ERASMUS UNIVERSITY ROTTERDAM

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Master Thesis

The Role of Institutional Quality in Chinese Foreign Direct Investment in Africa

Abstract

The aim of this paper is to study the characteristics of Chinese foreign direct investment (FDI) in Africa. By using FDI flows documented by the Chinese Ministry of Commerce between 2003 and 2010 and an institutional quality measure recorded by the World Governance Indicators (WGI) developed by the World Bank, a significant positive relationship, between these two variables, was discovered. In addition, other variables such as natural resources, rural population, productivity and life expectancy were found to have a significant effect as well. Results were robust with the use of two alternative measures for institutional quality. The first alternative measure is the Country Policy and Institutional Assessment's (CPIA) Property Rights and Rule-Based Governance, also developed by the World Bank, while the second one consists of a variable computed using both WGI and CPIA measures. This paper also establishes the link between foreign direct investment, economic growth and economic development, highlighting the role that institutions have in connecting them together, as well as the potential outcomes of these linkages for policy making in African countries.

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INTRODUCTION

As the economic ties between China and the African continent grow, so does the importance to study what characteristics and consequences this relationship may have. Despite the general feeling that this Sino[1]-African relationship is a rather modern occurrence, the linkages between them actually date back 50 years and have been different in nature throughout this period of time.

After the establishment of the People's Republic of China in 1949 in a rather politically unstable global setting, the first concrete interactions took place in 1956. In this early stage, Chinese interference in African states was mainly based on political ideologies and sought to provide assistance to independence movements (Brooks & Shin, 2006). These interactions led to a positive feeling and backing among African nations as China gained a permanent seat in the United Nations Security Council, replacing Taiwan in 1971. In the 70's Chinese aid included assistance in building stadiums, factories and establishing infrastructure among other similar actions. This went on until 1978 when Deng Xiaoping legitimized his position as the post-Maoist leader of China and gradually redirected the economic situation of the country to an open market scheme (Anshan, 2007). These economic reforms led to a change in the international relations with Africa, namely, aid was replaced with trade in order to fulfill a mutual beneficial agenda. During the 80's China wanted to be recognized internationally as an economic power by both the western and the eastern cold war blocs. This focus towards the North withdrew Chinese efforts in Africa. This was the case until China's international image deteriorated in 1989 because of the Tiananmen Square Protests. As a consequence of this incident, China destroyed its reputation among the North and was forced to redirect its trade efforts back to the South and with it, steadily increased trade and investments in Africa. This steady increase found a boost in 1999 with the Chinese Going Global policy (Taylor, 2006).

At this point in time, China is the fourth largest investor in Africa and is playing a key multidimensional part in Africa's growth; nevertheless the media sometimes sees Chinese business ventures as exploitative (Large, 2008; Miles, 2013). This is because the perception is

[1] Prefix added in front of a word indicating Chinese origin.

that Chinese investment is directed at states with weak institutions, which are vulnerable of losing their natural resources. This is why there is need for clarifying studies on the subject. Any step that deepens the research in this field or any study that enables an up-to-date assessment of these flows leads to an increase of knowledge that might be vital to the needed development of this continent. In this thesis, after developing an extensive literature review, an econometric analysis will be exposed which will try to convey the importance of institutional quality to attract Chinese foreign direct investment in Africa. Then a discussion of the results will be done with the assistance of theory derived from Development Economics regarding the important role that institutions play when determining development. Before the conclusion, the robustness of the results will be examined in order for this research to answer the following questions:

What are the distinctive features of Chinese FDI allocation in Africa?

Is institutional quality a determinant of Chinese FDI in Africa?

Is it bad or good institutions that attract Chinese FDI in Africa, and what consequences do these choices have on the development of Africa?

Which policy conclusions can be drawn from this analysis?

LITERATURE REVIEW

The United Nations Conference for Trade and Development (UNCTAD) defines FDI as "an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy in an enterprise resident in an economy other than that of the foreign direct investor" (UNCTAD, 2007, p.245). Meaning that the foreign investor has the inclination to exercise managerial influence on the entity that he is investing in, this active approach distinguishes it from portfolio investment. FDI flows consist of three different elements, namely, equity capital, reinvested earnings and intra-company loans. According to theory on FDI, investors are incentivized to embark on these endeavors if the potential operations are characterized by three advantages. These three advantages are often referred to as the OLI framework, which denotes the ownership advantages, locational advantages and internalization advantages of FDI. Ownership advantages are those that arise from firm-specific characteristics such as competitive advantages that set the firm apart from all others. Locational advantages are those that are specific to the country or region where the foreign investment is made, which can be elements such as natural resources that are hard to transport. Finally, internalization advantages can be thought of as the benefits of keeping an in-house production scheme such as avoiding opportunistic behavior that could occur if another company is selling the foreign investor's product (Dunning, 2000).[2]

This short theoretical introduction gives us a glimpse on what to expect, but a look into empirical work has to be done as well. The relevant literature will be covered focusing on two research topics related to this study. First, literature on the determinants of FDI allocation will take place. Second, literature on FDI effects on development will be summarized and discussed in detail.

FDI Allocation

The main focus of this paper is to see how institutional quality might influence the allocation of FDI in a certain country. The literature on this subject usually inclines towards the fact that good institutional quality attracts FDI. In fact, Daude and Stein (2007) made a study on bilateral FDI from thirty-four source countries to a hundred and fifty-two host countries and

[2] For an exhaustive theoretical background refer to Bowen, Hollander and Viaene (2012).

found that institutions have an overall positive significant economic effect that holds over time. The study analyzed five-year panel time periods from 1982 to 2002 and included a wide range of quality measures dealing with institutions.

When studying transitioning economies such as countries that were formerly part of the Soviet Union, as well as other Eastern European and Baltic States from 1990 to 1998, Kinoshita and Campos (2003) found that institutions, trade openness and agglomeration were the main locational determinants for foreign direct investment flows. In this case rule of law and quality of bureaucracy were the proxies used to highlight this relationship.

Similar results were found in Ali, Fiess and MacDonald (2006) in which a panel focused on sixty-nine developing countries from 1981 to 2005. In this case a measure of institutional quality derived from the protection of property rights reflected the highest level of significance when choosing between alternative measures. This study also stresses the presence of papers in the literature that find no causal link between these two elements, but assigns this to small sample sizes or the choice of wrong proxies for institutional quality.

Hence, the main findings consist of the fact that, in a global setting, good institutional quality attracts FDI. The next step would be to take a look at the regions that are relevant to this study, specifically, China and Africa.

According to Morck, Yeung and Zao (2008), outward Chinese FDI flows are mainly focused on Southeastern Asian economies, tax havens, and countries that are rich on natural resources. This same article mentions the fact that these investments are usually realized by state-controlled firms and that these companies are used to dealing with a complex institutional setting, which means that countries with a similar institutional environment do not discourage investors. Further insight provided by this article on the topic, exposes the fact that the Chinese economy is characterized by high saving rates, which accounts for capital accumulation and the possibility of outward investment. These claims are taken one step further by Kolstad and Wiig (2012) who explain that there is a two-fold element when dealing with Outward Chinese FDI. On the one hand, these investments seek large markets in OECD countries. On the other, non-OECD countries with a combination of large natural resource endowments and poor institutional quality are held accountable for attracting these

flows. This image of an imperialistic attitude of Chinese FDI coincides with the usual perception of the media (Grammaticas, 2012; Okeowo, 2013).

Buckley et al. (2007) offer a different approach to these findings. In this case the authors illustrate the fact that this general sentiment of opportunistic behavior might be, in fact, misinterpreted. After showing that a decrease of their political risk indicator leads to a significant reduction of Chinese FDI, they set forth a list of arguments that might justify this relationship. Namely, they state that China might have a specific and unique perverse attitude towards risk. This perverse attitude could be attributable to:

a. Non-Profit maximizing or maximizing subject to government-led institutional influences.

b. The fact that FDI is mainly focused on developing countries that are inherently high risk.

c. FDI heading towards ideologically related countries.

d. They are used to investing in developing countries with complicated political structures.

e. They are prepared to invest in countries that have been avoided by industrialized countries.

f. Chinese firms are relatively inexperienced when it comes to investing abroad.

g. Widely used measures for institutional quality might be oriented to fit the thoughts of an industrialized country and perhaps a developing country such as China might not share the same views on the matter.

The literature found on this subject mainly states that Chinese decision-making, when it comes to the allocation of outward FDI; goes against the typical FDI allocation literature. It is necessary now to take a look at what the general understanding is on the receiving end of the main focus of this research. This will be done by taking a look at studies focusing on the determinants of African FDI inflow.

A study realized by the African Development Bank Group (Anyanwu, 2011) researched these determinants using FDI inflow data from 1980 to 2007. The main results found were that urban population share, agglomerations, openness to trade, natural resources, government consumption and international remittances attract FDI while financial development had a negative impact.

Concerning the importance of institutional quality, Naud and Krugell (2007) found that good institutions in the form of political stability, accountability, regulatory burden and rule of law were key in attracting FDI.

