

Determining Foreign Direct Investment Inflows of African Nations through Property Rights

Master's Thesis

Melle Simonis - S4144783

Abstract. Foreign direct investment (FDI) plays an important role in the development of the nations on the African continent. However, the success of these nations in attracting FDI is low when compared to the developing nations outside the continent. A possible explanation for this is the poor state of the continent's property rights, which may discourage potential investors from investing in and developing Africa's land. This study provides the first continental-scale analysis of whether property rights determine the level of FDI flows towards African nations. I examine the effect of property rights protection on the inflow of FDI within 27 African nations through a panel data analysis. The results show that nations with the most well-defined and enforced property rights systems receive on average three times more FDI than nations with the weakest property rights. Additional findings demonstrate when property rights are weaker, more Chinese FDI is attracted by the nation's natural resources. This study's findings demonstrate the importance of property rights in creating an enabling environment for investors and also indicate how this enabling environment is different for Chinese investors.

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Supervisor: Dr. M.N. Daams

Rijksuniversiteit Groningen

Real Estate Studies – Faculty of Spatial Sciences



university of
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1. Introduction

Due to globalization, international economic and financial barriers are diminishing, causing developing economies to have an increased access to foreign direct investment (FDI) (IMF, 2007). This increased FDI inflow has been critical for developing nations because of its potential impact and benefits to economic growth, employment, technological innovation, international competitiveness and integration into the global economy (Asiedu, 2002). In Africa, FDI has overtaken development assistance as its main source of foreign capital inflow and is ascribed a crucial resource for the entire continent (UNCTAD, 2017).

Nevertheless, while its reliance on FDI for economic growth is high, Africa nations continue to receive the lowest volume of FDI in the world despite their enormous growth potential and efforts to create an enabling environment for foreign investors (UNCTAD, 2019). Africa is often perceived as a continent ravaged by weak governance such as corruption and political instability, ultimately limiting its ability to attract foreign investment (Gillanders & Parvianen, 2018).

Another sign of weak governance is the general state of property rights in the continent. Some say there are few greater challenges to the human mind than to discuss the state of property rights in Africa (African Liberty, 2019). In more objective terms, the World Bank estimates that roughly 90 percent of Africa's rural land is undocumented (World Bank, 2013). The World Bank (2013) also states that many African nations use antiquated property rights systems¹, inherited at independence, leaving farmers unable to cultivate their land effectively and depriving investors of access to title deeds that are required to develop the plots or to use the land as loan collateral. This may discourage potential investors from investing in and developing land as required to accommodate economic production and growth processes. Therefore, our focus on property rights is imperative to better understanding Africa's weak performance in attracting FDI.

A few studies have considered the importance of property rights in attracting investments to Africa. Fenske (2011) provides a summary of this existing body of research on property rights in Africa which reveals evidence regarding the existence of a positive causal relationship between property rights and investment incentives. This existing research does leave a gap when it comes to foreign direct investment as only domestic investment is being

¹ African nations consistently score poorly in long-standing annual property rights indices such as those published by the Fraser Institute, the Heritage foundation, the IPRI and the World Bank's Ease of Doing Business Rankings. These indices measure both the degree to which a nation's laws protect private property and the degree to which those particular laws are enforced.

studied, primarily in the agricultural sector. A research by Muli & Aduda (2018) does examine the influence of economic integration on FDI by using data from East-African nations, finding that property rights are important in transmitting the effect of economic integration to the attraction of FDI and recognizing property rights as being one of the contributors responsible for increasing intraregional trade between the four nations. The direct effect of property rights on the FDI-inflow in the entire continent however, remains unexplored.

Studies explaining the poor performance of FDI attraction in Africa instead present a multitude of different reasons for the continent's relatively poor performance. For example, Asiedu (2002) distinguishes the nations in Africa from other developing nations by their inability to attract FDI due to their excessive political risk. The research indicates an adverse regional effect for nations within the continent: an African nation will receive less FDI by virtue of being located on the continent, meaning that investors undervalue opportunities within Africa.

Kinuthia and Murshed (2015) research FDI determinants in Kenya, finding exchange rates, wages, volatile inflation rates, financial development and trade openness to be significant influencers of FDI-inflow. Alfaro et. al (2004) demonstrates the significance of inflation rates and black market exchange rates in determining FDI worldwide. Seyoum et. al (2014) establish a bidirectional casual relation between FDI and trade openness within Sub-Saharan Africa. Results by Adams (2009) and Cleeve et. al (2015) show trade openness and inflation rate to be significant in explaining FDI in Africa. They argue that the human capital stock is also an important factor in the explanation of FDI within the continent. Research by Akinlo (2004), Adams (2009) and Kinuthia and Murshed (2015) demonstrates that policies targeting the promotion of macroeconomic stabilization, financial development and trade openness are essential for the improvement of the investment framework in order for a nation to benefit from these FDI-inflows. Results by Anwar and Cooray (2012) demonstrate that the region of South-Asia does indeed benefit more from FDI-inflows than Africa due to their stronger investment framework. This means that a stable financial climate and the ability to trade not only enhance FDI inflows, but also increase its potential for economic growth.

A number of empirical studies try to understand the relationship between governance and FDI within Africa, with most of them finding a significant and positive relationship between governance related variables and global FDI inflows to the continent. Dupasquier & Osakwe (2006), Adeleke (2014), Okafor et. al (2017), Epaphra (2018) and Ali et. al (2018) provide evidence that characteristics of governance such as the quality of infrastructure, political stability and control of corruption are significant determinants of the low volume of

FDI in the continent. This is in contrast however with research by Onyeiwu and Shrestha (2004), Loots and Kabundi (2012) and Akhtaruzzaman et. al (2018). They examine FDI flows to African nations, finding the size of a nation's economy and its natural resource endowment to be significant and institutional factors such as political rights, infrastructure quality and overall strength of institutions to have a less robust impact on determining its volume.

This study will provide a unique analysis of property rights and FDI of many African nations and may help further understand what influences FDI-inflow for African nations by analyzing the interaction between their FDI-inflow and their level of development regarding the protection of property rights. To this end, I observe data of 27 African nations as sourced from the World Bank², UNCTAD and the Fraser Institute. A panel regression allows us to control for variables we cannot observe or measure such as cultural factors or difference in business practices across African nations. Controlling for these effects that are specific for every nation helps us to get an unbiased estimation of the effects of property rights on an African nation's FDI inflow by observing country-specific changes in their levels over time. The following central research question is formulated to form the basis of this research: "To what extent do property rights influence the foreign direct investment inflow of African Nations?"

In addition, this study separately examines Chinese FDI outflows to Africa as a number of empirical studies find governance to have insignificant or negative effects on FDI inflow from Chinese sources. Shan et. al (2018) finds the biggest markets in Africa receiving the relative largest slices of Chinese FDI, while they find all governance related factors except for voice and accountability of citizens to be either insignificant or even negative in determining this volume. Sy and Sow (2019) also find Chinese FDI to be either unaltered by governance characteristics or to be negatively influenced by them. Cheung & Qian (2008) find the relationship between institutional strength and Chinese FDI-flows to be insignificant on a global scale, while finding natural resources to play an important role in determining Chinese FDI. These results demonstrate that determinants of Chinese FDI might differ from general FDI inflows to Africa, as governance is a mostly insignificant factor in explaining its variance.

