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Quality of Institutions, Natural Resources and Foreign Direct Investment (FDI) in Sub-Saharan Africa: Dynamic Approach

Komlan Fiodendji, Ph.D[1].

Abstract

One of the problems which sub-Saharan African (SSA) countries are confronted with is low levels of investment. Yet, the theory of capital tells us that it is impossible to envisage development without a considerable accumulation of capital. An important channel through which those countries can solve the problem is to resort to foreign direct investment (FDI), especially now that we know the considerable role which such investment played in the development of the economy of several Asian countries. Sub-Saharan African countries have not benefited enough from such a type of investment. There are many reasons behind this, and they vary from country to country and region to region. One of these reasons is the quality of institutions. That is why the present study, using dynamic panel data, set out to identify the role of quality of institutions on the flows of foreign investment in SSA countries, according to certain characteristics of countries (resource intensive countries and non-resource intensive countries). Based on a dynamic panel data set for 30 SSA countries, over the period 1984-2007, our paper finds that different aspects of a country's institutional quality are almost always significant, regardless of the other control variables. Taking into account the interaction impact, we find that the impact of institutional quality on FDI depends on the importance of natural resources in the host country. Institutional quality promotes FDI in countries where the natural resources are abundant, but has a negative effect on FDI in natural resources intensive countries.The paper also finds that, the marginal effect of natural resources on FDI increases with resource abundance while institutional quality remains a factor. Interaction between the two factors is determinant in countries' ability to compete for FDI inflows.

I. Introduction

1.1 Motivation for the study

During previous decade, the literature dedicated to the theory of the economic development has been renewed by focusing to the quality of domestic institutions as key determinants of cross-country differences in both growth rate and income per capita. Voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and low level of corruption have shown to be highly correlated with growth. There also has been an increasing interest in the determinants of foreign direct investment (FDI) in developing countries. Several empirical studies revealed the role played by FDI as major constituents of capital flows in these countries. On the other hand, ability to deal with major obstacles such as shortages of financial resources, technology, and skills has attracted attention for policy makers in developing countries.

However, inflows represent additional resources a country needs to improve its economic performance, and provides both physical capital and employment possibilities that may not be needed in the host market.

[1] Department of Economics, Université de Montréal (UdeM), Montreal, Qc, Canada. daniel.fiodendji@umontreal.ca dansegun@yahoo.com

Not surprisingly, thus, a number of authors have also studied the link between institutions and FDI. FDI is now a large share of capital formation in poor countries, the FDI-promoting effect of good institutions might be an important channel of their overall effect on growth and development. Poorly regulated institutions and/or a complete lack of institutional governance incur additional costs to the wellness to invest in SSA countries (Wei, 2000). The high sunk costs associated with investing offshore, along with the uncertainty associated with poor physical and financial infrastructure together with weak enforcement of regulations and ineffective legal systems, has progressively forced companies to be increasingly selective as to where to invest.

To attract and increase investments of productive capital, countries must continue to endeavour create a transparent, stable foreseeable framework, equipped with mechanisms with execution of adequate contracts and respect for the property rights, articulated around macroeconomic policies, and of institutions which make it possible for the national as well as international companies to carry on their activities in an effective and profitable way, and to have a maximum impact on development.[2] Thus, it is essential to improve the principal aspects in order to influence the choices of establishment of the investment. This requires identifying these factors which can differ from an area to another, taking into account specificities and of the potentialities relative to each one of it. One of the quoted factors that lasted years in this literature is the quality of the institutions. Research on the determinants of FDI has focused mainly on classical factors such as domestic markets, availability of natural resources, an educated labour force, good infrastructure, low labour cost, good institutions, political stability, to mention a few. The empirical literature on the determinants of FDI to developing countries has generally focused on identifying the location-specific factors that are relevant for FDI to developing countries. Several studies exist on the determinants of FDI in sub-Saharan Africa (SSA).[3]

A common perception of all these studies is that FDI to Africa is driven by availability of natural resources, mainly solid minerals and crude oil. This has severe policy implications. If this is true, then FDI in the region is largely determined by an uncontrollable factor. In addition, it suggests that countries that do not have natural resources will attract very little or no FDI regardless of the policies they adopt (Asiedu, 2005). Moreover, several recent empirical studies have focused on the role of institutions in locating FDI (Glaeser et al., 2004; Acemuglo et al., 2001, 2003; Asiedu, 2002, 2004; Campos & Kinoshita, 2004; Alfaro et al., 2005; Wei, 1997, 2000; Globerman & Shapiro, 2002. These authors have argued that good institutions may have a positive impact on FDI outflows because they create favourable conditions for multinational companies to emerge and invest abroad. However, none of these studies has attempted to examine how the importance of these institutions varies depending on the characteristics of countries in the sample (oil exporters, non-oil exporters or countries rich in natural resources). Therefore, this paper tries to fulfill the gap in this respect, by examining the extent to which the economic, political, institutional characteristics of countries, as well as the policy environment affect FDI flows. An important contribution of the paper is that it reconciles investor surveys with empirical results.

1.2 Objectives of the study

This study asks the following questions: What are the determinants of FDI to SSA; can small countries or countries with lack of natural resources attract FDI; and finally, how natural resources influence government policies, institutions, in relation to the FDI flows in the sub-Saharan African countries. This paper also tries to provide an empirical link between FDI and quality of institutions in the sub-Saharan African countries. Thus, we try to determine whether the role of quality of institutions varies according to certain characteristics of countries (resource intensive countries and non-resource intensive countries). This is done by using panel data regression techniques on 30 sub-Saharan African countries[4], for the period 1984-2007, selection based on data availability.

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[2] See Note Secretariat on the Adoption of the Consensus of Monterrey of the United Nations (Draft conclusion and decisions of the International Conference on the Financing of the Development), March 1st, 2002.

[3] See, for example, Asiedu (2002, 2003, 2005); Morrisset (2000); Schoeman et al. (2000); Cheng (2000); Chakrabarti (2001); Campos and Kinoshita (2004); Ajayi (2007).

[4] Benin, Burkina Faso, Burundi, RDC, Ethiopia, Gambia, Ghana, Guinea Bissau, Kenya, Madagascar, Mali, Mozambique, Niger, Rwanda, Senegal, South Africa, Tanzania, Togo, Uganda, Zimbabwe, Angola, Chad, Cameroon, Congo, Côte d'Ivoire, Gabon, Nigeria, Botswana, Guinea, Zambia.

We move away from the traditional approach in the empirical literature that has tended to use either single-equation ordinary least squares (OLS) cross-country regression models or panel data estimators and employ the generalized methods of moments (GMM) dynamic panel estimator developed by Arellano and Bond (1991). We do this because we recognize the limitations of both traditional approaches. Using OLS to estimate single-period-averaged cross-country regressions results in biased and inconsistent estimates since it may not take into account the endogeneity of some of the regressors, suffer from omitted variable bias, or both. The use of fixed effects or random effects panel data estimators may also result in flawed estimates due to potential endogeneity and loss of dynamic information. The GMM dynamic panel estimator is thus superior since it controls for potential biases induced by the endogeneity of some variables such as FDI and growth, and also caters for the inclusion of lagged variables and the country-specific effects. Our key contribution is to analyse the impact of institutional quality in resource-intensive countries, and investigate the various interactions between natural resources and indicators of institutional quality in attracting FDI. Such empirical techniques for sub-Saharan African countries are believed to be adding to the growing literature in this debate.

The remainder of the paper is organized as follows: Section two presents a brief review of the theoretical and empirical literature on the determinants of FDI. Section three discusses some stylized facts in SSA countries. We then, discuss the estimation method, tests the key determinants of FDI, as well as the data sources. This is followed by the presentation of the econometric results and the policy implications; and the last section concludes.

2. Literature review

2.1 *Theoretical framework*

There are several theories attempting to explain why firms engage in transnational production, which is an effect of FDI. However, there is no clear-cut theory of determinant of FDI flows, especially in developing countries. Equally, the traditional theories of development, which lay important emphasis on international trade and exchange of capital, have come under severe criticism over the years. The first of these theories is the neo-classical microeconomic theory. It was the dominant theory used to explain reasons for FDI inflows until the 1960s (Dunning, 1993). According to this neo-classical microeconomic theory, capital movements are caused by the differences in interest rates that exist between countries. From the view of this neo-classical theory, capital is a commodity, thus its price determines its supply as well as its demand and allocation. In this case, capital, according to the neo-classical analysis, is determined by the interest rate (Aggarwal, 1980).

Capital will thus flow freely from countries with low rates of return to those with relatively high rates of return under conditions of perfect competition. The limitation of this theory, according to its critics, is its inability to explain the role of Trans-National Corporations (TNCs) in capital mobility because it limits itself to explaining how and where firms decide to obtain the capital needed to finance their global plans. Critics also hold the view that, because the theory does not say anything about the purpose of its investment, i.e., either for managerial control or production capabilities, its role in modern times is thus suited only to the explanation of portfolio investments rather than FDI.

Another theory of FDI is that of the intangible capital approach. According to this theory, the possession by a firm of specific 'monopolistic advantages 'or 'intangible assets' is a sine qua non for its overseas production (Lall, 1980). These advantages may include production techniques, managerial skills, industrial organization, and knowledge of the product, as well as the factor markets. The theory outlines three useful purposes, which these advantages must serve. First, these advantages must provide a competitive edge to the firm concerned and they must outweigh those of foreign rivals as well as those in the prospective country in which it plans to invest. Second, the monopolistic advantage that the firm possesses must be transferable abroad and should be employed most economically at the foreign location. Thirdly, the firm itself must profit from the exploitation of these advantages rather than licensing or selling them out to an independent firm.