The most similar research to this one found during the literature examination was written by Sanfilippo (2010). This specific paper studies the determinants of Chinese FDI towards Africa and highlights the ambiguity in Chinese behavior when it comes to risk taking. Specifically, macroeconomic instability, as well as weak political conditions, does not discourage foreign direct investment, whereas high country indebtedness, as well as conflict, does deter these capital flows. What makes this paper even more similar to this research is the use of the same outward FDI flows. Nevertheless, the author covered the 1997 to 2003 by making his own calculations using Chinese Annual Statistics to complement for lacking data without providing any explanations of his procedure, which damages the legitimacy of his results.

FDI, Institutions, Economic Growth and Economic Development

Another important aspect of this research is how FDI influences economic development and how institutional quality might play both the role of attracting FDI, as well as sustaining economic development.

One of the primordial needs for economic development is economic growth, which can be simply thought of as an increase of GDP from one specified period to the next. There are contradictory views in academia concerning the role that FDI plays in relation with economic growth. Nevertheless, despite the fact that there are articles that insist on the fact that FDI automatically leads to growth, the common ground lies that this link is not necessarily direct and a set of preconditions have to be met for this relationship to exist.

Luiz and de Mello (1997) state that some of these preconditions lie in the factor endowments existing in the host countries, the willingness to transfer new technologies by foreign investors, trade and policy regimes, different types of externalities and productivity spill overs, among others.

Hermes and Lensink's (2003) research suggested that the underlying factor in order for FDI to have a positive impact on economic growth is the state of development of the host country's financial system.

Another issue that can be highlighted is the fact that economic growth might not necessarily lead to long-term economic development. In fact, examining Chaudhuri and Ravallion (2007), as well as Fischer (2003), gives the impression that institutional quality plays a crucial role in the path that development takes. One reason for this might be how inequalities in developing countries develop, and how institutions play a role in this whole process.

Indeed, Chaudhuri and Ravallion (2007), while studying the rapid growths of China and India, claim that a country's economic growth might be uneven in three dimensions, specifically, geographically, sectorial and at the household level. In the first case, it might be that some regions of a country grow faster than others; in the second case this same phenomenon might be true for some specific economic sectors. The third conclusion was found when looking at household income in China and household consumption in India. The authors noticed that households at the bottom of the distribution have seen their income increase much slower than those at the top. They go on to say that these differences in growth lead the way to inequalities in society, which they characterize as 'good' or 'bad' depending on the specific role that these inequalities play in sustaining growth and reducing poverty. They define good inequalities as inequalities that "reflect and reinforce market-based incentives that are needed to foster innovation, entrepreneurship and growth" (Chaudhuri & Ravallion, 2007, p.193), while bad inequalities are inequalities that "are rooted in market failures, coordination failures and governance failures, they prevent individuals from connecting to markets and limit investment in human and physical capital" (Chaudhuri & Ravallion, 2007, p.195). This same paper highlights the central role that institutions have when fostering good inequalities and preventing bad ones from happening.

It is safe to say from this literature review, that institutional quality is indeed an essential part in the economic ins and outs of a society; that FDI allocation consists of multiple elements; that these investments could lead to growth and that growth cannot be mismanaged in order for it to achieve sustainable economic development. Concerning the specific regions in this research, there is ambiguity regarding which institutions play the determinant role. African FDI inflow literature suggests that good institutions attract FDI, while Outward Chinese FDI literature proposes that it is bad institutions that appeal to investors. Either way, both streams seem to agree that institutional quality does play a role.

DATA DESCRIPTION

Dependent Variable

Concerning the data, the main variable of interest is foreign direct investment going from China to the specific African country. Data on this variable was found in the Chinese Ministry of Commerce's (MOFCOM) 2010 Statistical Bulletin of China's Outward Foreign Investment (MOFCOM, 2010). The MOFCOM started reporting annual FDI flows under international standards in 2003, which makes the annual data on FDI for the period between 2003 and 2010 for fifty African countries available although some observations are missing for some of these countries. A map and a few graphs detailing where these investments flow into can be found in Appendices 1 and 2. As can be seen in these Appendices the highest amount of FDI is directed towards South Africa and the year with the highest flows was 2008, which accounted for more than five billion dollars in investments. In fact, in late 2007 the agreement was made for the Industrial and Commercial Bank of China to purchase twenty percent of the Standard Bank of South Africa, which brought in more than four billion US dollars in the following months (Gelb, 2010). If this peak year is ignored, Nigeria comes as a close second in terms of total flows received in the studied period. This can be appreciated in Appendix 2, Graph 9. These flows, unlike the ones in South Africa, which are normally targeted at the financial sector, are usually aimed at oil and gas exploits (Lufumpa, Ncube & Ndikumana, 2010). In order to normalize this variable during the regressions, each flow was included as a percentage of the country's gross domestic product for each respective year.

Main Explanatory Variable

The main explanatory variable in this study, which proxies for institutional quality, is the Rule of Law measure included among the World Governance Indicators established by the World Bank (Kaufmann, Kraay & Mastruzzi, 2003; World Bank Database I). The values of this indicator vary from -2.5 (poor) to 2.5 (good), and are meant to capture the perception of how the rules in a specified country affect the confidence of the actors belonging to this society. As can be seen in Appendix 3, the mean of this variable for the region was -0.87, which makes the sample to be consistent of rather poor quality institutions.

Other Explanatory Variables

The rest of the explanatory variables were retrieved from the World Bank database (World Bank Database II). These include alternative measures of institutional quality entitled 'CPIA Property Rights and Rule-Based Governance', which ranges from 0 (bad) to 6 (good). Its score is computed by addressing three main issues, specifically, the quality of the legal system that accounts for the protection of property rights, the quality of the legal system as a whole and finally the influence of crime and violence as an obstacle to economic activity.

It is commonly known that one of the main problems when doing research concerning Africa is the lack of data as well as the data quality. Using a reliable source, namely, the World Bank Database as well as establishing a time frame that is quite recent addresses the later one of these problems. Nevertheless, the first problem mentioned is still an issue and hence the selection of variables used to proxy the determinants was influenced by data availability. These additional variables found are, firstly, adjusted primary enrollment rate, which is included to represent Human Capital and Education in the region. Then, the variable, battle related deaths, is aimed to proxy for conflict in a determined country. The annual cereal yield growth rate has been chosen to highlight agricultural productivity in the African continent. Gross Domestic Product (GDP) and GDP per capita are both reported in constant 2005 dollars and follow the purchasing power parity, which is crucial when making cross-country and cross-period comparisons and are used to normalize some of the variables. Life expectancy is utilized to cast an idea of the health in a particular country. Exports have been added to imports and divided by GDP, which represents the country's openness to trade. Ores and metals as a percentage of merchandise exported are intended to represent the country's endowment of natural resources. Population and rural population are used to proxy the market size and the labor force of a specific country. The number of telephone lines intends to proxy infrastructure in the examined country. In addition to these proxies the tax rate and the exchange rate from local currency to US dollars have been included. A summary of the statistics, as well as correlation tables, can be found in Appendix 3 and Appendix 4, respectively.

EMPIRICAL METHODOLOGY

As hinted earlier, one of the major problems faced during the execution of this research was dealing with limited data for the ordinary least square panel data analysis. For instance, a linear regression model, which includes all variables that possibly affect FDI, is clearly over-parameterized for the number of observations available. The number of observations for this model is only fourteen. Consequently, estimation results of this first general model show that none of the explanatory variables is found to have a significant effect on FDI. This is because not every data point is available in order to make a valid estimation of the influence of these variables. The only variable that is not considered in this model is the alternative institutional quality measure which would reduce even further the amount of observations and eliminate any chance for this model to be feasible. As seen in the first column of Table 1, the P-value of the F-statistic confirms the fact that this model is not suitable. When examining the data, the variable that limits the sample size the most is 'battle related deaths' that intends to proxy conflict. As illustrated in Appendix 3, this variable only counts with forty-seven observations, while all the other variables have at least one hundred and forty observations. This is why a second model, which excludes this variable, is necessary. As expected, removing this variable from the regression provides a more reliable model.

As can be seen in the second column of Table 1, the observations in this model have increased tenfold, which facilitates inference. The first impression that can be taken from this model is that its estimations provide a rather adequate fit. An R-Squared of 42% indicates that almost half of the dependent variable's variance can be explained by the set of independent variables included in the model. This table also illustrates how some of the variables, including the main explanatory variable, are statistically significant.

Nevertheless, the model still includes several independent variables, which can result in an over-identified model and hence affect the precision of the estimated coefficients. This is especially true when examining such a small period of time. An econometric method that is found to be quite useful in these situations is the 'Principal Components Analysis'. Principal components analysis uses the variances of a specified subset of variables in order to create a smaller set of derived variables. It is able to do so by summarizing the information provided by the variables selected in the most efficient way without sacrificing much of the initial

accuracy (Esbensen, Geladi & Wold, 1987). This method is widely applied to handle over-parameterized models; hence it is suitable for the models considered in this thesis. Considering a principle component summarizing information from several independent variables instead of including all variables in the model increases the degrees of freedom and facilitates inference. Despite this advantage, the summarized information in principal components, thus, the choice of the variables to apply the principal components analysis, should be logical. If the chosen variables are not linked, there will be a substantial loss of information from decreasing the number of explanatory variables.