1.1 Outline

This research is dawned by an overview of recent FDI inflows to the nations within our sample, followed by the existing theory on the subject. The research then presents an overview of the

² These nations include Algeria, Benin, Botswana, Burundi, Cameroon, Cote d'Ivoire, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Tunisia, Uganda and Zambia.

used data and an explanation of the research methodology. The empirical part of the research is executed through a panel regression analysis which identifies the relationship between FDI and property rights. A separate analysis for FDI inflow from Chinese sources ends the empirical section. These results are followed by an extensive analysis that ultimately seeks to answer the main research question. A conclusive chapter, joined by policy implications and recommendations for future research, will finish the paper.

2. Overview of recent FDI inflows to African nations

Technologic innovations in the last decades – namely those in transportation – have led to substantial increases in FDI on a global scale (Te Velde, 2006). Africa enjoyed this surge in FDI as well, with many of its nations lifting their capital controls and trade restrictions around the end of the previous decade in order to participate more effectively in the global economy and attract a higher inflow of FDI (Rodrik, 1998). Africa has thus experienced an increase in the volume of FDI inflows over the past decades, though to a lesser extent than other developing regions in the world such as South-East Asia and South America (UNCTAD, 2017).

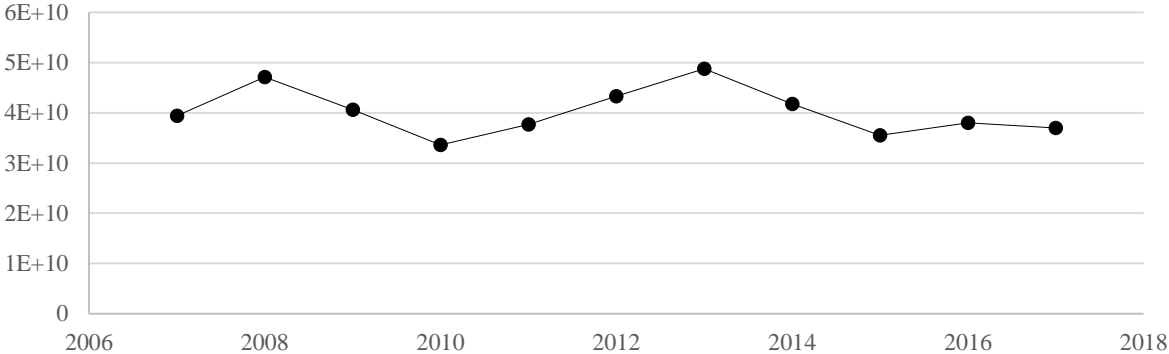


Figure 1. Total FDI inflows to African nations 2007-2017 (Data: World Bank, 2018).

Figure 1 shows the total FDI inflows to African nations within our sample. A likely explanation for its decline in FDI attraction from 2009 to 2010 is the 2008 global financial crisis, which had strong adverse effects on the economic growth of nations with a relatively big economy such as Egypt and South Africa (World Bank, 2018). After a period of recovery, FDI inflows to the African nations in our sample have declined again by almost 15% between 2012 and 2017. The World Investment Report by UNCTAD (2017; 2018) ascribes this general decline to the state of commodity prices in the continent as well as the decrease in global oil prices.

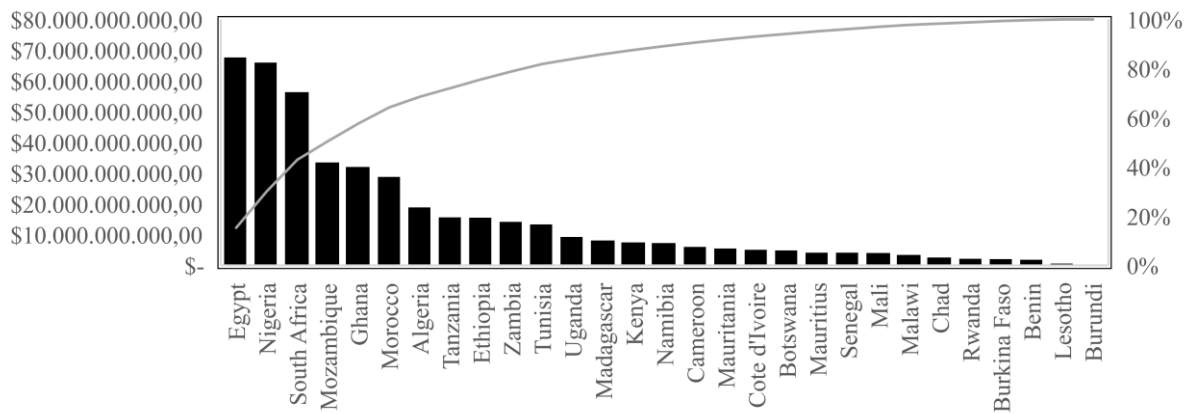


Figure 2. Total FDI-Inflow per Nation 2007-2017 (Data: World Bank, 2018).

The sum of FDI inflows within our sample are asymmetrical, with Egypt, Nigeria and South Africa receiving almost 50% of the FDI as shown by the pareto line in figure 2. The variations in FDI inflow as illustrated in figure 1 can be explained mostly by the performances of these 3 nations, as their volume of FDI outweighs the relatively smaller variations in FDI in many of the other nations within the sample (UNCTAD, 2019).

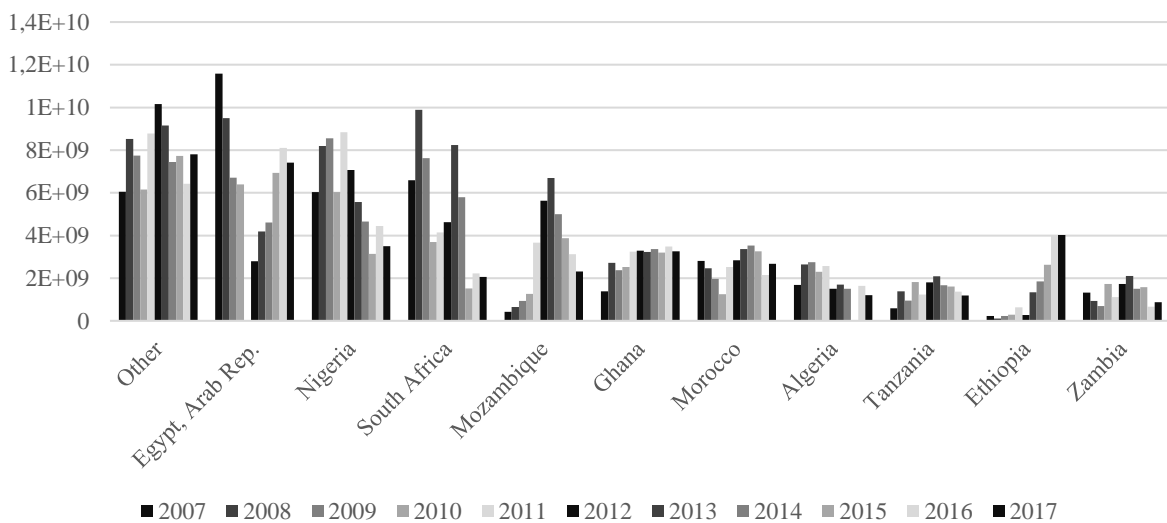


Figure 3 FDI-Inflow per Nation 2007-2017 (Data: World Bank, 2018).