Rugman (1986) proposes another explanation based on internalization theory. This theory examines FDI from the point of view of a need to internalize transaction costs in order to improve profitability and to explain the emergence of FDI effectiveness (Banga, 2003). During the past decade, world economy became increasingly integrated, consequently, a significant rise in FDI (Busse, 2003). However, these theories were not capable to explain, to a certain extent, why the FDI investors choose to invest in a country rather than in another and, particularly, the marginalization of the African continent. Actually, several determinants were identified through the literature.

One distinguishes mainly traditional determinants, including economic factors, while the other distinguishes social determinants like the ones based on human capital. Recent studies emphasized the need to improve and support advantages in the host countries by the incentive role their governments play. Following these studies, the debate on the choice of FDI establishment is now evolving around the quality of institutions as another important determinant.

2.2 *Institutional determinants*

The debate on the role of institutions in economic development catches researchers' attention. Since the late 1990s, a growing interest has emerged in studying the links between institutions and FDI. Good institutions are supposed to exert a positive influence on development through the promotion of investment in general. FDI represent a considerable part of capital formation in developing countries (UNCTAD, 2004), it remains an interesting question, therefore, to examine the role of good institutions in promoting FDI. According to Sachs (2003), the concept of institutions became the intermediate goal of any economic reforms. It emerges from recent studies (Rodrik, 1999; Acemoglu et al., 2001; Easterly and Levine, 2002; Sachs, 2003; Glaeser et al., 2004) that economic development of a country is explained mainly by its institutions, resources, economic policies, geography, and geopolitics.

Several empirical studies reveal the importance of institutions through FDI behaviour models (Acemoglu et al., 2001, 2003; Asiedu, 2003, 2005; Asiedu and Lien, 2011; Banga, 2003; Busse, 2003; Glaeser et al., 2004). Rodrik (1997) emphasized the fact that institutional quality explained the growth and FDI gaps between East Asian countries and African countries better than traditional economic factors (capital accumulation, technical progress, and rise in labour supply). Chan and Gemayel (2003) also emphasize that factors like political stability, institutional quality, a lack of internal and external conflicts, a low level of corruption, a lack of bureaucracy, trade liberalization and an attractive business environment attract foreign investors. Hall and Jones (1999), from a sample of 133 countries, reveal that institutions promoting production and private property stimulate human and physical capital accumulation and, consequently, increase the total factors productivity and the domestic product. Concerning the institutional quality in Africa, a study on 23 African countries draws up a negative evaluation which suggests that institutions in Africa have not yet progressed sufficiently to contribute significantly to development (Nsouli, 2000). Other studies, such as that of Asiedu (2003) related to 22 SSA countries reveal that the effectiveness of institutions, the political and economic stability, and the small level of corruption encourage private capital inflows.

Several contributions have focused on the role of institutions in locating FDI; for example, Wheeler and Mody (1992) find that a composite index of risk factors, which include bureaucratic red tape, political instability, corruption and quality of the legal system, has no significant influence in determining the location of US foreign affiliates. However, a composite index lumps together several institutional variables with other variables such as risk of terrorism, living environment of expatriates, inequality, etc., which are not directly related to the quality of institutions. Wei (1997, 2000) uses data on bilateral FDI stocks from OECD countries and finds that corruption, as well as uncertainty regarding corruption, has a significant negative effect on FDI.

Bonnie et al. (2012) examine the impact of institutional quality of 164 countries from 1996 to 2006 on foreign direct investment (FDI) levels and volatility. They find that good institutional quality matters to FDI. They provide evidence that institutional quality has a positive and significant effect on FDI. Their results suggest that, if there are institutional determinants of FDI volatility, and if such volatility is associated with lower economic growth, then the usual policy prescription of attracting FDI into countries by offering the "correct" macroeconomic environment would be ineffective without an equal emphasis on institutional reform. Moreover, Globerman and Shapiro (2002) argue that good institutions may have a positive impact on FDI outflows because they create favourable conditions for multinational companies to emerge and invest abroad. Globerman and Shapiro (2002) estimate the impact of governance indicators developed by Kaufman et al. (1999a, b) on both inflows and outflows of FDI. They find that, good governance impacts positively both on FDI inflows and outflows, although the latter effect is only significant for relatively big and developed countries.

One major limitation of these studies is that the empirical results do not incorporate bilateral parameters where, for example, institutional quality variables in both the source country and the host country are not included simultaneously. Thus, it is not possible to rank the importance of governance in the source country compared to that of the host country. Daude and Stein (2007) find inward FDI to be significantly influenced by the quality of institutional variables. They find that political instability and violence, government effectiveness, regulatory burden, rule of law, and graft matter for FDI. However, political representation and accountability indicators have an insignificant effect on inward FDI. The International Country Risk Guide (ICRG) and La Porta et al. (1998) variables such as risk of repudiation of contracts by government, and risk of the expropriation and shareholders rights are important variables when considering where to invest.

Hausmann and Fernandez-Arias (2000) use the Kaufmann et al. (1999a, b) data on institutional variables and indices of creditor and shareholder rights from La Porta et al. (1997, 1998, and 1999) to study the effects on the composition of capital inflows. They find that foreign portfolio investment is more sensitive to the quality of institutions, that regulatory burden, and government effectiveness and shareholders rights have significant effects on FDI as a share of GDP. Mody et al. (2001) find that the proportion of FDI in comparison to portfolio investment is lower in countries where institutions are more transparent. They present empirical evidence based on an index of creditor's rights from La Porta et al. (1998) in their gravity model to explain the ratio of FDI flows to trade.

In a set of cross-country regressions, Aizenman and Spiegel (2004) find that the share of FDI to gross fixed investment as well as the ratio of FDI to private domestic investment is negatively and significantly correlated with the level of corruption, and FDI is more sensitive than domestic investment to the level of institutional quality. Three general approaches are usually adopted by the recent empirical studies to measure institutional quality (Kaufmann et al., 2002; Rodrick et al., 2002; Acemoglu et al., 2003; Asiedu, 2003; Edison, 2003; Glaeser et al., 2004; Alfaro et al., 2005): (i) the quality of the public affairs management (corruption, political rights, effectiveness of the public sector, and weight of regulations); (ii) the existence of property rights and their application; and (iii) constraints imposed to political leaders. However, these measures are not objective since they emanate from subjective evaluations and appreciations of national experts or from evaluations of the population collected by surveys carried out by international and non-governmental organizations (Edison, 2003). Since institutional variables are also endogenous, Edison suggests being careful in empirical analyses, especially about the causality direction. From an econometric point of view, the problem would be solved by including instrumental variables.

Rodrick et al. (2002) estimate the respective contributions of institutions, geography, and trade in determining income levels around the world, using instruments for institutions and trade. Their results indicate that, once institutions are controlled for, measures of geography have at best weak direct effects on incomes, although they have a strong indirect effect by influencing the quality of institutions. Similarly, once institutions are controlled for, trade is almost always insignificant, and often enters the income equation with the wrong (i.e., negative) sign, although trade too has a positive effect on institutional quality.

Borenzstein et al. (1998) tested the effect of FDI on economic growth using cross country regressions for 69 developing countries. De Gregorio (1992) found a significant impact of FDI on growth using a panel analysis of 12 Latin American countries, while Blomstrom et al. (1996) found the same using a panel of least developed nations. De Mello Jr. (1996) employed both time series and cross section analysis to establish the complementarity between FDI and domestic investment. Bengoa-Calvo and Sanchez-Robles (2002) have delved into the interlinkages among FDI, economic freedom and economic growth. According to them, panel approach is relatively better than cross section analysis since it takes into account the variability within countries, and also "allow for differences in production function of the various nations in the form of unobservable individual effects".

Several recent studies have stressed the importance of quality of institutions for economic development (e.g., Acemoglu et al., 2001; Hall & Jones, 1999; Knack & Keefer, 1995; La Porta et al., 1999; Mauro, 1995). But in many researches on the resource curse hypothesis, the institutional channel has rarely been verified with much success, although it has frequently been mentioned as an important potential determinant of the curse. Quality of institutions is often simply controlled for by using a measure of corruption (e.g., Papyrakis & Gerlagh, 2004; Sachs & Warner, 1995).

Mehlum et al. (2006) show that the interaction of natural resource abundance with high-quality institutions, measured by an aggregate indicator, has a positive growth effect, while the direct negative growth effect of resource wealth seems to persist. However, these results are based on resource exports data, which pose the problems already discussed above: we contend that they more accurately depict the effects of natural resource exports dependence.

From a more qualitative angle, historians, political scientists, and economists generally agree that the presence of abundant natural resources (especially minerals) leads to rent-seeking behaviour and corruption, thereby decreasing the quality of government, which in turn negatively affects economic performance. Robinson et al. (2006) develop a political economy model which shows that the impact of a ''resource boom'' crucially depends on the quality of the political institutions, and in particular the degree of clientelism in the public sector. Countries with worse-quality institutions are more likely to suffer from a resource curse. There is also evidence that natural resource abundance considerably increases the potential of violent civil conflict (Collier & Hoeffler, 2005). Empirically, rent-seeking due to natural resources has been shown to be nonlinear, both with respect to income and the total amount of resources in a country. In his cross-country study, Ross (2001) finds that the negative resource effects of mineral abundance on institutions decline with increasing income levels and with greater past mineral exports. And in their case study of Nigeria, Sala-i-Martin and Subramanian (2003, p.10) describe how ''oil corrupts and excess oil corrupts more than excessively.'' They stress that the natural resource curse only holds for mineral—and particularly oil—abundance, and not agricultural products and food (all measured by their respective export shares).

In a different vein, Atkinson and Hamilton (2003) show that natural resource abundance may have negative effects on development when weak institutions allow resource profits to be spent in government consumption rather than investment, especially in countries with low levels of real saving. Stijns (2005) contends that there are both positive and negative channels through which natural resource abundance affects economic growth: he finds that, land abundance tends to have negative effects on all determinants of growth, including different measures of institutional quality, while the effects of mineral abundance are less clear-cut.

