OIL, FOREIGN DIRECT INVESTMENT AND CORRUPTION

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ABSTRACT

This paper addresses how oil changes the corruption-foreign direct investment relationship. With the advantage of our panel data set, we are able to account for issues of endogeneity in the causality between foreign direct investment and corruption. We find that corruption has a negative impact on attracting foreign direct investment but this is mitigated based on the amount of oil the receiving country produces. Foreign direct investment inflows are found to reduce corruption in countries, but not if the receiving country is a major oil producer. Results show that poor countries without oil may be using institutional corruption to attract foreign direct investment and that receiving these investments is reinforcing this corruption. The paper's analysis implies that oil is not only helping more corrupt regimes to attract foreign direct investment, it is also reducing the generally positive institutional benefits from receiving foreign direct investment that most middle and high-income countries receive. The analysis suggests a reinforcing relationship between corruption and foreign direct investment, which could lead to positive or negative spirals in institutional quality. Firms and international organizations must take account of the negative institutional side effects from investing in oil rich countries or when dealing with very poor governments.

JEL: F2

KEYWORDS: Corruption, Foreign Direct Investment, Oil

INTRODUCTION

Foreign direct investment (FDI) is an important phenomenon in the global economy. Globally, FDI has grown from $2 trillion in 1990 to $19.1 trillion in 2010 (UNCTAD, 2012). Developing countries have been gaining both a larger absolute amount and share of FDI. The percentage of worldwide FDI going to developing countries has risen from 25 to 35 percent in the last twenty years (UNCTAD, 2012). The rising share of FDI going to developing countries brings up new issues. The institutional framework and its interaction with FDI are much different in developing and developed countries. In general, the perception of corruption is a much larger problem for developing countries than it is for developed ones.

There are many high profile examples of multinational firms facing criticism for their business dealings in developing countries vis-à-vis corruption. As expected, the most prominent media cases tend to involve multinational corporations (MNCs) either adding to or ignoring the high level of corruption in a developing country. A couple of the classic examples are Royal Dutch Shell (in Nigeria) and the United Fruit Company (in Latin America). Resource rents and the importance of property rights have led to commodity sectors often being the target of corruption scandals. However, there are recent examples such as Wal-Mart (in Mexico) and IBM (in China) which show that corruption can also be an issue for manufacturing, retail and/or service companies. The potential positive impact from MNCs instilling better business practices in developing countries tend not to become major media stories. This potential for positive and/or negative spillovers from multinationals investing in developing countries has become an important issue on the international business agenda (Meyer, 2004).

Not surprisingly, fighting corruption has become a major concern for many developing countries and multilateral institutions. One of the objectives of the World Bank is reducing corruption in developing countries. Countries such as India and Nigeria are heavily engaged in large scale, difficult campaigns against corruption in their countries. At the same time, there is a growing concern that foreign direct investment may be increasing opportunities for corruption in developing countries. Companies seeking market access or government contracts may have an incentive to bribe officials. Poorly paid officials may be tempted by the potentially large sums of money available from multinational firms. The presence of natural resources and the accompanying resource rents have the potential to exacerbate this issue. The behavior of foreign firms in developing countries is a primary focus of the Organization for Economic Cooperation and Development (OECD), especially in resource rich countries (OECD, 2010). The desire of multilateral institutions and host governments is that receiving FDI will have positive spillovers from openness to the global economic and financial system rather than a negative impact from more corruption. Increased involvement with foreign firms has the potential to improve standards of transparency and good governance in developing countries.

Natural resources add another layer of complexity to the FDI-corruption relationship. Usually, the concern is that corruption will have a negative impact on attracting FDI. This is based on the idea that firms will be discouraged by the additional cost of dealing with corrupt officials or by the risk of contracting under corrupt institutional conditions. However, especially when natural resources are involved, firms may be more willing to deal with a corrupt regime or could even benefit from the corruption. The necessity of pursuing natural resources limits the locational decisions of firms. A multinational resource extraction firm could potentially benefit from corrupt officials if this allows them more access to resources at a lower royalty cost and/or with less regulation. Thus, it is possible that some of the mixed empirical results found in the literature regarding corruption's impact on FDI will be the result of moderating factors such as economic sector, and in the case of this paper, oil.

The next section will discuss the relevant literature. A theoretical model along with hypotheses to be tested follows this. The data set is then discussed which is followed by the empirical methodology. The paper concludes with an examination of the empirical results and conclusions.

LITERATURE REVIEW

Although recent, the body of literature investigating the relationship between FDI and corruption has grown (Hakkala et al, 2008; Sanyal & Samanta, 2008). Corruption is a ubiquitous, global and costly phenomenon that has become proxy for evaluating the quality of institutions and how they affect FDI flows to countries. Bardhan (1997), and later Aidt (2003), noted that corruption is a multifaceted phenomenon with various meanings depending on context. Nonetheless, corruption has often been defined as the use of public office for private gain "in a manner that contravenes the rules of the game" (Bardhan, 1997; Aidt, 2003; Jain, 2001). It encompasses actions such as bribery, kickbacks, embezzlement and private sale of government property by government officials.

The focus on institutional frameworks and their impact on FDI reflect the idea that "we have a reasonably good understanding of what institutions ought to achieve" (Dunning & Lundan, 2008). That is, "good" institutions attract FDI and thereby foster economic growth, and vice versa. There is a tendency to evaluate corruption within a bundle of risk and governance variables and to use the Corruption Perception Index (CPI) for "robustness". Hakkala et al (2008) relied primarily on the International Country Risk Group's (ICRG) assessment of corruption, which is also an index; being bundled with measures of a country's political system and other factors. Their study, limited to cross-section analysis of Swedish firm-level data for the year 1998, found that corruption lowered the probability that a firm might invest in a country. The finding that corruption lowers FDI has been found in several studies including Egger and Winner (2006), Fukumi and Nishijima (2010), Mathur and Singh (2013) and Wei (2000). However,

research evaluating the impact of corruption on FDI has often been unable to find conclusive or statistically significant results (Wheeler & Mody, 1992; Hines, 1995; Busse & Hefeker, 2007; Hakkala et. al, 2008).