In this research, it can be thought that the education of a country, the condition of its infrastructure and its agricultural productivity can be linked together and in this way put together puzzle pieces that in essence explain different aspects of a country's productivity level. It is obvious that cereal yield growth expresses productivity, nevertheless, this intuition is not necessarily as palpable for the other two variables and hence examining different studies to justify this choice might be useful. Morrison and Schwartz (1996) make use of a cost function framework to analyze the direct benefits of state infrastructure on productivity. In their sample, the authors were able to link a drop of infrastructure investment relative to output growth to a deceleration in productivity growth. The causal link between education, in the form of human capital, and productivity has also been proven to exist. In Benhabib and Spiegel (1994), a model is exposed in which a nation's human capital is proven to positively influence the total factor productivity growth rate. Still, it is worth noting that gathering these variables in this way remains an arbitrary decision and further justification of this method could be subject of future research. Once computing this principal component variable the following model was regressed and its respective results can be found in the third column of Table 1 at the end of this section.

This model's results are very similar to that of Model 2. The same variables that were significant in the previous model are significant in this model as well. This gives a sentiment of consistency throughout the estimation phase of this research, which also supports the decision to compute this new independent variable.

When comparing both models, in order to find which of them is most appropriate to utilize in the rest of this research, it is of utmost importance to take a look at comparative statistics that were designed for model selection. As can be noticed in the output tables throughout this

paper, there are two criteria that are permanently illustrated in each column, namely, the Akaike Information Criterion and the Schwarz—Criterion, where the latter is also called the Bayesian Information Criterion. These criteria take into account, among other things, the tradeoff between the complexity of the model and its goodness of fit by means of likelihood functions. Both of these statistical models are meant to portray relative quality and by no means are they to be considered as absolute measures. One of the prerequisites that need to be met in order to make use of these statistics is that both models have the same observations as well as the same dependent variable. Since this prerequisite is met, it is possible to compare the two models by these means. Despite the fact that the Schwarz—Criterion is widely considered a better indicator, a similar result from both criteria suggests that the results on model choice are robust. In both cases the model that presents the lowest value for these statistics is considered as most adequate for use. As can be appreciated in Table 1, Model 3 presents lower values for both of these criteria, which means that this model is the best alternative according to these statistics and shall be the one used while examining the results.

Table 1: Alternative Models

Dependent Variable: FDI	**Model 1**	**Model 2**		**Model 3**	
Rule of Law	-0.279138	0.108911	**	0.094412	*
Constant	-11.55699	0.616527		0.864799	
Battle related Deaths	-3.36E-04	-		-	
Cereal Yield Growth	0.018656	0.00035		-	
Enrollment	0.005562	0.002724	*	-	
Exchange Rate	0.013773	4.71E-06		3.07E-06	
Life Expectancy	-0.122035	-0.010783	***	-0.010411	***
Openness	0.015433	-0.000703		-0.000804	
Ores and Metals	1.59E-01	0.004028	***	0.003766	***
Population	2.17E-08	-1.01E-09		6.93E-10	
Rural Population	0.177382	-0.00274	*	-0.003034	**
Tax Rate	-5.51E-02	6.81E-05		1.45E-06	
Telephone Lines	2.41E-06	2.24E-07		-	
Principal Components Inputs (EIA)	-	-		0.070455	**
Observations	14	101		101	
R-Squared	0.96	0.42		0.41	
Adjusted R-Squared	0.53	0.34		0.35	
Akaike Info Criterion	[3]-1.76	-0.73		-0.75	
Schwarz-Criterion	-1.17	-0.42		-0.49	
F-Statistics	2.19	5.87		6.90	
P-Value F-Statistic	0.49	0.00		0.00	

Significant at a: *** 1% Level, ** 5% Level, * 10% Level.

[3] The Akaike Information and Schwarz—Criteria in Model 1 are not applicable for comparison since the observations used are different.

RESULTS

Expectations

Before interpreting the results from Table 1, the expectations of the variables' effects will be articulated. Given what was illustrated in the Literature Review as well as the use of general intuition, the expectations on the results of this regression were the following. Institutional quality is expected to be significant, although its sign is ambiguous. Literature focusing on FDI in Africa suggests that it will be positive, while the literature focusing on outgoing FDI flows from China suggests that a negative sign will be found. Conflict, in the form of battle related deaths, is expected to have a significant negative role in attracting FDI. This is because the instability produced by conflict has an impact in the general investment atmosphere in a country. These repercussions include the production capabilities of the labor stock, which finds itself in a situation in which the national authorities cannot provide a safe environment that is ideal to work in and might also be affected by psychological traumas.

The agricultural productivity of a country provides appealing features for capital holders. If agricultural productivity is strong, the returns on investing in agricultural productions will be high, since labor efficiency will be optimum. Education and human capital in a country is crucial for cross-regional and cross-sectorial productivity, which can be very appealing to investors. Infrastructure provides a basic level of operations. Available infrastructure in a country can be presented as a reduction in transaction costs and might be crucial when evaluating in which region to invest. Hence, these three variables, as well as their principal component variable, are expected to have a positive significant effect.

It is generally known that China's economy is widely dependent on their financial relation with the US. The US not only provides a vast consumer pool for Chinese products but China also accounts for ownership of US government debt. In fact, a report issued in June 2011 by the US Treasury reported that 26% of US government debt was owned by Chinese entities and this percentage can be assumed to be increasing (Flitter, 2011). Also, since the US dollar is known to be the dominant currency in international transactions, assuming that most of the Chinese investment is done in dollars, is not farfetched. Hence, the US dollar plays a crucial role for the Chinese economy, which means that the exchange rate between local African currencies and the US dollar can have significant effects in Chinese investment.

Health and life expectancy of a population are also issues that can catch the eye of investors given the fact that a healthier labor force is more productive. This is why the causal relation that can be expected in this instance is a positive one as well.

The role of openness can be ambiguous when attracting FDI, at a first glance; an open economy can transmit the feeling of a welcoming environment for foreign investors. This could imply that the society is used to having foreign consumer products and have a willingness to consume non-local brands. On the other hand, an open economy also allows the free movement of products and hence, establishing operations in the country might not be worthwhile since the transaction costs of importing or exporting a product are not as high as when an economy is closed.

Natural resource endowment, taking the form of ores and metals, are expected have a positive role when attracting FDI. This is especially true since some African countries are known to have a large pool of natural resources, which was the main reason for the occurrence of European colonization in this continent.

The size of a country's population exhibits the size of local markets and the available labor force; how accessible these markets are, will mainly rely on urban and rural inhabitant distributions. Given the generally low level of infrastructure, as well as the vast size of African nations, rural exodus, which feeds urban agglomerations, could be seen as attractive for investors. This is why the population variable is expected to have a positive sign, while the rural population indicator is expected to be negative.

Tax rates are also important factors in the agenda of foreign investors. If a foreign country exposes lower tax rates than the ones found domestically, investors will have a higher incentive to produce in this foreign market as it provides an opportunity to cut costs.

Interpretation of the Results

It is worth mentioning once more that the limited sample size due to data availability can have important consequences on these results and this caveat should be kept in mind while interpreting these results.

When looking at the main independent variable of interest, it is possible to notice that institutional quality has a positive and significant coefficient. This goes hand in hand with

what was found by Naud and Krugell (2007), specifically, FDI is attracted to good governance in Africa.

Despite having the positive sign that was expected, the exchange rate variable does not seem to significantly influence outward Chinese FDI in Africa. This might be as a result of the fact that dollars might not be used as a primary currency and perhaps there is need to use the Yuan exchange rate to local African currencies.

Life expectancy is significant as expected but its coefficient carries a negative sign. This result is rather counterintuitive and a possible explanation is related to the data properties. There might not be enough observations included or perhaps life expectancy is proxying an unobserved variable together with health. This variable might be quality of life derived from wages. This would make intuitive sense since higher wages would provide the financial ease of living a longer life but at the same time would deter foreign investment from happening. Unfortunately, data reflecting wages is not readily available to confirm this supposition.

Openness is found to be insignificant; this might be because of the two different effects, mentioned in the expectation subsection above, neutralizing each other out.

Natural resources have the positive significant effect that was expected. As was the case in Morck, Yeung and Zhao (2008) and Kolstad and Wiig (2012) natural resources attract Outward Chinese FDI. As well as Africa's role in the receiving end found in Anyanwu (2011).

Population size does not seem to affect investors but smaller rural proportions seem to have significant effects. This decrease in rural population attracting FDI in Africa also matches the results in Anyanwu (2011).

Tax rates were found to be insignificant, which would imply that tax rates do not influence decision-makers. This could be also because official tax rates might not reveal potential tax cuts that could be arranged between investors and local governments to incentivize investment.

As expected, the principal component variable encompassing productivity is found to have a significant and positive coefficient, highlighting the importance of these variables when attracting FDI.

ROBUSTNESS CHECKS

In this section, the robustness of the results is analyzed. The main method used to analyze robustness is to consider alternative measures for independent variables. Since the considered model includes several proxy variables, it is important to assess whether the included proxies are indeed informative or other independent variables could capture the effect more efficiently.

Specifically, the robustness checks are performed by using alternative measures for institutional quality. In a first instance the CPIA Property Rights variable, which is described in the data and methodology section, will be used.[4] As illustrated in Table 2, the results seem to be consistent when using an alternative measure in the original estimation model. The same variables are found significant and have the same signs increasing the robustness of the results.

These findings are also robust when using this alternative institutional quality measure in the model including the productivity principal component variable, which was chosen as the optimal model to discuss the results of this research. Once more the results are coherent with what the previous tables have shown with the only differences lying in the fluctuating significance levels of the relevant variables, making the results found more reliable. The estimates from this robustness check can be found on the second column of Table 2.

