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Foreign Direct Investment, Natural Resources and Institutions

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Abstract

This paper examines the interaction between foreign direct investment (FDI), natural resources and institutions. The paper answers three questions: (i) Do natural resources crowd out FDI—i.e., is there an FDI-natural resource curse?; (ii) Do institutions mitigate the adverse effect of natural resources on FDI? (iii) Can institutions completely neutralize the FDI-natural resource curse? We use the systems GMM estimator proposed by Blundell and Bond (1998) to estimate a linear dynamic panel data model. Our analyses employ a panel data of 99 developing countries over the period 1984-2011. We consider six measures of institutional quality from two different sources, and two measures of natural resources. We find that natural resources have an adverse effect on FDI and that the FDI-resource curse persists even after controlling for the quality of institutions and other important determinants of FDI. We discuss the implications of the results for Ghana and countries in Sub-Saharan Africa.

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1 Introduction

Global oil consumption has increased significantly in the past two decades, and this trend is expected to continue. From 1990-2010, world crude oil consumption increased by about 36%, from 64 billion barrels per day (bpd) to about 87 billion bpd (EAI, 2013).[1] Not surprisingly, the increase in the demand for energy has led to an increase in oil prices—the world price of crude oil increased by 196% in real terms from 1990 to 2010, from $23.66 per barrel to $69.99 per barrel in constant 2005 prices (WDI, 2013). The price boom has fuelled a rise in profits in the extractive industry.[2] The surge in the demand for oil, the high oil prices and the increase in profits has led to a substantial increase in the exploration and production of oil around the world, in particular in Sub-Saharan Africa (SSA). Indeed, the data suggest that the rise in the global demand for oil is being met by increased oil production in SSA (we expound on this in Chapter 6). Specifically, there has been a significant increase in oil exploration in the region. We use Tulow Oil plc, one of the largest multinational corporations (MNCs) in the oil industry, as an example to illustrate this point.[3] Tulow's expenditure on oil exploration and appraisal in Africa increased by about 32% from 2008 to 2009: from £294 million to £387 million. Meanwhile, the company's expenditure in the other regions declined over the same period: by 50% in Europe, 50% in South Asia and 42% in South America. Furthermore, the African expenditure accounted for 84% of the company's total exploration expenditure in 2008, and 93% in 2009.

Note that oil exploration is extremely risky in that the outcome is uncertain. However, anecdotal evidence suggests that the explorations in Africa have been successful. For example, Tulow reported a 100% success rate in oil explorations in Ghana in 2008, and a success rate of 88% in 2009. Also in 2007, there were significant new oil and gas discoveries in 15 countries in SSA: Uganda, Ghana, Congo-Brazzaville, Angola, Gabon, Guinea-Bissau, Guinea, Sierra Leone, Cameroon, Nigeria, Tanzania, Zambia, Namibia, Sao Tome and Principe.

With regards to the production of crude oil, we note that oil production has increased

[1] The increase in oil consumption was mainly driven by China and India. From 1990 to 2010, oil consumption by China increased by 309% — from 2.3 billion bpd in 1990 to 9.39 billion bpd in 2010. In addition, the share of global oil consumed by China increased from 3.6% to about 10.8%. Consumption in India increased by 167% during the same period— from 1.07 billion bpd to 3.12 billion bpd; and India's share of global consumption increased from 1.8% in 1990 to 3.6% in 2010 (Index Mundi, 2013).

[2] For example, according to UNCTAD (2008), the median after-tax profits as a share of revenue of Global 500 companies increased from 2% in 2002 to 6% in 2006. In contrast, the share of profits of Global 500 companies in extractive industries increased from 5% to 26% over the same period.

[3] See Tulow's annual report for more information; http://www.tullowoil.com/files/reports/ar2009/

much faster in Africa than in the rest of the World (Table 7). The increase in oil production in Africa is underscored by Tulow's expenditure on oil development and production in Africa. Specifically, the company's oil production expenditure in Africa increased by about 230% over a one year period; from 2008 to 2009. This contrasts with a 25% decrease in production expenditure in South Asia and a mere 3% increase in Europe. Finally, the African expenditure accounted for 70% of the company's total production expenditure in 2008 and 88% in 2009.

It is important to note that the exploration and production of oil results in foreign direct investment (FDI) inflows only when the activities are financed by foreign MNCs. In SSA, foreign firms dominate the oil industry. For example in 2005, the share of oil production by foreign firms was 57% for SSA. This compares with a foreign share production of about 18% for Latin America, 11% for transition countries and 19% for all developing countries (UNCTAD, 2007). Also, the share of foreign production in the top four oil exporting countries in SSA is quite high: about 41% for Nigeria, 64% for Sudan, 74% for Angola, and 92% for Equatorial Guinea. Indeed, in some countries such as Kuwait, Mexico and Saudi Arabia, oil is produced solely by domestic firms—there is no production by foreign firms. One reason for the dominance of MNCs in Africa's extractive industries is that mineral extraction is capital-intensive, requires sophisticated technology, has long gestation periods and is also risky—there is no guarantee that oil may be discovered after spending an extensive amount of resources on exploration. As a consequence, the increased exploration and production in the region has led to a substantial increase in extractive industry FDI. Another relevant point is that countries that are rich in natural resources, in particular oil, tend to have weak institutions (Auty 2001; Gylfason and Zoega, 2006; Collier and Hoeffler, 1998). It is therefore important to understand the interaction between FDI, natural resources and institutions in host countries.

This paper examines the link between FDI, natural resources and institutions. Examining the effect of the global increase in oil production on FDI flows is important because FDI has the potential to transform an economy. Indeed, many international development agencies, such as the World Bank, consider FDI as one of the most effective tools in the global fight against poverty, and therefore actively encourage poor countries to pursue policies that will encourage FDI flows. The importance of FDI to developing countries is noted in UNCTAD (2002, page 5) which states:

> "Foreign direct investment contributes toward financing sustained economic growth over the long term. It is especially important for its potential to transfer knowledge and technology, create jobs, boost overall productivity, enhance competitiveness and entrepreneurship, and ultimately eradicate poverty through economic growth and development."

The paper answers the following questions: (i) Do natural resources crowd out FDI—i.e., is there an FDI-natural resource curse?; (ii) Do institutions mitigate the adverse effect of natural resources on FDI? (iii) Can institutions completely neutralize the FDI-natural resource curse? Our analysis employs a panel data of 99 developing countries over the period 1984-2011. Several studies have found that lagged FDI is correlated with current FDI. We therefore use the systems GMM estimator proposed by Blundell and Bond (1998) to estimate a linear dynamic panel data model to capture the effect of lagged FDI on current FDI. We interact a measure of natural resources with a measure of institutional quality to determine whether good institutions mitigate the FDI-resource curse. We consider six measures of institutional quality from two different sources. The measures of institutional quality reflect the effectiveness of the rule of law, the level of corruption, the stability of government, the enforcement of government contracts, and government restrictions on FDI in host countries. We employ two measures of natural resources, the share of fuel in merchandise exports and oil rents as a share of GDP. For each regression, we control for important determinants of FDI, such as openness to trade, measured by trade/GDP, the level of development and the attractiveness of the host country's market measured by GDP per capita and GDP growth, and macroeconomic instability measured by the rate of inflation. We find that natural resources have an adverse effect on FDI and that the FDI-resource curse persists even after controlling for the quality of institutions and other important determinants of FDI. We also find that institutions have a direct and positive effect on FDI. Finally, we find that institutions mitigate the negative effect of natural resources on FDI, however, institutions cannot completely neutralize the FDI-natural resource curse.

The paper makes important contributions to the FDI literature. There is a voluminous literature on the determinants of FDI to developing countries however, to the best of our knowledge, only one paper has examined the FDI-natural resource curse (Poelhekke and van der Ploeg, 2010). The authors note that "it is surprising that there is no research available on the effects of natural resources on both the composition and volume of FDI." Furthermore,

we are aware of only one paper that has analyzed the interaction effect of natural resources and institutions on FDI, Asiedu and Lien (2011). Poelhekke and van der Ploeg (2010) use firm level data from MNCs in the Netherlands to investigate the effect of natural resources on FDI. They find that natural resources boosts FDI in the resource sector but crowds out FDI in the non-resource sector, and that the latter effect dominates. As a consequence, aggregate FDI is less in resource-rich countries. They also find that institutional quality has a positive and significant effect on resource FDI, but has no impact on non-resource FDI. Our paper complements Poelhekke and van der Ploeg (2010) in that we also analyze the FDI-natural resource curse, however, we find that good institutions facilitate FDI (we expound on this in Section 2). We extend their analysis by examining the interaction effect of natural resources and institutional quality on FDI. Asiedu and Lien (2011) examine the interaction between FDI, democracy, dem, and natural resources, nat. Our work differs from Asiedu and Lien in two respects. First, their paper focuses on the sign and significance of $\partial fdi/\partial dem$. We take a different approach in that we are interested in determining whether natural resources undermine FDI, i.e., we focus on the sign and significance of $\partial fdi/\partial nat$. The second difference is that the authors examine only one aspect of institutional quality, democracy. Our analysis is more comprehensive because our measures of institutional quality reflect several characteristics of a country's institutions, such as the effectiveness of the rule of law, enforceability of contracts and corruption.

The paper is also related to the small but growing literature that analyze how natural resources interact with institutions/political regimes to affect economic outcomes. Most of the studies examine the interaction effect of natural resources and institutions on economic growth (e.g., Collier and Hoeffler, 2009). We contribute to this literature by examining the interaction effect of natural resources and institutions on FDI.

This paper has important policy implications, especially for countries in Sub-Saharan Africa (SSA). The new oil and gas discoveries in several SSA countries has revitalized the discussion among academics and policymakers about how oil exporting countries in the region can avoid the natural resource curse. This paper expands the debate by analyzing the "resource problem" from a different perspective — examining how resource intensity interacts with institutions to affect FDI flows. In addition, it provides a framework that can be used by other researchers to analyze the potential impact of the increase in oil production in SSA on institutions and FDI flows to the region.

The remainder of the paper is organized as follows. Section 2 describes the data and the variables, Section 3 discusses the estimation procedure, Sections 4 and 5 present the empirical results, Section 6 discusses the policy implications of our results for Ghana and the SSA region, and Section 7 concludes.

2 The Data and the Variables

Our empirical analyses utilize panel data of 99 developing countries over the period 1984-2011 and we average the data over three years to smooth out cyclical fluctuations. As is standard in the literature, the dependent variable is net FDI/GDP. As a check for robustness we run regressions where the dependent variable is FDI per capita. The descriptive statistics of the variables are reported in Table 1, and Table 1A in the appendix shows the data on natural resources and institutional quality for the countries in our sample.

2.1 Natural Resources

We employ two measures of natural resources for our regressions: (i) The share of fuel in total merchandise exports, *oilex*; and (ii) oil rents as a share of GDP, *oilrent*.[4] Note that both measures reflect the importance of natural resources to the host country. If *oilex* or *oilrent* is large, then it implies revenue from oil is very important to the host country. Also note that *oilex* reflects the host country's trade diversification—a high *oilex* implies a less diversified economy. We hypothesize a negative association between natural resources and FDI for the following three reasons. The first reason is based on the idea that resource booms lead to an appreciation of local currency. This makes the country's exports less competitive at world prices, and thereby crowds out investments in non-natural resource tradable sectors. If the crowding out is more than one-for-one, it may lead to an overall decline in FDI. The second reason is that natural resources, in particular oil, are characterized by booms and busts, leading to increased volatility in the exchange rate (Sachs and Warner, 1995). In addition, a higher share of natural resources in total merchandise exports implies less trade diversification, which in turn makes a country more vulnerable to external shocks. All these factors generate macroeconomic instability and therefore reduce FDI. Finally, FDI in natural resource rich countries tend to be concentrated in the natural resource sector.