Figure 3 shows the FDI inflows to the ten biggest recipients of FDI in our sample, where “other” refers to the sum of annual FDI inflow from the remaining 17 nations. Egypt is the largest recipient of FDI within the continent, with large FDI inflows coming from international oil

companies and large-scale infrastructure projects in the past few years. In figure 3 it is visible that Egypt's FDI inflow in 2011 is (below) zero, a likely explanation for this is the Egyptian revolution of 2011, which had a strong negative effect on the nation's economic growth (Bayar & Gavriletea, 2018). Nigeria is a close second and obtains most of its FDI through the oil industry as well, although its FDI inflow has been decreasing since 2011. The world investment report by UNCTAD (2019) attributes this decline to the risk associated with the nation's recent instability concerning its elections, the low oil prices and the recent prevalence of disputes between its government and MNE's. The third largest recipient within our sample is South Africa, mostly thanks to its many special economic zone programmes and strong tertiary sector consisting mostly of financial services (SARB, 2019). It is difficult to point out the causes of its relatively poor performance from 2015 until 2017, although the presidency of Jacob Zuma that lasted until 2018 is often ascribed a negative role in the development of an attractive business climate for foreigners (SG, 2019). An example of this that relates to this study was his 2015 announcement to revise the Land Law in order to restrict property rights for foreigners, a law that was never passed in the end. It is interesting to note that FDI inflows are becoming more evenly distributed when comparing the first three years of our sample with the last three years. Nations such as Ghana and Ethiopia are becoming a more popular destination for FDI in their respective regions as they present high natural resource rents and a relatively stable political climate (UNCTAD, 2019).

3. Property right as an imperative to economic activity and trade

The recognition of the importance of property rights for economic activity dates as far back as the time of the classical economists such as Karl Marx and Adam Smith. However, it is only fairly recently that modern economists have accepted this notion of the central position of property rights in the process of economic development. While economists previously focussed on accumulation of capital and savings as the key drivers of economic growth, it is now understood that individuals cannot partake in efficient accumulation and saving when there is a substantial risk of expropriation from private and/or public sources (see Weingast, 1995; Besley & Ghatak, 2010).

Past critique on this central position of property rights exists in the institutional approach to economic development brought forward by North (1990). Property rights are an important element of the institutional structure of an economy, but they are not an exogenous factor as they are shaped by influences from societal, political and economic sources. This means that

the existence of laws regarding property rights is meaningless when in practice they are poorly administered and the implication of the laws constantly change. It should therefore also be considered that the property rights should be well documented, clearly understood and fully enforced for them to take this central position in allowing economic activity (and growth for that matter).

Property rights influence the pattern of production by determining who has the rights to a particular asset, allowing ownership to separate from control. With this in mind it quickly becomes clear how crucial property rights are for the development of a rental and development market. Other than the reassurance of secure ownership, well-developed property rights institutions could for example also enforce collateral in a mortgage contract to reduce default risk. Alchian and Demsetz (1973) theorize how the right to exclude non-payers has the ability to drive down transaction costs of assets by preventing a free-rider problem. They argue that this characteristic of property rights is very important in its ability to determine economic activity as it allows investors to secure returns on infrastructure developments (through toll-roads or tickets for instance) and real estate (through rent) without having non-payers benefit from these assets. Thus, well-defined and enforced property rights allow for plots of land not only to be securely developed, but also allows them to generate more profit.

In order for these plots of land to be traded on the land-market, well-defined property rights need to be in place that allow for the formulation and enforcement of trade contracts. These contracts allow those who have the highest utility from using the land to use it effectively. Besley and Ghatak (2010) demonstrate that the utility of renting out the land decreases if the risk a tenant leaves increases. In theory the land will always be rented out to the person with the highest utility, but when rental contracts are not effectively enforced, the utility reached from renting out the land will decrease and an owner is more likely to resort to autarky.

However, when looking from the perspective of the (international) tenant instead of the landowner, we can apply the 'eclectic paradigm' by Dunning (1977, 1993). This framework categorizes three types of advantages that determine whether a firm should engage in foreign direct investment based on the comparative advantages it might enjoy. These consist of Ownership, Location and Internalization advantages (hence it is also known as the OLI Framework). All advantages should in theory be present in order for a firm to engage in foreign direct investment, otherwise a firm is better off staying domestic, simply exporting the good or outsourcing the production of the good through a license. Since reliable and reputable property rights are a necessity for ownership advantages, the benefits of engaging in FDI should increase

when property rights are well developed. Based on the arguments above, the hypothesis is as follows:

H1: African nations with more well-defined and enforced property rights have a higher inflow of foreign direct investment.

Established theory suggests that foreign investors in search for profitable opportunities will require more developed property rights. It is therefore plausible to expect that property rights have a strong positive impact on the amount of FDI an African nation receives.

4. Methodology and Data

4.1 Property Rights

Index scores for property rights are drawn from the Fraser Institute's yearly 'Economic Freedom of the World report'. Their property rights index consists of 9 variables and indicates the ability for an individual to accumulate and use private property that is effectively protected by the government. The combination of these equally weighted variables is then adjusted for potential gender disparities as some property right systems exclude women from the right to own (and develop) property negatively affects their ability to participate in the economy (World Bank, 2013). The variables that make up the index score of property rights are 'Juridical Independence', 'Impartial courts', 'Reliability of police', 'Business costs of crime' and 'Protection of property rights', which are based on survey data by the World Economic Forum (2018). The variables 'Military interference in rule of law and politics' and 'Integrity of the legal system' are obtained through the 'International Country Risk Guide' by the PRS group (2018). The variables 'Legal enforcement of contracts' and 'Regulatory costs of the sale of real property' are obtained from the World Banks 'ease of doing business' rankings (2018). The combination of these equally weighted variables amalgamates to an index score that completely measures the variable 'property rights' and its governments ability to protect and enforce them as defined by the World Bank: *"Property Rights are the indication to which a nation's legal framework allows individuals to freely accumulate private property, secured by clear laws that are enforced effectively by the government. They signify the degree to which a nation's laws protect private property rights and the extent to which those laws are respected. They also assess the likelihood that private property will be expropriated by the state and portray the*

independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts.” (World Bank, 2019).

4.2 Foreign Direct Investment

A foreign direct investment is an investment made by an entity into a business in another nation. The difference with ‘other’ foreign investments is that in order for the investment to be labelled as FDI, foreign business operations need to be established or foreign business assets need to be acquired. Merely purchasing an equity of a foreign company is not classified as FDI. The inflow of FDI in US Dollars from 2007 until 2017 is obtained through the World Bank’s World Development Indicators (2019).

4.3 Control variables

Based on our literature overview, ten control variables have been selected for the analysis. These consist of Economy Size, Population Size, Trade Openness, Natural Resources, Inflation Rate, Exchange Rate, an Infrastructure index score, Gross Capital Formation (as % of GDP) and dummies for the development of Human Capital. The studies that support the inclusion of these control variables are listed in table 1. The inflation rates of Madagascar, Mozambique and Tunisia have been partially obtained through Statista (2019).

Economy Size (controlled by Population Size), Trade Openness, Infrastructure Quality and Human Capital are included on the grounds that they directly relate to the eclectic paradigm by Dunning (1977, 1993) as bigger and/or more developed markets present more opportunity for growth (see: Asiedu, 2006). Natural Resources are included as the concentration of FDI inflows across Africa strongly reflect the distribution of natural resource endowments, especially in the case of the least developed nations (see Rodríguez-Pose & Cols, 2017). Both Inflation- and Exchange Rates measure macroeconomic stability and thus are an indicator of both risk and competitive advantages on a financial level. Gross Capital Formation controls for the accumulation of capital which is a strong determinant of long-term economic growth, thus creating an enabling environment for foreign investors (see Ugochukwu & Chinyere, 2013).