[4] A scatter plot with a fitted line illustrating the expected positive relationship between the two alternative institutional quality measures can be found in Appendix 5, Graph 10.

Table 2: Robustness check using CPIA Property Rights and the Principal Components variable

Dependent Variable: FDI	**Model 4**		**Model 5**	
CPIA Property Rights	0.080304	*	0.068215	*
Constant	0.277215		0.58931	
Cereal Yield Growth	0.000332		-	
Enrollment	0.002969	**	-	
Exchange Rate	5.62E-06		3.84E-06	
Life Expectancy	-0.009926	***	-0.009641	**
Openness	-0.000819		-0.000899	
Ores and Metals	0.003987	***	0.003736	***
Population	-1.07E-09		5.50E-10	
Rural Population	-0.003057	**	-0.003285	**
Tax Rate	4.10E-05		-2.33E-05	
Telephone Lines	2.16E-07		-	
Principal Components Inputs (EIA)	-		0.075568	**
Observations	101		101	
R-Squared	0.42		0.4	
Adjusted R-Squared	0.34		0.34	
Akaike Info Criterion	-0.72		-0.73	
Schwarz-Criterion	-0.41		-0.48	
F-Statistics	5.66		6.68	
P-Value F-Statistic	0.00		0.00	

Significant at a: *** 1% Level, ** 5% Level, * 10% Level.

Another robustness check can be done by computing a variable through the principal components analysis method from both these alternative measures of institutional quality. Doing so creates an additional quality measure that includes aspects of both measures, and this variable in principle can be a better proxy for institutional quality. The results of the two models derived are shown in the Table 3.

Table 3: Robustness check using PC Rule of Law as an alternative measure

Dependent Variable: FDI	**Model 6**		**Model 7**	
Principal Components Rule of Law	0.038677	**	0.033141	*
Constant	0.517828		0.785738	
Cereal Yield Growth	0.000339		-	
Enrollment	0.002831		-	
Exchange Rate	5.49E-06	*	3.70E-06	
Life Expectancy	-0.01048		-0.010122	***
Openness	-0.00077	***	-0.000861	
Ores and Metals	0.00403		0.003766	***
Population	-1.05E-09	***	6.38E-10	
Rural Population	-0.002903		-0.003171	**
Tax Rate	6.25E-05	*	-4.77E-06	
Telephone Lines	2.24E-07		-	
Principal Components Inputs (EIA)	-		0.072818	**
Observations	101		101	
R-Squared	0.42		0.4	
Adjusted R-Squared	0.35		0.34	
Akaike Info Criterion	-0.73		-0.74	
Schwarz-Criterion	-0.42		-0.48	
F-Statistics	5.80		6.81	
P-Value F-Statistic	0.00		0.00	

Significant at a: *** 1% Level, ** 5% Level, * 10% Level.

These tables reaffirm the robustness of the results. One detail that is important to highlight from these alternate models is that, despite the fact that the main explanatory variable is significant in every case, its coefficient is always lower than the one found in Model 3, which probably means that the measure of Rule of Law provides the highest relevant information when capturing the influence of institutional quality on inward FDI in this research.

One last analysis that can be done with these alternative models is to compare the Akaike Information Criterion and the Schwarz—Criterion to see if Model 3 is still the best suited

one. It is important to highlight that all models have the same observations as well as the same dependent variable, which makes this comparison possible. By taking a look at the tables above it was possible to compute the following table:

Table 4: Akaike Information and Schwarz Criteria

	Akaike Information Criterion	Schwarz-Criterion
Model 2	-0.732406	-0.421698
Model 3	**-0.746758**	**-0.487835**
Model 4	-0.717309	-0.406601
Model 5	-0.733978	-0.475056
Model 6	-0.726858	-0.416151
Model 7	-0.741766	-0.482843

The lowest values are those found on Model 3, which justifies the choice of this Model as the one used in describing the results.

ANALYSIS AND POLICY IMPLICATIONS

The empirical analysis in this paper can be used to assess policy implications in terms of the Chinese FDI levels in African countries.

The conclusions that can be made from the Results section, which make intuitive sense are that better institutional quality; larger urban agglomerations; larger natural resource endowments and a more productive population significantly attract Chinese FDI in individual African countries. These findings have several implications on policy makers.

This is especially true when looking at what has been exposed during the second part of the literature review. China offers a very plausible opportunity for boosting development in Africa. An increase in FDI, given the right environment, will lead to economic growth. If not dwelled with correctly, growth can become harmful, as bad inequalities may take control of a country's economy and perverse effects might follow. Given the critical state of development in African societies, institutions play an ever-important role in assuring a prosperous setting that could guarantee the achievement of full economic potential in the region.

Good institutions are key in stimulating development, as well as essential in the prevention of negative effects such as natural resource curses[5] from happening. The results of this research offer a hopeful and promising sight into the issue. Nevertheless, the limitations in the size of the sample due to data issues prevent these results of being definitive. Also issues such as the possibility of bias in the availability of the data towards countries that actually have good enough institutions to report these numbers, make the results of this research to be taken with caution. What can definitely be extracted from this research is the need for African nations to develop stronger, more efficient and more accountable institutions. The reports of irregularities and a general feeling of lack of transparency in the recent 2013 re-election of Zimbabwe's President Robert Mugabe, who has been in power since 1980, presents evidence that African institutions are still far from perfect and that there is still work to be done (Polgreen, 2013). The implication for African countries is hence, that a focus on institutions should be made and that good institutional quality should be aimed for.

[5] Natural resource curses consist of the paradox that countries with the largest natural resource endowments tend to have slower growth rates than countries with small natural resource reserves.

If in fact, Chinese investors are attracted by good institutions in the African continent, then the policy implications that can be made towards these investors is to continue with their attitude. This would ensure good inequalities to occur and with it the achievement of long lasting return on the operations being carried in the country of interest. This is because good inequalities enable growth to become sustainable, which would allow long term increasing gains. An example that not only is useful in explaining the effects of good inequalities, but also gives Chinese decision-makers some benefit of the doubt concerning their intentions in Africa can be mentioned. In fact, part of the Chinese economic success can be explained by Chinese income inequality being characterized with elements of good inequalities. According to Chaudhuri and Ravallion (2007), one of the reasons why China has been able to sustain the unprecedented endeavor of such high growth rates for the last quarter of century is because of policy decisions such as the Household Responsibility System in the early 1980's. This particular reform ensured individual economic incentives to thrive in rural areas by allowing farmers to keep the excess of production in their assigned plots of land. A counter-example exists in Latin America. According to Landes (1990), one of the reasons why Latin American countries have not been able to achieve their growth potentials has been because of bad inequalities. These inequalities had limited the enriched elites to be content with trading primary products, restricting in this way, the diffusion of the industrial revolution at the end of the nineteenth century. One of the examples that Landes exposes is the case of Argentina. He mentions that, at the beginning of the twentieth century, Argentina was perceived as a state of boundless possibilities and was fated to join the world's richest nations. This prediction was never consumed because policy makers never did enough to transform earnings into balanced and sustainable growth in the following half-century.

To conclude this section it is possible to highlight that not only should the relation between these regions be economic but also African states should try to learn from their investors in the grounds of policy making, especially in promoting development in rural areas. China's rapid growth can serve as an example that development can happen in a short amount of time. Actually, Juma (2007) proposes the notion that an underlying reason in the growth of Sino-African relations is the fact that African nations see China as a success story of rapid growth and their presence in Africa brings a sign of hope to these states.

CONCLUSION AND FUTURE RESEARCH

This research was aimed to cast light on the role that institutional quality plays in attracting Chinese Foreign Direct Investment in Africa. In addition to this, this paper intended to stress the pivotal role institutions have in fostering and sustaining economic development. Despite all the known inconveniences of lagging behind in the global economic environment, Africa finds itself in a position where it can judge others' past mistakes and choose the most adequate road to economic realization. The growing role that China is playing in this side of the world might offer Africa a ticket to achieve higher growth rates and subsequently faster development opportunities, if the right measures are taken. In order to achieve these goals, China must also play a vital role that could help it consolidate itself not only as a global economic reference but as a social one as well. This reality makes the research at hand interesting, crucial and well timed. The results of this paper, especially the fact that good institutional quality attracts Chinese FDI, suggests that there are steps being taken in the right direction. In addition to this, outcomes that support the importance of life expectancy, natural resource endowment, rural population and productivity in this arena have also been found. Results were tested with the use of alternative measures of institutional quality and were found robust. Also, the Rule of Law indicator issued among the World Governance indicators by the World Bank was the measure which reflected the highest relevance when proxying institutional quality for the purposes of this study. The originality of this research lies in its unique aspect of linking empirical results with elements of development economics on the subject. The application of principal components analysis and updating previous results found, by using the most recent data available, are other contributions of this paper. Given the limitations of data, these results are derived from a rather small sample; future research should take advantage of further improvements in data collection. In addition, these flows are expected to continue growing and hence the effects driven by these flows will only grow in magnitude making further studies a must.