Mauro (1995) is one of the first researchers to note that this relationship may operate in the other direction; that FDI may affect corruption. Most of the literature, however, has focused on investigating how the perception of corruption affects FDI. Kwok and Tadesse (2006) found that FDI reduced corruption in the receiving country. This was tested for 100 observations using Transparency International's Corruption Perception Index for the 2000-2004 period. Fukumi and Nishijima (2010) also found evidence of a potential "virtuous cycle" between FDI and corruption using countries in Latin America and the Caribbean. In a related paper, Ades and Di Tella (1999) found that economies that are more open were less corrupt.

The Corruption Perception Index is commonly used in corruption studies (Wei, 2000; Egger and Winner, 2006). Egger and Winner (2006) argued that the index is "clean of other determinants of the institutional environment" and a more suitable measure than broader risk or governance variables. Both Wei (2000) and Egger and Winner (2006) study evaluated outward FDI stocks for select OECD countries flowing to 45 host countries. Wei (2000) analyzed one year of data, while Egger & Winner (2006) used panel data for 1983-1999. Wei (2000) is widely cited particularly as one of the first papers to find statistical significance on this issue, and for including tax variables that together with corruption, lowered FDI inflows. This was reinforced by Habib and Zurawicki (2002) who also found that corruption lowered FDI.

Egger & Winner (2006) found that corruption affects economies differently. In their study, corruption affected intra-OECD FDI but appeared almost irrelevant for investment in non-OECD countries. In a related paper, Cuervo-Cazurra (2006) found that corruption might impact the country of origin for FDI. Specifically, countries signatory to OECD conventions were less willing to invest in corrupt countries, than were countries deemed to have relatively higher corruption levels. Similarly, Benassy-Quere, Coupet and Mayer (2007) found that institutional distances between source and destination countries reduced FDI. Corruption may also change the type of FDI observed; as Meyer (2001) found companies were more likely to establish wholly-owned subsidiaries if the recipient country had better institutions. In a related study, Weitzel and Berns (2006) found that higher rates of corruption reduced the number of cross-border firm takeovers.

Egger & Winner note that the majority of FDI flows were concentrated between OECD countries, such that flows going to non-OECD countries might not be large enough to lead to significant results. An additional interpretation however, might be that in effect corruption perception was not detracting investments in developing countries despite notoriously higher levels of corruption. For our purposes, it is also important to note that early FDI to non-OECD countries was concentrated primarily to oil producing regions (UNCTAD, 1997; Ramamurti, 2004). This might further suggest that FDI inflows moved through specific channels, which made the relationship with corruption more complex.

Natural resources may add to this complexity. The literature on natural resources and oil often highlight the importance of rent-seeking (Tornell and Lane, 1999; Baland and Francois, 2000; Torvik, 2002). Studies have also pointed out political corruption under fragile institutions in countries with natural resource endowments(Robinson et al., 2006; Vicente, 2010). Bhattacharyy and Hodler (2010) found that countries with higher natural resource rents experienced increased corruption. Evidence of widespread poverty and wasteful corruption lend to the view of natural resources endowments as a potential curse (Pitlik et al, 2010; Vicente, 2010). Moreover, Vicente (2010) found an increase in the perception of corruption, from the mere discovery of oil. In a study of African nations, Asiedu (2006) found that corruption lowered FDI received. Natural resources were found to increase FDI. Asiedu (2006) considers corruption and natural resources as separate, independent factors that impact FDI. We build on

the work of Asiedu (2006) by viewing natural resources as a factor that can moderate the impact of corruption on FDI. The current literature on FDI and corruption does not address this possibility.
The literature recognizes that corruption might "grease the wheels" of commerce or act as a "grabbing hand" (Méon & Sekkat, 2007; Egger and Winner, 2006; Wei, 2000, 2000b). The latter view, that corruption is detrimental is accepted as common wisdom. The alternative perspective finds justification as early as Huntington (1968) who posited, "if foreign business is prevalent corruption tends to be promoted" (Klitgaard, 1998). While it has been used to suggest that corruption can be beneficial, Huntington's position was somewhat more nuanced. He observed "ill-functioning institutions" that distorted economic activity, such that corruption could help to circumvent those institutions. As already noted, later research has treated institutions and corruption as one and the same, rather than as distinct phenomena. One exception to this is Everhart et al (2009) who found that higher rates of corruption resulted in lower bureaucratic quality; this result supports the usage of institutions and corruption as related phenomena.

The focus on oil in this study, addresses the institutional dimension in another way. FDI and corruption studies tend to assume an indirect effect of corruption. For example, corruption (by a host country government official) "greases the wheels" to facilitate dealings between two firms. However, oil represents state ownership and involvement across the world, with the exception of the United States. The oil investment relationship reflects a firm in direct dealings with the state, increasing the possibility that the analysis may capture a closer approximation of corruption effect.

Notwithstanding, in the last few decades FDI flows have expanded to include the developing world, becoming less dominated by flows to oil producing countries (UNCTAD, 1997; Ramamurti, 2004). In addition, the World Investment Report (WIR) 2011 notes changing patterns where emerging markets attracted more than half of global FDI inflows and accounted for a record-high 29% of global FDI outflows in 2010. In light of changing patterns in FDI flows, understanding specific channels of economic activity remains relevant and necessary.

THEORETICAL MODEL

This model is intended as a mathematical framework in which to consider the foreign direct investment decision of a firm. While this model is original, it is not considered a primary contribution of the paper as the focus of our work is empirical. Readers uninterested in this model can skip to the hypotheses at the end of this section without loss of continuity in the paper. The particular focus of this model (and the paper) is on firms involved in natural resource based FDI; which is empirically tested using oil as the resource of interest. The firm's decision is whether to engage in a FDI project. This decision is made given the firm's goal to maximize expected profits. Profits are defined as revenues – costs.