[4] Oil rents is the value of oil exports net of production costs. Poelhekke and Ploeg (2010) employed *oilrent* as a measure of natural resource dependence.

While natural resource exploration requires a large initial capital outlay, the continuing operations demand a small cash flow. Thus, after the initial phase, FDI may be staggered. We employ *oilex* in our basic regressions and *oilrent* in our robustness regressions. The reason is that *oilex* provides more information about the nature of the host country's natural resources. Specifically *oilex* measures natural resource dependence and trade orientation whereas *oilrent* reflects only resource dependence. Furthermore, *oilex* has a wider coverage. The data for *oilex* is available for 99 countries and the data for *oilrent* is available for 90 countries. The data are from the World Development Indicators(WDI) published by the World Bank.

2.2 Quality of Institutions

Several measures of institutional quality have been used to analyze the effect of institutional quality on FDI. Most of the studies find that countries that have weak institutions, in particular, high corruption and an unreliable legal system tend to receive less FDI (Wei, 2000; Gastanaga et al., 1998). However, a few studies such as Wheeler and Mody (1992) and Poelhekke and Ploeg (2010) do not find a significant relationship between FDI and institutional quality. We provide two plausible explanations for the conflicting results. The first relates to how institutional quality is measured. The studies that find a significant relationship between institutional quality and FDI tend to employ indicators that measure a specific aspect of institutional quality (such as corruption, effectiveness of the legal system, etc.), and the studies that do not find an effect employ a composite measure of institutional quality. For example, Wei (2000) examines the effect of corruption on FDI. In contrast, the measure of institutional quality employed by Wheeler and Mody (1992) and Poelhekke and Ploeg (2010) is a composite measure and is derived by combining the data for different indictors of institutional quality, such as corruption, rule of law, etc.[5] It is possible that different types of institutions may have different effects on FDI. The second plausible explanation is that Wheeler and Mody (1992) and Poelhekke and Ploeg (2010) focus on FDI from one source country. Specifically, Wheeler and Mody (1992) analyze the determinants of US FDI and Poelhekke and Ploeg (2012) focus on FDI from the Netherlands. It is possible that MNCs from the US and Netherlands attach less weight to the quality of institutions in host coun-

[5] For example the composite measure employed in Wheeler and Mody (1992) combines thirteen indicators including corruption, attitude of opposition toward FDI, overall living environment of expatriates, etc.

tries' when making investment decisions. However this result may not apply to MNEs from other countries.[6]

We employ six measures of institutional quality from two different sources to assess the effect of institutional quality on FDI. Five of the measures are from the International Country Risk Guide ($ICRG$) published by the Political Risk Services (PRS).[7] The measure law, reflects the strength and impartiality of the legal system and the popular observance of the law; $corrupt$ is an assessment of corruption within the political system; $govstab$ measures the government's ability to carry out its declared program(s) and its ability to stay in office; $fdirisk$ is derived based on three factors that pose a risk to FDI, namely, contract viability/expropriation, profits repatriation and payment delays. The fifth measure, $inst$, is a composite indicator and is the unweighted average of law, $corrupt$, $govstab$ and $fdirisk$. The sixth measure of institutional quality, law_k is from Kauffman et al. (2012) and it reflects the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.[8] To ease comparison between the different measures of institutional quality, we follow Acemoglu et al. (2008) and normalize the indicators to lie between zero and one, such that a higher number implies higher quality institutions.

The measures of institutional quality vary in terms of coverage and availability. The $ICRG$ data are available for 1984-2011 and the data from Kauffman et al. (2012) are available for fewer years, covering 1996-2011. In addition, the regressions that employ the ICRG measure cover 99 countries and have up to 727 observations and the regressions that employ the measure from Kauffman et al. (2012) cover 97 countries and have 512 observations. We therefore employ the ICRG measures for our main regressions and use law_k in the robustness regressions. With regards to availability, the data for law_k are available free of charge, the $ICRG$ data are not.

2.3 Other Variables

Following the literature on the determinants of FDI, we include the following variables in our regressions. We use $trade/GDP$ as a measure of openness and the rate of inflation as a measure of macroeconomic uncertainty. All else equal, openness to trade and lower inflation

[6] The effect of the host country's institutions on FDI may be different for FDI from different countries. For example Wei (2000) finds that Japanese investors are less sensitive to corruption than American and European investors.

[7] A detailed description of the data can be obtained from http://www.prsgroup.com/icrg.aspx

[8] A detailed description of the data can be obtained from http://info.worldbank.org/governance/wgi/index.asp

should have a positive effect on FDI. Higher domestic incomes and higher growth imply a greater demand for goods and services and therefore makes the host country more attractive for FDI. In addition a higher GDP per capita reflects the level of development (including the availability of human and physical capital) in host countries. Asiedu and Lien (2003) find that domestic income has to achieve a certain threshold in order to facilitate FDI flows. We therefore include GDP growth, GDP per capita and the square of GDP per capita in our regressions. The data on GDP growth is from the $ICRG$ and the data for trade, inflation and GDP per capita are from the WDI.

3 Estimation Procedure

Several studies have found that lagged FDI is correlated with current FDI. We therefore estimate a linear dynamic panel-data (DPD) model to capture the effect of lagged FDI on current FDI. DPD models contain unobserved panel-level effects that are correlated with the lagged dependent variable, and this renders standard estimators inconsistent. The GMM estimator proposed by Arellano and Bond (1991) provides consistent estimates for such models. This estimator often referred to as the "difference" GMM estimator differences the data first and then uses lagged values of the endogenous variables as instruments. However, as pointed out by Arellano and Bover (1995), lagged levels are often poor instruments for first differences. Blundell and Bond (1998) proposed a more efficient estimator, the "system" GMM estimator, which mitigates the poor instruments problem by using additional moment conditions. Another advantage of the system GMM estimator is that it is less biased than the difference GMM estimator (Hayakawa, 2007).[9] We therefore use the system GMM estimator for our regressions. Also, we use the two-step estimator, which is asymptotically efficient and robust to all kinds of heteroskedasticity. We however note that the system estimator has one disadvantage: it utilizes too many instruments. Moreover, the procedures assume that there is no autocorrelation in the idiosyncratic errors. Hence, for each regression, we test for autocorrelation and the validity of the instruments. Specifically, we report the p-values

[9] The system GMM uses more instruments than the difference GMM, and therefore one might expect the system estimator to be more biased than the difference estimator. However, Hayakawa (2007) shows that the bias is smaller for the system than the difference GMM. He asserts that the bias of the system GMM estimator is smaller because it is a weighted sum of the biases of the difference and the level estimator, and that these biases move in opposite directions.

for the test for second order autocorrelation as well as the Hansen J test for overidentifying restrictions. Our results confirm the absence of autocorrelation and the validity of the instruments. We however note that these tests lose power when the number of instruments, i, is large relative to the cross section sample size (in our case, the number of countries), n—in particular when the ratio of the sample size to the number of instruments, $r = n/i < 1$ (Roodman, 2007; Stata, 2009). Thus, when $r < 1$, the assumptions underlying the two procedures may be violated. Furthermore, a lower r raises the susceptibility of the estimates to a Type 1 error—i.e., producing significant results even though there is no underlying association between the variables involved (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 (Roodman, 2007; Stata, 2009).[10] In all the 12 benchmark regressions and in 3 out of the 6 robustness regressions, $r \geq 1$, and therefore we do not restrict the number of lags of the dependent variable used for instrumentation. For the 3 cases where $r < 1$, we limit the number of lagged levels to be included as instruments to the point where $r \geq 1$, and we check whether our results are robust to the reduction in instrument count.

We now provide some details about our estimation strategy. First, we use the two-step GMM estimator, which is asymptotically efficient and robust to all kinds of heteroskedasticity. Second, we treat the independent variables as strictly exogenous in all the regressions, with the exception of the robustness regression where institutions and natural resources are endogenous. Third, our regressions utilize only internal instruments—we do not include additional (external) instruments.[11] Specifically, the system estimator uses the first difference of all the exogenous variables as standard instruments, and the lags of the endogenous variables to generate the GMM-type instruments described in Arellano and Bond (1991). In addition, it includes lagged differences of the endogenous variables as instruments for the level equation.

[10] See Asiedu and Lien (2011) for a detailed discussion.

[11] One reason is that adding more instruments increases the instrument count, i, and thereby reduces the instrument ratio, r.

4 Benchmark Regressions

We estimate the equation:

$$\begin{aligned} fdi_{it} &= \alpha nat_{it} + \delta inst_{it} + \beta nat_{it} \times inst_{it} + \rho fdi_{it-1} \\ &\quad + \Sigma_{j=1}^{J} \gamma_j Z_{jit} + \theta_i + \varepsilon_{it} \end{aligned} \tag{1}$$

where i refers to countries, t to time, θ_i is the country-specific effect, fdi is net FDI/GDP, $inst$ is a measure of institutional quality, nat is the share of fuel in total exports, $nat \times inst$ is the interaction term, and Z is a vector of control variables. We proceed by answering the questions posed in the introduction.

Question 1: Do natural resources crowd out FDI after controlling for other important determinants of FDI?

To answer this question we estimate equation (1) without the interaction term, $nat \times inst$. Thus we estimate the equation:

$$fdi_{it} = \alpha nat_{it} + \delta inst_{it} + \rho FDI_{it-1} + \Sigma_{j=1}^{J} \gamma_j Z_{jit} + \theta_i + \varepsilon_{it}.$$

Note that $\partial fdi/\partial nat = \alpha$ and therefore the parameter of interest is the estimated coefficient of nat, $\widehat{\alpha}$. Table 2 shows the estimation results. Column (1) shows the regressions where natural resources is the only explanatory variable. In column (2) we control for trade openness, inflation, growth opportunities and income per capita and in columns (3)-(7) we include measures of institutional quality. There are several noticeable points. First, $\widehat{\alpha}$ is negative and significant at the 1% level in all the regressions. In addition, $\widehat{\alpha}$ is fairly stable across specifications, suggesting that all else equal, natural resources have an adverse and robust effect on FDI. Second, $\widehat{\alpha}$ remains significant after controlling for trade openness, macroeconomic instability, the level of development in host countries, and the quality of institutions in host countries. This suggests that natural resources are not a proxy for poor quality institutions. For the regressions that employ the average of the measures on institutional quality as measure of institutional quality, $inave$, (Column 3 of Table 2), a one standard deviation increase in nat ($sd = 30.783$, see Table 1) will decrease fdi by about 1.56 percentage points [$\partial fdi/\partial nat = -0.051 \times 30.783 \approx -1.56$]. The results for the other measures of institutions are qualitatively similar. Specifically, a standard deviation increase in nat will decrease fdi by about 1.56 percentage points for $inst = law$, 1.66 percentage points for

$inst = corrupt$, by 1.56 percentage points for $inst = govstab$ and by about 1.72 percentage points for $inst = fdirisk$. We use an example to provide the reader with a better sense of the adverse effect of natural resources on FDI. Specifically, we consider two countries in SSA, Ghana and Nigeria. As pointed out in the introduction, a significant amount of oil has been discovered in Ghana. As a consequence Ghana will soon be classified as an oil exporting country. Nigeria on the other hand is an oil exporting country. The average value of nat from 1984-2011 is about 5.61 for Ghana and 95.38 for Nigeria. Then the estimation results for the regression that employ $inave$ as measure of institutional quality (Column 3) shows that all else equal, an increase in nat from the level of Ghana to the level of Nigeria will decrease fdi by about 4.478 percentage points in the short run and by about 5.543 percentage points in the long-run.[12] Note that the decrease in fdi is quite substantial because fdi for Ghana over the period 1984-2011 is about 2.769% (Table 1A).