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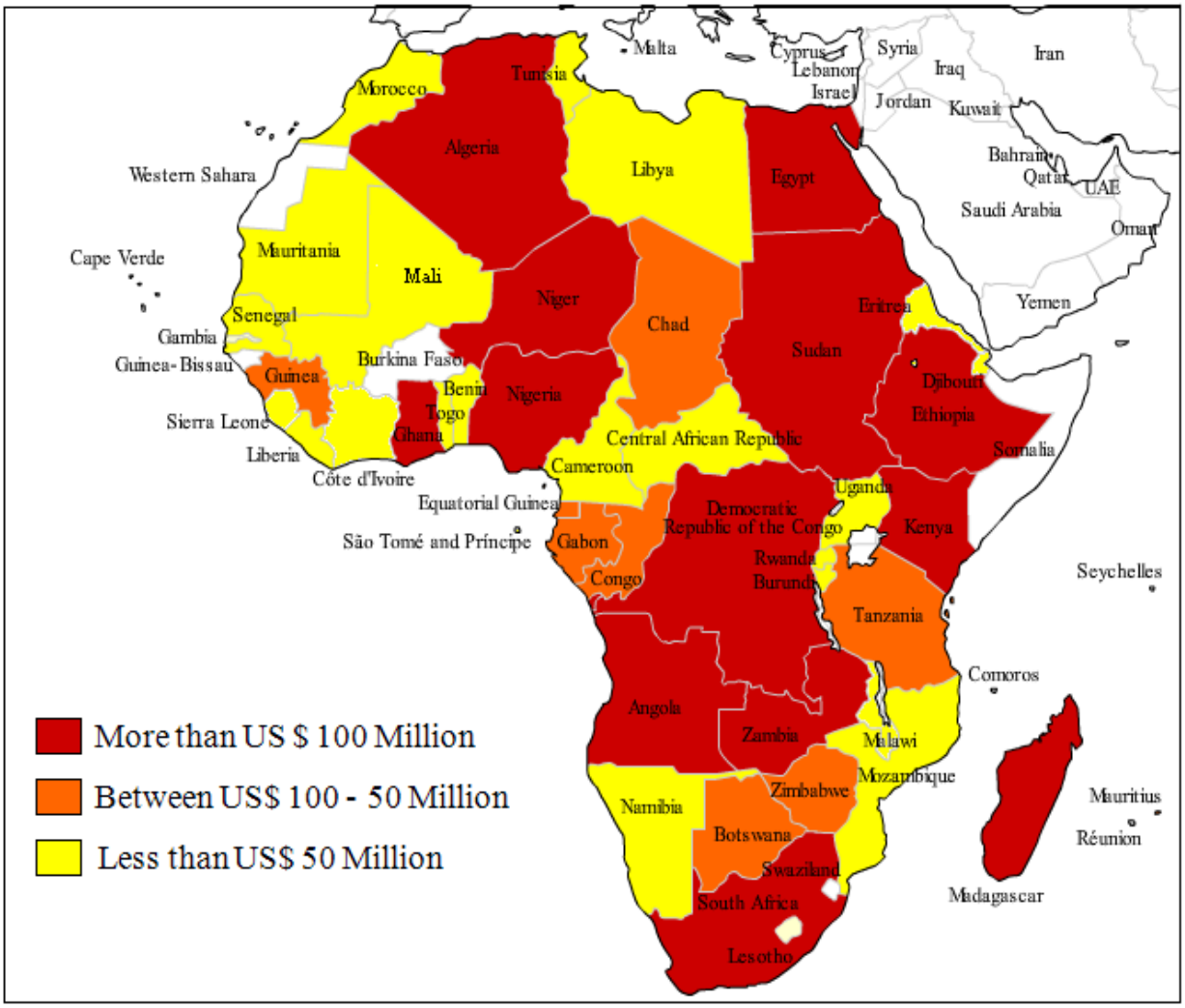
APPENDIX

Appendix 1:

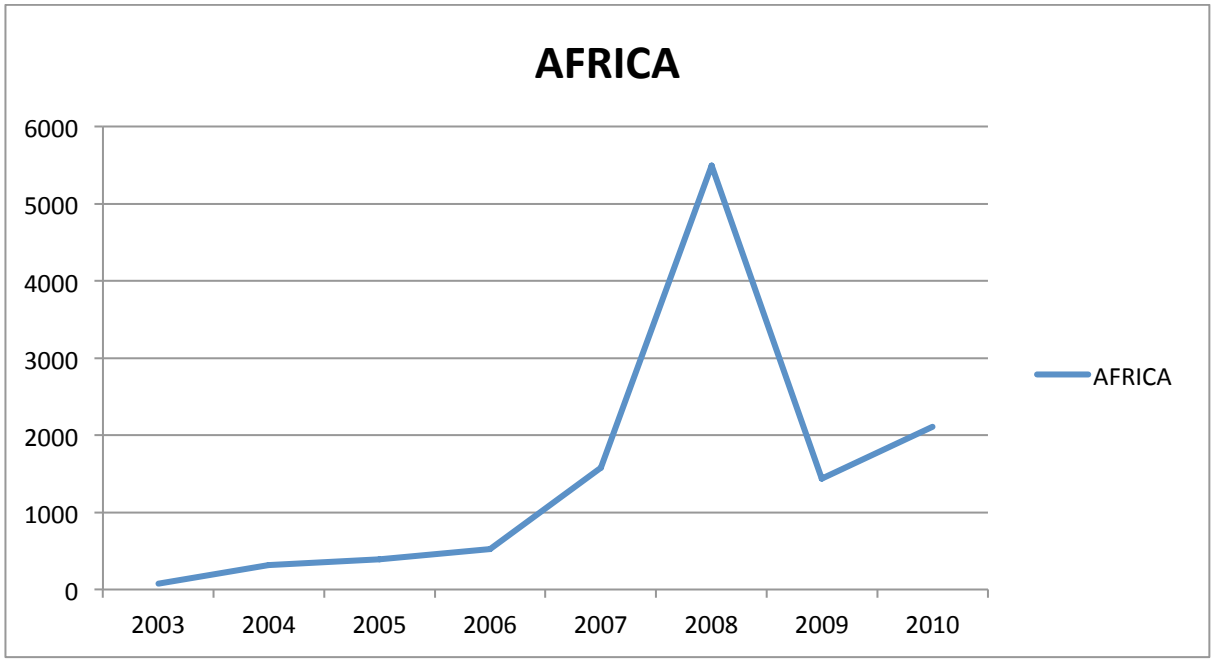
Figure 1: Total of Chinese FDI Flows from 2003 to 2010 by Receiving Country



Source: Author's illustration of data found in the Chinese Ministry of Commerce.

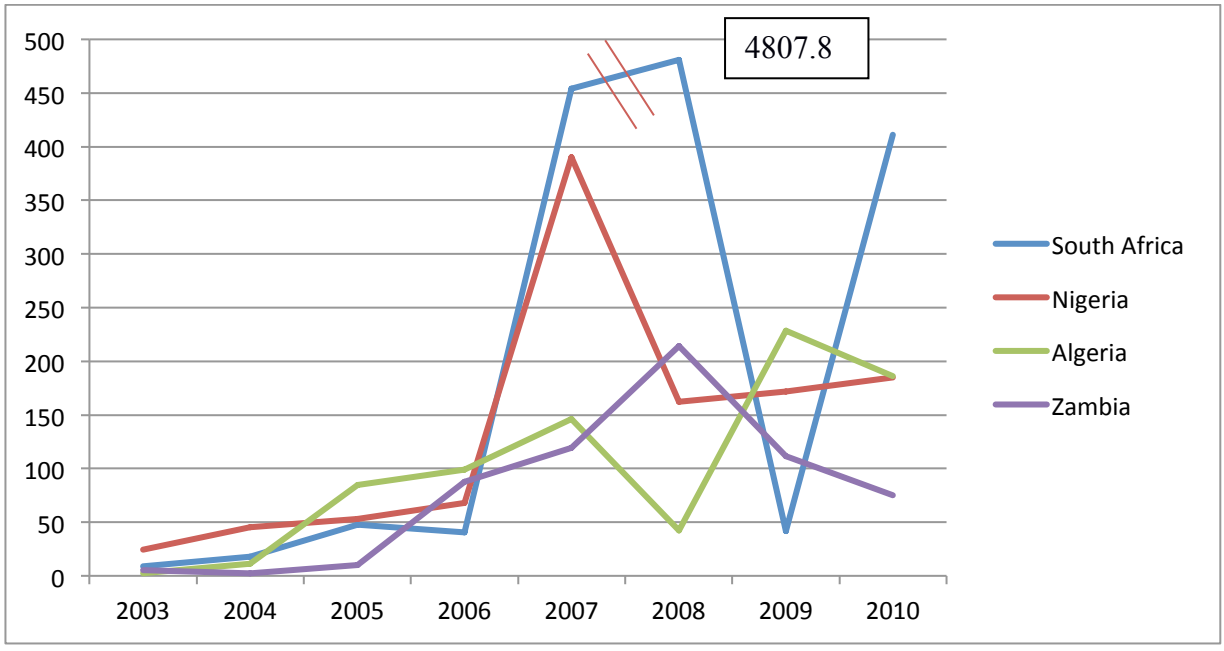
Appendix 2: Flows in millions of US$ from 2003 to 2010 in order of prominence

Graph 1: Flows in millions of US$ from 2003 to 2010 in the African Continent as a whole