The expected revenues for firm *i* are a function of output prices and natural resource availability. Output prices (P_i) are positively related to firm revenues. Natural resource availability is positively related to firm revenue but is more complex. Natural resources can be expensive to access, especially if following stringent social responsibility regulations. Countries that are more corrupt offer firms a method for circumventing expensive regulations. Bribery can increase the revenues from natural resource extraction, at least in the short term. Consistent with this reasoning, natural resources (N_i) are modified by the impact of corruption. The impact of corruption is defined as the level of bribery (B_i) multiplied by a parameter (α). Therefore, we can model the firm's revenue function as:

$$r_i(P_i, N_i^{\propto B_i}) \quad (1)$$

The expected costs of the firm are a function of factor prices, factor productivity, taxes, distance to market and bribery. The productivity of capital and labor (the factors of production, F_i) are important to the firm's FDI location decision. Firms are attracted by inputs that have higher productivity (as they will produce more units of output). Ceteris paribus, higher productivity lowers per unit production costs. The costs of hiring labor and capital raise the firm's production costs and are denoted as W_i. After production, the firm must get its product to market. Especially for natural resource based firms this involves exporting. The "distance to market" variable (D_i) is closer to an "effective distance to market". Thus, this includes factors such as available coastline and infrastructure. In many developing areas, the distance in kilometers is much less important than whether or not a good road exists to get there. Bribery (B_i) is positively related to firm costs, this captures the "grabbing hand" of government officials (and other individuals) requiring payouts from the firm. Taxes (T_i) are obviously a cost for the firm. The assumption is made that corruption/bribery can impact the tax burden of the firm. Thus, taxes are modified by the impact of corruption (θB_i). No assumption is made on the value of (θB_i) as a corrupt environment could either increase or decrease a firm's tax burden. The firm's cost function can be expressed as:

$$c_i(F_i, W_i, T_i^{\theta B_i}, D_i, B_i) \tag{2}$$

So, the firm's profit (π_i) function can be written as:

$$\pi_i = r_i\left(P_i, N_i^{\propto B_i}\right) - c_i(F_i, W_i, T_i^{\theta B_i}, D_i, B_i) \tag{3}$$

The Impact of Changing Parameters on Expected Profits

As the various cost and revenue variables change, this will impact the firm's expected profit and consequently the decision on whether or not to proceed with an FDI project. An increase in the firm's output price will be positively related to profits, $\frac{\partial \pi_i}{\partial P_i} = \frac{\partial r_i}{\partial P_i} > 0$. An increase in the cost of hiring inputs will lower the firm's profits, $\frac{\partial \pi_i}{\partial W_i} = -\frac{\partial c_i}{\partial W_i} < 0$. On the other hand, the productivity of inputs is positively related to profits as it lowers costs per unit, $\frac{\partial \pi_i}{\partial F_i} = -\frac{\partial c_i}{\partial F_i} > 0$. The "distance to market" is positively related to costs and therefore negatively to profits, $\frac{\partial \pi_i}{\partial D_i} = -\frac{\partial c_i}{\partial D_i} < 0$.

The level of bribery/corruption in the economy will be a factor in determining the impact of tax rates and natural resources on the firm's profits. Tax rates have a positive impact on the firm's costs which reduces profits, $\frac{\partial \pi_i}{\partial T_i} = -\frac{\partial c_i}{\partial T_i^{\theta B_i}} \frac{\partial T_i^{\theta B_i}}{\partial T_i} = -\frac{\partial c_i}{\partial T_i^{\theta B_i}} \theta B_i T^{(\theta B_i - 1)} < 0$. We can see in this expression that one of the variables which will influence the impact of tax changes on profits is how corruption impacts taxes (θB_i). If corruption is reducing the company's effective tax rate significantly then a marginal increase in the tax rate may not have as much impact on the firm. Natural resource availability is positively related to the firm's revenues and therefore its profits, $\frac{\partial \pi_i}{\partial N_i} = \frac{\partial r_i}{\partial N_i^{\propto B_i}} \frac{\partial N_i^{\propto B_i}}{\partial N_i} > 0$.

The result of most interest in the model is how corruption is related to firm profits. The impact of corruption on firm profits is ambiguous and is derived as:

$$\frac{\partial \pi_i}{\partial B_i} = \frac{\partial r_i}{\partial N_i^{\propto B_i}} \frac{\partial N^{\propto B_i}}{\partial B_i} - \frac{\partial c_i}{\partial T^{\theta B_i}} \frac{\partial T^{\theta B_i}}{\partial B_i} - \frac{\partial c_i}{\partial B_i} = \frac{\partial r_i}{\partial N_i^{\propto B_i}} \left(\alpha N_i^{\propto B_i} ln N_i\right) - \frac{\partial c_i}{\partial B_i} - \frac{\partial c_i}{\partial T^{\theta B_i}} (\theta T^{\theta B_i} ln T_i) \gtrless 0. \tag{4}$$