Finally, Acemoglu et al. (2001) test the effects on current income levels of their instrumented indicator for institutions against those of natural resource abundance, measured by the country shares of world nonfuel mineral reserves and per capita oil resources. They find no significant influence of natural resource abundance at all, confirming their view that institutional quality alone can explain a great deal of the cross-country differences in economic development, and implicitly questioning the natural resource curse hypothesis even further.

2.3 *Economic determinants*

Economic determinants cover various areas, such as the business climate, the search for markets, the search for resources and assets, as well as the search for efficiency gains. There are quite many economic factors usually mentioned to account for the evolution of FDI. The existence of raw materials or the abundant local labour is generally known as a factor susceptible of drawing external capitals (Taylor and Sarno, 1997). According to Morisset (2000), the role of natural resources in investment decisions of multinationals is perceptible through the sectoral distribution of FDI flows in sub-Saharan Africa. Generally, there is more than 60% probability that a dollar of FDI in Africa is directed towards the sector of natural resources and petroleum (UNCTAD, 1999). Another advantage is the presence of a good level of human capital that could promote productivity gains.

Wages and investment rates are potentially important in the explanation of the movement of capitals (Brewer, 1991). Low wage rates and high investment rates mean a favourable environment for businesses. According to Bhattacharya et al. (1997), costs of salaries turn to be higher in SSA in comparison with Asian countries, which is susceptible to explain their poor performance in attracting FDI. The level of openness indicates the degree of accessibility to regional and worldwide markets; the more the country has an important external trade, the more it opens the way to portfolio investments (Sader, 1995). The real interest rate expresses the incentive to save in a country, while the real exchange rate represents the level of competitiveness of the country. Public consumption indicates the weight of the government in the economy; the more it is high the less foreign investors are incited to invest in the country (Brewer, 1991; Sader, 1995). The market size and the income per capita can stimulate capital earnings in the country (Mallampally and Sauvant, 1999).

The weakness of FDI flows in SSA countries can also be explained by the narrowness of their domestic markets. As for income per capita, it measures the purchasing power of the market and the higher it is, the more inhabitants are able to acquire property in the production of which we invest.

For most observers, African countries capacity to attract private capital is mostly determined by the existence of natural resources and their local market size (Morisset, 2000). That is the reason why countries such as Nigeria and Angola, in spite of their economic and political instability, succeeded in attracting a lot of private capital due to their oil resources. However, Morisset emphasizes the fact that African countries can attract FDI too, based not on natural resources and the local market, but on political reforms. Some studies have shown that, within a regional South-South integration, macroeconomic stability seems more determined than regional integration in the explanation of FDI inflows, as is the case in MERCOSUR countries (Blomström and Kokko, 1997). The authors have also emphasized the fact that when regional integration is well carried out, like in the case of MERCOSUR[5], it may stimulate high investments. However, the inequality of FDI distribution in the member countries indicates that the way regional agreement affect FDI depends on factor endowments, local firms' competitiveness, and incentives for investments in each country.

A review of literature suggests that, while the role of quality of institutions in attracting FDI has received increasing interest from academic scholars lately, these studies focused on the general level of institutions and moreover have largely ignored developing country cases, particularly African economies. Thus the current study attempts to fill in this gap and thus supplements the growing literature on FDI.

3. FDI in sub-Saharan African countries: Stylized facts

The choice to focus on the case of the SSA countries in this study can be justified by several reasons: first, the study seeks to explain why there have been low levels of flows of FDI to SSA. Second, analysis of the situation of the different SSA countries enable us to identify what is specific to each country, which provide a suitable framework for reflection on possible measures to take in order to strengthen political integration; third, through an analysis of the effects of a governance indicator, the study will seek to find out whether the institutional environment could lead to an increase in FDI.

3.1 *Trends of the SSA FDI*

Statistics show that FDI in SSA have increased from $4.4 billion in 1995 to about $33 billion in 2007 (cf. Table 1). During the same period, the share in the world's FDI was increased relatively slightly, passing from 1.3% to 1.8%. This appears too low since the share of developing countries in the world's FDI is higher than 27%, except for the period 1999-2001. However, the growth in the share of SSA was marked by declines in some years (cf. Table 1). The largest decline was recorded in 2000 with a share of 0.5%. This decrease can be explained by various factors. On the one hand, the potential markets are limited, not very dynamic and much divided because of important transportation costs, not only between countries of the region, but also towards the other countries of the world. On the other hand, the legal environment does not meet the expectations of international investors. This decrease could also be explained by socio-political instability in the majority of countries of the region, with, in particular, the intensification of political and social conflicts in certain African countries, such as Côte d'Ivoire, Madagascar, Republic of Central Africa, and Zimbabwe. This situation affects the incentive to invest significantly. Indeed, although the levels are significantly higher than in the early 90s, the situation remains characterized by imbalances. From 1995 to 2007, 60% in average of the total foreign capital in sub-Saharan Africa were concentrated in rich natural resources and oil exporting countries.

[5] South common market in South America.

Table 1: Flows of FDI (billions of dollars) and shares in the global FDI (given in parentheses and in percentage) in SSA (oil exporting and non-oil exporting countries) and developing countries, 1995-2007

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
World	343 (100)	393 (100)	489 (100)	709 (100)	1099 (100)	1411 (100)	833 (100)	622 (100)	564 (100)	742 (100)	946 (100)	141 (100)	183 (100)
Developing countries	116 (34)	147 (37)	191 (39)	190 (27)	228 (21)	256 (18)	212 (26)	166 (27)	179 (32)	283 (38)	314 (33)	413 (29)	499 (27)
SSA countries	4.4 (1.3)	4.5 (1.1)	8.3 (1.7)	7.0 (1.0)	9.1 (0.8)	6.7 (0.5)	15.0 (1.8)	11.4 (1.8)	14.8 (2.6)	13.1 (1.8)	19.5 (2.0)	26.1 (1.9)	33 (1.8)
Oil countries in SSA	1.5 (34.6)	2.4 (52.4)	2.2 (25.8)	3.6 (51.0)	4.7 (52.0)	3.4 (51.0)	6.0 (40.0)	6.1 (53.5)	9.8 (66.0)	8.2 (62.3)	10.8 (55.0)	23.5 (90.0)	19.9 (60.4)
Non oil countries in SSA	2.9 (65.4)	2.1 (47.6)	6.1 (74.2)	3.4 (49.0)	4.4 (48.0)	3.3 (49.0)	9.0 (60.0)	5.3 (46.5)	5.0 (34.0)	4.9 (37.7)	8.7 (45.0)	2.6 (10.0)	13.1 (39.6)
Asia	80 (23)	94 (24)	106 (22)	95 (14)	112 (10)	148 (11)	113 (14)	99 (16)	115 (20)	170 (24)	210 (22)	273 (19)	319 (17)
Latin America	29 (8.5)	43 (11)	64 (13)	69 (9.8)	86 (7.9)	78 (5.6)	70 (8.5)	53 (8.5)	42 (7.5)	63 (8.8)	69 (7.2)	68 (4.8)	104 (5.7)

Source: UNCTAD, *World Investment Report 2008*.

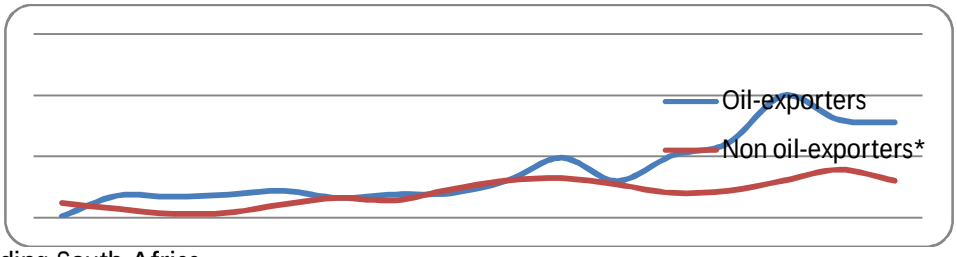
The clear message from these trends is that, while FDI is increasing in sub-Saharan African countries, it remains insufficient and is not sufficiently responding to the improvements in economic and political conditions observed on the continent over the past two decades.

3.2 Sectorial distribution of FDI

Generally speaking, the quality of information on FDI in Africa is poor (Pigato, 2000). However, data from the 1999 UNCTAD Report (see UNCTAD, 1999) can enable us to establish, with regard to the FDI stock, that in 1997 the primary sector ranked first, with 1716 million dollars, which makes up a 53.4% share; then follow the manufacturing sector (26.8%), and the services sector (19.8%). However, when it comes to flows of FDI themselves, of the 581 million dollars which African countries received in 1997, 15% were destined for the primary sector, 32% for the manufacturing sector, and 42% to the services sector. The mines and oil sub-sector represented 9.2% of the FDI received; regarding the services sector, the bulk of FDI seems to go to the finance sub-sector, which allocated 22.2% of the total amount. This underscores the interest which foreign investors have in the recent years shown for the services sector, one which, in the current international environment characterized by globalization and the development of communication technology, seems to provide opportunities for investment in the years to come.

FDI flows to sub-Saharan Africa appear to be concentrated in enclave sectors such as oil and natural resources (McDonald et al., 2006; World Bank, 2007a). FDI flows to oil-exporting and commodities-exporting countries were larger than in other countries in the region from 1990 onwards (Figure 1). Oil exporters received nearly 70% of FDI going to sub-Saharan African countries, other than South Africa, in 2005. Net FDI inflows to four major oil-producing countries in sub-Saharan Africa (Angola, Equatorial Guinea, Nigeria, and Sudan) were estimated at $10 billion in 2006, half of all FDI to low-income countries in 2006 (World Bank, 2007a). Non-resource-intensive countries, other than South Africa, recorded rising but substantially lower inflows.

Figure 1: FDI flows are larger in oil-exporting countries in sub-Saharan Africa



(*) excluding South Africa.