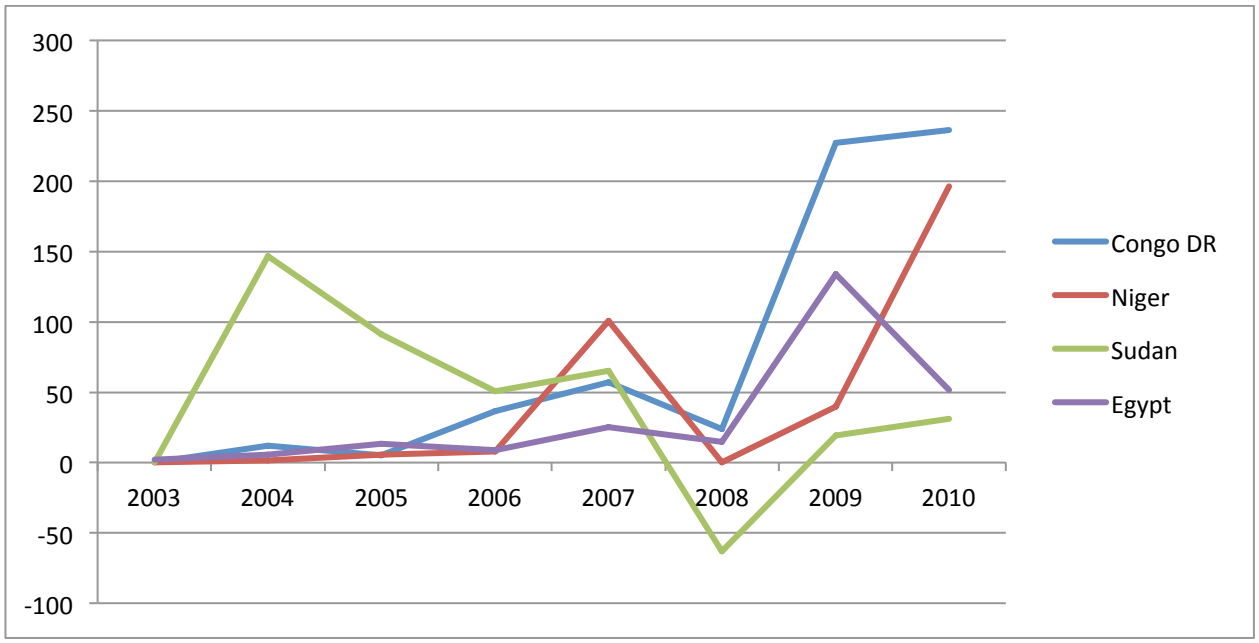
Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Graph 2: Flows in millions of US$ from 2003 to 2010 in the top four receiving country



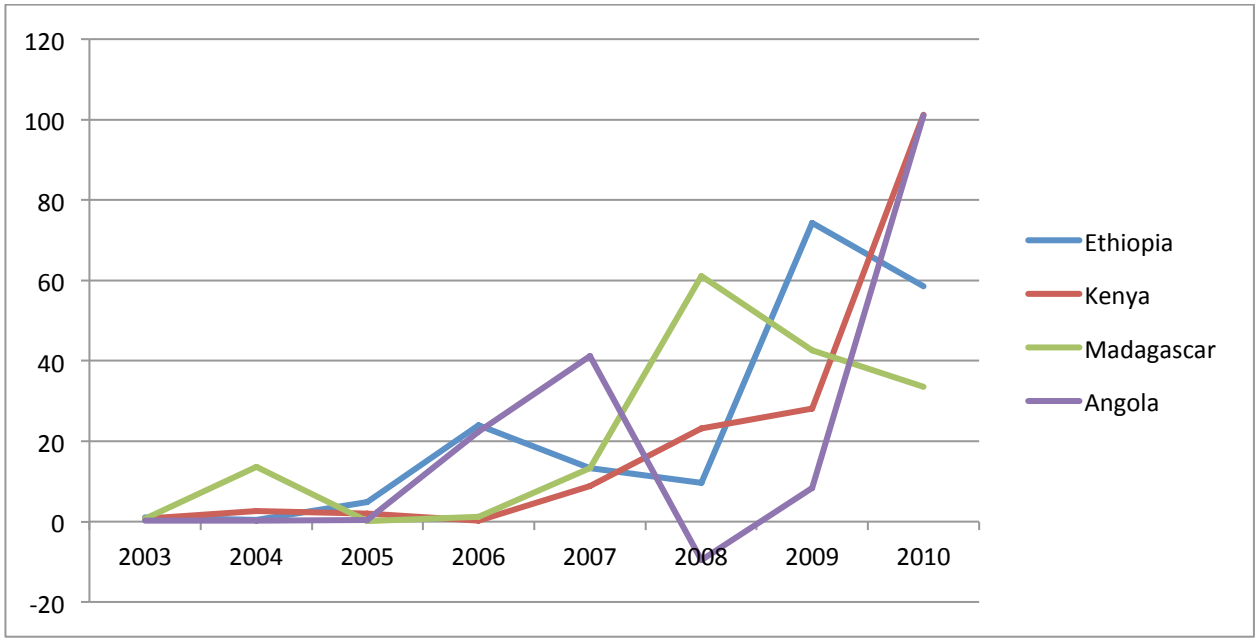
Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Graph 3: Flows in millions of US$ from 2003 to 2010 in the second highest receiving group of four countries



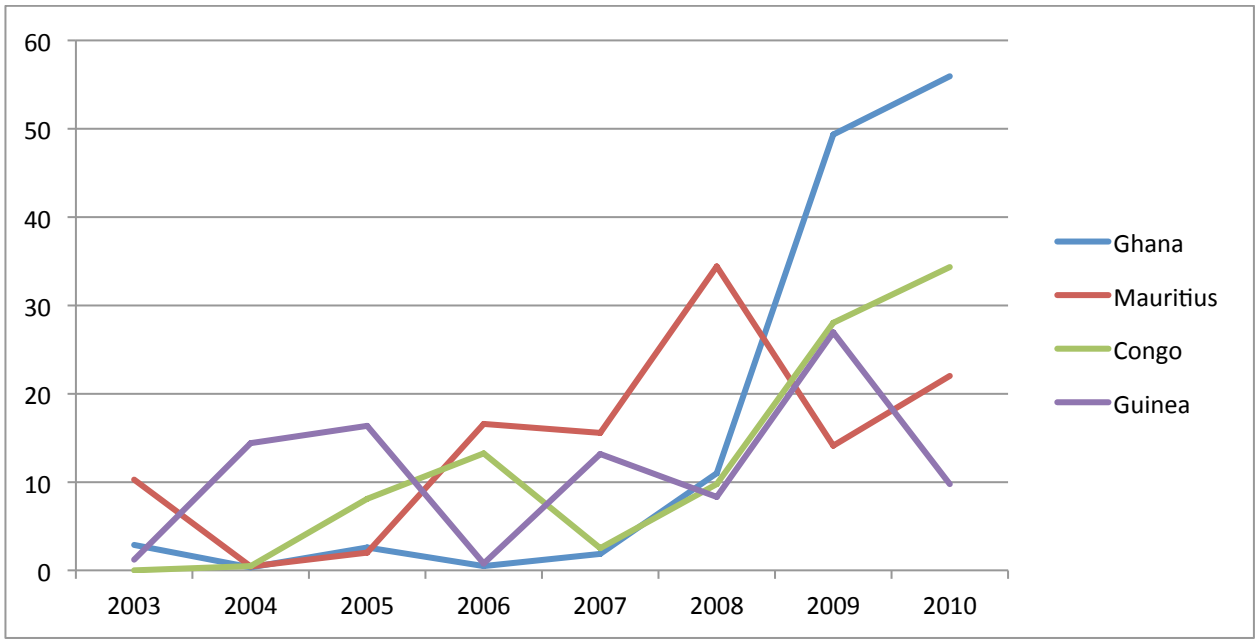
Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Graph 4: Flows in millions of US$ from 2003 to 2010 in the third highest receiving group of four countries



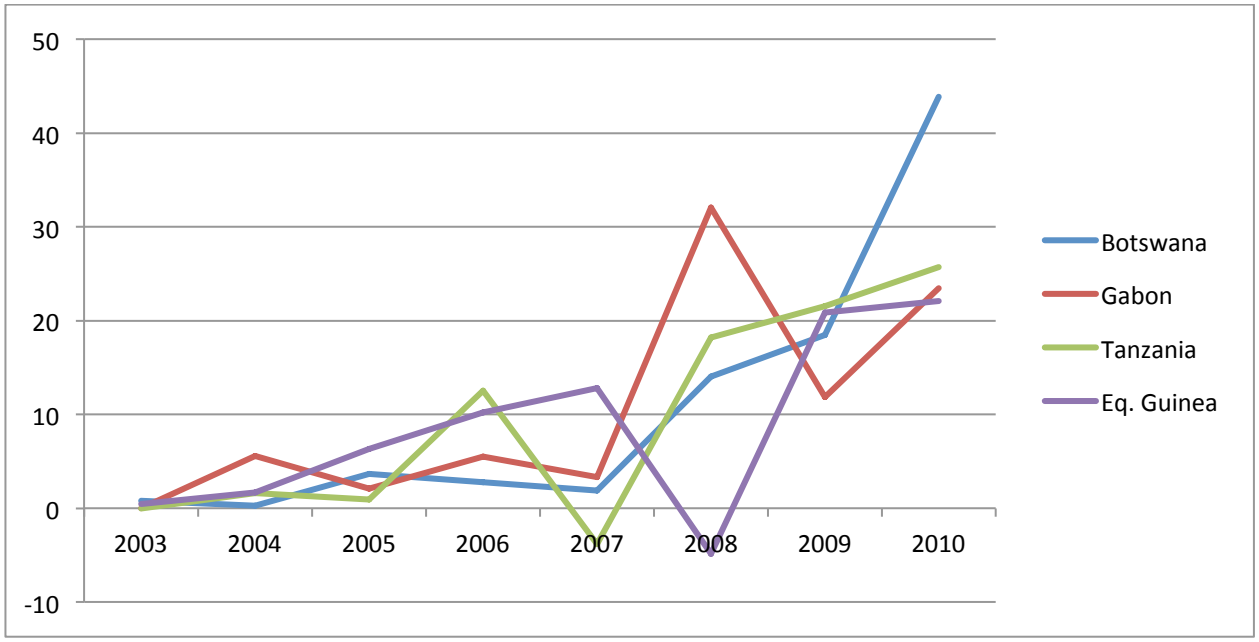
Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Graph 5: Flows in millions of US$ from 2003 to 2010 in the fourth highest receiving group of four countries



