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Yulei Li
Durham University, yulei.li@durham.ac.uk

Shan Shan
Northumbria University, shan.shan@northumbria.ac.uk

Zhibin Lin
Durham University, zhibin.lin@durham.ac.uk

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What E-gov Systems should African Countries Invest In? A Panel Data Analysis (Full Paper)

Yulei Li

Durham University

Stockton Road

Durham

DH1 3LE

UK

Yulei.li@durham.ac.uk

Shan Shan

Northumbria University

2 Sandyford Road

Newcastle upon Tyne

NE1 8SB

Shan.shan@northumbria.ac.uk

Zhibin Lin

Durham University

Stockton Road

Durham

DH1 3LE

UK

Zhibin.lin@durham.ac.uk

Abstract

Can applying e-gov increase African countries' FDI inflows? While e-gov has been proved to improve various aspects of governance, the link between e-gov and FDI inflows seems to be ignored by previous literature. At the same time, as an emerging economy, China's outward FDI has increased steadily in recent years. However, China's OFDI flows to Africa is relatively low compared with the flows to Asia and other industrialised economies. Leveraging the current literature, this study used institutional factors by Kaufmann and indices of ease of doing business to explore how each institutional factor influenced by e-gov affect FDI inflows from China. This research argues that to attract more China's FDI, African countries should invest in those factors which can influence FDI inflows, such as staring a new business and paying taxes. This study contributes to the literature by revealing the most influence factors for African countries to invest e-gov in to attract China's OFDI.

Keywords: E-gov, Institutional Quality, Ease of doing business, China's FDI, Africa, International Business, OFDI, E-governance

1 Introduction

The benefits of electronic governments (e-gov) on institutional quality of a country, such as reducing search and coordination costs, paper handling and wait for business start-up (Veiga, Janowski, & Barbosa, 2016) and reducing corruption (Arwati & Latif, 2019) have encouraged more public organisations to embrace it. However, whether applying e-gov in host countries can attract more Foreign Direct Investment (FDI) from outside is still the myth. For developing regions, like African countries, FDI plays an essential role in their economy. The foreign direct investment makes a more significant contribution to economic growth than domestic investment by driving the technology spillover effect from developed countries to developing countries (Borensztein, De Gregorio, & Lee, 1998; Kahouli & Maktouf, 2015). However, because of poor infrastructures and weak institutions, namely 2% of global FDI flows to African countries (Asiedu, 2006; De Maria, 2009; Rodríguez-Pose & Cols, 2017). Therefore, it is necessary to explore whether and how the application of e-gov can influence their institutional quality and further affect the FDI flows to host countries.

There have been many theoretical and empirical studies on how the institutional quality of host countries can influence the inflow of FDI. Most previous studies refer the institutional quality to the framework developed by Kaufmann, Kraay, and Mastruzzi (2009) which includes six factors: voice and accountability; political stability and absence of violence; regulatory quality; the rule of law; control of corruption and government effectiveness. Recently, a new index which is developed and measured by the world bank also has a relationship with e-gov. This index measure how easy to start and operate a local firm in the economy and it is measured based on the Distance to Frontier (DTF) of ten sub-indices including starting a new business; dealing with construction permits; getting electricity; registering property; getting credits; protecting minority investors; paying taxes; trading across borders; enforcing contracts; resolving

insolvency (The World Bank, 2018a). It can be predicted that the higher score of "ease of doing business" index in the host country, more investors are willing to invest in this country because it means the operating costs of the business will be lower than those in countries with a lower score. With the index, Linda and João (2018) note that e-gov help businesses owners by decreasing bureaucratic procedures, and by disseminating good practices related to transparency and accountability.

However, there is scarce research discussing whether the e-gov with the country can attract more FDI and few empirical studies take this factor into account with the other six factors when analysing the effect of "institutional quality" on FDI inflows. Although there are a few researchers who investigate the impact of ten sub-indices of "ease of doing business" index on FDI inflows, most of them use static analysis rather than dynamic panel data regression analysis.