Source: Global Development Finance database, September 2007.

In terms of the sources of FDI, Germany's FDI has increasingly been going into the manufacturing sector, while more than 60% of the British FDI stock is in manufacturing and services. Also, the FDI from the United States of America has been in manufacturing, mainly in food and primary and fabricated metals (UNCTAD, 1999). The share of US FDI stock in Africa that is in the primary sector dropped from 79% in 1986 to 53% in 1996 (Ikiara, 2003). A survey of multinational corporations in 2000 indicated that the sectors with the greatest potential to attract FDI in Africa are tourism, natural resources industries, and industries for which the domestic market is important.

3.3 The relationship between FDI and key determinants

To investigate this relationship, we use Pearson's correlation coefficient (the correlation between two variables reflects the degree to which the variables are related). As can be seen in Table E in the Appendix, FDI inflows are significantly and positively correlated with a range of determinants typically employed in the literature: GDP growth, openness as measured by the ratio of trade to GDP, infrastructure, investment profile, human capital and the quality of institutions (see, e.g., Asiedu, 2002, 2004, 2005; Dupasquier and Osakwe 2006; Kandiero and Chitiga 2006; Lydon and Williams 2005; UNECA, 2006). A positive correlation is evident between FDI/GDP and the stock of FDI inflows. This correlation is likely to be the result of foreign companies continuing to invest in countries where they have a presence in addition to the attraction of other foreign entities to an established market that already caters for foreign investors. In terms of institutional variables, FDI inflows are positively correlated with government stability, rule of law, indicator of democracy, and negatively correlated with a level of corruption. This suggests that FDI inflows are higher in countries which are more politically stable, more democratic, and have less corruption. FDI inflows are unsurprisingly also positively correlated with the proportion of natural resources in merchandise exports.

4. Methodological approach

4.1 *Choice of the variables*

The dependent variable, *FDI*, is measured as the net foreign direct investment inflow as a percentage of GDP and is a widely used measure (see Asiedu and Lien, 2011)

Institutional variables*:* In order to assess the role of institutions as a determinant of the location of FDI, information on institutions is taken from the International Country Risk Guide (ICRG), provided by the Political Risk Services (PRS) Group. Since 1984, PRS Group (2005a) has provided information on 12 risk indicators that address, not only political risk, but also various components of political institutions. The main advantage of these datasets is that they are available for a considerable time span, also allowing us to test the relevance of institutions in attracting FDI exploiting the time variation. This also enables us to control for potential unobserved heterogeneity that could bias our cross section estimates. The variables we consider are a subset of the ones available from the ICRG database that refer to political risk. Specifically, we use the following indicators: Government Stability, Profile Investment, Democratic Accountability, Law and Order, Government Effectiveness, and Control of Corruption. While the first two variables are assessed on a scale from 0 to 12, the last four are coded between 0 and 6; and Bureaucratic Quality is assessed on a scale from 0 to 4. In order to facilitate comparability, as Kaufmann et al. (1999a), we standardize all variables in our sample to mean zero and standard deviation of one. In all cases, high score equates to very low risk and low score means very high risk. In other words, higher rankings imply better institutions. In Table D of the Appendix, we present the simple correlations between the different institutional variables. The ICRG variables are all positively correlated.

Political risk*:* The empirical relationship between political instability and FDI flows is unclear. For example, Jaspersen et al. (2000) and Hausmann and Fernandez-Arias (2000) find no relationship between FDI flows and political risk, while Shneider and Fry (1985) find an inverse relationship between the two variables. Using data on US FDI for two time periods, Loree and Guisinger (1995) find that political risk had a negative impact on US FDI in 1982 but no effect in 1977. Edwards (1990) uses two indices to measure political risk: □ political instability (which measures the probability of a change of government) and political violence (the sum of the frequency of political assassinations, violent riots and politically motivated strikes). The political instability variable was significant but the political violence variable was not.

For our analysis, we use political risk by two indices: internal conflict *(inconf)* and external conflict *(exconf).*[6] The data were obtained from the International Country Risk Guide (ICRG). The sign of the coefficient is not determined a priori. Each indicator is assessed on a scale from 0 to 12, with higher values indicating less political risk and better institutions. In general, we would expect that all indicators are positively related to FDI inflows, as less political risk and better institution may attract FDI due to a lower risk.

Natural resource intensity (nat): As posited by the eclectic theory, all else being equal, countries that are endowed with natural resources would receive more FDI. In fact, a natural resource endowment plays key role in FDI flows to Africa, leading to a situation where about 55% to 80% of foreign investment flows to the region are concentrated in the primary economic sector (UNCTAD, 2005). Very few studies on the determinants of FDI control for natural resource availability (except Gastanaga et al., 1998; Morisset, 2000 and Noorbakhsh et al., 2001). As some of the studies, we use dummy variable to capture the availability of natural resource endowments (Campos and Kinoshita, 2004). Following UNCTAD (2011) and IMF classification, countries are defined as major natural resource exporters if the share of natural resource export to total export is greater than 50%. We define dummy variable representing whether a country is classified either as resource-rich (binary digit 1) or non-resource-rich (binary digit 0). We employ dummy variables because the use of true time series data on natural resource reserves poses a serious endogeneity problem; a country's reserves may be depleted due to active foreign business involvement (hence, high FDI), which introduces endogeneity into the equation. That is, an increase in FDI, our dependent variable, will lead to a decrease in natural resource reserves, our independent variable. In the case of endogeneity, single-equation regression techniques will return biased and inconsistent parameter estimates. Thus, we opt to use dummy variables to capture the presence of natural resources. Though such an approach means we miss some of the variation in natural resource reserves within and across countries, it lessens the likelihood that our econometric tests will be plagued with endogeneity problems.

Other economic variables: Following the literature on the determinants of FDI, we include the following control variables in our regressions. We use the *degree of openness (DO)*, as measured by the significance of foreign trade, a factor likely to influence the flows of FDI, with a positive sign being expected. This is conceivable because most investors prefer to invest in a sector of exchangeable goods. The degree of openness will be measured by the ratio of the total amount of exports and imports (as a %age GDP). Such a ratio is meant to capture in some way the restrictions imposed on international trade. The *domestic investment (INV)* is another important factor, proxied by gross capital formation (%age of GDP), to represent a country's domestic investment climate, with a positive sign being expected. The increase in domestic investment may mean that the conditions to carry out business activities have improved, which is likely to motivate foreign investors to invest in the country. *Inflation rate (INFL)*, a related determinant of FDI, increases the user cost of capital, and thus affects the profitability of FDI in a negative way (De Mello 1996). A higher rate of inflation results from irresponsible monetary and fiscal policies, such as excessive money, budget deficits, and a poorly managed exchange rate regime. It may also reflect macroeconomic uncertainty. It is often assumed that *external debt (DET),* measured by external deficit/GDP, could also have an impact on foreign investment inflows. After all, an increase in foreign debt could be perceived, to some extent, by investors as a future increase in taxation to finance the servicing of the subsequent debt (Dahl, 2002). That is why its effect is expected to be negative. *The real exchange rate (rer)* could prove to be an important factor in the FDI fluctuations on the world market. It is a measure of international competitiveness. The GDP per capita comes in as a proxy of the size-of-the-market variable, with a positive sign being expected.

More precisely, it measures the effort to increase the size of the market. It is indeed assumed that the bigger the size of the market is, the higher the hopes of the investor are to find enough outlets for his/her products to achieve economies of scales. Moreover, higher domestic incomes imply a greater demand for goods and services and therefore make the host country more attractive for FDI. *The secondary school enrolment* (*chas*) measures the level of education in each country with an expected positive effect.

[6] Internal conflict measures political violence within the country and its actual or potential impact on governance by focusing on, for example, civil war, terrorism, political violence or civil disorder. External conflict, namely the risk to the incumbent government from foreign action, ranging from non-violent external pressure, such as diplomatic pressures, withholding aid or trade sanctions, to violent external pressures, ranging from cross-border conflicts to all-out war.

It is a measure of the labour quality and could be an important determinant of FDI inflows, especially in the area of computers and new information technologies. *Infrastructures (infr):* Good infrastructure increases the productivity of investments and therefore stimulates FDI flows. As is standard in the literature, we use the number of telephones per 1000 population to measure infrastructure development. A good measure of infrastructure development should take into account both the *availability* and *reliability* of infrastructure. Thus the measure we use falls short since it captures only the availability aspect of infrastructure. Clearly, infrastructure is of little use if it is not reliable. Hence, one would expect infrastructure reliability (e.g., how often the phone lines are down or electricity supply is available) to be more important to foreign investors than infrastructure availability (the number of telephones in a country). Since data on the reliability of telecommunication is not available, we use telephones per 1000 population to measure infrastructure development, albeit imperfectly.

The one year lagged dependent variable (FDI_{t-1}*)* will be included as an explanatory variable in the model, in order to grasp the impact of previous investment. Singh and Jun (1995) point out that the inclusion of the lagged dependent variable will enable us, on the one hand to account for possible autocorrelations of errors, and, on the other hand, to indirectly capture the effect of factors omitted from the model but which may have negatively influenced FDI in the past. Busse and Hefeker (2005) agree on the idea that taking into account the lagged IDE solves the time series problem of autocorrelations, but they expect a positive effect since foreign investors are more attracted by countries receiving already considerable foreign investments. In fact, FDI often involves high initial costs and therefore tends to be persistent over time. At the aggregate level, this can be captured by a positive feedback effect of past FDI on to current FDI (Asiedu and Lien, 2011). Additionally, foreign investors prefer to operate in familiar environment; therefore, the existing foreign investments serve to encourage the operations of new and existing companies by creating a more familiar environment and increasing investors' confidence. The expected effect thus seems to be ambiguous.