We next discuss the effect of institutions on FDI. Note that $\partial fdi/\partial inst = \delta$ and therefore the parameter of interest is the estimated coefficient of $inst$, $\widehat{\delta}$. Also recall that a higher value of $inst$ implies more efficient institutions. As shown in Table 2, $\widehat{\delta}$ is positive and significant at the 1% level for all the measures of institutional quality, suggesting that good institutions promote FDI. Column 3 shows that all else equal, a one standard deviation increase in $inave$ ($sd = 0.122$, Table 1) will increase fdi by about 0.645 percentage points [$\partial fdi/\partial inst = 5.288 \times 0.122 \approx 0.645$]. A one standard deviation increase in $inst$ is expected to increase fdi by about 0.667 percentage points for law ($sd = 0.196$), 0.209 percentage points for $corrupt$ ($sd = 0.156$), about 0.357 percentage points for $govstab$ ($sd = 0.171$) and about 0.166 percentage points for $fdirisk$ ($sd = 0.177$). Here again, we provide an example to illustrate the catalyzing and direct effect of good institutions on FDI. Consider two countries in SSA that differ significantly in terms of institutional quality— Angola, a country with very poor institutions and Botswana, a country with the best institution in SSA. The average values of the measures of institutional quality from 1984-2011 for the two countries are $inave$: Botswana = 0.729; Angola = 0.421; law: Botswana = 0.616; Angola = 0.234; $corrupt$: Botswana = 0.543; Angola = 0.265; $govstab$: Botswana = 0.683; Angola = 0.572 and $fdirisk$: Botswana = 0.571; Angola = 0.454 (see Table 1A). Then all else equal,

[12] This follows from the fact that the short-run effect of a Δ change in nat on fdi is given by $(\widehat{\alpha}\times\Delta)$ and the long-run effect is $(\widehat{\alpha}\times\Delta)/(1-\widehat{\rho})$, where $\widehat{\alpha}$ is the estimated coefficient of nat and $\widehat{\rho}$ is the estimated coefficient of fdi_{it-1}. Here, $\Delta = (5.61 - 95.38)$ and from Table 3, $\widehat{\alpha} = -0.051$ and $\widehat{\rho} = 0174$. Then $\partial fdi/\partial nat = -0.051 \times (5.61 - 95.38) = 4.578$ in the short run and $\partial fdi/\partial nat = -0.051 \times (5.61 - 95.38)/\,(1 - 0.174) = -5.543$ in the long run.

an improvement in institutional quality from the level of Angola to the level of Botswana will increase fdi by about 1.629 percentage points for $inave$, 1.298 percentage points for law, 0.058, percentage points for $corrupt$, 0.827 percentage points for $govstab$ and about 0.386 percentage points for $fdirisk$.

We now turn our attention to the other explanatory variables. The control variables carry the expected signs and are all significant at the 1% level. The estimated coefficient of lagged FDI is positive and significant, an indication that FDI is persistent. Indeed, this provides justification for using the Blundell and Bond (1998) GMM estimator. The results also show that the relationship between FDI and income per capita is non-linear: GDP per capita has a positive impact on FDI only if income per capita exceeds a certain threshold. Finally, consistent with many empirical studies on the determinants of FDI, we find that GDP growth, openness to trade and lower inflation have a positive and significant effect on FDI.

Question 2: Do institutions mitigate the adverse effect of natural resources on FDI?

Our results so far show that natural resources undermines FDI and that institutions have a direct and positive effect on FDI. We now test the central hypothesis of the paper, i.e., whether an improvement in institutional quality will result in a significant reduction in $\partial fdi/\partial nat$. Here, we estimate equation (1) and we report the results in Table 3. Note that $\partial fdi/\partial nat = \widehat{\alpha} + \widehat{\beta} \times inst$, and therefore the parameters of interest are the estimated coefficient of nat, $\widehat{\alpha}$, and the estimated coefficient of the interaction term, $\widehat{\beta}$. For all the measures of institutional quality, $\widehat{\alpha}$ is negative and significant at the 1% level and $\widehat{\beta}$ is positive and significant at the five percent level, suggesting that good institutions significantly reduces the adverse effect of natural resources on FDI. For the regressions that employ the average institutional quality index as a measure of institutional quality, $inave$, (see column (1)), the marginal impact of nat is

$$\frac{\partial fdi}{\partial nat} = -0.076 + 0.045 \times inave.$$

Here again, we use Angola and Botswana as examples to make our point. Recall that the average value of $inave$ is equal to 0.729 for Botswana and 0.421 for Angola. Suppose the share of natural resources in exports, nat, for Angola increases by one sample standard

deviation. Then for the regressions that employ *inave* as a measure of institutional quality (Column 3), the increase in *nat* will decrease fdi in Angola by about 1.663 percentage points $[\partial fdi/\partial nat = (-0.073 + 0.045 \times 0.421) \times 30.783 \approx -1.663]$. Now suppose Angola implements policies that lead to an improvement in its institutions, such that the value of *inave* increases to the level of Botswana. Then, a one standard deviation increase in *nat* will decrease fdi by only 1.237 percentage points $[\partial fdi/\partial nat = (-0.073 + 0.045 \times 0.729) \times 30.783 \approx -1.237]$, which is about 27 percent less than the expected decrease in fdi under the current level of institutional quality. An important to note is that the estimated coefficient of *inst*, $\widehat{\delta}$, remains significant suggesting that institutions have a direct and indirect impact on FDI.

Question 3: Can institutions completely neutralize the adverse effect of natural resources on FDI?

Having ascertained that institutions mitigate the adverse effect of natural resources on FDI, a natural question that arises is this: can institutions eliminate the FDI-resource curse? For our analysis, we are interested in determining the level of institutional quality that drives $\partial fdi/\partial nat$ to zero (i.e., $\widehat{\alpha}+\widehat{\beta}\times inst = 0$). We proceed by evaluating $\partial fdi/\partial nat$ at reasonable values of *inst*. Specifically we calculate the average value of the measures of institutional quality over the period 1984-2011 for each of the countries in our sample, and we denote it by $\overline{inst}$. We then evaluate $\partial fdi/\partial nat$ at the mean, 10^{th}, 25^{th}, 50^{th}, 75^{th} and the 90^{th} percentile of $\overline{inst}$. Panel A of Table 4 shows the results for *inave*. The 10^{th}, 25^{th}, 50^{th}, 75^{th} and the 90^{th} percentile of $\overline{inave}$ correspond to the average value of *inave* for Pakistan, Venezuela, Mexico, South Africa and Latvia, respectively and the mean correspond to the average value for Argentina. There are two notable points from Panel A. First, $\partial fdi/\partial nat$ decreases substantially as $\overline{inave}$ increases. The second notable point is that $\partial fdi/\partial nat$ remains negative and significant even when *inave* is quite high, as high as the 90^{th} percentile of $\overline{inave}$. The other institutional measures produce similar results (see Panels B, C, D and E). Note that these results suggest that although an improvement in institutional quality mitigates the FDI-resource curse, it *may not* completely neutralize the negative effect of natural resources on FDI. To confirm this conjecture, we compute the critical value of *inst*, $inst^*$, defined as the level of *inst* at which $\partial fdi/\partial nat = 0$. Thus, $inst^* = -\widehat{\alpha}/\widehat{\beta}$. The value of $inst^*$ is about 1.68 for *inave*, 1.92 for *law*, 2.95 for *corrupt*, 8.18 for *govstab* and 3.52 for $fdirisk$. Note that the critical values are implausible because *inst* lies between 0 and 1. Indeed, the highest values of the average measures of institutional quality for the countries

in our sample is 0.812 for $\overline{inave}$, 0.918 for $\overline{law}$, 0.767 for $\overline{corr}$, 0.952 for $\overline{govstab}$ and 0.958 for $\overline{fdirisk}$. Thus, the results confirm our conjecture, that overall, good institutions reduce the FDI-resource curse, but cannot completely neutralize the resource curse.

5 Robustness Regressions

We run several regressions to test the robustness of our main results: that institutions mitigate the adverse effect of the natural resource curse on FDI. In order to keep the discussion focused, we report the regressions which employ the measure of institutions that reflects the overall institutional quality in host countries, *inave*. Furthermore, to conserve on space, we report only the values of $\widehat{\alpha}$ and $\widehat{\beta}$ in Table 5 and Table 6. The preview of the outcome of our robustness regressions is that our results are robust: $\widehat{\alpha}$ is negative and significant at the 1% level and $\widehat{\beta}$ is positive and significant at least at the 5% level in all the regressions, suggesting that institutions mitigate the adverse effect of natural resources on FDI. We now provide a brief discussion of the robustness estimations.

(i) Sub-samples: We run regressions where we exclude countries in SSA. This exercise is motivated by two reasons. Asiedu (2002) finds that the factors that drive FDI to SSA are different from the factors that drive FDI to other developing countries. Second, natural resources dominates the exports of many of the countries in SSA. Thus, it is possible that our results may change if SSA countries are excluded from the regressions. For this regression, we limit the number of lagged variables used as instruments to ensure that $r < 1$. Clearly, the results are robust: $\widehat{\alpha}$ is positive and significant at the 1% level and $\widehat{\beta}$ is negative and significant at the 5%.[13]

(ii) Alternative Measure of Institution: The measures of institutional quality employed in the benchmark regressions are from the same source, $ICRG$. We check whether our results hold if we use data from a different source. We use the rule of law variable from Kauffman et al. (2012). Our results are robust to the alternative measures of institutional quality: $\widehat{\alpha}$ and $\widehat{\beta}$ are significant at the 1% level.

(iii) Alternative Measure of Natural Resources: The resource curse literature suggests that rents generated from natural resources play a significant role in explaining

[13] We do not run separate regressions for SSA because the instrument ratio, $r = 0.76$, is very low. Specifically, $n = 28$ and $i = 37$. In addition, r remains less than one even after a reduction in the instrument count. As pointed out earlier, the results are not reliable when $r < 1$.

the natural resource curse.[14] The measure of natural resources employed in the benchmark regressions, $oilex$ does not capture natural resource rents. As a robustness check we examine whether the results hold when we use oil rents as a share of GDP, $oilrent$, as a measure of natural resources in host countries. Here we limit the instrument count to ensure that $r > 1$. As shown in Table 5, $\widehat{\alpha}$ and $\widehat{\beta}$ have the expected signs and are significant at the 1% level.

(iv) Internal Conflict and Political Instability: Several studies have found that natural resource dependence generates political instability and internal conflict, in particular, civil wars (e.g., Collier and Hoeffler, 1998). We use the conflict index reported in Cross National Time Series ($CNTS$) database as a measure of internal conflict in host countries.[15] The measure, $conflict$, is the weighted average of the number of: assassinations, strikes, guerrilla warfare, government crises, purges, riots, revolutions and anti-government demonstrations. We did not include $conflict$ in the benchmark regression because the estimated coefficient of $conflict$ is not significant. do not include a measure of political instability. Our results are robust: $\widehat{\alpha}$ and $\widehat{\beta}$ have the correct signs and are significant at the 1% level.

(v) Alternative Measure for the Dependent Variable: We note that one could use FDI per capita as a dependent variable to analyze the effect of natural resources on FDI flows. Thus, we examine whether our results hold when we use FDI per capita as the dependent variable. Column 1 of Table 6 shows that our results pass the robustness checks: $\widehat{\alpha}$ and $\widehat{\beta}$ have the correct signs and are significant at the 1% level.

(vi) Endogeneity of Natural Resources and Institutional Quality: There is a potential endogeneity problem associated with our measure of natural resources. Specifically, it is possible that an unobserved variable may affect both FDI and exports. Since we measure natural resources as a share of exports, it is possible that our estimates are biased. The system estimator mitigates the endogeneity problem. However, in order to be thorough,

[14] Different channels through which natural resources affect growth have been studied extensively, including the "voracity effect" induced by rent-seeking. The "voracity effect" is formalized by Lane and Tornell (1996) and Tornell and Lane (1999) . Different interest groups, fight to capture a greater share of the rents from natural resources, and this induces a bad allocation of resources – public subsidies and other forms of transfers grow more quickly than the increase in windfall income, lowering the effective rate of return to investment. Torvik (2002) argues that a greater amount of natural resources increase the number of entrepreneurs engaged in rent seeking and reduces the number of entrepreneurs running productive firms. Hodler (2006) finds natural resources lower incomes in fractionalized countries but increase incomes in homogenous countries since natural resources cause fighting activities between rivalling groups which in turn reduces productive activities and weakens property rights.

