institutional measures that are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

Table B5
Regression results: Bilateral FDI flows from China by Chinese SOEs.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Average institutional quality	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption
$\ln FDI_{ijt-1}$	0.0010 (0.0073)	0.0057 (0.0070)	0.0147 (0.0168)	-0.0089 (0.0116)	0.0077 (0.0182)	0.0081 (0.0126)	-0.0213* (0.0117)
$\ln GDPPC_{jt}$	0.8121*** (0.2500)	0.4072 (0.2403)	1.0771* (0.5799)	0.6571 (0.3997)	1.8662*** (0.6262)	0.4605 (0.4350)	0.4041 (0.4034)
$FIXEDTELE_{jt}$	0.0238 (0.0140)	-0.0102 (0.0135)	0.1193*** (0.0326)	0.0495** (0.0225)	-0.0434 (0.0352)	0.0454* (0.0244)	-0.0179 (0.0227)
$GOVEXP_{jt}$	0.0153** (0.0072)	0.0029 (0.0069)	0.0180 (0.0167)	0.0062 (0.0115)	0.0348* (0.0180)	0.0240* (0.0125)	0.0061 (0.0116)
$POPGROWTH_{jt}$	-0.2295 (0.1502)	0.0188 (0.1444)	-0.1354 (0.3485)	0.0690 (0.2401)	-0.9238** (0.3763)	-0.4530* (0.2614)	0.0476 (0.2424)
Constant	-6.5999*** (1.9393)	-3.7513* (1.8635)	-9.5085** (4.4978)	-5.7999* (3.0997)	-12.8992** (4.8571)	-3.8027 (3.3742)	-3.8380 (3.1285)
Year fixed effects	Included	Included	Included	Included	Included	Included	Included
Group variable	Host-country	Host-country	Host-country	Host-country	Host-country	Host-country	Host-country
Number of groups	19	19	19	19	19	19	19
$\text{corr}(u_i, X_b) =$	-0.8406	-0.0815	-0.8724	-0.7024	-0.9634	-0.7914	-0.3091
σ_u	.91014595	.67185529	1.3587097	.67564586	2.1307661	.78449337	.50164286
σ_e	.06442986	.06191026	.14943005	.10298159	.1613682	.11209999	.10393645
ρ (fraction of variance due to u_i)	.99501367	.9915802	.98804909	.97729576	.9942973	.97998968	.95883843
Observations	60	60	60	60	60	60	60
Within R-squared	0.7419	0.7514	0.7176	0.5281	0.5488	0.6380	0.4519

Standard errors are in parenthesis.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table B6
Regression results: Impact of FDI flows using aggregate ICRG measure of institutional quality.

	(1) Home: Developed Economies	(2) Aggregate sample	(3) Home: Developing Economies	(4) Home: China
$\ln FDI_{ijt-1}$	0.3799* (0.1956)			-0.4571 (0.4342)
$\ln FDI_{ijt-2}$		-0.2485 (0.1864)		
$\ln FDI_{ijt-3}$			0.6092* (0.3286)	
$\ln GDP_{jt}$	0.6285 (0.5949)	4.4757 (3.9238)	1.7280* (0.9479)	-0.6291 (1.2112)
$FIXEDTELE_{jt}$	0.6703*** (0.1239)	0.4606** (0.2253)	0.6169** (0.2684)	0.1727 (0.3170)
$GOVEXP_{jt}$	0.5344*** (0.0723)	0.0431 (0.0597)	-0.0123 (0.1129)	1.0015*** (0.1845)
$POPGROWTH_{jt}$	-0.1706 (0.5584)	0.2006 (0.4769)	-1.5771 (1.3477)	-3.3749 (2.0880)
Constant	43.1443*** (5.2783)	26.8223 (27.8682)	42.9616*** (8.4258)	61.4896*** (12.6884)
Year fixed effects	Included	Included	Included	Included
Observations	322	292	139	85
Group variable	Host-country	Host-country	Host-country	Host-country
Number of groups	22	22	22	22
$\text{corr}(u_i, X_b) =$	-0.0103	-0.1572	-0.1340	0.0346
σ_u	1.9603584	7.5646154	4.2120843	2.8919157
σ_e	4.6549598	3.4085526	5.3428287	5.3643654
ρ (fraction of variance due to u_i)	.15063723	.8312325	.38329278	.22518223
Within R-squared	0.4723	0.3048	0.4995	0.7006

Notes: Standard errors are in parenthesis *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the level of aggregate institutional quality in host country j at time t based on twelve institutional indicators that are government stability, socio-economic conditions, investment profile, internal conflict, external conflict, corruption military in politics, religion in politics, law and order, ethnic tensions democratic accountability and bureaucracy quality.

Appendix C

Mini case

For example, following the end of the Angolan civil conflict, securing funding for the post-war reconstruction of the country was of utmost importance to the Angolan government formed by the People's Movement for the Liberation of Angola (MPLA). The International Monetary Fund was prepared to offer loans to the Angolan government, but this was based on the fulfilment of certain conditions that included fiscal probity, and improvement of domestic institutions. The IMF proposal was not satisfactory to the Angolan government who appealed to China for assistance. After negotiations between China and Angola began in 2003, the first agreement was signed in March 2004, and by the end of 2007, the China Import and Export Bank had provided a total of \$4.5 billion in loans backed by oil exports to China (Corkin, 2007). A further \$6 billion was granted in July 2010 (Corkin, 2011). These loans were directed specifically towards the rebuilding of the Angolan infrastructure with the loans repayable at the London Interbank Offered Rate (LIBOR) with an additional 1.5 % over a period of 17 years (Bräutigam, 2011). Not only were the loans offered by China acceptable as a financing option for Angolan infrastructure, but it was also without the strings attached demanded by the IMF such the demands of transparency and improvement domestic political and economic institutions. It is no coincidence that the entry into Angola by China Petroleum and Chemical Corporation (Sinopec) occurred not long after the announcement of the first loan of \$2 billion by China Exim Bank in 2004. In the same year, Sinopec acquired a 50 % stake of Block 18 although Shell the previous owner had an agreement in place with Oil and Natural Gas Corporation (an Indian Oil Company) for the purchase of Block 18 (Wall Street Journal 29.03.2010). In somewhat controversial circumstances, the Angolan state-owned oil company Sonangol acting on behalf of the Angolan government refused to approve this agreement and then awarded the stake to Sinopec. In similar circumstances, Block 3/80 was acquired by Sinopec when Sonangol failed to renew Total's contract and

Table B7

List of countries used in the regressions.

Host countries	Home countries
Algeria	Australia
Angola	Brazil
Botswana	Canada
Burkina Faso	China
Cameroon	France
Congo (DRC)	Germany
Cote D'Ivoire	India
Egypt	Italy
Ethiopia	Japan
Gabon	Netherlands
Gambia	Portugal
Ghana	Russia
Guinea	Saudi Arabia
Guinea Bissau	South Korea
Kenya	Spain
Liberia	Turkey
Libya	UAE
Madagascar	UK
Malawi	United States
Mali	
Morocco	
Mozambique	
Namibia	
Niger	
Nigeria	
Republic of the Congo	
Senegal	
Sierra Leone	
Somalia	
South Africa	
Sudan	
Tanzania	
Togo	
Tunisia	
Uganda	
Zambia	
Zimbabwe	

acquired further shares in block 15 (20 %), 17 (27.5 %) and 18 (40 %) after the formation of a joint venture with Sonangol called Sonangol Sinopec International (SSI).

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