These control variables are added in order to clearly identify the relationship between property rights and FDI and have been selected based on their ability to predict variance in FDI based on the literature. Their definitions, sources, expected signs and supported studies are summarized in table 1. The expected signs are based on the results of the supported studies.

Table 1. Overview of variables and expected sign based on theory.

Variable	Abbrev.	Definition	Source	Exp. sign	Supported studies
Foreign Direct Investment	$\ln FDI$ ($\ln CFDI$)	The log of the inflow of (Chinese) foreign direct investment in US Dollars.	WDI (2020) CARI (2020)		
Property Rights 1. Very poor 2. Poor 3. Strong 4. Very strong	PR	Index score of the strength a nation's property rights. Divided into 4 groups based on equal cut-offs and a normal distribution of scores.	Fraser Institute (2018)	$\beta > 0$	Direct relationship has not been researched yet.
Economy Size	$\ln GDP$	Log of a nation's gross domestic product.	WDI (2020)	$\beta > 0$	The impact of GDP on FDI is well established
Population Size	$\ln Pop$	Log of a nation's population count	WDI (2020)	$\beta > 0$	Controls for the relative productivity of the economy
Trade Openness	$Trade$	The ratio of a nation's GDP that is composed of trade.	WDI (2020)	$\beta > 0$	Adams (2009) Seyoum et. al (2014) Cleeve et. al (2015)
Natural Resources	$\ln Nat$	Log of the ratio of fuel and metal exports to merchandise exports.	WDI (2020)	$\beta > 0$	Onyeiwu & Shrestha (2004) Loots & Kabundi (2012) Akhtaruzzaman et. al (2018)
Inflation Rate	$\ln R$	Log of the inflation rate of a nation, measured through consumer prices.	WDI (2020) Statista (2020)	$\beta < 0$	Adams (2009) Kinuthia and Murshed (2015) Cleeve et. al (2015)
Exchange Rate	E	The exchange rate of a nation, measured as local currency units to US Dollars.	WDI (2020)	$\beta > 0$	Basu & Srinivasan (2002) Alfaro et. al (2004) Kinuthia and Murshed (2015)
Infrastructure Quality 1. Poor 2. Strong	$Infra$	Index score of the strength of a nation's Infrastructure. Divided into 2 groups based on the 50 th percentile.	WEF (2020)	$\beta > 0$	Dupasquier & Osakwe (2006) Okafor et. al (2017) Ali et. Al (2018)
Gross Capital Formation	$\ln GCF$	Log of the ratio of a nation's GDP that is composed of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	WDI (2020)	$\beta > 0$	Adeleke (2014) Saini & Singhania (2018)
Development of Human Capital 1. Very poor 2. Poor 3. Average 4. Strong 5. Very Strong	HDI $Dummies$	The level of development of human capital of an African nation proxied through their human development index score. Divided into 5 groups based on equal cut off and the 50 th percentile.	UNDP (2020)	$\beta > 0$	Adams (2009) Cleeve et al (2015)

4.4 preliminary analyses

The statistics of the variables used in this research are summarized in Table 2. The average amount of observed year per nation is 9.1 years for global FDI and 8 for Chinese FDI. FDI, CFDI, GDP, Pop, Nat, R and GCF were log-transformed to rescale their values to a more constant level. PR, Infra and HDI are discrete variables, these have been transformed to dummy variables as demonstrated by tables 1 and 2. This is done so their coefficients can be interpreted meaningfully (Brooks & Tsacos, 2010).

Table 2. Summary statistics of variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
FDI	255	1.59e+09	2.12e+09	55420.36	1.16e+10
CFDI	223	9.70e+07	3.38e+08	30000	4.81e+09
PR	260	2.612	.824	1	4
GDP	260	6.72e+10	1.09e+11	1.36e+09	5.68e+11
Pop	260	3.04e+07	3.55e+07	1240000	1.91e+08
Trade	260	70.729	27.176	20.723	161.894
Nat	260	28.454	28.755	.049	98.297
Infra	260	1.562	.497	1	2
R	260	7.02	5.494	.079	33.25
E	260	478.919	760.039	1.058	3611.224
GCF	260	25.873	9.52	4.704	58.826
HDI	260	3.004	1.154	1	5

This does lead us to a limitation of this research in that the dependent variable FDI cannot have negative values when using its natural logarithm. Negative values in FDI inflows may indicate disinvestment, they may however also indicate a situation where the loans from the affiliate to its parent exceed the loans and equity capital given by the parent to the affiliate. Since natural logarithms cannot be obtained from values of 0 or lower, 5 observations with values equal or lower than 0 were removed from the FDI analysis and 37 observations with values equal or lower than 0 were removed from the Chinese FDI analysis (with 25 of those being negative while 12 are values equal to zero). The transformation was still executed due to the presence of a relatively skewed dataset, decreasing the risk of our model being inefficient (Brooks & Tsacos, 2010). This means our analyses contain 255 and 223 land-year observations respectively for global FDI and Chinese FDI.

Moreover, the interpretation of negative FDI inflows is not straightforward and cannot be done with the available dataset, as the negative value in some cases depends on whether the

statistic is presented by the affiliate or the parent and doesn't necessarily indicate disinvestment (OECD, ND). Finally, the transformation also increases the capacity to interpret the results in a more convenient manner. The result is that the model fails to capture the effect between property rights and negative FDI inflows, meaning we can only make assumptions about the effect of property rights on positive FDI inflows.

Multiple statistical test are performed to test the efficiency and consistency of the estimators. These include a correlation matrix, variance inflation test, Breusch and Pagan Lagrangian multiplier test, Durbin-Wu-Hausman test, Breusch-Pagan / Cook-Weisberg test for heteroskedasticity, Pesaran's test for cross-sectional independence and Wooldridge's test for autocorrelation in panel data. The results of these test can be found in the appendix under tables 4 through 9. These tests conclude heteroskedasticity and autocorrelation to be present in our model, which is resolved through the utilization of clustered standard errors (Drukker, 2003)

4.5 Empirical Model

To examine the impact of property rights on foreign direct investment, a panel data model is used. Panel regression analyses are considered as efficient estimators since they allow for the combination of different cross-sections and time periods, thus providing more reliable, valid and robust results when using panel data. Panel regression analysis examines cross-sectional (cluster) and time-series (time) effects, these effects can then be fixed or random. A fixed effects regression assumes that individual effects have a similar intercept in the regression equation (are correlated to the independent variables), while a random effects regression hypothesizes individual effects to have a random disturbance (are uncorrelated to the independent variables).

$$\ln FDI_{it} = \alpha_i + \beta^1 PR_{it} + \beta^2 \ln GDP_{it} + \beta^3 \ln Pop_{it} + \beta^4 Trade_{it} + \beta^5 \ln Nat_{it} + \beta^6 \ln R_{it} + \beta^7 E_{it} + \beta^8 Infra_{it} + \beta^9 \ln GCF_{it} + \beta^{10} HDI_{it} + \epsilon_{it} \quad (1)$$

With this model we are able to estimate how the explanatory variable of property rights has an influence on the dependent variable of the FDI inflow, while controlling the results for other established influencers of FDI inflow and the interaction term between property rights and natural resource exports. The models are estimated in STATA SE 16.0. In order to ascertain the robustness of the results, multiple alternative specifications of the model will be presented following the main analysis

To test for a panel effect, a Breusch and Pagan Lagrangian multiplier test will be examined (see table 4 in the appendix), verifying that the variance of the panel units (nations)

is different from zero and the panel regression analyses are the most efficient estimators and a pooled ordinary least squares regression will produce biased estimates (Clark & Linzer, 2012). In order to determine whether a fixed- or random effects model is the most efficient estimator, a Hausman test was examined (see table 5 in the appendix). In practice, however, it is often difficult to determine which model is the most efficient since both models have their strengths and weaknesses. Clark and Linzer (2012) argue the choice between the models is based on both the Hausman test and the balance between variance and bias. The fixed effects analysis will account for unobserved heterogeneity and produces unbiased coefficient estimates, but those estimates are prone to being subjected to high sample variance. The random effects analysis is prone to introducing bias in coefficient estimates, but it has the possibility to greatly constrain the variance of those estimates due to its use of partial pooling. This leads to estimates that are more likely to be closer to the true value in any particular sample. Both the fixed- and random specifications will thus be presented to verify the robustness of the estimation results.