[15] The data are produced by Databank International. For more details see http://www.databanksinternational.com

we address this issue explicitly by specifying natural resources as an endogenous variable in our regression. Note that if natural resource is endogenous, then the interaction between institutional quality and natural resources is also endogenous. Thus here, we re-estimate equation (1) where we specify $oiex$ and $oilex \times inst$ as endogenous variables. We also take into consideration the potential endogeneity of institutions, and consider a specification where $inst$ and $oilex \times inst$ are specified as endogenous variables. As expected, the introduction of the endogenous variables increases the instrument count substantially, and as a consequence r is low.[16] We therefore curtail the number of instruments. As shown in Columns 2 and 3 of Table 6, the results are robust: $\widehat{\alpha}$ and $\widehat{\beta}$ are significant at the 1% level and have the correct signs.

(vii) Time and Region Fixed effects: We test whether our results hold when we take into account time and region fixed effects. We did not include the regional and time dummy variables in our main regressions because it lowers r. The results reported in Columns 4 and 5 of Table 6 show that the results are robust.

6 Implications of Results for SSA and Ghana

As pointed out in the introduction, the paper has important implications for SSA countries. There are four reasons for this. First, there has been a significant increase in the exploration and production of oil in the region. As a consequence more countries in the region will soon be classified as natural resource exporting countries. Second, several studies have shown that FDI is crucial for poverty reduction in SSA (Asiedu and Gyimah-Brempong, 2008). Third, although FDI to SSA has increased substantially since 2000, the investments are concentrated in extractive industries. The fourth reason is that most of the countries in SSA, in particular, natural resource exporting countries have weak institutions. It is therefore important to analyze how the quality of institutions in the host country affect the natural resources (increased oil production)-FDI relationship. In this section we provide data to support these assertions and discuss the policy implications of our results for countries in SSA. In addition we use Ghana as an example of an emerging resource exporting country to highlight the implications of our results for countries that have recently discovered oil.

[16] For example the instrument count increases from 86 for the case where $oilex$ is exogeneous to 215 when $oilex$ and $oilex \times inst$ are endogenous.

6.1 FDI, Oil Production and Institutions in SSA

The production of crude oil in Africa has increased substantially since the 1990s. Table 7 shows the average daily production of crude oil for the world, the various geographical regions and the top four oil exporting countries in SSA: Angola, Equatorial Guinea, Nigeria and Sudan, from 1992 to 2011. There are several notable points in Table 7. First, oil production grew faster in Africa than in the other regions. Over the period 1992-96 to 2008-11, oil production in Africa increased by 40%. This compares with an increase of 32% for Asia, 24% for South America, 15% for Europe, and a decline of 4% for North America. Second, the growth in production in Equatorial Guinea and Sudan was quite substantial: $3,946\%$ for Equatorial Guinea and $207,437\%$ for Sudan. Third, a large share of the production in Africa occurred in the top four oil exporting countries, with the share of production increasing from about 38% to about 53%. Note that oil was discovered in Equatorial Guinea in 1990 and in Sudan in 1991, suggesting that the increase in oil production in SSA is driven by new discoveries. This indeed underscores the point made earlier, that the rise in the global demand for oil is being met by increased production of oil in SSA.

Figure 1 displays FDI flows to SSA from 1980-2011, and it shows that FDI to the region has increased substantially since 2000. From 2000-2011, net FDI inflows to the region increased by about 368% in real terms—from $\$7,598$ million in 2000 to $\$35,596$ million in 2011 (WDI, 2013). Indeed, from 1990-1999 to 2000-2009, average annual FDI to SSA grew faster than FDI to non-SSA developing countries (excluding China): FDI growth for SSA was about 1.6 times the growth in non-SSA developing countries; 4.5 times the growth in East Asia and Pacific, and about 4 times the growth in Latin America (WDI, 2013). However, the investments are concentrated in oil-exporting countries. For example in 2009, about 43% of FDI flows to SSA went to the top four oil-exporting countries (Angola, Equatorial Guinea, Nigeria and Sudan) and the share is higher when FDI to South Africa is excluded–the share increases to 51%. Note that this implies that the remaining 43 countries in the region received only 49% of the investment. The conjecture is supported by Figure 2, which shows a graph of FDI flows and the share of oil in total exports for 21 countries in SSA, averaged from 2000-2009. The graph shows a positive correlation between FDI and oil export intensity. An ordinary least square regression of $ln(FDI)$ on oil export intensity yielded a coefficient of 0.033, with a robust p-value 0.007 and $R^2 = 0.26$. This implies that all else equal, a one percentage point increase in oil export intensity will raise FDI by about 3.3%.is supported.

Thus, one can infer from the data that the recent increase in FDI to SSA is mainly in the oil industry.

Table 8 shows the data for two measures of institutional quality, corruption and the effectiveness of the rule of law, for SSA countries and developing countries outside SSA. We also report the data for the eight top oil exporting countries in SSA: Angola, Cameroon, Chad, Congo Republic, Equatorial Guinea, Gabon, Nigeria, and Sudan. The data are averaged from 2000-2009 and they range from zero to one. A higher number implies a higher level of corruption and a more effective legal system. Table 8 shows that the average corruption index for SSA is higher than the index for non-SSA countries, and the average index for the eight oil exporting countries is higher than the index for SSA. This suggests that corruption is more prevalent in SSA countries than in non-SSA countries, and that oil exporting countries are more corrupt than non-oil exporting countries. The rule of law index is higher for non-SSA countries than SSA countries, and lower for oil exporting countries. Thus the data suggests that overall SSA has weaker institutions than other developing countries, and oil exporting countries in SSA have worse institutions than non-oil exporting countries in the region.

6.2 FDI, Oil Production and Institutions in Ghana

Oil was discovered in Ghana in 2007 and production began in 2010.[17] Production has increased significantly since 2010. Specifically, production in 2010, 2011 and 2012 was 7.19 million bpd, 72.58 million bpd and 2000 million bpd (Index Mundi, 2013). Thus, oil production in Ghana increased by 175% within a year, from 2011-2012. The surge in oil production is reflected in the increase in the share of oil in exports from 2009 to 2011. Oil as a share of exports increased from about 4% in 2009 to 54% in 2012 (WDI, 2013). If this trend continues, then it is likely that very soon, Ghana will be classified as an oil exporting country.

Figure 3 shows FDI flows to Ghana from 1980 to 2011. FDI to Ghana has increased substantially since 2005. From 2005 to 2011, FDI increased by about $1,834\%$ in real terms, from \$140 million to $\$2,7778$ million. Table 9 shows investments by firms in the extractive industries from 1991-2010. As pointed out earlier, foreign firms dominate the extractive industry, hence the data may be interpreted as FDI in extractive industries. The data shows

[17] See GNPC (2011) for a discussion about the history of oil and gas exploration in Ghana.

that FDI in extractive industries has increased significantly since 1991. Over the periods 1991-1995, 1996-2000, 2001-2005 and 2006-2010, the average annual investment increased from $385 million to $470 million, to $515 million to $631 million (constant 2005 dollars), respectively. In addition, over the periods 2001-2005 to 2006-2010, total investments in the extractive industry increased by about 23%.

We now discuss how institutional quality in Ghana has evolved over time. Figure 4 shows the trend for corruption and Figure 5 shows the trend for law and order from 1987-2011. The graphs show that Ghana has weak institutions and the quality of institutions has gotten worse over time. For example, the corruption index increased from 0.48 in 1987-1991 to about 0.7 in 2007-2011, and the rule of law index declined from 0.49 to 0.39 over the same period.

6.3 Discussion–Policy Implications

Our discussion so far suggests that a continual increase in oil production in SSA will expose more countries in the region to the FDI-natural resource curse. Another important point is that good institutions can mitigate the adverse effect of natural resources on FDI. However, SSA countries have weak institutions, suggesting that the curse, if it occurs will be more severe in African countries. We end the section by discussing the importance of FDI to SSA and highlighting the potential effect of the FDI-natural resource curse on poverty reduction and economic growth. We also discuss policies that may mitigate the "curse".

The importance of FDI to SSA is well articulated in the United Nations Millennium Declaration Goal (MDG) document, adopted in September 2000, that notes that

> "We [the United Nations General Assembly] resolve to halve, by the year 2015, the proportion of the world's people whose income is less than one dollar a day. We also resolve to take special measures to address the challenges of *poverty eradication and sustainable development in Africa*, including debt cancellation, improved market access, enhanced Official Development Assistance and increased flows of *Foreign Direct Investment*,... "

It is important to note that the impact of FDI on host economies depends on the type of FDI that the country receives (Asiedu, 2004; Axarloglou and Pournarakis, 2007). Thus an important issue that comes to bear is whether the recent increase in extractive industry

FDI will enhance economic growth and reduce poverty in SSA countries. We assert that employment by MNCs is one of the most effective ways by which FDI can facilitate poverty reduction and economic growth in host countries. MNC employment increases domestic employment, boosts domestic wages, enhances the productivity of the labor force and it fosters the transfer of technology between foreign and domestic firms (Asiedu, 2004). However, extractive industry FDI generates very limited local employment. This point is noted in UNCTAD (2007: 92): "mineral extraction is primarily an export-oriented activity, with significant revenue creation, but limited opportunities for employment creation and local linkages". The employment effects of FDI are important to SSA, because in most African countries unemployment is prevalent. High unemployment rate countries in SSA include South Africa, 23%; Kenya, 40%; Senegal, 48% and Zambia, 50% (CIA, 2011). In addition to expanding domestic employment, MNC employment boosts wages in host countries. MNCs pay higher wages than domestic firms and the presence of multinationals generates wage spillover: wages tend to be higher in industries and in provinces that have a greater foreign presence (Asiedu, 2004; Lipsey and Sjoholm, 2001). This is important because wages are low in SSA. For example, about 46% of the workers in South Africa (one of the richest countries in the region), earn less than the living wage (Fields, 2000). Thus, for countries such as South Africa, the contribution of FDI to employment is crucial. Indeed, foreign affiliates accounted for about 23% of employment in South Africa in 1999 (UNCTAD, 2002).

We employ data from US MNCs to show that FDI in manufacturing generates more jobs than FDI in extractive industries in Africa. Specifically, we compare the employment effects of FDI in manufacturing and extractive industries. For each industry, we compute the number of employees per $1 million stock of FDI of affiliates of US MNCs abroad, and we use this measure as a proxy for the elasticity of job creation. Table 10 shows the employment elasticity data for the World and the various regions. A higher elasticity implies FDI generates more jobs. We also report the elasticity ratio, which we define as the ratio of the elasticity for manufacturing to the elasticity for mining. There are three notable points. First, the elasticity ratios are greater than one, suggesting that in all the regions, an equal investment in manufacturing and mining will produce more jobs in manufacturing than in mining. For example the elasticity ratio for Africa is 17, which means that for the same level of investment, the number of jobs created in manufacturing will be equal to 17 times the number of jobs created in mining. Second, Africa has the highest elasticity ratio, implying

that the relative benefit (in terms of job creation) of receiving FDI in manufacturing versus FDI in mining is higher for Africa than the other regions. Third, Africa has the highest employment elasticity in manufacturing. A $1 million investment in manufacturing will create about 34 jobs in SSA—this compares with 21 in Latin America, 15 in Asia and about 10 in Europe and the Middle East. This implies that in terms of employment creation, manufacturing FDI is more "productive" in Africa than in other regions.