To address the literature gap, this research will take Chinese FDI to African counties as an example to explore whether the e-gov can help African counties on attracting more investment in the future and fatherly to cope with slow growth, poverty and inequality. The primary objective of this research is to analyse the panel data (including cross-sectional and time-series data) across 22 African countries for the period 2007-2016 to explore whether and how the sixteen individual institution indicators in African countries can impact on China's OFDI inflow.

The main contribution of this study is 2-fold. First, this study enriches the insight of how the institution of host countries in Africa can attract China's investors by combining the ten sub-indices with the traditional Kaufmann's framework and by using dynamic panel data analysis. The results have a direct implication to African countries attempting to attract greater FDI from China. Establishing the right policies based on the differences becomes imperative. Second, this study can provide practical implications and suggestions for African countries to decide which institutional field to invest e-gov resources to, by providing the different impacts of individual indicators.

2 Literature review

2.1 Link between e-gov and institutional quality
The application of e-gov may increase institutional quality-related factors, such as government effectiveness and also improve the business environment, such as ease of doing business. There have been various studies on how e-government can influence the institutional quality in those countries. An effective e-gov system can reduce the burden of starting a new business and other business activities. Martins and Veiga (2018) conduct a panel analysis across over 160 countries. They argue that there is a positive and significant relationship between e-gov and six Ease-of-Doing-Business indices, such as starting a new business and getting credit. Ebenezer (2018) also prove that applying e-gov in a country can make starting a new business and paying taxes

easier. However, the influence of e-gov adoption in different regions, such as Africa, can be distinct. de Oliveira Almeida and Zouain (2015)

Besides the research on the influence of e-gov on ease of doing business, scholars have also paid attention to other institutional factors. Zouain, Almeida, and Sato (2013) conduct a panel analysis and claim that the preparation of e-gov can lead to a dynamic business environment and less perception of corruption level.

To decide what specific e-gov system African countries should invest, exploring the link between individual, institutional factors and FDI inflows should not be ignored.

2.2 Link between institutional quality and FDI inflows
In the modern era, China began to reintegrate with the global economy with the 'Open Door' policy initiated by Deng Xiaoping (Peter J Buckley et al., 2010). After Deng Xiaoping, the Chinese government did not change its principals of involvement with other countries, such as mutual benefits, compliance with obligations, provision of equipment made in China, etc. (Chaponnière, 2009; Larkin, 1971). In 1971, Africa was a critical player in securing China's membership at the United Nations (Kolstad & Wiig, 2012). After the Tiananmen Square event in 1989, the international community isolated China who urgently needed allies to combat against the America and China also required natural resources to support its rapid economic growth (Campbell, 2008). In 2006, China published the China Africa Policy encapsulating all aspects of the relationship between China and Africa (Van Dijk, 2009). Although the China Africa policy did provide a specific action plan on how to accomplish the goals, it did show that China decided to maintain the relationship with Africa in a long-term (Van Dijk, 2009). Kolstad and Wiig (2012, p. 34) mention that "FDI, trade, and aid represent the key economic channels of interaction between China and African countries". The three flows are interlinked, and the interaction of three flows are essential to understanding the impact of Chinese investment in Africa (Kolstad & Wiig, 2012).