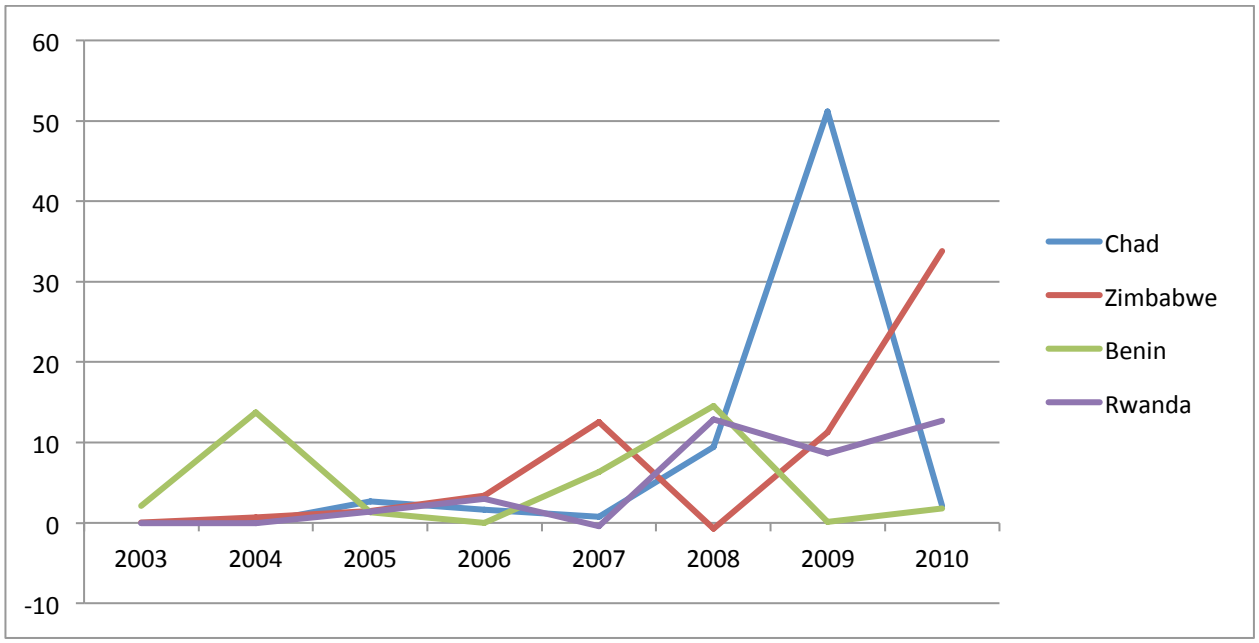
Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Graph 6: Flows in millions of US$ from 2003 to 2010 in the fifth highest receiving group of four countries



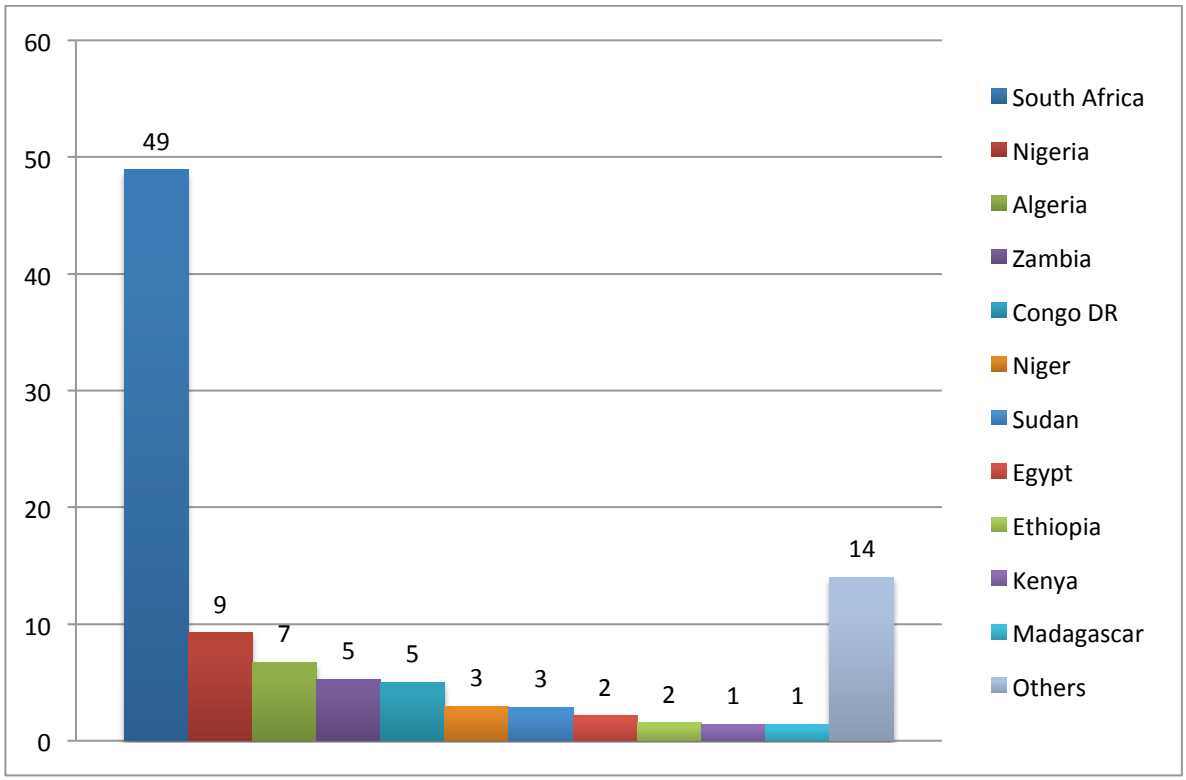
Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Graph 7: Flows in millions of US$ from 2003 to 2010 in the lowest receiving group of four countries



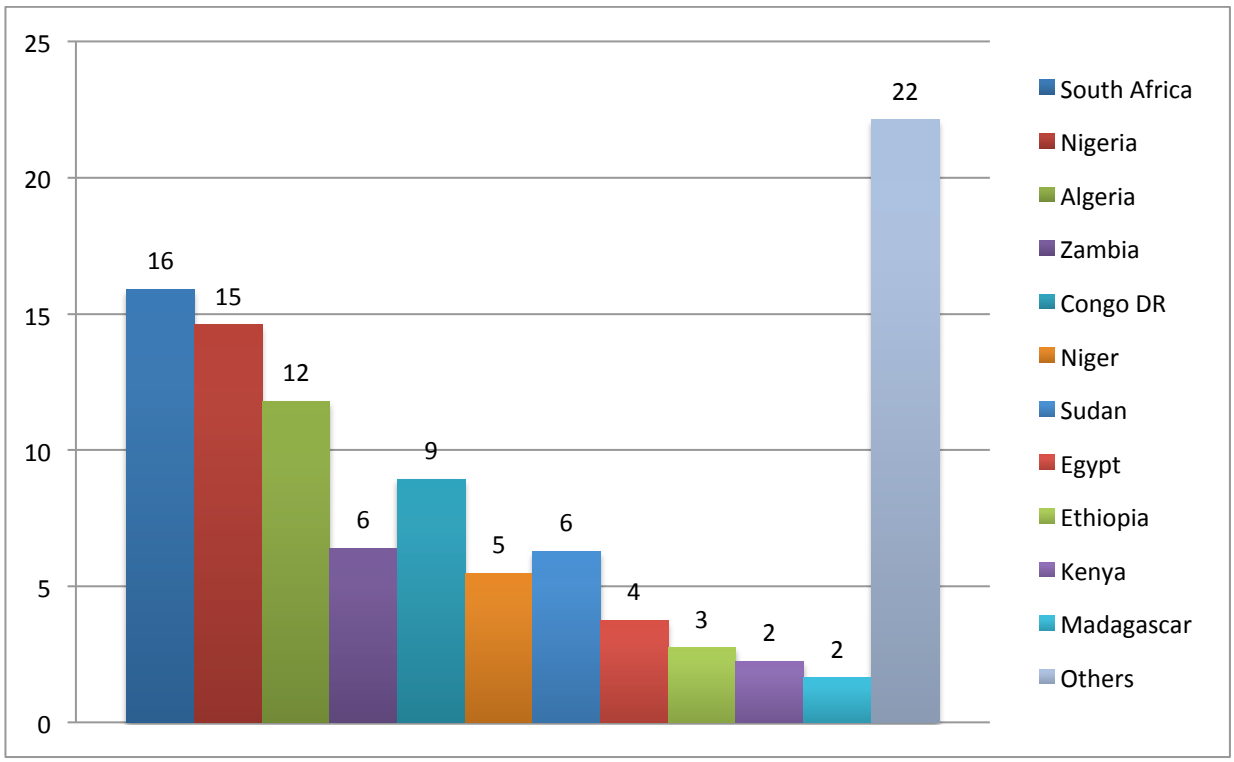
Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Graph 8: Flows in millions of US$ from 2003 to 2010 in percentages



Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Graph 9: Flows in millions of US$ from 2003 to 2010 in percentages (excluding 2008)



Source: Author's illustration of data found in the Chinese Ministry of Commerce.