Thus, the challenge facing countries in SSA, in particular, oil-exporting countries in the region, such as Ghana, is to find ways to avoid the FDI resource curse and attract FDI in non-extractive industries. In analyzing this issue, it is important to note that non-extractive industry FDI is sensitive to the conditions in host economies, in particular, the size of the local market, quality of physical infrastructure, the productivity of the labor force, openness to trade, FDI policy and the quality of institutions. Another relevant point is that non-extractive industry FDI is more footloose than FDI in extractive industry. This implies that countries in SSA need to compete with developing countries outside SSA in order to attract non-extractive FDI.

Three policy recommendations emerge from our discussion. First, countries in the region need to improve their institutions and this is particularly relevant for resource-exporting countries. Second, countries in SSA need to boost investments in physical infrastructure and education. Here, oil-exporting countries have an advantage, in that they can use some of the rents that accrue from oil production to finance these investments. The results also suggest that regional economic cooperation may facilitate FDI to SSA (Elbadawi and Mwega, 1997).[18] One reason is that regionalism expands the size of the market, and therefore makes the region more attractive for FDI. The importance of large markets for FDI in Africa is documented in several surveys. For example, "narrow and missing markets" was cited as the main factor preventing French companies from investing in African countries (Arias-Chamberline, 2002).[19] The market size advantage of regionalism is particularly important for Africa because countries in the region are small, in terms of population and income. For example, 15 out of the 48 countries in SSA have a population of less than two million

[18] An example of a successful regional bloc in SSA is the Southern African Development Community (SADC). Countries in the SADC include Angola, Botswana, Congo Dem Rep, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Elbadawi and Mwega (1997) find evidence that after controlling for relevant country conditions, countries in the SADC region receive more FDI than other countries in Africa.

[19] The discusssion on regionalism draws from Asiedu (2006).

and about half of the countries have a population of less than six million. With regards to income, about half of the countries have a GDP of less than $3 billion. Indeed, the total GDP of SSA in 2009 was $956 billion, which was about equal to the GDP of Mexico and about 61% the GDP of Brazil (WDI, 2011). Furthermore, SSA's GDP falls to about $498 billion (i.e., about 30% the GDP of Brazil and about 57% the GDP of Mexico) when Nigeria and South Africa are excluded. [20] Thus, due to the small size of African countries (both in terms of income and population), a large number of countries will have to be included in the regional bloc in order to achieve a market size that will be large enough to be attractive to foreign investors.

Finally, we note that an increase in FDI, even in the manufacturing industry, does not necessarily translate into higher economic growth. Specifically, several studies have found that FDI enhances growth only under certain conditions – when the host country's education exceeds a certain threshold (Borensztein et al., 1998); when domestic and foreign capital are complements (de Mello, 1999); when the country has achieved a certain level of income (Blomstrom et al., 1994); when the country is open (Balasubramanyam et al., 1996) and when the host country has a well-developed financial sector (Alfaro et al., 2004). Therefore for countries in the region, reaping the benefits that accrue from FDI may be more difficult than attracting FDI. However, there is room for optimism. The policies that promote FDI also have a direct impact on long-term economic growth. As a consequence, African countries cannot go wrong implementing such policies.

7 Conclusion

This paper has empirically examined the link between FDI, natural resources and institutions. We find that natural resources have a negative effect on FDI and good institutions mitigate the adverse effect of natural resources on FDI, but institutions cannot neutralize the adverse effect. We also find that good institutions have a direct effect on FDI. With regard to policy, our results suggest that an improvement in institutional quality will be beneficial to countries, but more beneficial to natural resource rich economies. This recommendation is particularly relevant for countries in Sub-Saharan Africa, since many of the countries in the region are rich in natural resources, have weak institutions and are in dire need of FDI.

[20] In 2009, the share of SSA's GDP from Nigeria and South Africa, was 18 percent and 30 percent, respectively.

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Table 1: Summary Statistics

Variables	Mean	Std. Dev.	Min	Max
Law and Order (ICRG)	0.547	0.196	0.046	1
Government Stability	0.647	0.171	0.132	1
FDI Risk	0.593	0..177	0.083	1
Corruption	0.429	0.156	0.000	1
Law and Order (Kauffman)	0.43	0.137	0.143	0.841
Overall Institutional Quality	0.554	0.122	0.159	0.894
Fuel/Exports (%)	21.615	30.783	0.000	98.786
Oil rents/GDP (%)	6.986	11.934	0.000	58.798
FDI/GDP (%)	2.921	3.964	-28.916	32.933
FDI per capita	1.718	6.954	-5.851	107.401
Trade/GDP (%)	78.730	53.856	12.227	434.185
GDP growth	6.812	2.215	0.000	10.000
Ln (GDP per capita)	7.366	1.250	4.764	10.476
Inflation	0.473	3.703	-0.084	77.797
Domestic Conflict	0.956	1.593	0.000	11.583

Table 2: Regression Results without the Interaction Term

VARIABLES	(1) Exclude Institutions	(2) Exclude Institutions	(3) Institution Index	(4) Rule of Law	(5) Lack of Corruption	(6) Government Stability	(7) Lack of FDI Risk
nat=Fuel/Exports (%), $\hat{\alpha}$	-0.050***	-0.056***	-0.051***	-0.051***	-0.054***	-0.052***	-0.056***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
inst=Institutional Quality, $\hat{\delta}$			5.288***	3.394***	1.336***	2.096***	0.937***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lagged FDI/GDP	0.304***	0.196***	0.174***	0.174***	0.193***	0.192***	0.190***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
trade/GDP (%)		0.038***	0.039***	0.039***	0.038***	0.038***	0.039***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP Growth		0.460***	0.351***	0.436***	0.477***	0.361***	0.420***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lgdpc= ln (GDP per capita)		-2.101***	-2.067***	-2.039***	-2.063***	-2.008***	-2.135***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lgdpc×lgdpc		0.017***	0.015***	0.015***	0.018***	0.017***	0.016***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inflation		-0.015***	-0.012***	-0.008***	-0.013***	-0.011***	-0.014***
		(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Constant	3.175***	3.203***	1.653***	2.277***	1.593***	2.116***	3.570***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen J-Test (p-value)	0.6719	0.8101	0.8062	0.7949	0.8003	0.8068	0.8213
Serial Correlation Test(p-value)	0.2476	0.3293	0.3111	0.2609	0.3398	0.2544	0.3705
Number of Observations	727	727	727	727	727	727	727
Number of Countries, n	99	99	99	99	99	99	99
Number of Instruments, i	90	90	90	90	90	90	90
Instrument Ratio, (n/i)	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Restricted the number of Instruments	No	No	No	No	No	No	No

P-values in parenthesis. ***$p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 3: Interaction Effect of Natural Resource and Institutions

VARIABLES	(1) Institutional Index	(2) Rule of Law	(3) Lack of Corruption	(4) Government Stability	(5) Lack of FDI risk
nat = Fuel/Exports (%), $\hat{\alpha}$	-0.076***	-0.073***	-0.062***	-0.057***	-0.067***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
inst = Institutional Quality, $\hat{\delta}$	4.527***	2.756***	0.921***	1.982***	0.360
	(0.000)	(0.000)	(0.000)	(0.000)	(0.224)
nat × inst, $\hat{\beta}$	0.045***	0.038***	0.021***	0.007**	0.019***
	(0.000)	(0.000)	(0.000)	(0.017)	(0.000)
Lagged FDI/GDP	0.174***	0.174***	0.191***	0.194***	0.191***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trade/GDP (%)	0.039***	0.040***	0.038***	0.038***	0.039***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP Growth	0.355***	0.439***	0.477***	0.358***	0.431***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lgdpc = ln(GDP per capita)	-2.048***	-2.099***	-2.048***	-1.997***	-2.106***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lgdpc×lgdpc	0.015***	0.016***	0.019***	0.017***	0.016***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inflation	-0.011***	-0.009***	-0.013***	-0.013***	-0.013***
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
Constant	1.850***	2.418***	1.460***	2.119***	3.783***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
Hansen J-Test (p-value)	0.7998	0.7889	0.8096	0.8023	0.8091
Serial Correlation Test (p-value)	0.3272	0.2874	0.3649	0.295	0.3764
Number of Observations	727	727	727	727	727
Number of Countries, n	99	99	99	99	99
Number of Instruments, i	91	91	91	91	91
Instrument Ratio, (n/i)	1.09	1.09	1.09	1.09	1.09
Restricted the number of instruments	No	No	No	No	No

P-values in parenthesis. ***$p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 4: $\partial fdi/\partial inst = \hat{\alpha} + \hat{\beta} inst$, **evaluated at different values of institutions**

Panel A: Average Institutional Quality

Percentile	Corresponding Country	Value	Measure of Institutions
10	Pakistan	0.488	-0.0544
			(0.000)
25	Venezuela	0.485	-0.0545
			(0.000)
50	Mexico	0.553	-0.0515
			(0.000)
Mean	Argentina	0.564	-0.0510
			(0.000)
75	South Africa	0.614	-0.0488
			(0.000)
90	Hong Kong	0.730	-0.0468
			(0.000)

Panel B: Corruption

Percentile	Corresponding Country	Value	Measure of Institution
10	Armenia	0.277	-0.05565
			(0.000)
25	Phillipines	0.335	-0.0544
			(0.000)
50	Cote D'Ivoire	0.418	-0.0526
			(0.000)
Mean	Syria	0.42	-0.0526
			(0.000)
75	Dominican Republic	0.472	-0.0515
			(0.000)
90	Botswana	0.543	-0.05
			(0.000)

Panel C: Government Stability

Percentile	Corresponding Country	Value	Measure of Institution
10	Honduras	0.545	-0.0534
			(0.000)
25	Panama	0.575	-0.0532
			(0.000)
50	Lithuania	0.661	-0.0525
			(0.000)
Mean	Albania	0.668	-0.0525
			(0.000)
75	Armenia	0.719	-0.0521
			(0.000)
90	Hong Kong	0.804	-0.0514
			(0.000)

Panel D: Lack of FDI risk

Percentile	Corresponding Country	Value	Measure of Institutions
10	Syria	0.44	-0.059
			(0.000)
25	Brazil	0.584	-0.0575
			(0.000)
50	Albania	0.586	-0.0563
			(0.000)
Mean	Russia	0.602	-0.056
			(0.000)
75	Mexico	0.676	-0.0555
			(0.000)
90	Singapore	0.804	-0.0522
			(0.000)

Panel E: Rule of Law

Percentile	Corresponding Country	Value	Measure of Institution
10	Nigeria	0.344	-0.0597
			(0.000)
25	South Africa	0.427	-0.0565
			(0.000)
50	India	0.552	-0.0518
			(0.000)
Mean	Argentina	0.563	-0.0513
			(0.000)
75	Malaysia	0.671	-0.0472
			(0.000)
90	Hong Kong	0.807	-0.042
			(0.000)

Table 5: Robustness Regressions

VARIABLES	(1) Exclude SSA countries	(2) Alternative measure of institutions	(3) Alternative measure of Nat, oil rents	(4) Control for Political Instability
nat = Fuel/Exports $(\%)$, $\hat{\alpha}$	-0.097***	-0.160***	-0.195***	-0.072***
	(0.000)	(0.000)	(0.000)	(0.000)
inst = Institutional Quality, $\hat{\delta}$	3.016**	-0.612	1.520***	4.561***
	(0.022)	(0.725)	(0.009)	(0.000)
nat $\times$ inst, $\hat{\beta}$	0.050**	0.244***	0.154***	0.039***
	(0.044)	(0.000)	(0.000)	(0.000)
Hansen J-Test (p-value)	0.0501	0.1995	0.1746	0.2773
Serial Correlation Test (p-value)	0.7621	0.6589	0.8662	0.7879
Number of Observations	547	512	754	723
Number of Countries, n	71	97	90	98
Number of Instruments, i	37	65	63	92
Instrument ratio, (n/i)	1.919	1.492	1.429	1.065
Restricted the number of instruments	Yes	No	Yes	No