Between 2005 and 2016, Chinese investors had invested 293 FDI projects which valued at US\$66.4 billion (Ernst & Young, 2017). As China's OFDI kept increasing during the last decade, a common agenda in literature is how institutional quality and political risk of host countries can attract China's OFDI. Traditional internationalisation theories suggest that poorer institutional quality is generally associated with a lower level of FDI inflows because high political risk and low institutional quality mean the increased uncertainty and sunk costs of international firms (Peter J. Buckley & Casson, 1998; Chakrabarti, 2001). While there are many measurements of institutional quality in literature, most previous studies use the framework developed by Kaufmann et al. (2009) which includes six factors: voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption. Thus, for government effectiveness, Kaufmann et al. (2009) use "government effectiveness" cluster to measure the ability of the government in producing and implementing good policies and delivering public goods. This factor

includes "the quality of public service provision, the quality of the bureaucracy, the competence and independence of the civil service, and the credibility of the government's commitment to policies"(Kaufmann et al., 2009, p. 255). Many empirical studies believe that government effectiveness can significantly impact the growth and productivity of the country Globerman and Shapiro (2003); (Rodrik, 1999) Naudé and Krugell (2007). Therefore, it is reasonable to note that the factor "government effectiveness" can significantly influence the inflow of FDI, and the first hypothesis is as follow:

Hypothesis 1: *Government effectiveness in an African country is positively related to the inflows of China's FDI.*

Howell (2011) defines control of corruption is an assessment on how well a host country can control their corruption within the political system, and he explains that bribery may impede foreign investment by reducing the efficiency of government and by introducing instability. Concerning the effect of corruption on China's FDI to Africa, Cheung, De Haan, Qian, and Yu (2012) present a negative correlation between corruption and the inflow of China's OFDI. However, some empirical studies show different results on the effect of corruption. For example, Gu (2009) and Shan, Lin, Li, and Zeng (2018) claim that the high level of corruption in Africa does not hinder Chinese investors. Although Habib and Zurawicki (2002) explains that Chinese investors understand how to take advantage of corruption to achieve goals, Kwok and Tadesse (2006) note that the instability and uncertainty caused by corruption can involve hidden costs which can concern foreign investors. Asiedu (2006) uses panel data for 22 countries over the period 1984-2000 and agrees that the corruption level can have an adverse effect on promoting FDI inflows. Thus, we present the second hypothesis as below:

Hypothesis 2: *Control of corruption in an African country is positively related to China's FDI to that country.*

To discuss the specific relations between e-gov and attacking FDI, we extend a new institutional factor, called "ease of doing business" which is developed and measured by The World Bank (2018a). The World Bank Group has been collecting data and ranking 190 economies across the globe on their ease of doing business since 2003. Ease of doing business can help decision-makers, including government policymakers, business owners, and investors understand the business environment in an economy from a new perspective. Although the World Bank does not declare that the improvements in the ranking can help countries attract more FDI (Jayasuriya, 2011), much empirical research has confirmed the positive relationship between the "ease of doing business" ranking and the inflows of FDI from other countries. Bartels, Alladina, and Lederer (2009) even note that without an improved rank of the ease of doing business, there is no point to offer incentives to attract FDI. However, some scholars express some doubt on the link between the ease of doing business rank and the inflows

of FDI. Corcoran and Gillanders (2015) analyse how ease of doing business can influence the FDI inflows in 36 Sub-Saharan African and Asian countries and claim that the significance of the relationship between the two occurs only in middle-income nations but not in Sub-Saharan African. Therefore, it is critical to examine whether the ease of doing business rank can influence the location decision of the investors from China. At the same time, not all the factors in the ease of doing business index related to the e-gov, this research will make the hypothesis which is only associated with the e-gov.

According to The World Bank (2018b), this index "measures the paid-in minimum capital requirement, number of procedures, time and cost for a small- to medium-sized limited liability company to start up and formally operate in economy's largest business city". The higher score of this index means the lower costs of starting a business (The World Bank, 2018b). Thus, we made our third hypothesis:

Hypothesis 3: *The ease of starting a new business is positively related to the inflows of China's FDI.*