4.2 *Model specification*

Following the literature, we estimate the following model specification describing the determinants of FDI:

$$FDI_{it} = \psi_0 + \eta FDI_{it-1} + \psi_1 (INST)_{it} + \psi_2 (polrisk)_{it} + \psi_3 (ecocvr)_{it} + \chi_{it} \quad (1)$$

Where *FDI*, is measured as the net foreign direct investment inflow as a percentage of GDP in country *i* and at time *t*. It is a function of the vector of economic variables ($ecocvr_{it}$), the vector of institutional variables ($INST_{it}$), the vector of political risk ($polrisk_{it}$) and of a random term χ_{it}. To empirically investigate the role played by institutional quality in determining FDI, the following simple model is estimated:

$$FDI_{it} = \psi + \phi_{INST} INST_{it} + \pi_1 Infr_{it} + \pi_2 cahs_{it} + \pi_3 Infl + \pi_4 inv_{it} + \pi_5 gov_{it} + \pi_6 debt_{it} + \pi_7 gdp_{it}$$
$$+ \pi_8 exchrat_{it} + \pi_9 do_{it} + \eta FDI_{it-1} + \gamma naturalresources_{it} + \vartheta_{it} \quad (2)$$

Where ϑ_{it} is a random term. Apart from institutional variables, political risk, human capital variables and variables *exchrat* and *Infr*, all the others are expressed in terms of GDP.

Our model will be estimated using the GMM estimator used by Arellano and Bond (1991). By supposing that the constant term ψ includes an individual effect ψ_i, one can set out $\mu_{it} = \psi_i + \vartheta_{it}$, where ϑ_{it} is the stochastic component as defined in previous equations. The random effects model consists, when one supposes that the unobserved term ψ_i is correlated with none of explanatory variables, to estimate the Equation 3, but with μ_{it} as random term. For the second procedure, it will be a question of eliminating individual effects. Indeed, we obtain the 'within' estimator by applying the ordinary least squares (OLSs) to the following equation:

$$\left(FDI_{it} - MFDI_{it}\right) = \theta\left(INST_{it} - MINST_i\right) + \pi\left(polrisk_{it} - Mpolrisk_i\right) + \lambda\left(ecocvr_{it} - Mecocvr_i\right) +$$
$$\delta\left(FDI_{it-1} - MFDI_{it-1}\right) + \left(\mu_{it} - \mu_i\right) \quad (3)$$

Where $MFDI_{it}$; $MINST_i$, $Mpolrisk_i$, and $Mecocvr_i$ are the means of the dependent variable and explanatory variables. Taking into account deviations from individual means allows us to rule out individual effects possibly correlated with explanatory variables, what should provide us an unbiased estimator. The test of Hausman makes it possible to choose between the fixed effects model and the random effects model. Yet, the two estimators (RE and 'within') are biased and inconsistent because of the autoregressive nature of the model. There is indeed the following relation: $E\left(FDI_{it-1}\psi_i\right) \neq 0$ (4) Moreover, nothing rules out the existence of a correlation between other explanatory variables and the fixed individual effect ψ_i. In the case of dynamic panels, Arellano and Bond (1991) GMM estimator is most often used in order to solve the autoregressiveness and simultaneity bias problems.

This estimator use lags of variables in level by at least two periods as valid instruments for their first differences, on the assumptions that variables are predetermined and that error terms are not auto correlated. We thus get consistent estimators.

4.3 ***Sources of the data***

The majority of data on economic variables come from African Development Indicators reports of the World Bank, in particular the degree of openness (*do*), the public consumption (*gov*), the real exchange rate (*exchrat*), the external debt (*debt*), the domestic investment (*inv*) and the infrastructure (*infr*). The data on the quality of institutions are provided mainly by the International Country Risk Guide (ICRG), the Institutional Investors Rating report of the IMF and the Hellman et al. (2003) database. The data on foreign investments (FDI) comes from the World Investment Report of the UNCTAD. While, data on the secondary school enrolment (*chas*) and real gross domestic product per capita (*gdp*) are provided by African Development Indicators reports. The sample of the study is made up of 30 countries in sub-Saharan Africa over the period 1984-2007.

5. Results and discussion

5.1 The statistical validity of the model

The descriptive statistics are presented in Table1 in the Appendix. In short, data vary enough so that one can apprehend relevant correlations between the dependent variable and explanatory variables. Moreover, the matrix of correlations between explanatory variables (Table C in the Appendix) suggests that the inclusion of all these variables in the same model pose no problem of multicollinearity. Indeed, coefficients of correlation appear quite low on the whole.

A central issue before making the appropriate specification, often ignored by past researchers, is to test if the variables are stationary or not. Since the papers by Levin & Lin (1992, 1993), this test has become popular. We thus carry out panel unit root tests on the dependent and independent variables. We follow the approach of Levin & Lin (LL test) and Im, Pesaran, and Shin (IPS test) who developed a panel unit root test for the joint null hypothesis that every time series in the panel is non-stationary (Im et al., 1995). This approach is based on the average of individual series ADF test and has a standard normal distribution once adjusted in a particular manner. The results of these tests suggest that, in every case, we reject a unit root in favour of stationary at the 5% significance level (see Table B in the Appendix). We thus use dynamic (Generalized Methods of Moments (GMM)) technique to identify and compare the determinants of FDI. In fact use of panel data allows, not only to control for unobserved cross-country heterogeneity, but also to investigate dynamic relations, i.e., model to capture the effect of lagged FDI on current FDI.

This type of model contains unobserved panel-level effects that are correlated with the lagged dependent variable, and this renders standard estimators inconsistent. To overcome this problem of endogeneity, an instrumental variable need to be used. Two approaches, namely Instrumental Variable (IV, Anderson and Hsiao, 1982) and GMM estimators (Arellano and Bond's, 1991), first and second step, respectively, can be used in this regard. We used the latter technique, as the IV approach leads to consistent, but not necessary, efficient estimates of the parameters (see Baltagi, 1995). The GMM estimator proposed by Arellano and Bond (1991) provides consistent estimates for dynamic model. This approach consists to take the first difference of the data and then use lagged values of the dependent variable as instruments. However, as pointed out by Arellano and Bond (1991), lagged levels are poor instruments for this approach.

To avoid the problem of poor instruments, Blundell and Bond (1998) proposed a more efficient estimator, system GMM estimator, by using additional moment conditions. The only disadvantage of this approach is that it uses too many instruments.

Despite what Hayakawa (2007) underlines that the difference estimator suffers from the weak instruments problem and the system estimator exhibits the too many instruments problem, we decide to use system estimator approach, while controlling the number of lagged levels. Because according Roodman (2007), the easiest solution to this problem is to reduce the instrument count by limiting the number of lagged levels to be included as instruments. For consistency, we limit the number of instruments also when we assume the variables to be exogenous. Finally, we control for heteroscedasticity between individuals using the robust option in Stata 2009.[7] The estimation has begun with a broad model, also containing lagged explanatory variables.

Afterwards, a more parsimonious model was obtained excluding the less relevant variables. This type of estimation is one whose results are discussed for total samples (Table 2). The various estimated equations pass all diagnosis tests for autocorrelation and the validity of the instruments. Specifically, we report the result for the test for second order autocorrelation as well as the Hansen J test for over-identifying restrictions. This result is necessary for the consistence of GMM estimators. The model proved also to be robust for various changes in the number of lags considered for instruments.

5.2 Interpretation and economic analysis of the results

Our empirical analyses utilize panel data of 30 sub-Saharan African countries over the period 1984–2007. We estimate a dynamic panel data model to capture the impact of lagged FDI on current FDI, where we interact the measure of institutional quality with the natural resources.

First, we employ the two-step GMM estimator, which is asymptotically efficient and robust to all kinds of heteroscedasticity. Second, the exogenous variables are considered as strictly independent in all the regressions. Third, our regressions use only internal instruments (no additional external instrument is included in our regression). We use the first difference of all the independent variables as standard instruments, and the lags of the dependent variables to generate the GMM-type instruments (see Arellano and Bond, 1991). Moreover, the system estimations include lagged differences of dependent variables as instruments for the level equation. Table 2 reports the regression results of direct effect of institutional quality on FDI, and Table 3 shows the interaction effect of institutional quality and natural resources on FDI.

5.3 The direct effects of institutional quality on FDI

The first question we seek to address is whether the stylized determinants of FDI affect FDI flows to SSA in conventional ways. The system-GMM model shows the regression results in Table 2. The regression statistics show that one of the basic assumptions for applying the Arellano-Bond estimator, that is, no second-order serial correlation, is appropriate for our data sample, as the null-hypothesis has never been rejected. Moreover, the Sargan test results show that the applied instruments are valid for all our regressions.

[7] For more details see (Roodman, 2007; Stata, 2009).

Table 2: The direct effect of institutional quality on FDI

Variables	Model 0	Law and Order	Corruption	Democracy
Institutions		0.531b(0.257)	-0.181a(0.012)	0.870a(0.238)
Lagged FDI / GDP	0. 798a (0.012)	0.791a (0.015)	0.748a(0.012)	0.765a(0.023)
Market size = Ln(GDP per capita)	3.279a (0.442)	3.356a(0.455)	2.682a(0.496)	2.965a(0.784)
Domestic investment = Gross fixed capital formation / GDP	0.387a (0.028)	0.378a(0.027)	0.387a(0.048)	0.427a(0.030)
Infrastructures = Phone per 1000 persons	0.018a (0.004)	0.017a(0.004)	0.019a(0.003)	0.015a(0.005)
Human Capital = Secondary school enrolment	0.043a (0.019)	0.048b(0.021)	0.027(0.022)	0.051b(0.022)
Debt = External Deficit / GDP	-0.038a (0.012)	-0.037a(0.013)	-0.007(0.014)	-0.013(0.011)
Openness = Trade / GDP	0.091a (0.017)	0.089a(0.018)	0.086a(0.017)	0.086a(0.016)
Natural Resources	0.006b (0.002)	0.042a(0.013)	0.026b(0.011)	0.042a(0.014)
Exchange Rate	0.005b (0.002)	0.006b(0.003)	0.003(0.002)	0.003(0.002)
Inflation	-0.001 (0.001)	-0.001(0.001)	-0.004(0.008)	-0.001(0.001)
Public Consumption	-0.091a (0.014)	-0.086a(0.013)	-0.077a(0.015)	-0.085a(0.017)
Constant	-22.919a (3.107)	-24.913a(3.262)	- 25.431(16.321)	-19.203a(5.99)
Hansen J test (p-value)*	0.6722	0.3588	0.4309	0.5722
Serial correlation test (p-value)**	0.9314	0.8719	0.6119	0.6314
Number of observations	658	658	658	658
Number of countries	30	30	30	30
Limit the number of lags of dependent variable used in instrumentation?	Yes	Yes	Yes	Yes

Notes: Standard deviation in parenthesis. a, b, c denotes significance levels at 1%, 5% and 10%, respectively.