4.6 Research Area

This research studies the effects of property rights on foreign direct investment in 27 African nations from 2007 until 2017. These nations have been selected as their datasets are (largely) complete and thus their estimates are characterized by a high internal validity. As is frequently the case when researching developing economies, data can often prove to be difficult to gather. This leaves our research prone to selection bias, with many of the lowest income nations being absent from the database due to incomplete data (e.g. the Central African republic, the Democratic Republic of the Congo, Niger, Liberia and Sierra Leone). It is thus difficult to interpret the results as valid for the whole continent of Africa, as they only demonstrate the effects of property rights on FDI for the 27 nations in our sample. This sample is represented mostly by wealthier nations that receive a relatively large amount of FDI annually, producing results that may not be applicable for low-income nations in the continent as the included and excluded nations might be systematically different from each other. Even though the analysis is still meaningful for the included nations, we should however be careful in drawing conclusions for the continent as a whole.

5. Results

The estimation results are presented in table 3. According to the Hausman test, the random effects model is preferred over the fixed effects model. The random effects model is thus presented here, while the fixed effects model, which shows qualitatively similar results, can be found in the appendix as table 10. We now turn to each of the main models.

First, model 1.1 shows the relationship between the key independent variable (property rights) and the dependent variable (global FDI-inflow) without any control variables. Property rights that we classified as being ‘very poor’ (1) serve as a frame of reference in the model. Subsequent higher levels of property rights development demonstrate a gradual increase in FDI attraction.

Model 1.2 adds to the determinants by including four control variables whose results have been consistent in the existing body of research as to be a (positive) determinant of FDI. A strong rise in R-squared can be observed when adding these control variables, signalling the strong increase in explanatory power of the model.

Next, model 1.3 includes three other control variables whose influence is inconclusive in other studies. Model 1.4 adds the dummies for human development and controls the results for gross capital formation. This model may bring the coefficients for property rights closer to their true value as omitting both HDI and GCF in model 1.3 inflates the coefficients of property rights due to their strong positive covariance with these control variables. For these reasons, we will use model 1.4 for the further analysis.

Table 3. Results random effects model for global FDI inflows.

Indep. Var.	Model 1.1	Model 1.2	Model 1.3	Model 1.4
PR – (2)	1.024** (2.31)	1.028*** (2.58)	0.979** (2.50)	0.876** (2.02)
PR – (3)	1.165** (2.39)	1.229*** (3.00)	1.270*** (3.10)	1.085** (2.36)
PR – (4)	1.309** (2.19)	1.650*** (3.29)	1.718*** (3.32)	1.344** (2.46)
lnGDP		0.744*** (4.63)	0.759*** (5.39)	0.797*** (3.74)
lnPop		0.602*** (4.46)	0.596*** (4.04)	0.419** (2.12)
Trade		0.027*** (3.65)	0.027*** (3.73)	0.022*** (3.33)
lnNat		0.113** (2.33)	0.124** (2.54)	0.107** (2.33)
lnR			-0.081 (-1.22)	-0.042 (-0.69)

E			0.000	-0.000
			(0.02)	(-1.01)
Infra			-0.197**	-0.171*
			(1.99)	(1.83)
lnGCF				0.332
				(1.01)
HDI Dummies	No	No	No	Yes
Constant	19.14***	-10.84***	-10.70***	-9.672**
	(32.46)	(-2.65)	(-2.71)	(-2.27)
N	255	255	255	255
R-sq. (Within)	0.054	0.205	0.212	0.245
Hausmann	0.9926			

T-statistics in parentheses. Dependent variable for the model is the log of FDI inflows. The model used a random effects estimation. * p<0.10, ** p<0.05, *** p<0.01

All levels of property rights are significant at the 5% level in the final model, with nations that have the strongest (4) property right systems receiving 283.78% percent more FDI than nations that have the weakest (1) property right systems. The gradual increasing pattern of the protection of property rights demonstrates that the more well-defined and enforced a property rights system is, the more FDI it attracts. Controlling variables that are significant at the 1% level are GDP and trade openness. Population size and export of natural resources are significant at the 5% level and infrastructure quality is significant at the 10% level. All but one of these significant results is in line with the predicted signs, as the relationship between FDI and infrastructure quality is negative according to the model. A significant relationship cannot be found for interest rates, exchange rates, gross capital formation and human development.

Overall, the robustness of the results for the measure of property rights is supported by comparing the different models, as their coefficients, significance levels and signs only change to a minor extent. The main results thus provide a meaningful overview of how property rights in the observed nations, on average, relate to the inflow of FDI.

6. Are Chinese investments different?

We observe that the degree to which property rights are protected are positively related to foreign direct investment flows in the models. In contrast to conventional theory about FDI flows, however, we do observe in recent research by Shan et. al (2018) and Sy & Sow (2019) that Chinese FDI outflows to African nations are negatively influenced by most indicators of their respective governance-strength. Cheung and Qian (2008) find no significant relationship between strength of institutions and Chinese FDI-outflows on a global scale. Buckley et. al,

(2007) find institutional strength measured through political risk to be negatively associated with Chinese FDI on a global scale. These results suggest that poor institutions either attract or are insignificant to Chinese investors. Chinese investors may thus act in a different way based on the characteristics of the host nation than other investors, at least in respect to strength of their institutions. A separate analysis regarding Chinese FDI will be performed in addition to the main analysis regarding global FDI inflows.

Since the early 2000's, China has become one of Africa's largest trading partners. China engages with Africa on themes such as aid, trade and project/infrastructure financing (Jayarem et. al, 2017). It can be argued that China's primary motive for investing in Africa is energy security as energy is needed to maintain high growth rates and meet growing consumer demand (Taylor, 2006). Duan et. al, (2018) predict that China's crude oil consumption will be 721.51 million ton in 2020. The demand for resources is not limited to oil, as China is the world's largest consumer of copper and steel as well (CNBC, 2019).

Based on the established insignificance or negative influence of institutional strength on Chinese FDI, it can be argued that Chinese investors might not be influenced by the strength of institutions of a nation and are more interested in natural resource availability that meets their high resource demand. Theory thus leads us to believe that the effects of institutional strength and natural resource availability on Chinese FDI may be significantly different than those on global FDI. However, Kolstad & Wiig (2009) provide possible evidence on why these concepts of poor institutional quality and large natural resource demand depend on each other and might not differ from the global context in separate fashion. They point out that natural resources can present substantial rents. These rents can contribute to the occurrence of corruption, rent-seeking behaviour and patronage in resource rich nations with poor institutions. A study by Wiig & Kolstad in 2010 on Angolese oil companies provides possible evidence that, while institutions may reduce costs, risk and increase productivity, they can also influence the distribution of rents, possibly shifting rents from the FDI host and MNO's to the host nation itself. Given the substantial rents in natural resource rich nations, it can be argued that the benefits of a competitive advantage Chinese investors have in conducting business with nations that have a weak institutional framework are larger where large amounts of natural resources are available.