As The World Bank (2018b) notes, the score of dealing with construction permits can measure how easy to build a warehouse in an economy, including "obtaining the necessary licences and permits, submitting all required notifications, requesting and receiving all necessary inspections and obtaining utility connections" (The World Bank, 2018b). The e-gov can significantly reduce the dealing time and cooperation cost due to the development of ICT (Veiga et al., 2016). Thus, a better score of the index means fewer costs of obtaining all required building licences and better building quality. For those profit-driven investors, a higher score of this index can increase their profitability. Thus, we predict that the lower cost of obtaining construction permits can attract Chinese investors, and this leads to the fourth hypothesis:

Hypothesis 4: *The ease of dealing with construction permits is positively related to the inflows of China's FDI.*

Getting electricity measures how easy for a new warehouse to connect to permanent electricity The World Bank (2018b). Geginat and Ramalho (2015) use the fixed effects model for a cross-sectional dataset to examine the correlation between better electricity connection process and firm performance by using total sales as a measure of output. They find that firms perform better, where it takes fewer costs and time to obtain a reliable electrical connection. Geginat and Ramalho (2015) also mention that some industries which rely heavily on electricity, such as manufacturing refined petroleum, are even more likely influenced by the ease of getting electricity connection than other sectors. Thus, this study predicts that:

Hypothesis 5: *The ease of getting electricity is positively related to the inflows of China's FDI.*

Getting credit examines how strong the credit reporting systems in an economy are and how effective collateral and bankruptcy laws regarding lending are (The World Bank, 2018b). This index matters a lot to financial lenders. They are least likely to provide credit if there is no legal system to enable them to collect debt or collateral with low transaction costs, or in other words, with a cost-effective process (The World Bank, 2018b). With a higher ranking of getting credit index, it is easier and less costly for entrepreneurs to obtain funds or resources for growth.

Hypothesis 6: *The ease of getting credits is positively related to the inflows of China's FDI.*

Paying taxes measures how much taxes and other mandatory contributions a medium-size company in an economy should pay in a given year, as well as records the tax administration (The World Bank, 2018b). Within the e-gov, it is easier to check how much tax the investor should pay, which also integrate the government and the investors by using technology. The ranking of ease of paying taxes is determined by their distance to frontier scores like other factors and firms in an economy with a higher ranking are most likely to consider tax rates as less of a barrier to their business (Djankov, Ganser, McLiesh, Ramalho, & Shleifer, 2010; Romer & Romer, 2010; The World Bank, 2018b). The index is essential for both the design of tax policy and economic growth (Barro, 1991; Baumol, Litan, & Schramm, 2007; Summers, Bosworth, Tobin, & White, 1981). Therefore, we predict that the improvement of host countries paying taxes index can attract more FDI from Chinese investors and developed the hypothesis as below:

Hypothesis 7: *The score of "paying tax" index is positively correlated with the inflows of China's FDI.*

3 Methodology

The researcher gathered the panel data from 22 African countries across ten years period (2007-2016). Due to the benefits of panel data analysis, this study used the panel datasets gathered from the Statistical Bulletin of China's Outward Foreign Direct Investment, the World Bank Database, the International Country Risk Guide for 22 sample African countries across ten years period. Table 1 presents the dependent and independent variables used in the estimation.

Variables	Proxy for	Sources
Dependent variable		
OFDI	The stock of China's outward FDI to each African country	SBCOFDI
Independent variables		ICRG
va	Voice and accountability	

pv	Political stability and absence of violence	ICRG
ge	Government effectiveness	ICRG
rq	Regulatory quality	ICRG
rl	Rule of law	ICRG
cc	Control of corruption	ICRG
stab	Starting a business	WB
conspermit	Dealing with construction permits	WB
getelect	Getting electricity	WB
regprop	Registering property	WB
getcredits	Getting credits	WB
protminoinvest	Protecting minority investors	WB
paytax	Paying taxes	WB
tradeborder	Trading across borders	WB
enforcecon	Enforcing contracts	WB
resinv	Resolving insolvency	WB

Table 1: Main variables used

Notes: SBCOFDI: Statistical Bulletin of China's Outward Foreign Direct Investment; WB: World Bank Database; ICRG: International Country Risk Guide, the sample period is 2007-2016 (annual)

3.2 Discussion of variables

Dependent variable

The dependent variable in this study is the stock of China's FDI flowing to the sample of 22 African countries from 2007-2016. The data was from the Statistical Bulletin of China's Outward Foreign Direct Investment. We chose the stock instead of net flows of China's FDI because the stock of FDI is a sufficient measurement of how the host countries can create a satisfying business and investment environment for foreign investors.