Appendix 3:

Table 5: Summary Statistics for the data found for the whole African Continent

	FDI in millions of US$	Rule of Law	CPIA Property Rights	Cereal Yield Growth	Enrollment
Mean	19.74	-0.83	2.75	5.74	74.69
Median	2.60	-0.87	2.50	1.79	75.77
Maximum	390.35	0.57	4.00	205.99	99.35
Minimum	-63.14	-1.82	1.00	-73.13	34.68
Std. Dev.	47.92	0.50	0.62	27.40	17.53
Observations	217	235	235	235	149

Source: Author's illustration of data found in the World Bank Development Indicators, World Bank Governance Indicators and Chinese Ministry of Commerce.

Table 6: Summary Statistics for the data found for the whole African Continent *Continuation*

	Exchange Rate	Life Expectancy	Openness	Ores & Metals	Population
Mean	1111.75	54.17	74.71	15.55	19106628
Median	472.19	53.66	68.60	3.15	12379612
Maximum	18498.60	73.77	176.81	85.97	158000000
Minimum	0.91	43.86	27.97	0.00	152622
Std. Dev.	2523.66	6.28	31.09	23.58	26724750
Observations	232	235	218	171	235

Source: Author's illustration of data found in the World Bank Development Indicators, World Bank Governance Indicators and Chinese Ministry of Commerce.

Table 7: Summary Statistics for the data found for the whole African Continent *Continuation*

	Rural Population	Tax Rate	Telephone Lines	Battle Related Deaths	PC Rule of Law	PC EIA
Mean	64.05	78.84	194283.5	287.26	0.00	-0.31
Median	65.72	47.90	81566.5	126	-0.14	-0.25
Maximum	90.63	339.70	1687972	1978	3.42	0.68
Minimum	23.00	14.40	2374	1	-3.33	-2.22
Std. Dev.	15.19	77.33	293896.4	397.04	1.39	0.71
Observations	235	235	232	47	235	146

Source: Author's illustration of data found in the World Bank Development Indicators, World Bank Governance Indicators and Chinese Ministry of Commerce.

Appendix 4: Correlation Tables

Table 8: Correlation Tables

	FDI	Rule of Law	CPIA Property Rights	Cereal Yield Growth	Enrollment
FDI	1.000	-0.237	-0.084	-0.077	-0.138
Rule of Law	-0.237	1.000	0.932	-0.285	0.043
CPIA Property Rights	-0.084	0.932	1.000	-0.301	0.057
Cereal Yield Growth	-0.077	-0.285	-0.301	1.000	0.075
Enrollment	-0.138	0.043	0.057	0.075	1.000
Exchange Rate	-0.361	-0.332	-0.283	-0.089	-0.200
Life Expectancy	0.140	0.451	0.501	0.042	0.514
Openness	0.004	0.204	0.380	0.182	-0.112
Ores & Metals	-0.214	-0.612	-0.664	0.528	-0.005
Population	0.781	0.072	0.107	-0.269	0.012
Rural Population	-0.366	0.234	0.133	-0.278	0.460
Tax Rate	-0.353	-0.623	-0.629	0.073	-0.011
Telephone Lines	0.756	0.106	0.154	-0.277	0.131
PC Rule of Law	-0.158	0.980	0.985	-0.298	0.051
PC EIA	0.218	0.124	0.158	-0.207	0.873
Battle Related Deaths	0.686	-0.276	-0.123	-0.255	0.076

Source: Author's illustration of data found in the World Bank Development Indicators, World Bank Governance Indicators and Chinese Ministry of Commerce.

Table 9: Correlation Tables *Continuation*

	Exchange Rate	Life Expectancy	Openness	Ores & Metals	Population
FDI	-0.361	0.140	0.004	-0.214	0.781
Rule of Law	-0.332	0.451	0.204	-0.612	0.072
CPIA Property Rights	-0.283	0.501	0.380	-0.664	0.107
Cereal Yield Growth	-0.089	0.042	0.182	0.528	-0.269
Enrollment	-0.200	0.514	-0.112	-0.005	0.012
Exchange Rate	1.000	-0.796	-0.019	0.206	-0.701
Life Expectancy	-0.796	1.000	0.280	-0.430	0.506
Openness	-0.019	0.280	1.000	-0.061	-0.139
Ores & Metals	0.206	-0.430	-0.061	1.000	-0.519
Population	-0.701	0.506	-0.139	-0.519	1.000
Rural Population	0.061	0.277	-0.407	-0.525	0.042
Tax Rate	0.894	-0.766	-0.237	0.466	-0.655
Telephone Lines	-0.734	0.585	-0.137	-0.516	0.989
PC Rule of Law	-0.311	0.486	0.303	-0.651	0.092
PC EIA	-0.464	0.668	-0.178	-0.304	0.471
Battle Related Deaths	-0.065	0.077	-0.267	-0.312	0.528

Source: Author's illustration of data found in the World Bank Development Indicators, World Bank Governance Indicators and Chinese Ministry of Commerce.

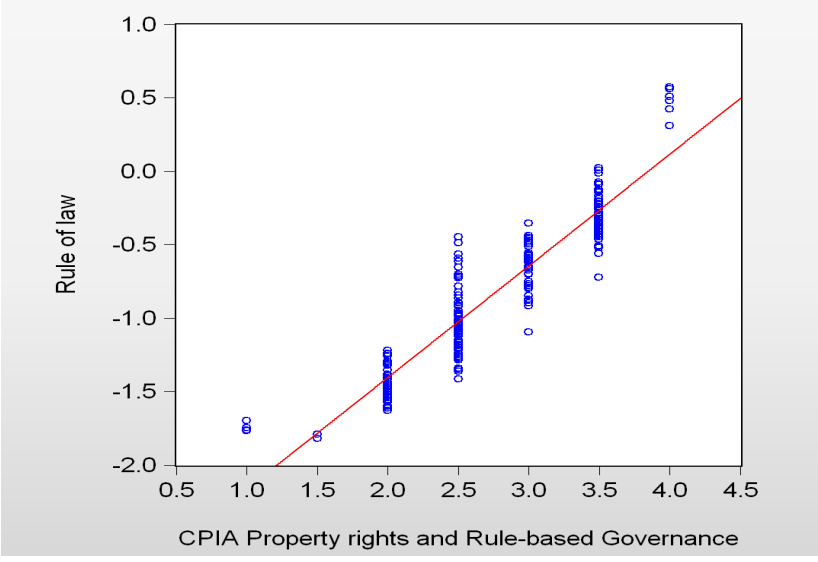
Table 10: Correlation Tables *Continuation*

	Rural Population	Tax Rate	Telephone Lines	PC Rule of Law	PC EIA	Battle Related Deaths
FDI	-0.366	-0.353	0.756	-0.158	0.218	0.686
Rule of Law	0.234	-0.623	0.106	0.980	0.124	-0.276
CPIA Property Rights	0.133	-0.629	0.154	0.985	0.158	-0.123
Cereal Yield Growth	-0.278	0.073	-0.277	-0.298	-0.207	-0.255
Enrollment	0.460	-0.011	0.131	0.051	0.873	0.076
Exchange Rate	0.061	0.894	-0.734	-0.311	-0.464	-0.065
Life Expectancy	0.277	-0.766	0.585	0.486	0.668	0.077
Openness	-0.407	-0.237	-0.137	0.303	-0.178	-0.267
Ores & Metals	-0.525	0.466	-0.516	-0.651	-0.304	-0.312
Population	0.042	-0.655	0.989	0.092	0.471	0.528
Rural Population	1.000	0.118	0.078	0.183	0.457	0.135
Tax Rate	0.118	1.000	-0.676	-0.637	-0.308	-0.028
Telephone Lines	0.078	-0.676	1.000	0.134	0.575	0.538
PC Rule of Law	0.183	-0.637	0.134	1.000	0.145	-0.198
PC EIA	0.457	-0.308	0.575	0.145	1.000	0.330
Battle Related Deaths	0.135	-0.028	0.538	-0.198	0.330	1.000

Source: Author's illustration of data found in the World Bank Development Indicators, World Bank Governance Indicators and Chinese Ministry of Commerce.

Appendix 5:

Graph 10: Alternative Institutional Quality Measures Scatter Plot and Fitted Line



Source: Author's findings from data found in World Bank Databases I and II.