(*) The null hypothesis is that the instruments are not correlated with the residuals.
(**) The null hypothesis is that the errors in the first difference regression exhibit no second order serial correlation.

Table 2: The direct effect of institutional quality on FDI

Variables	Stability of Government	Internal Conflict	External Conflict	Profile Investment	Bureaucracy
Institutions	0.575a (0.082)	0.078(0.081)	0.257a(0.069)	0.264a(0.118)	1.170(0.842)
Lagged FDI / GDP	0.715a (0.028)	0.788a(0.014)	0.789a(0.015)	0.805a(0.014)	0.759a(0.012)
Market size = Ln(GDP per capita)	4.904a (1.381)	3.042a(0.421)	3.140a(0.457)	3.341a(0.486)	3.243a(0.507)
Domestic investment = Gross fixed capital formation / GDP	0.339a (0.039)	0.376a(0.032)	0.368a(0.027)	0.355a(0.034)	0.400a(0.030)
Infrastructures = Phone per 1000 persons	0.018a (0.005)	0.018a(0.003)	0.017a(0.003)	0.012b(0.005)	0.020a(0.005)
Human Capital = Secondary school enrolment	0.246b (0.115)	0.226a(0.065)	0.070(0.078)	0.170a(0.098)	0.021(0.070)
Debt = External Deficit / GDP	-0.001 (0.015)	- 0.032a(0.011)	- 0.034a(0.012)	-0.022(0.015)	- 0.037a(0.014)
Openness = Trade / GDP	0.106a (0.011)	0.086a(0.017)	0.091a(0.017)	0.080a(0.018)	0.097a(0.015)
Natural Resources	0.006 (0.013)	0.068a(0.011)	0.019c(0.011)	0.041a(0.013)	0.029b(0.013)
Exchange Rate	0.001 (0.003)	0.007a(0.002)	0.007a(0.002)	0.005c(0.003)	0.003(0.003)
Inflation	0.0001 (0.0001)	- 0.0002(0.001)	-0.001(0.001)	-0.003(0.002)	-0.005(0.004)
Public Consumption	-0.105a (0.017)	- 0.089a(0.013)	- 0.080a(0.013)	- 0.082a(0.015)	- 0.096a(0.011)
Constant	-32.674a (9.642)	- 22.26a(2.887)	-23.49a(3.35)	-23.06a(2.95)	-20.19a(4.42)
Hansen J test (p-value)*	0.5679	0.3573	0.4156	0.5037	0.3214
Serial correlation test (p-value)**	0.7731	0.6751	0.8968	0.7078	0.7140
Number of observations	658	658	658	658	658
Number of countries	30	30	30	30	30
Limit the number of lags of dependent variable used in instrumentation?	Yes	Yes	Yes	Yes	Yes

Notes: Standard deviation in parenthesis. a, b, c denotes significance levels at 1%, 5% and 10%, respectively.

(*) The null hypothesis is that the instruments are not correlated with the residuals.
(**) The null hypothesis is that the errors in the first difference regression exhibit no second order serial correlation.

Column 1 of Table 2 reports the results of the benchmark Model (Model 0) without the institutions variable and the interactions variable. All control variables have the expected sign. The results show that natural resource has a positive impact on FDI. Regarding the other control variable, we note that openness to trade, good infrastructure, high level of education, market size, domestic investment, less government consumption and less external deficit promote FDI. The estimated coefficient of lagged FDI is positive, suggesting that current FDI is positively correlated with future FDI. This implies that the past FDI is extremely important for multinationals' decisions on where to invest.

We then add institutional quality one by one to the model to see whether they explain any variation to the control variables. The results are in column 2 to 8 of Table 2. Our findings indicate that all indicators, except bureaucracy and internal conflict, are positively correlated with FDI flows. These results indicate that institutional quality plays significant roles in determining FDI inflows. This means that FDI is attracted to countries with high institutional quality that protect property rights. The results for government stability and democracy of the government show that foreign investors are highly sensitive to changes in political stability and the framework in which governments operate. Fundamental democratic rights, like civil liberties and political rights do matter to multinationals operating in SSA countries, even when we control for other factors that affect FDI flows. The results are in line with the findings by Asiedu and Lien (2011), Busse and Hefeker (2007), Busse (2004) and Jensen (2003), which all showed that basic democratic rights are positively correlated with FDI, even if the specifications of their models differ.

The result for corruption has a negative impact and significant at the 1% level, meaning that an improvement in the corruption is negatively related to FDI. However, the coefficient of corruption has to be interpreted more carefully. Corruption is indexed such that the higher value refers to cleaner administration. Accordingly, a negative sign indicates that less corruption has positive impact on the economic growth. Our regression indicates that less corruption in the host country would increase FDI. Although economic theory is ambiguous on the ultimate effects of corruption on FDI, it does propose several different mechanisms that can discourage FDI, including corrupt institutions acting as a tax on investment and heightened insecurity and uncertainty (see, for example, Wei 2000). Moreover, the relative importance of investment profile is hardly surprising, given that investment profile contains key sub-components, such as contract viability, expropriation of assets or the ability of multinationals to repatriate profits. Clearly, these sub-components are exceptionally important for multinationals decisions on where to invest.

In the same way, foreign investors seem to care about conflicts that affect the host country of their investment, as it increases economic and political instability. The threat of incidence of these conflicts, such as civil war, trade sanctions, cross-border conflicts or an all-out war, creates higher uncertainty. Thus, investors increase the risk premium of investment projects, which in turn reduces overall investment. In addition, such conflicts have a strong negative impact on a country's growth rate, thus making investment generally less attractive. Our results with respect to the quality of institutions support those reported by Busse (2004), Asiedu (2005), Daude and Stein (2001), Harms and Ursprung (2002) and Campos and Kinoshita (2007)[8], who all found a statistically significant link between quality of institutions and foreign investment inflows. Another important result is natural resources availability; it is a very important explanatory variable for FDI flows to SSA. Thus, countries that are well-endowed with natural resources tend to receive more FDI than resource-poor countries. This, perhaps, explains why oil countries (Angola, Nigeria, Gabon, Chad, Congo, etc.) received the largest volume of FDI in SSA.

The results also indicate that large domestic market, domestic investment, human capital, openness, less public consumption, infrastructure and exchange rate are statistically significant at the 1% level. The contribution of the work factor to the production process is appreciated through the productivity of every factor. With regard to productivity, it is axiomatic that a high level of education will enable a country's working population to be more competitive internationally. Furthermore, a higher level of human capital enables individuals to better adjust to new production and export structures. The coefficient of this variable is statistically significant and respect positive sign is an indication of the role that a high literacy rate can play in attracting foreign capital into the SSA countries. It is reasonable to think that the low level of human capital in these countries and the absence of coordination between the quality of training and the demands of the economy (choice of investment) did not attract enough foreign investment for the impact of this to be felt at the econometric level. Our results show that openness is very important determinant of FDI flows to SSA. Open economies are more likely to implement and maintain stable and credible macroeconomic policies than autarkic regimes. Since stable macroeconomic policies (including low inflation rates) tend to reduce business risks, foreign investors are more prone to investing in open economies than in closed economies. This result on the openness variable is also consistent with previous studies (Asiedu, 2002; Ajayi, 2007; Onyeiwu and Sherstha, 2005).

[8] In Ajayi, 2007.

For infrastructure, proxy of the number of telephone lines per 1000 people is positively and significantly related to FDI. These findings are consistent with the findings of other studies on developing countries such as: Asiedu and Lien (2011); Nonnemberg and Cardoso (2002); Onyeiwu and Sherstha, (2005); Loree and Guisinger (1995); Agiomirgianakis et al. (2003); and Demekas et al. (2005). Although the number of telephone lines may not be the best proxy for infrastructure, its importance shows, nevertheless, that the development of the infrastructure remains an essential asset in the attraction of FDI towards sub-Saharan Africa. Overall, we find that FDI into SSA countries is driven mainly by large market size, high level of education, infrastructure, and domestic investment. Moreover, countries with good institutions and greater openness on FDI flows are likely to receive more FDI. It appears that there was a non-stop flow of FDI: the results of this study show that the FDI of the previous year had a positive effect on the year under study. The theory of investment provides a justification for such a situation (Singh and Jun (1995) found the same result). This means, on the one hand that other factors not taken into account in a model whose effects can be observed in the short- and medium-term might influence the results and, on the other hand, that foreign investment can itself constitute an incentive for further investment, if it yields a positive output or of it is invested in sectors that improve the economic environment of the country (like infrastructure, education, etc.).

Several aspects of the results from our regressions can be highlighted: First, it seems that institutional quality has a positive and significant impact on FDI, and this impact is not sensitive to controlling variable changes. Second, as far as the country sample and time period covered are concerned, it seems that FDI is driven mainly by the liberty of the trade regime, good infrastructure, high education level, natural resources, domestic investment and institutional quality; external deficit, exchange rate, and macroeconomic stability did not play a significant role in determining FDI. Given these results, it might be interesting, especially for policy makers, to explore the relative importance of institutions in attracting FDI compared with other variables, particularly with policy-related variables like inflation rate. This is particularly important as empirical literature provides little guidance on the relative contribution of institutional quality in attracting FDI.