Explanatory variables

The six other variables (voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law and control of corruption) are the traditional way to measure the institutional quality of a country. The data of all six indices are drawn from the International Country Risk Guide (ICRG) by Political Risk Services (PRS). ICRG is a methodology adopted by the PRS group (The PRS group, 2017). This research used the Distance to Frontier (DTF) figure of ten indices measured by the World Bank as the proxies for ease of doing business. The data are extracted from the database of the World Bank group.

3.3 Model and robustness test

According to the hypotheses developed in the literature review, the central estimate equation of this research is present as follows:

$$China's\ OFDI\ stock_i$$
$$= \alpha_i + \beta_1 va + \beta_2 pv + \beta_3 ge + \beta_4 rq + \beta_5 rl + \beta_6 cc + \beta_7 stab$$
$$+ \beta_8 conspermit + \beta_9 getelect + \beta_{10} regprop + \beta_{11} getcredits$$
$$+ \beta_{12} protminoinvest + \beta_{13} paytax + \beta_{14} tradeborder$$
$$+ \beta_{15} enforcecon + \beta_{16} resinv + \varepsilon_i$$

where α_i denotes the unobserved effect, ε_i refers to the error item, and β_i means the coefficients of all variables in the estimation.

As the researcher expect non-linearities in the correlation based on theory and previous empirical studies, the author applies the natural log transformation to the variables to conduct the regression analysis (Peter J Buckley et al., 2010). Benoit (2011) suggests that, in a regression model, when there is a non-linear relationship between the dependent and independent variables, logarithmically transforming variables is a very commonly used method which can make non-linear relationship effective while still keeping the linear model.

There are four possible combinations of logarithm transformation (Benoit, 2011):
1) $Y_i = \alpha + \beta X_i$ (the original linear case)
2) $Y_i = \alpha + \beta log X_i$ (linear-log transformation)
3) $log Y_i = \alpha + \beta X_i$ (log-linear transformation)
4) $log Y_i = \alpha + \beta log X_i$ (log-log transformation)

The researcher used log-log natural logarithmical transformation where the base is e ≈ 2.71828. After the transformation, the estimate equation is now:

$$lnChina's\ OFDI\ stock_i$$
$$= \alpha_i + \beta_1 lnva + \beta_2 lnpv + \beta_3 lnge + \beta_4 lnrq + \beta_5 lnrl + \beta_6 lncc$$
$$+ \beta_7 lnstab + \beta_8 lnconspermit + \beta_9 lngetelect + \beta_{10} lnregprop$$
$$+ \beta_{11} lngetcredits + \beta_{12} lnprotminoinvest + \beta_{13} lnpaytax$$
$$+ \beta_{14} lntradeborder + \beta_{15} lnenforcecon + \beta_{16} lnresinv + \varepsilon_i$$

As we discussed above, using panel data analysis can help researchers eliminate unobserved effects. There are two popular methods to accomplish it: fixed effects and GLS random effect regression. As Wooldridge (2015, p. 485) defines, "a pooled OLS estimator that is based on the time-demeaned variables is called the fixed effects or the within estimator" and he continues to define a random effect model as a model when the unobserved effect α_i is uncorrelated with each independent variables. The next question is when to use fixed effects and when to use random effects. Hausman (1978) first proposed a test called the Hausman test for the choice of fixed effects or random effects. The null hypothesis of the test is that the difference in coefficients is not precise,

meaning random effects are better than fixed effects in this model. Table 2 below shows the results of the Hausman test of the regression model in the study. It shows the p-value for this test is .0000, meaning we can reject the null hypothesis and accept the alternative hypothesis that fixed effects (FE) are better than random effects (RE) in this study.