P-values in parenthesis. ***$p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 6: Robustness Regressions

VARIABLES	(1) Dependent variable is FDI per capita	(2 Natural resources is endogenous	(3) Institutions is endogenous	(4) Include time fixed effects	(5) Include regional dummies
nat = Fuel/Exports $(\%)$, $\hat{\alpha}$	-0.043***	-0.067***	-0.090***	-0.088***	-0.078***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
inst = Institutional Quality, $\hat{\delta}$	0.618***	3.472***	1.329***	2.729***	2.748***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
nat $\times$ inst, $\hat{\beta}$	0.050***	0.090***	0.110***	0.052***	0.045***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen J-Test (p-value)	0.2231	0.2467	0.1802	0.1802	0.3774
Serial Correlation Test (p-value)	0.9985	0.7655	0.2960	0.2960	0.8193
Number of Observations	726	727	727	727	727
Number of Countries, n	99	99	99	99	99
Number of Instruments, i	91	86	81	95	91
Instrument ratio, (n/i)	1.088	1.151	1.222	1.042	1.088
Restricted the number of instruments	No	Yes	Yes	No	No

P-values in parenthesis. ***$p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 7. Oil Production (thousands of barrel per day), 1992-2011

Region/Country	1992-1996	1997-2001	2002-2006	2008-2011	Change from 1992-1996 to 2008-11 (%)
World	60064.4	64644.4	69319.2	71966.9	20
Asia	23949.2	27196.1	29277.2	31517.8	32
Europe	10724.5	10346.9	12343.6	12331.8	15
North America	11231.2	11121.6	11172.1	10758.7	-4
South America	4994.6	6241.0	5972.1	6192.1	24
Africa	6808.6	7369.5	8671.8	9508.4	40
Angola	585.2	736.6	1102.8	1871.2	220
Equatorial Guinea	7.7	117.3	298.0	312.1	3946
Nigeria	1965.4	2167.4	2357.8	2340.8	19
Sudan	0.2	118.5	315.8	472.1	207437
Total for top oil producing countries in SSA	2558.6	3139.8	4074.4	4996.2	
Share of oil produced by the top four countries (%)	37.6	42.6	47.0	52.5	

Notes: The data for Africa includes SSA and North Africa.
Source: Index Mundi and author's calculations.

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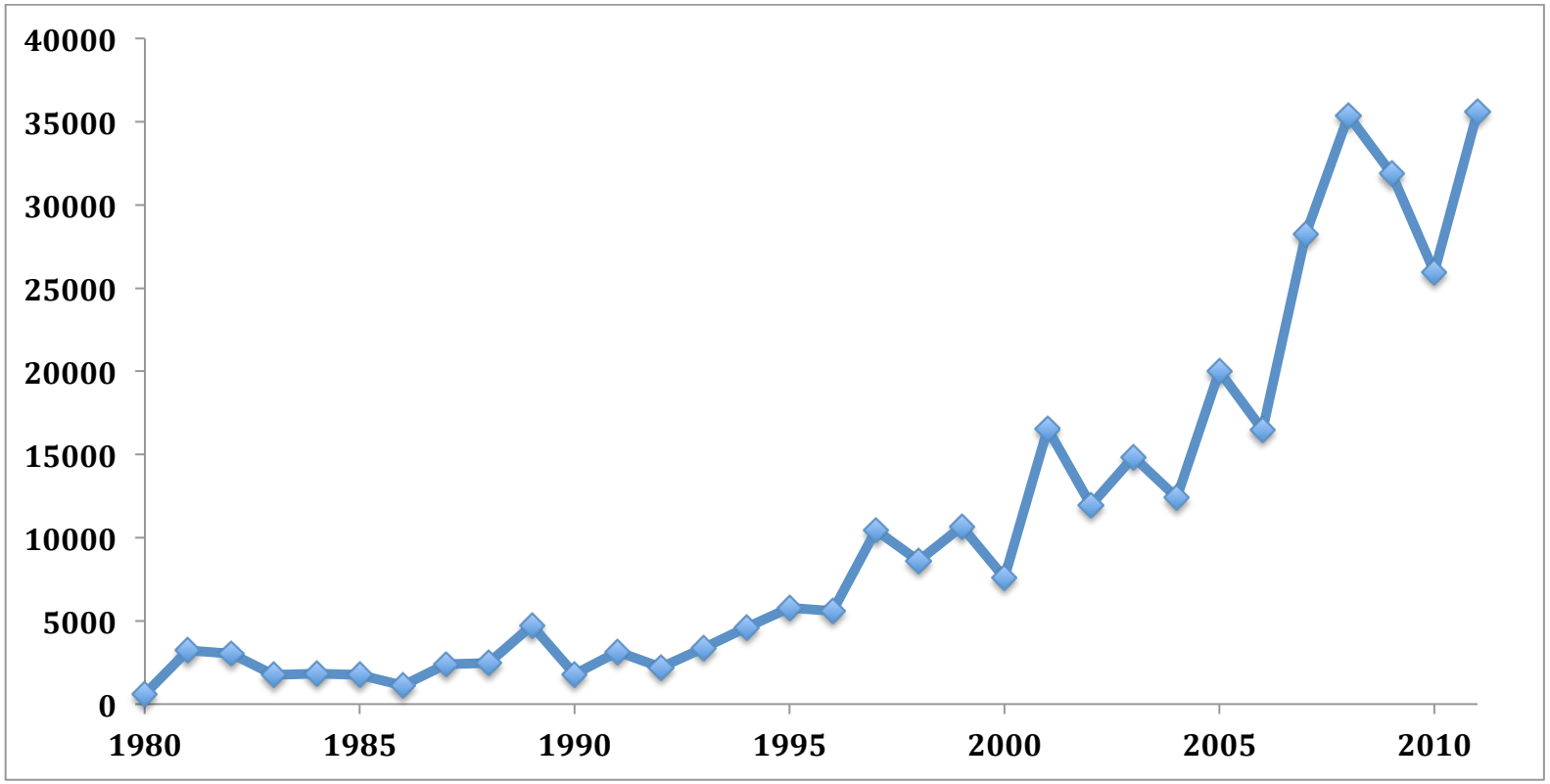
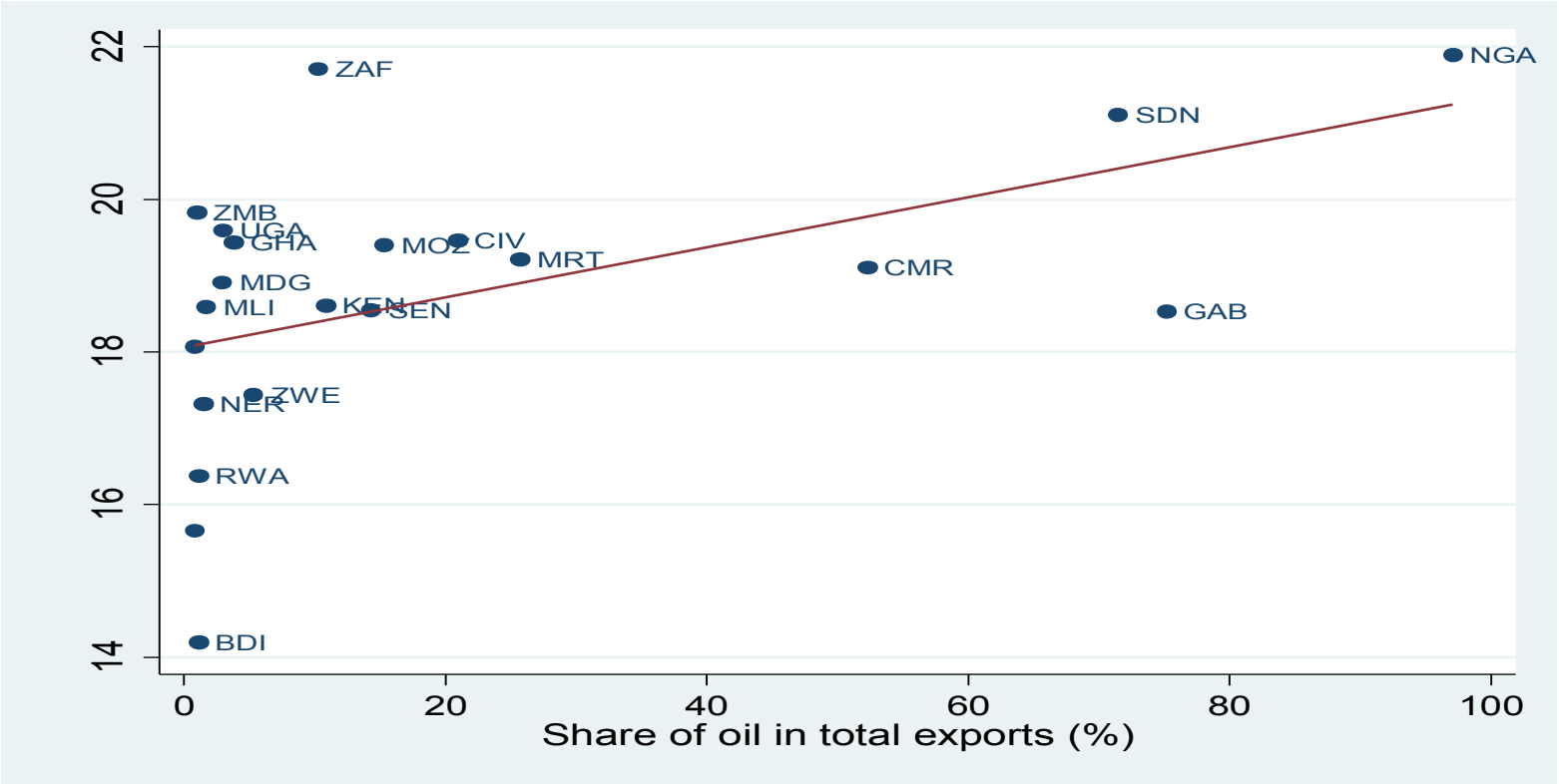
Figure 1
Net FDI Inflows to SSA, 1980-2011 (Constant 2005 US$, Millions)



Source: World Development Indicators (2013) and calculations by author.

Figure 2
FDI Inflows and the Share of Oil in Total Exports



Notes: The data are averaged from 2000-2009. An ordinary least square regression of the share of oil on in FDI flows yielded a coefficient of 0.033, with robust p-value=0.007, and R^2=0.26. N=21.