5.4 The interaction effect of institutional quality and natural resources on FDI

To explain the interaction between natural resources and institutional quality on FDI, we introduce interaction factor in our analysis. This helps us explore whether the levels of quality of institutions play a role in the ability of a country to use natural resources to its advantage and reap its benefits by attracting more FDI. For this, we alter our regression specification (Equation 1) as

$$FDI_{it} = \psi + \phi_{INST_{it}} + \pi_1 Infr_{it} + \pi_2 cahs_{it} + \pi_3 Infl + \pi_4 inv_{it} + \pi_5 gov_{it} + \pi_6 debt_{it} + \pi_7 gdp_{it}$$
$$+ \pi_8 exchrat_{it} + \pi_9 do_{it} + \eta FDI_{it-1} + \gamma naturalresources_{it} + \lambda (INST * naturalresources)_{it} + \vartheta_{it} \quad (5)$$

The results of our new specification are given in the Table 3. To conserve on space we report only the values of our interest parameters (ϕ and λ). The full estimation results are available in the Appendix. The nonlinear term that is introduced is an interaction term between the natural resource and the control variables. This term implies that the impact of quality of institutions on FDI varies with the level of natural resource of a country. The interaction term has high explanatory power in the case from resource intensive countries than non-resource intensive countries, and moreover, most of the variables that measure quality of institutions by themselves are significant in the case of non-resource intensive countries. Our result shows, however, that excluding the interaction between resources and institutions is too restrictive an empirical model.

Table 3: The interaction effect of institutional quality and natural resources on FDI

Variables	Law and Order	Corruption	Democracy	Stability of Government
Institutions	0.883b (0.437)	-0.893(1.204)	0.449a(0.174)	0.434a(0.259)
Interaction = Institution*Natural Resources	-0.032a (0.011)	0.039a(0.013)	-0.009a(0.002)	-0.014a(0.001)
Hansen J test (p-value)*	0.4087	0.4151	0.4722	0.8402
Serial correlation test (p-value)**	0.8558	0.6319	0.6310	0.8748
Number of observations	658	658	658	658
Number of countries	30	30	30	30
Limit the number of lags of dependent variable used in instrumentation?	Yes	Yes	Yes	Yes

Notes: Standard deviation in parenthesis. a, b, c denotes significance levels at 1%, 5% and 10%, respectively.

(*) The null hypothesis is that the instruments are not correlated with the residuals.
(**) The null hypothesis is that the errors in the first difference regression exhibit no second order serial correlation.

Table 3: The interaction effect of institutional quality and natural resources on FDI

Variables	Internal Conflict	External Conflict	Profile Investment	Bureaucracy
Institutions	0.247c(0.133)	0.403a(0.126)	0.568a(0.173)	1.638(3.148)
Interaction = Institution*Natural Resources	-0.006b(0.002)	-0.007a(0.002)	-0.013a(0.002)	-0.058b(0.026)
Hansen J test (p-value)*	0.5722	0.3706	0.4732	0.3487
Serial correlation test (p-value)**	0.7314	0.6162	0.6284	0.4617
Number of observations	658	658	658	658
Number of countries	30	30	30	30
Limit the number of lags of dependent variable used in instrumentation?	Yes	Yes	Yes	Yes

Notes: Standard deviation in parenthesis. a, b, c denotes significance levels at 1%, 5% and 10%, respectively.

(*) The null hypothesis is that the instruments are not correlated with the residuals.
(**) The null hypothesis is that the errors in the first difference regression exhibit no second order serial correlation.

When adding the interaction between institutional quality (law and order, corruption, democratic accountability, investment profile, and bureaucratic quality) and natural resources, we get a significant and negative coefficient for these terms, while results otherwise are qualitatively unchanged. In other words, rejecting the impact of institutional quality and natural resources on FDI in SSA based on the first regression would be premature.

In fact, what the significance of the interaction effects tells us is that, effect of natural resources on FDI depends on the institutional quality of the host country. Furthermore, the analysis of this interaction reveals that impact of institutional quality on FDI depends on abundance of natural resources in host countries. This suggests that natural resources significantly alter the relationship between FDI by reducing the positive effect of institutional quality on FDI. According to Asiedu and Lien (2011), this indicates that natural resources drastically reduce the effectiveness of institutional quality in promoting FDI. Our results also show that the interaction between the corruption and natural resources is significant, but corruption index by itself is not significant, while natural resource is significant. This result implies that foreign investors attach more importance to the abundance of natural resources to improving the quality of institutions in their decision making. Under a government that enjoys a low level of corruption, the more natural resources of host country have the more attractive for foreign investors it is. These results imply that policies that assure better quality of institutions (low level of corruption, improvement of government stability, investment profile, low level of bureaucracy, and low level of internal and external conflict) affect the attractiveness of a country for foreign investors.

It appears, from these results, that moving forward, host country policy makers should consider taking incremental steps to crack down on corruption in areas critical to investors (e.g., the customs service). They might also consider liberalizing imports, removing price controls, and minimizing industrial and trade licensing requirements. Policy makers might also consider rigorously enforcing laws that safeguard the intellectual property rights of investors and enhance bureaucratic quality by boosting pay and strengthening meritocratic recruitment procedures. As Rauch and Evans (2000) have observed, long-term career path arrangements, that significantly reduce internal conflict and smaller pay differentials between the public and the private sectors are associated with lower levels of bureaucratic corruption. Over the longer term, policy makers must figure out ways to make the benefits of institutional reform more apparent to the public so as to build a constituency for such reforms. This is especially important given the huge unmet investment needs in emerging economies in areas such as infrastructure development, which are critical to long-term competitiveness and poverty reduction (UNCTAD, 2008). The research community can contribute to this by determining which institutional reforms are most likely to yield the greatest benefit, in both the short and long term, and the best ways to sequence these reforms to achieve maximum positive impact on foreign investors.

6. Conclusion

Foreign direct investments are the most desirable form of capital inflows to emerging and developing countries because they are less susceptible to crises and sudden stops. The goal of this paper was to explore, in detail, the role of quality institutions in host countries as determinants of foreign direct investment, and whether the role of quality of institutions varies according to certain characteristics of countries (resource intensive countries and non-resource intensive countries). As we have pointed out, our main contribution is not to find new and provocative policy recommendation but to distinguish several alternative hypotheses about the relative influence of such factors as natural resources availability and quality of institutions more broadly in those countries. This paper has also attempted to make a contribution to the empirical literature on the relationship between FDI and the institutional quality using a dynamic panel data model covering 30 SSA countries over the period 1984-2007.

Our findings suggest that the impact of institutional quality in host countries is one of the most important determinants of FDI inflows. In particular, institutional quality in host countries appeared more important for foreign investors than many other characteristics of host countries, such as external deficit and macroeconomic stability. Considering the interaction impact, we find that the impact of institutional quality on FDI depends on the importance of natural resources in the host country. Institutional quality promotes FDI in countries where the natural resources are abundant, but has a negative effect on FDI in natural resources intensive countries. This result has important implications for countries in SSA because many of them have weak institutional quality (Fosu, 2008) and their economies are dominated by agriculture. Our paper provides evidence comparing the effects of institutional quality on FDI with the effects of non-policy variables like the availability of natural resources. In general case, we conclude that countries that are small or lack natural resources can attract FDI by improving their institutional quality. More importantly, given the growing interest of many countries in attracting FDI, policy makers may be interested more in knowing the relative importance of institutions compared with other policy tools they have, rather than non-policy variables. This can help them to build their priorities for attracting FDI.

For future work, we can explore the role of other institutional determinants developed by La Porta et al. (1999) and compare the impacts of both types of indicators on FDI. The question of threshold effects could be analysed by looking for different levels of institutional quality that could affect the behaviour of foreign investors. Furthermore, additional work could be done to take account of possible structural breaks for both variables.

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Key data from WIR Annex Tables: www.unctad.org/wir.

Appendix

Table A: Descriptive statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
FDI	720	2.023	3.949	-8.757	46.488
GDP	720	11518.750	29088.250	130.230	283743.400
INFR	720	42.993	107.621	0	986
INV	720	18.383	7.211	2	60
DO	720	70.594	32.627	11	296
CORR	720	2.435	1.101	0	6
ROL	720	2.682	1.087	0	5
DEMO	720	2.713	1.248	0	5.500
BURQAL	720	1.333	0.940	0	4
GOV	720	14.738	7.151	4	60.600
DEBT	720	-4.566	9.374	-53	44.600
EXCHRAT	720	118.364	55.934	29	772
INFL	720	85.746	1039.601	-29	26762
CHAS	719	21.603	18.862	2.700	96
NATRES	720	0.333	0.472	0	1
INCONF	720	7.247	2.559	0	12
EXCONF	720	8.633	2.326	2	12
PROFINV	720	5.834	2.187	0	11.5
STABGOV	720	7.038	2.454	0.667	11.583

Table B: Results of panel unit root tests

Variables	FDI	BURQAL	ROL	DEMO	CORR	DO	INV	CHAS	GOV	NATRES
LL Test	-2.89 (0.001)	-1.84 (0.033)	-2.802 (0.000)	-1.69 (0.041)	-8.31 (0.000)	-1.66 (0.040)	-11. 85 (0.000)	-8.69 (0.000)	-10.78 (0.000)	-8.0569 (0.000)
IPS Test	-2.035 (0.02)	-9.77 (0.000)	-1.85 (0.030)	-1.35 (0.089)	-9.54 (0.000)	-1.96 (0.020)	-1.34 (0.09)	-9.62 (0.000)	-13.84 (0.000)	-6.370 (0.0000)