Test: Ho: difference in coefficients not systematic $\quad$ Chi2(16) $\quad = \quad$ (b-B) ' [(V_b-V_B) ^ (-1)] (b-B) $\qquad\qquad\qquad$ = 128.12 $\quad$ Prob > chi2 = 0.0000

Table 2: Hausman test results

Before the regression, this study first examined whether the multicollinearity issue exists. According to Wooldridge (2015), multicollinearity issue occurs when there is a high correlation between two or more dependent variables in the model. It is clear that, for estimation, it is better to have less correlation between explanatory variables when everything else is equal (Wooldridge, 2015). Therefore, we produced the correlation matrix, as shown in Table 3 to examine the correlation between all 16 independent variables. Although Wooldridge (2015) notes that it is difficult to define how much correlation among independent variables is too much. He continues to argue the most common threshold used by International Business study agenda is 0.80, meaning if the correlation between two variables is above 0.80, we can claim the two variables are highly related. According to the correlation matrix, multicollinearity should not be an issue in the estimation because the all correlation among the 16 independent variables are below the 0.80 threshold. Therefore, we can conduct the regression.

Table 3 Correlation matrix

	lnva	lnpv	lnge	lnrq	lnrl	lncc	lnstab	lncons	lngete	lnreg	lngetc	lnprot	lntax	lntrade	lnenf	lninv
lnva	1.0000															
lnpv	0.4521	1.0000														
lnge	0.0228	0.0136	1.0000													
lnrq	0.3504	0.2230	0.1519	1.0000												
lnrl	0.0092	0.2847	−0.1187	0.0682	1.0000											
lncc	0.4983	0.5790	0.1276	0.5930	0.2445	1.0000										
lnstab	0.4344	0.3425	−0.0127	0.3372	−0.2185	0.3700	1.0000									
lncons	0.2821	0.2113	0.2658	0.4208	0.0782	0.3934	0.1432	1.0000								
lngete	0.1467	0.2933	0.1556	0.1701	0.2707	0.2216	0.0292	0.2844	1.0000							
lnreg	0.0531	0.2437	0.4268	0.0051	0.2056	0.1649	−0.0672	0.0809	0.1835	1.0000						
lngetc	0.3792	0.2118	0.3327	−0.0186	0.0417	0.1998	0.1950	0.3158	0.3715	0.2435	1.0000					
lnprot	0.6057	0.3475	0.0290	0.0553	−0.2676	0.2199	0.5628	−0.0824	−0.1194	0.1708	0.4371	1.0000				
lntax	0.3531	0.0529	0.1820	−0.0447	0.1620	0.1959	0.0738	0.0049	−0.0171	0.5102	0.2689	0.5371	1.0000			
lntrade	0.0701	0.2201	0.1416	0.3906	−0.0345	0.2384	0.3869	0.1135	0.0764	−0.1005	−0.1014	0.0218	−0.1995	1.0000		
lnenf	0.1938	0.0635	0.2761	0.2995	0.4226	0.3348	−0.1337	0.1102	0.3712	0.2031	0.3158	0.0080	0.1681	0.0470	1.0000	
lninv	0.2205	0.0329	0.1160	0.6075	0.1432	0.3480	0.2018	0.3251	0.1557	0.0507	0.0167	0.0060	0.0731	0.1365	0.2810	1.0000

4.0 Results and discussion

The preliminary results from the regression with fixed effects model, using sixteen independent variables is shown in Table 4.