Table 8. Quality of Institutions

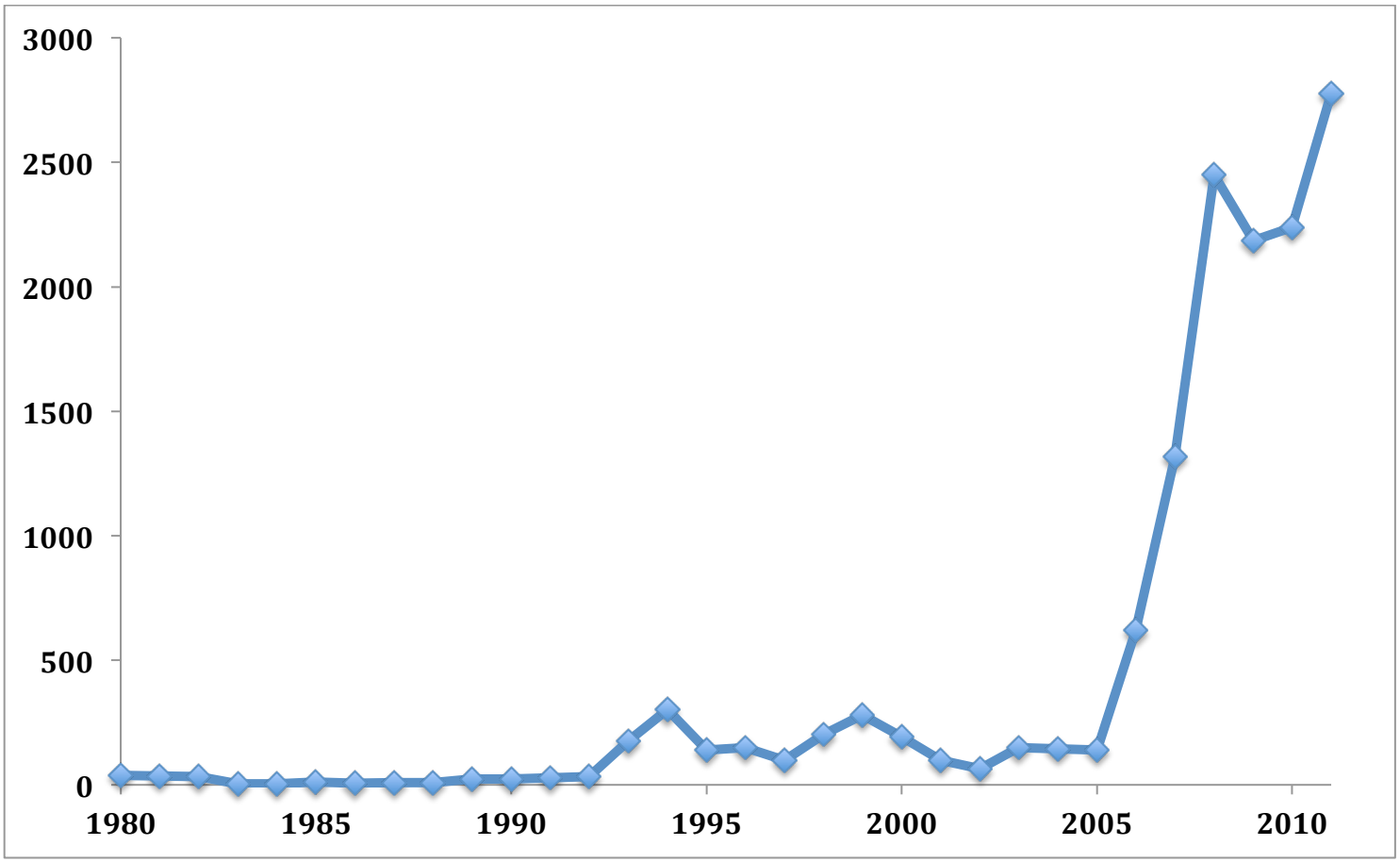
Region	Corruption		Effectiveness of the rule of law	
	Mean	Standard deviation	Mean	Standard deviation
Non-SSA Developing Countries	0.64	0.10	0.57	0.17
SSA Countries	0.69	0.12	0.48	0.18
Top Eight Oil Exporting Countries in SSA[1]	0.72	0.12	0.40	0.08

Notes: The data are averaged from 2000-2009, and range from zero to one. A higher number implies more corruption and a more effective legal system.

Source: International Country Risk Guide (ICRG) database and author's calculation.

[1] The oil exporting countries are Angola, Cameroon, Chad, Congo Republic, Equatorial Guinea, Gabon, Nigeria, and Sudan.

Figure 3
Net FDI Inflows to Ghana, 1980-2011 (Constant 2005 US$, Millions)



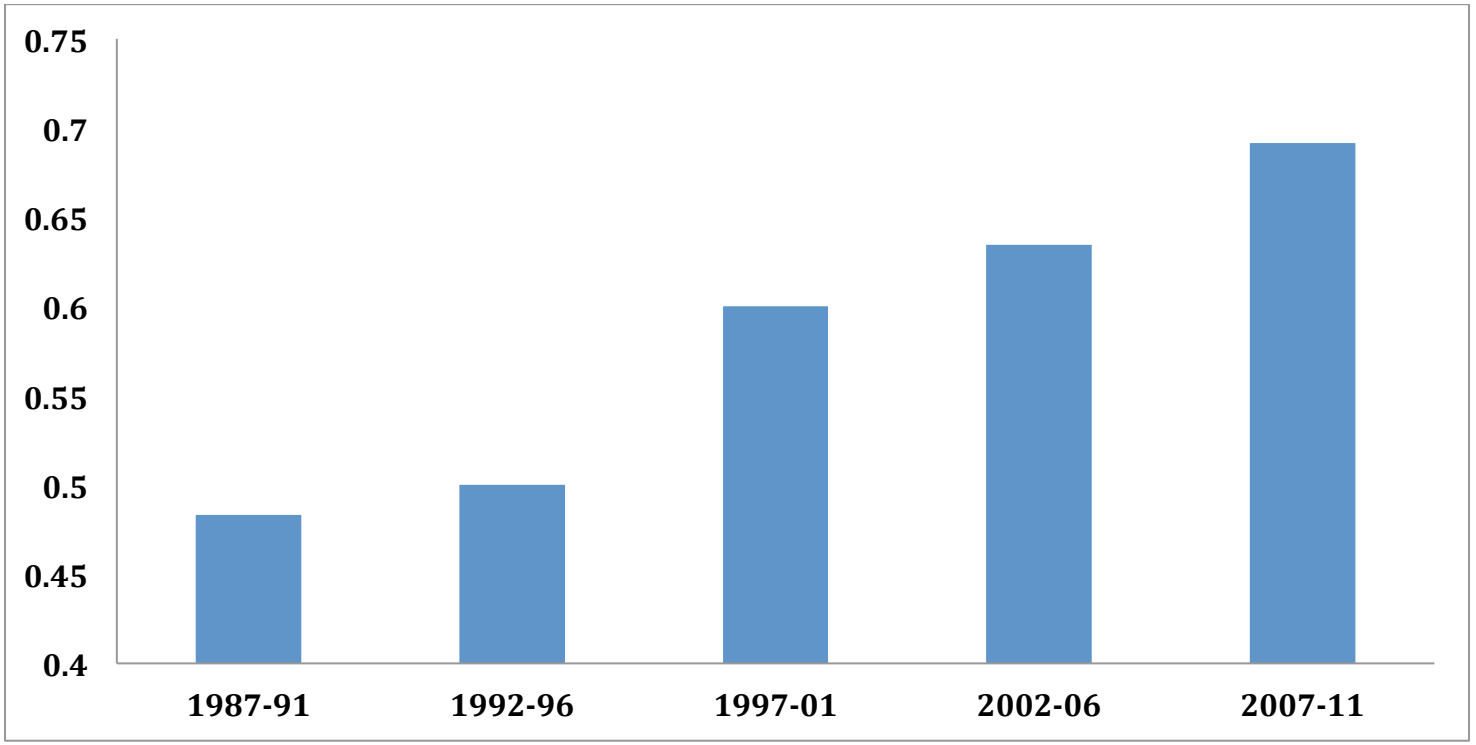
Source: World Development Indicators (2013) and calculations by author.

Table 9
Investments in Extractive Industries in Ghana, 1991-2010 (Constant 2005 US$, Millions)

Year	Production Companies	Exploration Companies	Total
1991	125.34	275.43	400.77
1992	586.36	242.31	828.67
1993	9.14	347.62	356.76
1994	13.27	116.29	129.55
1995	30.72	180.69	211.41
1996	99.32	865.32	964.64
1997	265.51	391.80	657.30
1998	207.05	75.76	282.81
1999	180.35	28.36	208.71
2000	33.92	203.46	237.38
2001	119.81	160.16	279.97
2002	119.97	202.42	322.39
2003	345.76	210.34	556.09
2004	421.41	214.40	635.80
2005	543.12	228.50	771.62
2006	320.04	225.62	545.66
2007	386.40	221.73	608.13
2008	423.37	245.56	668.93
2009	465.16	202.96	668.12
2010	455.15	206.89	662.03
Annual Average			
1991-1995	152.97	232.47	385.43
1996-2000	157.23	312.94	470.17
2001-2005	310.01	203.16	513.17
2006-2010	410.02	220.55	630.57
% Change from 2001-2006 to 2006-2010	32.26	8.56	22.88

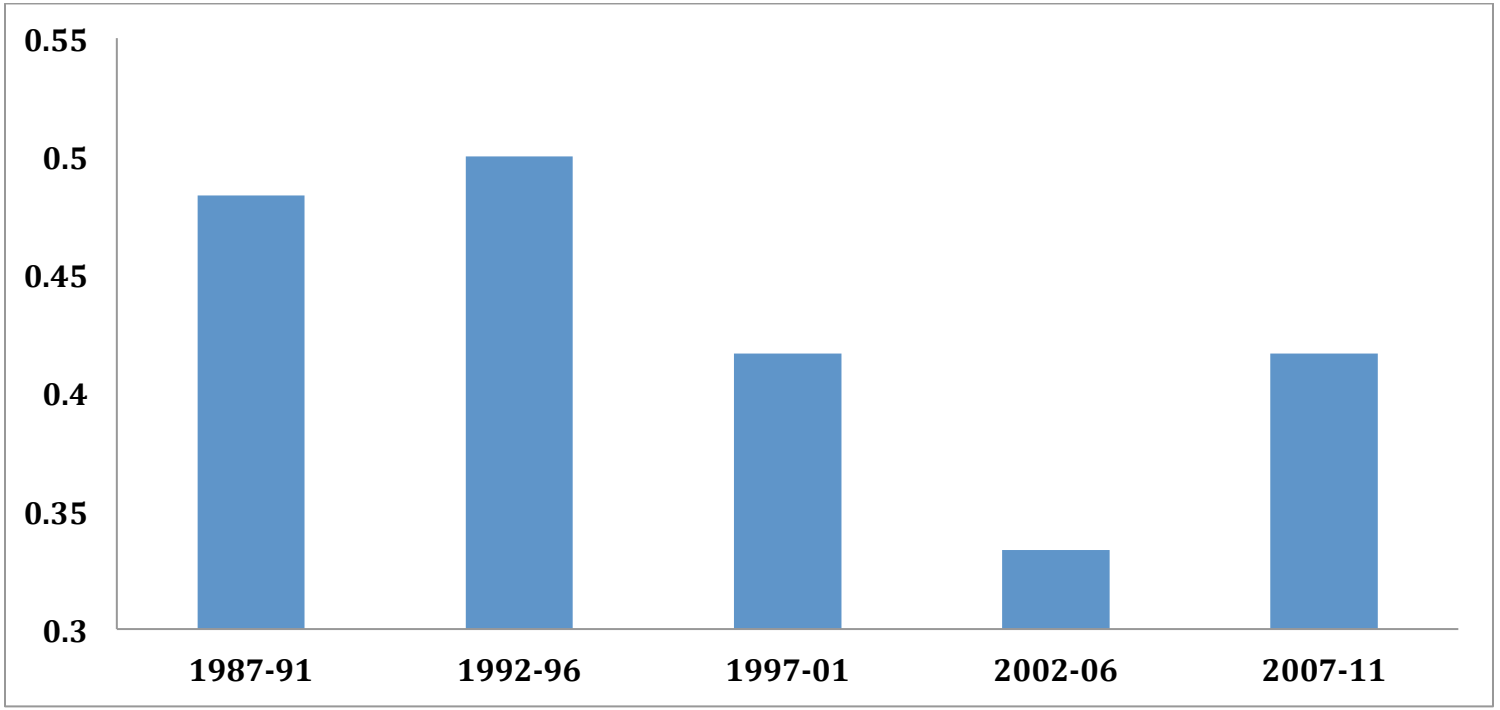
Source: Ghana Minerals Commission and author's calculations.

Figure 4: Corruption Index for Ghana, 1987-2011



Notes: The data range from 0 to 1. A higher number implies more corruption.
Source: International Country Risk Guide (ICRG) and author's calculations.

Figure 5. Index for the Effectiveness of the Rule of Law for Ghana, 1987-2011



Notes: The data range from 0 to 1. A higher number implies a more effective legal system.
Source: International Country Risk Guide (ICRG) and author's calculations.