Investors with a competitive advantage in bribery are likely to invest in nations where the benefits from bribing are larger, which is arguably the case in nations with large amounts of natural resources. The previously mentioned 'uneven' distribution of rents through institutions is more likely to outweigh the positive effects such as cost/risk reduction and

productivity increase in nations with large amounts of natural resources, creating larger benefits to investors that are able to exploit a less stable institutional setting. It may also be that China's own relatively high level of corruption makes Chinese investors less afraid and/or more familiar with the innerworkings of weak institutions such as bribery and other forms of exploitation (TI, 2019) (See: Kolstad & Wiig, 2012).

This established theory suggests that Chinese investors are able to obtain higher rents from natural resources when joined by weak institutions. We assume investors to always choose the most profitable opportunity whenever possible. The hypothesis considered here is as follows:

H1: The interaction between the strength of the property rights and natural resource endowment in an African nation are negatively related to foreign direct investment inflows from Chinese investors.

In order to test this hypothesis, we create an interaction variable that consists of property rights and the export of natural resources, this variable is denoted as $\beta^{11}Nat_{it}PR_{it}$ in equation 2. The dependent variable in this model is $lnCFDI_{it}$, which is the inflow of FDI from Chinese investors.

$$lnCFDI_{it} = \alpha_i + \beta^1 PR_{it} + \beta^2 lnGDP_{it} + \beta^3 lnPop_{it} + \beta^4 Trade_{it} + \beta^5 lnNat_{it} + \beta^6 lnR_{it} + \beta^7 E_{it} + \beta^8 Infra_{it} + \beta^9 lnGCF_{it} + \beta^{10} HDI_{it} + \beta^{11} Nat_{it} PR_{it} + \epsilon_{it} \quad (2)$$

Multiple specifications of the model are presented in the results section in order to ascertain their robustness. These specifications will be similar to the previous analysis regarding global FDI-inflows, with the only difference being the addition of an extra specification that controls for the interaction variable³. Since we use a different dependent variable in this analysis we cannot make direct comparisons with the previous analysis concerning global FDI, as the methodology used to gather its values might differ between both variables.

Chinese Bilateral FDI flows are obtained from the China Africa Research initiative (2019) and consist of a combination of data from UNCTAD and the China Statistical yearbook. Since we use different sources for both variables, we don't subtract the Chinese FDI variable

³ One problem that often arises when using an interaction variable is that of multicollinearity with its two original separate variables. According to the correlation matrix in table 3 of the appendix, this turns out not to be the case for the model, suggesting that the precision of the estimation coefficients is not substantially lowered as a result of its inclusion.

from the ‘Global’ FDI variable to create a Chinese and Non-Chinese group as data measurement can differ between both sources, thus not guaranteeing that the newly obtained variable would be valid. In table 2 it can be observed that there are less observations for Chinese FDI than for Global FDI, caused mainly by data (in)availability⁴.

The estimation results presented in table 4 utilize the same sensitivity analysis as model 1 through the addition of control variables. According to the Hausman test, the fixed effects model is preferred over the random effects model. We thus present the fixed effects model here, while the random effects model can be found in the appendix as table 11. The coefficients are more volatile than the model 1, which is to be expected with the more volatile FDI-flows from China in combination with the lower number of observations. Despite this increased volatility, the signs stay consistent throughout the model, verifying the robustness of the results. Again in this model, the significance level of some variables does vary over the different models. We will use model 2.5 for the analysis of the results as it has the highest R-squared.

Table 4. Results fixed effects model for Chinese FDI inflows.

Indep. Var.	Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5
PR – (2)	1.083* (1.94)	0.870** (2.14)	0.727* (1.75)	0.512** (2.19)	0.558** (2.18)
PR – (3)	2.046*** (2.80)	1.725*** (3.21)	1.626** (2.65)	1.102** (2.05)	1.264** (2.41)
PR – (4)	1.821** (2.40)	1.924*** (3.60)	1.852*** (3.14)	1.157** (2.16)	1.393** (2.64)
lnGDP		1.580*** (3.09)	1.422** (2.52)	1.304** (2.12)	1.233** (2.20)
lnPop		5.332*** (2.82)	4.914** (2.27)	3.349 (1.39)	3.269 (1.36)
Trade		0.021** (2.29)	0.022** (2.43)	0.012 (1.39)	0.014* (1.70)
lnNat		0.0729 (0.79)	0.0864 (0.95)	0.119 (1.21)	0.292*** (3.00)
lnR			-0.298 (-1.39)	-0.207 (-0.97)	-0.235 (-1.08)
E			0.000 (0.15)	0.001 (1.26)	0.001 (1.37)
Infra			-0.128 (-0.42)	-0.121 (-0.40)	-0.177 (-0.60)
lnGCF				1.231*** (3.62)	1.303*** (3.54)
PRxNat					-0.004**

⁴ This also explains why the amount of observations for the independent variables are slightly higher than the amount of observations for the dependent variables, since there are 5 observations that do have Chinese FDI data but no Global FDI data and 37 observations that do have Global FDI data but no Chinese FDI data.

					(-2.33)
HDI Dummies	No	No	No	Yes	Yes
Constant	15.36*** (26.43)	-112.8*** (-4.71)	-101.4*** (-3.71)	-76.35** (-2.47)	-73.59** (-2.38)
N	223	223	223	223	223
R-sq.	0.061	0.318	0.335	0.377	0.388
Hausmann	0.000***				

T-statistics in parentheses. Dependent variable for the model is the log of Chinese FDI inflows. The model used a fixed effects estimation. * p<0.10, ** p<0.05, *** p<0.01

The importance of property rights for the attraction of Chinese FDI is demonstrated in these results, with nations that have the strongest (4) property right systems receiving 302.69% percent more Chinese FDI than nations that have the weakest (1) property right systems. The levels of property rights development again demonstrate a gradual increase in FDI attraction, with all subsequent levels being significant at the 5% level. Natural resource export and the gross capital formation are found to be significant at the 1% level, economy size and the interaction variable are found to be significant at the 5% level and trade openness is found to be significant at the 10% level. No significant relationship can be found between population size, inflation and exchange rates, infrastructure and human development. Apart from infrastructure quality, all signs adhere to the predictions in table 1.

The inclusion of the interaction variable between property rights and natural resources leads to an improvement in the R-squared of the model and amplifies the significance of natural resources. Its resulting coefficient is significant and negative. This means that Chinese investors are attracted to nations that have weaker property right systems in combination with high natural resource export ratio's, possibly due to their ability to obtain higher rents in these markets. A one unit increase in the interaction variable results in a 0.40% decrease in Chinese FDI-inflow.

When including this interaction variable in the model 1, the resulting coefficient was positive yet not significant. There was also no increase in R-squared and changes in the coefficients of other variables were minimal, implying that the inclusion of the variable added very little to the explanatory power of the model. The result for both its inclusion in the fixed and random effects model can be found in the appendix as table 12.