Variables	Coefficient
Kaufmann's framework	

Voice and accountability (lnva)	1.81**
Political stability and absence of violence (lnpv)	-4.93***
Government effectiveness (lnge)	-.94
Regulatory quality (lnrq)	.40
Rule of law (lnrl)	-3.85***
Control of corruption (lncc)	.10
Ease of doing business	
Starting a business (lnstab)	3.30***
Construction permits (lncons)	.80*
Getting electricity (lngete)	-.61
Registering property (lnreg)	-1.79***
Getting credit (lngetc)	.01
Protecting minority investors (lnprot)	-.69
Paying taxes (lntax)	1.44**
Trading across borders (lntrade)	.14
Enforcing contracts (lnenf)	1.69*
Resolving insolvency (lninv)	-.04

Note: *, ** and *** indicates significance at the 10%, 5% and 1% level

Source: own computation

Table 4: Results of regression with fixed effects model

Government effectiveness: The estimation results show an insignificant relationship between government effectiveness and China's FDI stock, and therefore, H1 was not supported. This finding means that Chinese investors do not concern government efficiency in terms of location decision. This finding contradicts those of much empirical research, such as Buchanan, Le, and Rishi (2012)and Gani (2007), but it is in line with Naudé and Krugell (2007). One possible explanation is that, according to PRS Group (2016), in 2016, China's government effectiveness index is 0.50 which is rather low compared with other industrialised countries investors (United States: 1.00; United Kingdom: 1.00; France: 0.75). In the same year, the mean of the index across 22 African countries is 0.39, which is rather similar to China's figure. As a result, Chinese investors may not concern the government effectiveness as much as other industrialised FDI sources do and

Control of corruption: The estimation results indicate that corruption is not significant in explaining the inflow of China's OFDI to African countries. As a result, this result cannot support H2. This finding confirms the results by Habib and Zurawicki (2002), Shan et al. (2018) and Gu (2009) that Chinese investors do not concern the corruption level of the host countries. It is contrary to the work by Asiedu (2006), Cheung et al. (2012), and Kwok and Tadesse (2006). A possible explanation of the unexpected result is that China has a high level of corruption and therefore, as Habib and Zurawicki (2002) explain earlier, Chinese investors can take full advantages of bribery to gain their benefits, such as the entry of markets which cannot be achieved by regulation formalisation. Therefore, there is still an opportunity for those African countries with a

high level of corruption to attract FDI from China. However, this finding does not necessarily suggest Africa should ignore the reduction of corruption. Instead, African countries should create more formalised procedures and regulations to help Chinese investors achieve and also reduce rent-seeking behaviours.

Starting a business： The estimation results suggest a significant (at the 1% level) and

positive (3.30) relationship between the starting a business index and China's FDI. Therefore, this finding supports our hypothesis H3. Consequently, we suggest African countries should attempt to reduce the "paid-in minimum capital requirement, the number of procedures, time and cost for a small-to-medium-sized limited liability company to start up and formally operate in economy's largest business city."

Dealing with construction permits：The results indicate that dealing with construction permits

index is significantly and positively correlated with China's FDI inflow. It confirms the H4 and suggests that every 1% of the change in China's FDI stock can be explained by 0.79% of the change of dealing with construction permits. It is understandable that if, in a host country, it takes fewer costs and time to obtain an official construction permit, Chinese investors are more likely to choose this country and more willing to establish greenfield projects. Therefore, African countries should reduce the minimum requirements and procedures for Chinese investors to speed up the process of obtaining the necessary licences and permits.

Getting electricity： Table 4.1 indicates no significant correlation between getting electricity and

China's FDI. Thus, H9 is not supported. This finding means Chinese investors do not concern the ease of getting electricity when deciding the investment destination. It runs counter to the expected results for this variable (The World Bank, 2018b) and (Geginat & Ramalho, 2015). As an essential variable for FDI inflows in most literature, we do not expect this finding. One possible explanation is that most Chinese firms investing in natural resources and strategic sectors, such as oil or infrastructure, are owned by states. The Chinese government provides substantial financial and institutional support for those firms. Furthermore, the government should be easier to negotiate with the host countries with more reliable and less costly electricity connection than those investors from industrialised countries. As a result, Chinese investors do not see the getting electricity as an issue as the government has done most of the work for them.