This is ambiguous because while corruption may increase revenues from natural resource extraction, $\frac{\partial r_i}{\partial N_i^{\propto B_i}}\left(\alpha N_i^{\propto B_i} lnN_i\right) > 0$, it may impose direct costs on the firm by requiring them to bribe officials ($-\frac{\partial c_i}{\partial B_i} < 0$). In addition, corruption can either raise or lower a firm's effective tax bill, $-\frac{\partial c_i}{\partial T^{\theta B_i}}(\theta T^{\theta B_i} lnT_i) \gtrless 0$. However, this is only the first stage in determining the relationship between natural resources, corruption, and profits in the model. The next step is to take the second derivative of this expression with respect to natural resources. The question then becomes, how does increasing availability of natural resources affect how corruption impacts the firm's profits? This second derivative can be expressed as:

$$\frac{\partial(\frac{\partial \pi_i}{\partial B_i})}{\partial N_i} = \alpha^2 B_i N^{(\alpha B_i - 1)}(lnN_i)\frac{\partial r_i}{\partial N_i^{\alpha B_i}} + \alpha N_i^{\alpha B_i}\left(\frac{1}{N_i}\right)\frac{\partial r_i}{\partial N_i^{\alpha B_i}} + \alpha N_i^{\alpha B_i}(lnN_i)\frac{\partial\left(\frac{\partial r_i}{\partial N_i^{\alpha B_i}}\right)}{\partial N_i}. \quad (5)$$

We can assume that $\frac{\partial\left(\frac{\partial r_i}{\partial N_i^{\alpha B_i}}\right)}{\partial N_i} = 0$, which would be true for all but the largest global natural resource finds. This simplifies the expression:

$$\frac{\partial(\frac{\partial \pi_i}{\partial B_i})}{\partial N_i} = \alpha^2 B_i N^{(\alpha B_i - 1)}(lnN_i)\frac{\partial r_i}{\partial N_i^{\alpha B_i}} + \alpha N_i^{\alpha B_i}\left(\frac{1}{N_i}\right)\frac{\partial r_i}{\partial N_i^{\alpha B_i}} > 0. \quad (6)$$

Greater amounts of natural resources increase the potential gains for the firm from corruption (by increasing revenues from natural resource extraction operations). This is not meant to imply that corruption is good for firm profits, $\frac{\partial \pi_i}{\partial B_i}$ is still ambiguous. $\frac{\partial(\frac{\partial \pi_i}{\partial B_i})}{\partial N_i} > 0$ implies that corruption in an absolute sense could be positive or negative on firm profits but that natural resources will make the impact of corruption more positive/less negative than it would be without the natural resources.

There are two main hypotheses that we are testing in this paper:

H1. What effect (if any) does the perception of corruption have on FDI? This is ambiguous in the theoretical model and has been mixed in the literature. There are two conflicting forces at work, as discussed in the model.

H2. Will natural resources help to mitigate the negative effect of the perception of corruption on FDI? The model predicts that natural resources will increase the positive impact of corruption on FDI and/or lower its negative effect.

DATA AND METHODOLOGY

The panel data set consists of 112 countries for the years 1999-2010. The frequency of the data is annual. There are two dependent variables used in the analysis: foreign direct investment and corruption. In the FDI equation, the independent variables are lagged corruption, lagged real GDP, lagged oil production*lagged corruption, labor force and oil rents. In the corruption equation, the independent variables are lagged FDI, lagged oil production, lagged oil production*lagged oil prices, and oil rents. Due to the use of lags, we lose one year of usable data. Taking account of this and missing observations, the number of usable observations is 1,080 for the full sample. Analyses are also run for the sample

stratified by two different methods. The analysis is run for countries that produce more than 200,000 barrels of oil per day (323 observations) and those that produce less than this amount (757 observations). The sample is also tested based on productivity levels: low productivity (343 observations) versus medium or high productivity countries (737 observations).

Foreign direct investment is taken from World Development Indicators (WDI) available through the World Bank database. The variable follows the standard definition of an investment with 10% or more ownership (WDI, 2012). FDI as used in this analysis is defined as annual net inflows, measured as a percentage of GDP. FDI is the dependent variable in one of the two equations. In the corruption equation, lagged FDI is used as an independent variable. This is to measure the potential impact of FDI on corruption in a country.

The corruption variable used is the Corruption Perception Index (CPI) published by Transparency International. Available since 1995, the CPI is widely respected as a composite index of various data from international agencies, expert and business surveys and polling sources, focused specifically on corruption perception of public officials (Transparency International, 2012). While the index was started in 1995, significantly more countries were added to this database over time; which is why we are not starting the data set until 2000. Egger and Winner (2006) note similar results using the CPI and the World Bank index of corruption, but the CPI is available for more years (the World Bank Index started in 2005). For ease of interpretation, we reversed the scale so that it now reflects higher values translating to more corrupt. This does not impact the behavior of the variable but makes interpreting results easier with higher corruption index values meaning more corruption.

Corruption is a dependent and an independent variable in this study, depending on the specified equation. In the FDI equation, lagged corruption serves as an independent variable. This is meant to directly test the impact of corruption on FDI, taking into account that observed FDI is usually the result of decisions made in a previous time period. The lagged version of corruption is also used to create an interaction variable with lagged oil production, as an independent variable. This interaction of lagged corruption*lagged oil production is used in the foreign direct investment equation to measure whether oil production has a mitigating role in terms of the impact of corruption on FDI.

Oil production, measured in millions of barrels per day, is obtained from the United States Energy Information Administration (USEIA). From this same source, we also obtained data on the price of crude oil. The USEIA also provides data on weekly spot price by estimated export volume (dollars per barrel) for all countries. Using this data, we computed average annual oil price per country (dollars per barrel). Lagged oil prices are multiplied by lagged oil production to form an interaction variable included in the FDI equation. This is intended to capture the impact of the total value of oil production in a country on FDI inflows. Therefore, it is included as an explanatory variable in both equations. Oil rents are the difference between the value of crude oil production at world prices and total costs of production and are taken from World Development Indicators. The inclusion of oil rents is motivated by the work of Bhattacharyya and Hodler (2010).