Variables	EXCHRAT	INFR	GDP	DEBT	INFL	EXCONF	INCONF	STABGOV	PROFINV	TXGDP
LL Test	-2.69 (0.003)	-3.492 (0.000)	-6.10 (0.000)	-2.56 (0.005)	-5.86 (0.000)	-3.19 (0.000)	-2.26 (0.011)	-1.87 (0.032)	-2.21 (0.012)	-5.35 (0.000)
IPS Test	-2.78 (0.003)	-3.15 (0.000)	-11.02 (0.050)	-3.23 (0.000)	-6.78 (0.000)	-3.50 (0.047)	-1.98 (0.020)	-0.38 (0.031)	-1.34 (0.090)	-8.05 (0.000)

Note: P-values are in parentheses

Table C: Matrix of correlations

	GDP	INFR	INV	DO	CORR	ROL	DEMO	PROFINV	INFL	BURQAL	GOV	DEBT	EXCHRATE	STABGOV	CAHS	NATRES	INCONF	EXCONF	RRFDI
GDP	1.00																		
INFR	0.55	1.00																	
INV	0.02	0.20	1.00																
DO	-0.09	0.12	0.22	1.00															
CORR	0.14	-0.05	0.09	0.04	1.00														
ROL	-0.05	0.06	0.18	0.11	0.30	1.00													
DEMO	0.27	0.27	0.23	-0.02	0.33	0.36	1.00												
PROFINV	0.22	0.43	0.33	0.06	0.11	0.33	0.49	1.00											
INFL	-0.01	-0.03	-0.06	-0.04	-0.11	-0.10	-0.04	-0.11	1.00										
BURQAL	0.27	0.11	0.14	0.05	0.39	0.17	0.36	0.23	-0.01	1.00									
GOV	0.18	0.06	0.09	0.29	0.08	0.10	0.10	0.06	0.03	0.19	1.00								
DEBT	0.18	0.22	-0.09	0.18	-0.01	0.10	0.13	0.16	-0.01	0.14	0.13	1.00							
EXCHRAT	0.02	-0.09	-0.05	-0.19	0.05	-0.10	-0.08	-0.11	-0.06	0.02	0.01	0.09	1.00						
STABGOV	0.11	0.32	0.26	0.13	-0.06	0.24	0.28	0.57	-0.09	0.05	-0.01	0.15	-0.19	1.00					
CAHS	0.03	0.25	0.24	-0.07	-0.06	-0.05	0.05	0.15	-0.05	0.03	-0.04	0.06	-0.08	0.23	1.00				
NATRES	-0.05	0.07	0.17	0.24	0.01	0.03	-001	0.09	-0.01	0.16	0.21	0.26	0.09	0.06	0.13	1.00			
INCONF	0.06	0.25	0.32	0.12	0.13	0.45	0.49	0.55	-0.08	0.23	-0.01	0.09	-0.11	0.44	0.14	0.08	1.00		
EXCONF	0.14	0.24	0.26	0.07	0.07	0.23	0.40	0.38	0.02	0.15	-0.08	-0.01	-0.14	0.35	0.09	0.10	0.62	1.00	
RRFDI	-0.01	0.08	0.32	0.14	-0.05	0.11	0.11	0.15	-0.01	-0.05	0.12	-0.04	-0.10	0.30	-0.02	0.23	0.08	0.13	1.00

Table D: Matrix of correlations of institutional variables

	Rol	Corr	Stabgov	Inconf	Exconf	Demo	Burqal	Profinv
Rol	1.00							
Corr	0.31	1.00						
Stabgov	0.24	0.06	1.00					
Inconf	0.45	0.13	0.44	1.00				
Exconf	0.24	0.08	0.35	0.62	1.00			
Demo	0.37	0.33	0.28	0.50	0.40	1.00		
Burqal	0.17	0.39	0.04	0.23	0.15	0.36	1.00	
Profinv	0.34	0.12	0.57	0.56	0.39	0.49	0.23	1.00

Table E: **Correlations between FDI/GDP and key determinants**

Variables	Pearson's corr. Coeff.	P-value	No. Of observations
GDP growth	0.127	0.00	720
Investment	0.317	0.00	720
Openness	0.138	0.00	720
Infrastructure	0.081	0.03	720
TCRE volatility	-0.103	0.00	720
Human Capital	0. 030	0.05	720
Debt	-0.112	0.01	720
Corruption	-0.051	0.17	720
Rule of Law	0.125	0.00	720
FDI stock	0.681	0.00	720
Government	0.154	0.00	720
Consumption	0.157	0.00	720
Investment	0.083	0.03	720
Profile	0.123	0.00	720
Internal conflict	0.106	0.00	720
External conflict	0.295	0.00	720
Democracy			
Government Stability			

Source: http://www.prsgroup.com, ICRG 2008; UNCTAD FDI online database; World Development Indicators online database

Table F: The interaction effect of institutional quality and natural resources on FDI

Variables	Law and Order	Corruption	Democracy	Stability of Government
Institutions	0.883b (0.437)	-0.893(1.204)	0.449a(0.174)	0.434a(0.259)
Interaction = Institution*Natural Resources	-0.032a (0.011)	0.039a(0.013)	-0.009a(0.002)	-0.014a(0.001)
Lagged FDI / GDP	0.793a (0.021)	0.774a(0.037)	0.771a(0.020)	0.643a(0.019)
Market size = Ln(GDP per capita)	3.719a (0.826)	4.222a(1.408)	3.407a(0.934)	1.517(1.280)
Domestic investment = Gross fixed capital formation / GDP	0.377a (0.029)	0.396a(0.054)	0.407a(0.031)	0.327a(0.032)
Infrastructures = Phone per 1000 persons	0.018a (0.004)	0.020b(0.003)	0.014a(0.004)	0.016a(0.004)
Human Capital = Secondary school enrolment	0.048a (0.019)	0.165c(0.099)	0.037b(0.018)	0.079a(0.019)
Debt = External Deficit / GDP	-0.038a (0.013)	0.003(0.013)	-0.017(0.013)	-0.007(0.012)
Openness = Trade / GDP	0.094a (0.018)	0.087a(0.017)	0.085a(0.017)	0.075a(0.020)
Natural Resources	0.042a (0.016)	0.065a(0.029)	0.067a(0.016)	0.129a(0.014)
Exchange Rate	0.005c (0.003)	0.002(0.002)	0.003(0.002)	0.005c(0.003)
Inflation	-0.004 (0.012)	0.001(0.001)	-0.002b(0.001)	0.003(0.005)
Public Consumption	-0.079a (0.011)	-0.089a(0.019)	-0.106c(0.061)	-0.091a(0.011)
Constant	-28.79a (6.76)	-26.89a(11.23)	-23.26a(7.08)	-8.428(7.791)
Hansen J test (p-value)*	0.4087	0.4151	0.4722	0.8402
Serial correlation test (p-value)**	0.8558	0.6319	0.6310	0.8748
Number of observations	658	658	658	658
Number of countries	30	30	30	30
Limit the number of lags of dependent variable used in instrumentation?	Yes	Yes	Yes	Yes

Notes: Standard deviation in parenthesis. a, b, c denotes significance levels at 1%, 5% and 10%, respectively.

(*) The null hypothesis is that the instruments are not correlated with the residuals,

(**) The null hypothesis is that the errors in the first difference regression exhibit no second order serial correlation.

Table F: The interaction effect of institutional quality and natural resources on FDI

Variables	Internal conflict	External conflict	Profile investment	Bureaucracy
Institutions	0.247c(0.133)	0.403a(0.126)	0.568a(0.173)	1.638(3.148)
Interaction = Institution*Natural Resources	-0.006b(0.002)	-0.007a(0.002)	-0.013a(0.002)	-0.058b(0.026)
Lagged FDI / GDP	0.788a(0.016)	0.787a(0.013)	0.819a(0.024)	0.770a(0.022)
Market size = Ln(GDP per capita)	2.909a(0.533)	3.354a(0.419)	4.089a(0.867)	3.323a(0.739)
Domestic investment = Gross fixed capital formation / GDP	0.350a(0.056)	0.370a(0.029)	0.341a(0.035)	0.350a(0.035)
Infrastructures = Phone per 1000 persons	0.017a(0.003)	0.013a(0.004)	0.013b(0.005)	0.017a(0.003)
Human Capital = Secondary school enrolment	0.220a(0.078)	0.119c(0.085)	0.184(0.150)	0.049b(0.024)
Debt = External Deficit / GDP	-0.037b(0.015)	-0.028b(0.013)	-0.023(0.016)	-0.045c(0.023)
Openness = Trade / GDP	0.083a(0.017)	0.095a(0.018)	0.079a(0.018)	0.080a(0.017)
Natural Resources	0.052b(0.021)	0.052a(0.019)	0.082a(0.014)	0.082c(0.050)
Exchange Rate	0.007a (0.003)	0.007a(0.002)	0.005b(0.002)	0.005c(0.003)
Inflation	-0.001(0.001)	-0.002(0.003)	-0.005(0.008)	0.003(0.005)
Public Consumption	-0.099a(0.019)	-0.086a(0.017)	-0.070a(0.017)	-0.076a(0.016)
Constant	-22.54a (4.40)	-25.46a(3.13)	-30.88a(5.39)	-25.56a(8.87)
Hansen J test (p-value)*	0.5722	0.3706	0.4732	0.3487
Serial correlation test (p-value)**	0.7314	0.6162	0.6284	0.4617
Number of observations	658	658	658	658
Number of countries	30	30	30	30
Limit the number of lags of dependent variable used in instrumentation?	Yes	Yes	Yes	Yes

Notes: Standard deviation in parenthesis. a, b, c denotes significance levels at 1%, 5% and 10%, respectively.

(*) The null hypothesis is that the instruments are not correlated with the residuals,
(**) The null hypothesis is that the errors in the first difference regression exhibit no second order serial correlation.