7. Discussion

The analysis carried out in this study uses property rights as a determinant of FDI inflow in African nations in order to contribute to the growing literature on African FDI flows. The results are in line with existing theory, demonstrating that the strength of the property rights framework of a nation influences FDI-Inflows as they influence ownership advantages. We thus reject the null hypothesis in favour of the following alternative hypothesis: “African nations with more well-defined and enforced property rights have a higher inflow of foreign direct investment”. Our findings imply that, if investors would be better guaranteed the protection of their property rights through the amendment and effective enforcement of existing laws concerning property rights, they may be more likely to seize the large opportunities of the continent through land acquisition and development knowing that their land/tenure is secure and risk of expropriation is low.

These findings make an important contribution to the existing literature concerning the determinants of FDI in the developing region of Africa, as they reveal a new mechanism by which an enabling environment for foreign investors could be established. The implementation of resulting policy implications could create greater incentives for large-scale economic production and investment by foreign entities, thereby making significant strides towards promoting human and economic development within the continent. According to the World Bank (2013), improved enforcement of property rights can be reached through implementing formalized land ownership and registration to combat the low registration rate of 10% throughout the continent, as well as the education of people about land ownership and title deeds. The road to more well-defined property rights also includes better security of both individual and communal land, increasing the access to the land market, resolving land ownership disputes and lowering the formalization costs of land administration services through increasing their transparency and efficiency (also see Cai et. al, 2018).

When it comes to Chinese FDI, the results highlight the existence of possible negative effects of FDI in poorly governed resource rich nations. This result is in line with the theory by Kolstad & Wiig (2012) that hypothesizes Chinese FDI is conducted to exploit (African) nations with a low institutional strength and large amounts of natural resources. We thus reject the null hypothesis in favour of the following alternative hypothesis: “The interaction between the strength of the property rights and natural resource endowment in an African nation are negatively related to foreign direct investment inflows from Chinese investors”. These findings contribute to the growing research on the determinants of Chinese FDI outflow to Africa, as

they demonstrate the interaction effect also to be present when institutional strength is proxied through property rights protection.

Future studies could replicate this research for both additional temporal and spatial dimensions to test whether the relationships uncovered hold true across different economic cycles and different nations. This research uses a composition of multiple variables that make up ‘property rights’, which acts as a proxy for their overall enforcement and strength. Testing different proxies for property rights may produce more valid results, an example of this could be the relative amount of property that has been expropriated both by public and private sources in a particular timespan. This variable would be more straightforward to interpret and its results could be more easily generalized to real-world settings. Our study, however, does enable us to better understand the importance of the protection of property rights for the attraction of FDI in Africa. It does this by providing a unique overview through extensive coverage of many nations within the continent and its results are relevant to further understanding the relationship between property rights and FDI.

8. Conclusions

This study examined to what extent property rights influence the foreign direct investment inflow of African Nations. In specific, by examining the effect of property rights protection on the inflow of FDI within 27 African nations through a panel data analysis. Our findings show property rights to be a significant determinant of both global FDI inflow and FDI inflow from Chinese investors to these nations, as nations with the most well-defined and enforced property rights systems respectively are estimated to receive approximately 284% and 303% more FDI than nations with the least well-defined and enforced property rights. In addition, our results suggest Chinese FDI outflows to be different in their attraction to African nations with poorer property rights that are rich in natural resources. The robustness of these findings is verified as different estimation techniques and multiple model configurations showed qualitatively similar results. This statistically robust empirical methodology, combined with the use of large sample and more recent data, provide empirical evidence that can provide practitioners and policy makers with more precise and far reaching implications.

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Appendix

Table 4. Correlation matrixes of variables & variance inflation factor tests.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	VIF	
(1) lnFDI	1.000												
(2) PR	0.1753	1.0000										2.39	
(3) lnGDP	0.7487	0.0291	1.0000									11.08	
(4) lnPop	0.5004	-0.3893	0.7205	1.0000								11.49	
(5) Trade	-0.0335	0.3334	-0.3413	-0.7225	1.0000							3.10	
(6) lnNat	0.4030	-0.1904	0.4250	0.3363	-0.1087	1.0000						1.38	
(7) lnR	0.0461	0.0160	0.0215	0.1635	-0.1025	0.0440	1.0000					1.18	
(8) E	-0.2225	-0.3082	-0.2309	0.1807	-0.4208	-0.1168	0.0750	1.0000				1.82	
(9) Infra	0.2315	0.5825	0.2538	-0.1670	0.2810	0.0370	-0.1221	-0.2771	1.0000			1.94	
(10) lnGCF	0.2342	0.2290	0.0088	-0.1295	0.2902	0.1085	-0.1469	-0.1351	0.0486	1.0000		1.29	
(11) HDI	0.3531	0.4760	0.4496	-0.1562	0.2882	0.0958	-0.1201	-0.2800	0.5117	0.1672	1.0000	3.74	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	VIF
(1) lnCFDI	1.000												
(2) PR	0.0925	1.0000											2.52
(3) lnGDP	0.6096	-0.0572	1.0000										11.50
(4) lnPop	0.4309	-0.4467	0.7345	1.0000									12.61
(5) Trade	-0.2705	0.3651	-0.4247	-0.7554	1.0000								3.40
(6) lnNat	0.2980	-0.2148	0.4353	0.3449	-0.1411	1.0000							3.61
(7) lnR	0.1498	0.0289	0.0729	0.1902	-0.0857	0.0680	1.0000						1.24
(8) E	-0.0156	-0.2723	-0.2054	0.1784	-0.4007	-0.1287	0.0467	1.0000					1.92
(9) Infra	0.1305	0.5968	0.1823	-0.1979	0.2634	-0.0085	-0.0575	-0.2460	1.0000				1.86
(10) lnGCF	0.1787	0.1866	-0.0193	-0.1365	0.2961	0.1040	-0.1566	-0.0858	0.0399	1.0000			1.35
(11) HDI	0.3609	0.4505	0.4108	-0.1855	0.2561	0.0589	-0.0961	-0.2560	0.4693	0.1621	1.0000		3.87
(12) PRNat	0.3684	0.0210	0.4125	0.2422	-0.0137	0.7996	0.1553	-0.3165	0.0735	0.2238	0.1310	1.0000	3.79

In order to control the model for multicollinearity, both a correlation matrix and a variance inflation (VIF) test were examined. Dohoo et al. (1997) argue that multicollinearity is certain at a correlation coefficient of ≥ 0.8 . Lin (2008) argues the VIF-value should be < 10 to prevent multicollinearity. According to the VIF test there are two of multicollinearity within the chosen variables. These can be found in the variables of lnGDP and lnPop, which correlate at a value

of 0.7205 and 0.7345 and have a VIF score of respectively 11.08/11.49 and 11.50/12.61. This can result in biased regression coefficients for these two variables. However, since these are control variables that are not of direct interest, the analysis regarding to what extent property rights influence Chinese FDI is still meaningful.

Table 5. Breusch and Pagan Lagrangian multiplier tests

Variable	Var.	Std. Dev.	chibar2(01)	Prob>Chi2
logFDI	3.343446	1.828509		
e	.5141536	.7170451		
u	.8195183	.9052725		
			172.73	0.0000
logCFDI	4.103894	2.025807		
e	1.100076	1.048845		
u	.813029	.9016812		
			39.39	0.0000

To determine whether the research should adopt a panel model or an OLS model, we employ a Breusch-Pagan Lagrange multiplier test. The null hypothesis in the Lagrange Multiplier test is that the variance across countries is zero. This means that there is no significant difference across the panel units (no panel effect). Since Prob>Chi2 is smaller than 0,05 for both hypothesis, the null hypothesis is rejected and we can assume that there is a significant difference across the panel units.