Productivity, as measured by GDP per worker (thousands of constant 2000 US$), is taken from World Development Indicators and is an independent variable in the specified equations. For the study, this is also a lagged variable. Empirical research has determined that GDP is an important variable when analyzing models of FDI. Some researchers have even proposed that GDP may be the most important determinant of FDI (Busse and Hefeker, 2007; Chakrabarti, 2001). It could also be possible that the positive relationships between institutional indicators (i.e. corruption) and FDI could be due to the effect of GDP on institutions, making controlling for GDP important to the analyses (Bénassy-Quéré et al, 2007). Another potential determinant of FDI flows is the size of the country's labor force, also taken from WDI. Total labor force comprises people ages 15 and older who meet the International Labour

Organization (ILO) definition of the economically active population. This is measured in millions of people. Oil rents can potentially impact both FDI and corruption. A linear time trend variable was included as a control. Results were robust to the use of year dummies instead of a time trend. However, the time trend had some significance, which suggests it is picking up a trend in the data not accounted for by dummy variables. This is intended to account for trends occurring over time that may be caused by a variable not included in the analysis.

Table 1: Descriptive Statistics

Variable	#	Mean	Standard	Minimum	Maximum
Foreign Direct Investment (% of GDP)	1080	4.211	5.646	-32.643	51.060
Corruption Index	1080	5.601	2.312	0.100	9.600
Oil Production (millions of barrels per day)	1080	0.6363	1.595	0.0000	10.783
Productivity ('000 Real GDP per worker)	1080	16.980	20.758	0.2198	77.704
Oil Rents	936	0.6806	2.348	0.0000	23.100
Tax Rate	641	47.300	27.193	9.600	339.70
Real Interest Rate	882	8.282	29.794	-27.930	578.23
Labor Force (millions)	1080	26.100	85.100	0.1756	813.00
Official Exchange Rate ('000 LCU per dollar)	1023	6565.0	210000	0.00006	6720000

This table shows descriptive statistics for the variables used in the analyses. The five columns contain information on the number of observations, mean, standard deviation and minimum and maximum values of the variables. The different ranges in the number of observations is one motivation for running several models rather than only one model that includes all variables.

METHODOLOGY

Foreign direct investment and corruption have a complex relationship. There may be unobservable factors that impact both FDI and corruption which could make estimating FDI and corruption as two independent equations problematic, as the error terms would be correlated. We employ a system estimation approach since a Breusch-Pagan test found significant correlation in the error terms. The two equations in the system are foreign direct investment and corruption. Therefore, we utilized a three stage least squares (3SLS) regression method.

Three stage least squares (3SLS) is a form of generalized least squares regression that jointly estimates equations. 3SLS adjusts the error terms in the two equations for interdependence. Using a 3SLS approach helps to account for the asymmetric impact of unobserved variables that affect FDI and corruption. The 3SLS approach also takes account of potential endogeneity in the independent variables. Using a 3SLS approach, one can include a dependent variable from one equation as an independent variable in the other equation. While we are not doing that in our analysis, we are using lagged FDI and lagged corruption as independent variables. Using the 3SLS approach takes into account the possibility of persistence in either of these variables. The equations estimated are:

$$Cor_{t,i} = \beta_0 + \beta_1 FDI_{t-1,i} + \beta_2 Oilprod_{t-1,i} + \beta_3 Oilprod_{t-1,i} * Oilprice_{t-1,i} + \beta_4 rents_{t,i} + \beta_5 v_{t,i} + \epsilon_{t,i} \quad (7)$$

$$FDI_{t,i} = \propto_0 + \propto_1 Cor_{t-1,i} + \propto_2 Cor_{t-1,i} * Oilprod_{t-1,i} + \propto_3 GDP_{t-1,i} + \propto_4 Lab_{t,i} + \propto_5 rents_{t,i} + \propto_6 v_{t,i} + \varepsilon_{t,i} \quad (8)$$

The variables in the equations are described in the previous section. The subscripts refer to time t and country i. The time variable ($v_{t,i}$) is defined as a time trend, explained in the data section. Results were robust to the usage of year dummies instead of a time trend but as the time trend had some significance in the regressions, it suggested that the time trend might be a better specification.

Both equations make significant use of lags. FDI is modeled as a function of lagged real GDP, lagged corruption and the lagged corruption*oil production interaction. Due to the nature of investments, FDI

observed in period t is a function of an investment decision made in time period t-1. In the second equation, corruption is modeled as a function of lagged FDI, lagged oil production and the lagged oil production*oil price variable. It is assumed that FDI and oil revenues take some time to impact the institutional framework in a country. Using lagged variables in the equations also helps to mitigate concerns about endogeneity regarding the independent variables (as does using the 3SLS methodology).

Stratifying the Sample

In order to gain further insight into the corruption-FDI relationship, the sample was stratified in two different manners. It is possible that the behavior of this relationship varies strongly enough based on key variables that it may be useful to separate the sample. The first stratification is done based on oil production. Oil production is obviously one of the most important variables in the analysis. It is likely that if the country is a major oil producer, this has a significant impact on how firms deal with the country regarding FDI. The stratification was made at 200,000 barrels of oil per day. This level puts a country approximately in the top 30% of the sample in terms of oil production. Attempts to make the level higher resulted in too few observations to run the regressions.

It is expected that for countries, which are major oil producers, the perception of corruption will be less important of a concern for firms (as they will be motivated to invest by the presence of oil). In fact, corruption may even be a positive factor in the FDI equation for major oil producers. Corruption is expected to have a strong, negative impact on FDI for countries that are not major oil producers. It may also be that FDI has a more negative impact on corruption for major oil producers. The presence of rent seeking can cause natural resource based FDI to have a more negative impact on institutions (than FDI based on manufacturing or services).

The second stratification of the sample is based on productivity levels. Productivity is defined as real GDP per worker. The delineation between low and high productivity is made at $3000 per worker. Firms interested in investing in low productivity countries are usually interested in either some sort of natural resource or low value added production. In both cases, corrupt governments may attract FDI and this FDI may then reinforce the corruption. The natural resource case has already been stated. For low value added production, firms may be interested in reducing associated environmental, health and/or safety standards. Low productivity countries may also offer MNC protection from unions. Therefore, it is expected that for low productivity countries corruption may attract FDI. Additionally, it is expected that FDI will increase corruption in low-income countries.