Getting credit： The estimation results show no significant correlation between the African

country getting credit index and China's FDI inflow. Therefore, we find no evidence to support H7. Getting credit measure how easy for investors to obtain credits which are a significant financial resource for firms' growth. We find that the ease of getting credit in African countries cannot influence the location of China's OFDI and this is contrary with the findings by Morris and Aziz (2011)and The World Bank (2018b). As analysed earlier, most of the Chinese outbound investors are state-owned enterprise, and the significant financial support from the Chinese government makes Chinese investors care less about the source of funds than investors from developed countries do. However, this does not suggest that African countries do not need to enhance their credit reporting systems to reduce the uncertainty for the lender to provide funds for enterprises. As Chen, Dollar, and Tang (2015) assert, profits are the most important driver for most private investors from

China. Therefore, developing an environment with secure credit protecting can help Chinese investors access required funds for their growth, to promote the inflow of future FDI from China.

Paying taxes : The estimation results indicate that paying taxes is significantly and positively correlated with China's FDI inflow. It is evident to support H9. The results also show that a 1% increase in host countries paying taxes index is positively associated with 1.44% change in China's OFDI stock in those countries. This finding is in line with current studies by The World Bank (2018c), Bird (2010), Baumol et al. (2007), Summers et al. (1981) and Barro (1991) and Djankov et al. (2010). Chinese investors seem to concern local taxes tremendously when deciding their investment location. This suggests that African countries should reasonably design their tax rates and improve their tax administration, such as keeping tax simple and effective tax administration through risk-based audits as suggested by The World Bank (2018c).

5.0 Conclusion and future implications
While e-gov can influence many aspects of institutional aspects, such as government effectiveness and control of corruption, this study tried to explore whether applying e-gov in African countries can help them attract FDI from China. By exploring the individual effects of multiple institutional quality factors on FDI, this research linked the relationship between e-gov and FDI inflows.

For policymakers of African countries. As this study provides essential insight on how e-gov in host countries can affect the institutional quality and further influence China's ODI flows to African countries, those policymakers of African countries should take full advantages of the key findings to attract more FDI from China. Due to the scarcity of resources is the underlying assumption of economic theory, the governments of African countries should use the limited resources to focus on those factors which can significantly influence China's ODI. For example, according to the estimation results, Chinese investors do not seem to concern the effectiveness of government and the corruption level in host countries as much as other industrialised countries. Therefore, African countries should not adopt the e-gov system for merely increasing their government effectiveness and reducing the corruption level. On the contrary, those investors from China do concern the ease of actually setting up and operating businesses, such as the ease of starting a new business and paying taxes. Therefore, African policymakers should invest and develop the infrastructure and software system to make setting up businesses and paying taxes easier to attract more FDI from China.

For future studies, researchers are encouraged to gather more data and explore the effect of institutional quality on these two types of Chinese investors respectively, and this would provide valuable knowledge for African countries on how to attract different Chinese investors.   Second, there is very little literature on the effect of dealing with construction permits and registering property on FDI. The ease and costs of obtaining construction permits and registering are essential for foreign investment, particularly the greenfield projects. According to UNCTAD (2018), the number of China's greenfield projects dropped slightly since 2015. Increasing the scores of these two indices may stimulate the inflows of China's FDI. Thus, future studies should pay more attention to both theory and empirical research on these two indices and their effects on import, export and FDI inflow. Third, we motivate future researchers to gather more updated datasets with

more countries and a more extended period for more accurate estimation results. The panel data this research used is for 22 countries over ten years period. Therefore, more cross-sectional samples and the more extended term can add more complete and dynamic insight to literature and provide more accurate implications for policymakers of Africa and China.

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