Table 10
United States Outward FDI Stock in Extractive Industries (Constant 2005 US$, Millions)

Region	1995	2000	2005	Growth from 1995-2005 (%)
Total World	1,052	853	1,143	9
Developed Countries	642	395	558	-13
Less Developed Countries (LDC)	335	438	498	49
Africa	19	68	112	489
Latin America	92	195	173	88
Middle East	40	25	56	40
South and East Asia	167	131	96	-43
Africa's share of LDC (%)	5	15	22	
Africa's share of World (%)	1	8	9	

Notes: The data for Africa includes SSA and North Africa.
Source: UNCTAD 2007 and author's calculation.

Table 1A: Countries Included in the Regressions

country	FDI/GDP (%)	Fuel/Exports (%)	Oil Rents /GDP (%)	Inst. Quality	Law & Order	Government Stability	FDI Risk	Corruption	Law & Order (Kauffman)
Sub-Sahara African Countries									
Angola	2.780	94.155	29.237	0.421	0.234	0.455	0.497	0.500	
Botswana	5.470	0.168	0.000	0.729	0.616	0.849	0.909	0.543	0.621
Burkina Faso	0.966	0.513		0.601	0.629	0.724	0.680	0.372	0.361
Cameroon	1.082	41.248	9.061	0.518	0.418	0.683	0.572	0.401	0.261
Congo, Rep.	3.203	90.358	40.318	0.424	0.378	0.442	0.374	0.500	0.234
Cote d'Ivoire	1.686	17.971	2.358	0.499	0.499	0.590	0.492	0.416	0.259
Ethiopia	2.106	0.598	0.000	0.601	0.797	0.702	0.573	0.333	0.341
Gabon	-0.022	80.950	41.667	0.487	0.484	0.649	0.594	0.222	0.408
Gambia, The	3.999	0.262		0.624	0.710	0.721	0.598	0.469	0.468
Ghana	2.769	5.614	0.000	0.509	0.395	0.683	0.571	0.385	0.469
Guinea	2.469	0.294		0.544	0.462	0.709	0.507	0.500	0.233
Kenya	0.524	11.105	0.000	0.500	0.460	0.561	0.601	0.376	0.302
Liberia	4.753	0.565		0.318	0.333	0.306	0.465	0.167	
Madagascar	2.829	3.073		0.570	0.481	0.603	0.542	0.654	0.406
Malawi	1.343	0.103		0.513	0.473	0.502	0.586	0.492	0.436
Mali	2.501	1.803		0.561	0.500	0.749	0.632	0.365	0.434
Mozambique	5.130	12.820	0.000	0.564	0.488	0.757	0.589	0.421	0.360
Namibia	1.840	0.757	0.000	0.728	0.918	0.859	0.816	0.319	0.533
Niger	0.464	0.850		0.441	0.333	0.680	0.548	0.203	0.334
Nigeria	3.234	95.381	32.773	0.408	0.344	0.572	0.454	0.264	0.247
Senegal	1.193	17.653	0.001	0.546	0.436	0.702	0.587	0.458	0.469
South Africa	1.154	8.929	0.033	0.614	0.427	0.678	0.722	0.628	0.516
Sudan	3.478	48.965	10.010	0.426	0.373	0.642	0.490	0.199	0.205
Tanzania	3.109	0.838	0.000	0.668	0.833	0.827	0.614	0.398	0.425
Togo	1.567	0.515	0.000	0.468	0.430	0.594	0.534	0.313	0.330
Uganda	3.623	1.920		0.609	0.646	0.764	0.670	0.356	0.387
Zambia	5.814	1.415	0.000	0.552	0.616	0.549	0.558	0.486	0.395
Zimbabwe	0.772	2.321	0.000	0.401	0.417	0.552	0.315	0.320	0.225
Other Countries									
Albania	4.417	6.522	1.778	0.517	0.452	0.668	0.586	0.360	0.326
Algeria	0.699	96.725	12.084	0.527	0.396	0.690	0.584	0.438	0.322
Argentina	1.892	9.836	3.315	0.526	0.563	0.569	0.462	0.509	0.418
Armenia	6.348	3.506	0.000	0.525	0.506	0.719	0.596	0.277	0.420
Azerbaijan	11.811	84.228	40.085	0.613	0.632	0.806	0.719	0.296	0.319

country	FDI/GDP (%)	Fuel/Exports (%)	Oil Rents /GDP (%)	Inst. Quality	Law & Order	Government Stability	FDI Risk	Corruption	Law & Order (Kauffman)
Bahamas, The	1.444	22.830		0.601	0.667	0.648	0.757	0.333	0.754
Bahrain	5.638	29.848	23.280	0.646	0.782	0.636	0.691	0.474	0.586
Bangladesh	0.304	1.042	0.003	0.365	0.301	0.511	0.458	0.190	0.315
Belarus	2.379	24.944	1.624	0.596	0.667	0.818	0.475	0.424	0.286
Bolivia	3.300	32.091	3.714	0.439	0.366	0.547	0.497	0.347	0.379
Brazil	1.729	4.333	1.487	0.528	0.481	0.581	0.518	0.531	0.439
Brunei Darussalam	1.596	94.611	34.410	0.801	0.875	0.953	0.958	0.417	0.580
Bulgaria	8.944	9.659	0.030	0.634	0.625	0.646	0.805	0.458	0.454
Chile	4.784	0.838	0.341	0.660	0.760	0.596	0.687	0.597	0.742
China	3.156	5.066	2.554	0.612	0.695	0.740	0.559	0.453	0.415
Colombia	2.464	32.963	4.875	0.471	0.238	0.614	0.577	0.456	0.364
Costa Rica	3.251	0.799	0.000	0.628	0.654	0.581	0.605	0.673	0.607
Croatia	4.887	11.154	0.550	0.672	0.816	0.709	0.719	0.444	0.492
Cuba	0.025	0.973	1.624	0.567	0.684	0.795	0.396	0.395	0.320
Cyprus	4.987	2.383	0.000	0.732	0.738	0.711	0.814	0.666	0.696
Dominican Republic	2.582	1.589	0.000	0.537	0.503	0.586	0.585	0.472	0.379
Ecuador	1.656	47.894	16.316	0.509	0.572	0.560	0.415	0.491	0.336
Egypt, Arab Rep.	2.585	43.698	10.595	0.533	0.555	0.696	0.528	0.354	0.491
El Salvador	1.040	2.139	0.000	0.460	0.330	0.556	0.517	0.437	0.357
Guatemala	1.351	4.066	0.630	0.451	0.277	0.549	0.601	0.377	0.281
Guyana	6.648	0.010		0.608	0.552	0.743	0.637	0.500	0.391
Haiti	0.094	0.000	0.000	0.334	0.394	0.431	0.197	0.315	0.165
Honduras	3.033	0.984	0.000	0.436	0.322	0.545	0.537	0.340	0.318
Hong Kong SAR, China	22.775	1.986	0.000	0.806	0.807	0.804	0.957	0.657	0.784
India	0.777	7.133	1.222	0.532	0.552	0.569	0.574	0.434	0.528
Indonesia	0.776	36.413	5.376	0.477	0.446	0.617	0.558	0.288	0.365
Iran, Islamic Rep.	0.951	82.104	29.467	0.598	0.727	0.717	0.490	0.458	0.364
Jamaica	3.233	5.559	0.000	0.474	0.370	0.575	0.597	0.352	0.415
Jordan	4.657	0.201	0.004	0.613	0.575	0.706	0.631	0.540	0.566
Kazakhstan	8.369	60.080	23.044	0.651	0.664	0.917	0.704	0.318	0.314
Kuwait	0.193	92.093	44.683	0.695	0.851	0.733	0.750	0.446	0.616
Latvia	4.524	3.594	0.000	0.676	0.808	0.713	0.795	0.387	0.599
Lebanon	12.427	0.327	0.000	0.551	0.667	0.612	0.723	0.201	0.392
Lithuania	3.799	20.871	0.258	0.636	0.667	0.665	0.801	0.413	0.607
Malaysia	3.942	14.995	7.345	0.647	0.671	0.683	0.645	0.588	0.598
Malta	7.436	0.788	0.000	0.699	0.748	0.707	0.758	0.585	0.772
Mexico	2.175	23.840	6.866	0.553	0.469	0.625	0.676	0.441	0.392

country	FDI/GDP (%)	Fuel/Exports (%)	Oil Rents /GDP (%)	Avg. Inst. Quality	Law & Order	Government Stability	FDI Risk	Corruption	Law & Order (Kauffman)
Moldova	5.710	0.298	0.051	0.587	0.817	0.740	0.504	0.287	0.417
Mongolia	5.142	2.611	0.355	0.611	0.667	0.712	0.586	0.479	0.482
Morocco	1.211	2.583	0.008	0.627	0.704	0.728	0.612	0.463	0.502
Nicaragua	3.899	0.853	0.000	0.538	0.513	0.536	0.473	0.628	0.354
Oman	1.605	83.654	34.103	0.679	0.757	0.763	0.729	0.468	0.620
Pakistan	1.059	2.276	0.642	0.448	0.431	0.582	0.465	0.316	0.339
Panama	4.105	3.358	0.000	0.488	0.438	0.575	0.605	0.333	0.466
Papua New Guinea	3.197	12.398	14.444	0.513	0.519	0.578	0.526	0.428	0.316
Paraguay	1.384	0.113	0.000	0.478	0.453	0.564	0.661	0.236	0.300
Peru	2.487	10.569	2.654	0.472	0.383	0.498	0.540	0.468	0.368
Philippines	1.293	1.686	0.079	0.450	0.376	0.517	0.570	0.335	0.435
Qatar	4.380	85.972	23.152	0.755	0.868	0.940	0.830	0.382	0.636
Romania	3.327	7.759	1.762	0.604	0.702	0.619	0.602	0.494	0.480
Russian Federation	1.936	53.017	12.974	0.583	0.611	0.802	0.603	0.314	0.317
Saudi Arabia	1.957	90.984	38.488	0.641	0.764	0.711	0.711	0.377	0.530
Singapore	12.170	14.253	0.000	0.812	0.877	0.800	0.804	0.767	0.798
Sri Lanka	1.084	1.840	0.000	0.499	0.364	0.550	0.571	0.511	0.524
Suriname	-8.513	2.210	5.676	0.458	0.387	0.571	0.426	0.447	0.445
Syrian Arab Republic	0.873	61.078	19.075	0.551	0.618	0.727	0.440	0.420	0.412
Thailand	2.512	2.181	0.442	0.566	0.617	0.635	0.605	0.406	0.545
Trinidad and Tobago	5.818	63.860	14.298	0.578	0.604	0.616	0.669	0.424	0.543
Tunisia	2.571	17.425	4.718	0.598	0.646	0.701	0.595	0.452	0.496
Turkey	0.886	2.777	0.253	0.568	0.615	0.639	0.569	0.450	0.496
Ukraine	3.745	6.857	0.950	0.532	0.667	0.630	0.499	0.332	0.318
United Arab Emirates	3.621	71.896	19.115	0.697	0.667	0.880	0.905	0.336	0.609
Uruguay	1.822	1.244	0.000	0.567	0.472	0.624	0.667	0.505	0.606
Venezuela, RB	1.495	84.867	25.181	0.485	0.536	0.625	0.388	0.393	0.264
Vietnam	5.951	20.346	8.118	0.640	0.713	0.856	0.614	0.375	0.415
Yemen, Rep.	1.691	81.624	28.731	0.539	0.404	0.741	0.595	0.415	0.249

The data in the table are the averages for each country for the sample period of 1984 to 2011. The institutional quality variables (Law and order, Government Stability, Corruption, FDI Risk, Law and Order (Kauffman) and Average Institutional Quality) have been normalized to fall between zero and one.

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