RESULTS AND DISCUSSION

The analyses yield several significant results, which are listed in Tables 2-7. The analyses were performed for the entire sample (Tables 2 and 3), based on oil production (Tables 4 and 5) and based on productivity level (Tables 6 and 7). Tables 2 and 3 contain coefficient, standard errors and significance levels. In order to conserve space, Tables 4-7 contain only the significance levels of variables (t-statistics). Coefficients and standard errors for the stratified samples are available on request.

The results from the full sample in Table 2 support the hypothesis that corruption has a negative impact on the amount of FDI received. One can see that across all eight models, the coefficient on the lagged corruption variable is significant at the 1% level. Also in Table 2, results support the hypothesis that oil has a mitigating impact on the role of corruption in deterring FDI. The more oil a country possesses, the smaller impact corruption has on reducing FDI. This can be seen in the positive and significant coefficients for the lagged corruption*oil production interaction variable.

Table 2: Foreign Direct Investment Equation for Full Sample

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Corruption (lag)	-0.5413	-0.5903	-0.5902	-0.5919	-1.072	-1.145	-1.494	-1.451
	(.1498)***	(0.1554)***	(0.1613)***	(0.1639)***	(0.2304)***	(0.2568)***	(0.2529)***	(0.2788)***
Corruption*Oil (lag)	0.0739	0.0797	0.0877	0.0888	0.0594	0.0711	0.1270	0.1410
	(.0232)***	(.0237)***	(.0247)***	(.0249)***	(.0337)*	(.0377)*	(.0378)***	(.0415)***
Productivity (lag)	-0.0121	-0.0136	-0.0065	-0.0080	-0.0529	-0.0537	-0.0372	-0.0303
	(.0075)	(.0180)	(.0193)	(.0195)	(.0255)**	(.0294)*	(.0280)	(.0322)
Labor Force	-0.0033	-0.0034	-0.0030	-0.0031	-0.0053	-0.0050	-0.0035	-0.0035
	(.00207)	(.00210)*	(.00218)	(.00220)	(.00289)*	(.00318)	(.00301)	(.00321)
Exchange Rate	-	0.0000	-	0.0000	0.0000	0.0000	0.1350	0.1010
		(.0000)		(.0000)	(.0000)	(.0000)	(.1170)	(.1260)
Oil Rents	-	-	0.0866	0.0781	-	0.0294	-	-0.0031
			(0.0799)	(0.0808)		(0.0913)		(0.0946)
Taxes	-	-	-	-	0.0298	0.0261	0.0376	0.0336
					(.00927)***	(.0101)**	(.00972)***	(.0111)***
Interest Rates	-	-	-	-	-	-	-0.0036	-0.0048
							(.00753)	(.00747)
Timetrend (year)	0.1084	0.1528	0.2112	0.2286	-0.1710	-0.0471	-0.1666	0.0038
	(.0592)*	(0.0622)**	(0.0710)***	(0.0728)***	(0.1468)	(0.1905)	(0.1653)	(0.2118)
Number of Observations	1080	1023	936	913	600	496	483	409
Chi2 (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*This table shows the results of Equation 8 ($FDI_{t,i} = \propto_0 + \propto_1 Cor_{t-1,i} + \propto_2 Cor_{t-1,i} * Oilprod_{t-1,i} + \propto_3 GDP_{t-1,i} + \propto_4 Lab_{t,i} + \propto_5 rents_{t,i} + \propto_6 v_{t,i} + \varepsilon_{t,i}$) for the full sample. There are eight models run in order to test different independent variables and to allow for some models to include more explanatory variables while other models have more observations. The number of observations for each model is shown in the table. The first figure in the cell is the regression coefficient with the standard errors in parentheses below them. The symbols *, ** and *** denote significance at 10%, 5% and 1% level, respectively. Exchange rate coefficients and standard errors in models 2, 4, 5 and 6 were too small to be shown at the four decimal point level of precision.*

It is significant at the 1% level in six of the eight models and at the 10% level in the other two models. Most of the control variables in Table 2 have significance in only a couple of the models with the exception of the tax rate and the time trend. The tax rate has a positive, significant coefficient. This variable had no a prior prediction. The time trend variable was positive and significant for the first four models which were run, suggesting an increase in FDI over time. This is not surprising as FDI has increased globally over the time period of the sample.

Table 3: Corruption Equation for Full Sample

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
FDI (lag)	-0.0707	-0.0726	-0.0801	-0.0772	-0.0677	-0.0748	-0.1032787	-0.104
	(.0113)***	(.0114)***	(.0117)***	(.0117)***	(.0150)***	(.0159)***	(.0151)***	(.0159)***
Oil Production (lag)	-0.1340	-0.1330	-0.1580	-0.1610	-0.0537	-0.0959	-0.1502	-0.1520
	(.106)	(.106)	(.108)	(.108)	(.241)	(.247)	(.243)	(.249)
Oil prod (lag)*Oil price	0.0021	0.0018	0.0022	0.0023	0.0009	0.0015	0.0008	0.0006
	(.00176)	(.00176)	(.00189)	(.00189)	(.00334)	(.0035)	(.00342)	(.00361)
Exchange Rate	-	0.0000	-	0.0000	0.0000	0.0000	0.1750	0.1860
		(.0000)		(.0000)	(.0000)	(.0000)	(.0377)***	(.0416)***
Oil Rents	-	-	0.0110	0.0105	-	0.0144	-	-0.0326
			(.0324)	(.0325)		(.0329)		(.0308)
Taxes	-	-	-	-	0.0167	0.0183	0.0177	0.0199
					(.0033)***	(.0038)***	(.0031)***	(.0035)***
Interest Rates	-	-	-	-	-	-	0.0035	0.0034
							(.00247)	(.00251)
Timetrend (year)	0.0003	0.0150	0.0073	0.0038	0.0753	0.0621	0.0606	0.0874
	(.0257)	(.0268)	(.0313)	(.0319)	(.0551)	(.0731)	(.0558)	(.0737)
Number of Observations	1080	1023	936	913	600	496	483	409
Chi2 (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*This table shows the results of Equation 7 ($Cor_{t,i} = \beta_0 + \beta_1 FDI_{t-1,i} + \beta_2 Oilprod_{t-1,i} + \beta_3 Oilprod_{t-1,i} * Oilprice_{t-1,i} + \beta_4 rents_{t,i} + \beta_5 v_{t,i} + \epsilon_{t,i}$) for the full sample. There are eight models run in order to test different independent variables and to allow for some models to include more explanatory variables while other models have more observations. The number of observations for each model is shown in the table. The first figure in the cell is the regression coefficient with the standard errors in parentheses below them. The symbols *, ** and *** denote significance at 10%, 5% and 1% level, respectively. Exchange rate coefficients and standard errors in models 2, 4, 5 and 6 were too small to be shown at the four decimal point level of precision.*