Table 6. Durbin-Wu-Hausman Tests

	Coefficient
Chi-square test value	8.329
P-value	.9099

Through the Durbin-Wu-Hausman test we can see whether the estimates of the coefficients, taken as a group, are significantly different for a random- and fixed effects model. For the first hypothesis, Prob>Chi2 is larger than 0,05, implying no significant difference and thus the random effects model is preferred for the model concerning global FDI.

	Coefficient
Chi-square test value	65.54
P-value	.0000

For the model concerning Chinese FDI inflows, Prob>Chi2 is smaller than 0,05, implying a significant difference and thus the fixed effects model is the more efficient estimator for the model concerning Chinese FDI. That is to say, since the null hypothesis of this test is rejected, the random effects model will violate the Gauss-Markov Theorem and end up with inconsistent/biased estimates (Clark & Linzer, 2012). The difference (in interpretation) between both models that comes as a result of these specifications is discussed in subchapter 4.5.

Table 7. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Variable	Chi2(1)	Prob>Chi2
FDI	135.54	0.0000
CFDI	5.35	0.0207

To determine whether there is heteroskedasticity present in the variables, a Breusch-Pagan / Cook-Weisberg test is conducted. Since we previously established the residuals to be normally distributed, the results produced by this test are unbiased. Prob>Chi2 is smaller than 0,05, meaning there is heteroskedasticity present within the variables. This is controlled for by including robust standard errors in the model, as they prevents biased estimates regarding standard deviations and significance tests from being present in the estimation.

Table 8. Pesaran's test for cross-sectional independence

Variable	CD	P-Value
FDI	-0.881	0.378
CFDI	-0.203	0.839

Pesaran's test of cross-sectional dependence is used to test whether the residuals are correlated across entities (Pesaran, 2015). Cross-sectional dependence can lead to biased estimates as the entities in the sample are not independently drawn observations anymore but affect each other's results. Since $P > 0,05$, we don't reject the null hypothesis and conclude that the residuals are not cross-sectionally dependent.

Table 9. Wooldridge test for autocorrelation in panel data

Hypothesis	F	P-Value
1	26.607	0.0001
2	0.052	0.8210

Serial correlation in linear panel-data models biases the standard errors and causes the results to be less efficient. For the analysis concerning global FDI, $P < 0,05$ which means that autocorrelation is present. For the analysis concerning Chinese FDI this is not the case as $P > 0,05$. If there is serial correlation in the idiosyncratic error term, using clustered (robust) standard errors will produce consistent estimates of the standard errors (Drukker, 2003). Since we employ these in both models we control for autocorrelation in the results.

Table 10. Results fixed effects model for global FDI inflows.

Indep. Var.	Model 1.1	Model 1.2	Model 1.3	Model 1.4
PR – (2)	0.983** (2.32)	1.042** (2.63)	0.961** (2.38)	0.924** (2.26)
PR – (3)	1.083** (2.34)	1.231*** (3.02)	1.246*** (2.87)	1.140** (2.68)
PR – (4)	1.395** (2.29)	1.536** (2.72)	1.591** (2.63)	1.275** (2.27)
lnGDP		1.231*** (3.31)	1.170*** (3.33)	1.053*** (3.29)
lnPop		-0.251 (-0.26)	0.339 (0.30)	-0.402 (-0.28)
Trade		0.028*** (4.24)	0.028*** (4.24)	0.023*** (3.61)
lnNat		0.110* (2.01)	0.116** (2.17)	0.108** (2.21)
lnR			-0.077 (-1.21)	-0.051 (-0.91)
E			-0.000* (-1.94)	-0.000 (-1.41)
Infra			-0.158 (1.55)	-0.149 (1.56)
lnGCF				0.186 (0.52)
HDI Dummies	No	No	No	Yes
Constant	19.23*** (47.46)	-8.421 (0.78)	-16.18 (1.19)	-1.907 (0.10)
N	255	255	255	255
R-sq. (Within)	0.055	0.212	0.224	0.253
Hausmann	0.9099			

T-statistics in parentheses. Dependent variable for the model is the log of FDI inflows. The model used a fixed effects estimation.. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11. Results random effects model for Chinese FDI inflows.

Indep. Var.	Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5
PR – (2)	1.042* (1.71)	0.816 (1.35)	0.888* (1.93)	0.513** (2.10)	0.535** (2.14)
PR – (3)	1.949*** (2.66)	1.563** (2.11)	1.672*** (2.64)	0.976** (2.41)	1.021** (2.42)
PR – (4)	1.445** (1.97)	1.891** (2.41)	2.074*** (2.94)	1.285** (2.38)	1.332** (2.36)
lnGDP		1.101*** (4.37)	1.255*** (4.87)	0.783** (2.15)	0.798** (2.20)
lnPop		0.373 (0.82)	0.205 (0.42)	0.329 (0.65)	0.340 (0.68)
Trade		0.011 (0.83)	0.017 (1.39)	0.001 (0.15)	0.002 (0.23)
lnNat		0.0332 (0.33)	0.0822 (0.87)	0.0692 (0.76)	0.109 (0.73)
lnR			-0.319* (1.82)	-0.127 (0.78)	-0.135 (0.82)
E			0.001*** (5.73)	0.001*** (3.07)	0.001*** (3.20)
Infra			-0.220 (-0.67)	-0.112 (-0.40)	-0.122 (-0.42)
lnGCF				1.173*** (4.30)	1.197*** (4.13)
PRxNat					-0.001 (0.33)
HDI Dummies	No	No	No	Yes	Yes
Constant	15.36*** (21.16)	-17.82*** (-2.65)	-18.91*** (-3.32)	-13.09*** (-2.71)	-13.78*** (-2.56)
N	223	223	223	223	223
R-sq.	0.061	0.253	0.294	0.331	0.339
Hausmann	0.000***				

T-statistics in parentheses. Dependent variable for the model is the log of Chinese FDI inflows. The model used a random effects estimation. * p<0.10, ** p<0.05, *** p<0.01

Table 12. Results inclusion interaction variable for global FDI inflows

Indep. Var.	Random	Fixed
PR – (2)	0.873** (2.00)	0.920** (2.25)
PR – (3)	1.075** (2.36)	1.124** (2.69)
PR – (4)	1.320** (2.44)	1.255** (2.27)
lnGDP	0.797*** (3.78)	1.061*** (3.23)
lnPop	0.414** (2.07)	-0.394 (-0.28)
Trade	0.022*** (3.26)	0.023*** (3.53)

lnNat	0.100* (1.85)	0.093 (1.63)
lnR	-0.0426 (-0.70)	-0.0487 (-0.87)
E	-0.000 (-1.08)	-0.000 (-1.41)
Infra	-0.168* (-1.87)	-0.145 (-1.64)
lnGCF	0.324 (0.98)	0.182 (0.50)
PRxNat	0.0002 (0.19)	0.0004 (0.28)
HDI Dummies	Yes	Yes
Constant	-9.532** (-2.29)	-2.212 (-0.11)
N	255	255
R-sq.	0.246	0.253

T-statistics in parentheses. Dependent variable for the model is the log of FDI inflows. The left model used a random effects estimation and the right model uses a fixed effects estimation. * p<0.10, ** p<0.05, *** p<0.01