Table 4 examines the impact of corruption on FDI with a stratified sample. The results in Table 4 separate the sample based on oil production. This provides even more insight on this corruption-FDI relationship. Results from Table 4 show that if a country is a major oil producer, corruption does not have a significant impact on FDI. This can be seen in the lack of significance of the corruption variable for the sample with oil production greater than 200,000 barrels per day across all five models.

Corruption is significant and negative for non-major oil producers (less than 200,000 barrels per day) but not for the major oil producers. This is shown by the significant, positive results on the corruption*oil production interaction variable for only the non-major oil producers. The positive time trend that was apparent in the full sample results (from Table 2) are found for the non-major oil producers but not for the major oil producers. Size of the labor force variable has a negative, significant impact on FDI for the non-major oil producers but not for the major oil producers.

Table 4: FDI for Countries with Oil Production less than 200,000 Barrels per Day and more than 200,000 Barrels per Day

	Less than 200.000 BPD					More than 200.000 BPD				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Corruption (lag)	-3.22***	-3.65***	-3.42***	-3.44***	-4.28***	1.20	1.39	0.92	1.05	-0.09
Corruption*Oil (lag)	3.56***	3.56***	2.65***	2.65***	3.52***	0.43	0.49	0.55	0.55	-0.24
Productivity (lag)	1.36	1.16	1.16	1.06	-0.45	-0.45	-0.50	-0.54	-0.62	-1.12
Labor Force	-3.26***	-3.15***	-3.09***	-3.12***	-1.87*	-1.44	-1.58	-1.43	-1.53	-1.66*
Exchange Rate	-	-0.48	-	-0.64	-0.42	-	-1.24	-	-1.43	0.06
Oil Rents	-	-	1.71*	1.58	-	-	-	-0.60	-0.57	-
Taxes	-	-	-	-	3.83***	-	-	-	-	0.84
Timetrend (year)	2.10**	2.90***	3.11***	3.35***	-1.38	-0.03	0.09	0.50	0.53	-0.03
Number of Observations	757	710	645	627	419	323	313	291	286	181
Chi-Squared (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09

*This table shows the results of Equation 8 ($FDI_{t,i} = \propto_0 + \propto_1 Cor_{t-1,i} + \propto_2 Cor_{t-1,i} * Oilprod_{t-1,i} + \propto_3 GDP_{t-1,i} + \propto_4 Lab_{t,i} + \propto_5 rents_{t,i} + \propto_6 v_{t,i} + \varepsilon_{t,i}$) for the stratified sample. The panel on the left shows results for countries which produce less than 200,000 barrels per day of oil. The panel on the right show results for countries which produce greater than 200,000 barrels per day of oil. The number of observations for each model is shown in the table. The numbers shown in the cells are t-statistics for the variables. The symbols *, ** and *** denote significance at 10%, 5% and 1% level, respectively.*

The impact of corruption on FDI varies based on the productivity levels of countries. These results are shown in Table 6. Results show that the full sample results regarding corruption reducing FDI holds only for the high productivity countries. For the high income countries, the coefficient on the corruption variable is negative and significant across all six models. The results are quite difference for the low productivity countries. For the low productivity (< $3000 per worker) countries, there is some evidence that corruption may increase FDI. The coefficient on corruption is positive and significant in four of the six models. Perhaps some firms interested in producing in low productivity (i.e. poorer) countries are seeking to take advantage of more corrupt governments to reduce labor and environmental standards and other safeguards which lead to higher costs. The time trend variable is positive and significant only for the high productivity countries, across most of the models. The positive effect of taxes on FDI is found only for the low productivity countries. The negative impact of the labor force variable which was found among the non-major oil producers was found only for the low productivity countries in this sample. This is further evidence that the aggregate results need to be stratified in different ways to understand the dynamics of the model.

Table 5: Corruption for Countries with Oil Production less than 200,000 Barrels per Day and more than 200,000 Barrels per Day

	Less than 200,000 BPD					More than 200,000 BPD				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
FDI (lag)	-8.32***	-8.81***	-8.69***	-8.57***	-6.81***	2.60***	3.13***	2.25**	2.69***	2.52***
Oil Production (lag)	-1.54	-2.36**	-1.02	-1.56	-1.47	-1.71*	-1.39	-1.82*	-1.51	-0.48
Oil production (lag)*Oil price	0.27	0.70	0.51	0.68	0.60	0.95	0.94	1.10	1.04	0.47
Exchange Rate	-	0.95	-	0.94	0.82	-	3.80***	-	3.92***	3.16***
Oil Rents	-	-	0.95	0.91	-	-	-	-1.57	-1.63*	-
Taxes	-	-	-	-	5.1***	-	-	-	-	2.82***
Timetrend (year)	0.05	0.49	0.21	0.01	1.31	0.11	1.00	0.08	0.09	0.52
Number of Observations	757	710	645	627	419	323	313	291	286	181
Chi-Squared (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09

*This table shows the results Equation 7 ($Cor_{t,i} = \beta_0 + \beta_1 FDI_{t-1,i} + \beta_2 Oilprod_{t-1,i} + \beta_3 Oilprod_{t-1,i} * Oilprice_{t-1,i} + \beta_4 rents_{t,i} + \beta_5 v_{t,i} + \epsilon_{t,i}$) for the stratified sample. The panel on the left shows results for countries which produce less than 200,000 barrels per day of oil. The panel on the right show results for countries which produce greater than 200,000 barrels per day of oil. The number of observations for each model is shown in the table. The numbers shown in the cells are t-statistics for the variables. The symbols *, ** and *** denote significance at 10%, 5% and 1% level, respectively.*

Table 6: Foreign Direct Investment for Low and High Productivity Countries

	Low Productivity Countries						High Productivity Countries					
Models	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Corruption (lag)	1.84*	2.06**	2.22**	2.36**	-0.93	0.06	-4.74***	-4.75***	-4.87***	-4.74***	-	-3.73***
Corruption*Oil (lag)	-0.90	-0.81	-1.05	-0.99	0.08	0.26	2.69***	2.80***	3.01***	2.95***	1.70*	1.63*
Productivity (lag)	0.96	1.00	1.54	1.55	1.26	1.62*	-1.23	-1.41	-1.20	-1.38	-1.57	-1.84*
Labor Force	-1.85*	-1.81*	-1.87*	-1.86*	-2.02**	-1.43	-0.70	-0.80	-0.52	-0.62	-0.37	-0.37
Exchange Rate	-	-0.73	-	-0.83	-0.86	-0.95	-	-0.91	-	-1.03	-0.90	-0.96
Oil Rents	-	-	1.68*	1.62*	-	1.11	-	-	0.00	-0.15	-	-0.73
Taxes	-	-	-	-	5.59***	3.43***	-	-	-	-	-0.96	-0.47
Timetrend (year)	1.37	1.52	1.08	1.20	0.47	0.89	1.71*	2.43**	3.17***	3.42***	-1.79*	-0.82
Number of	343	331	312	302	189	161	737	692	624	611	411	335
Chi-Squared (p-value)	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00

*This table shows the results of Equation 8 ($FDI_{t,i} = \propto_0 + \propto_1 Cor_{t-1,i} + \propto_2 Cor_{t-1,i} * Oilprod_{t-1,i} + \propto_3 GDP_{t-1,i} + \propto_4 Lab_{t,i} + \propto_5 rents_{t,i} + \propto_6 v_{t,i} + \varepsilon_{t,i}$) for the stratified sample. The panel on the left shows results for countries which are deemed to be low productivity (GDP per worker less $3,000 per year. The panel on the right show results for countries which are deemed to be high productivity (GDP per worker greater than $3,000 per year. The number of observations for each model is shown in the table. The numbers shown in the cells are t-statistics for the variables. The symbols *, ** and *** denote significance at 10%, 5% and 1% level, respectively.*

Examining the other direction of causality from FDI to corruption also yields interesting, significant results. The results from the full sample are in Table 3. In these results, we see that FDI has a significant negative impact on corruption in all eight models. Receiving more FDI is having a positive impact on future rates of corruption in the country. Also of interest in the table is the positive, significant coefficient on the tax variable. This suggests that higher tax rates are associated with a higher rate of corruption. This is logical as a larger government (and accompanying tax rates) provides more opportunity for

corrupt officials to engage in rent seeking behavior. Most of the other control variables were not significant in this regression.

The results differ across subsamples. Table 5 provides results for Equation 7 (the corruption equation) with countries stratified by oil production. Separating the sample shows that the negative impact of FDI on corruption does not hold for the sample of major oil producing nations. For the countries producing less than 200,000 barrels per day, the coefficient on lagged FDI is negative and significant. However, for the countries producing more than 200,000 barrels per day, the coefficient on lagged FDI is positive and significant. This is consistent with the previously discussed finding that firms investing in major oil producing countries are not being deterred by corruption. It is logical that firms that are not deterred by corruption in a country may not have a significant impact on reducing corruption in that country. In fact, these results suggest that FDI reduces corruption if you are not a major oil producer but may actually increase corruption if you are a major oil producer. The two models with tax rates found the positive relationship between taxes and corruption which was found in the full sample in both the high and low oil producers.

The results in Table 7 stratified the sample based on productivity levels for Equation 7 (the corruption equation). For the low productivity countries, results suggest that more FDI may increase corruption. The coefficient on lagged FDI is positive and significant in four of the six models. This is consistent with the paper's other sets of results regarding this subsample. Firms that are attracted to countries that are more corrupt are likely to be increasing the corruption level of that country through their activities there. For high productivity countries, the coefficient on lagged FDI is negative and significant. This suggests that the negative impact of FDI on corruption from the overall sample is being driven by the high productivity countries rather than the low productivity countries. Having more oil is not a significant factor for FDI in these poorer countries. The coefficient on oil production and its interaction with oil prices are all insignificant for both low and high productivity countries. The results on the time trend variable is mixed for the low productivity countries, with some coefficients being positive while others are negative. Consistent with the other samples, the coefficient on tax rates are positive and significant with respect to increasing corruption.

Table 7: Corruption for Low and High Productivity Countries

	Low Productivity Countries						High Productivity Countries					
	Models	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
FDI (lag)	2.16**	2.46**	2.45**	2.67***	0.38	0.80	-5.73***	-5.36***	-6.13***	-5.57***	-2.80***	-3.07***
Oil Production	-0.50	-0.63	-0.28	-0.39	-0.36	-0.03	0.11	-0.09	-0.18	-0.37	-0.13	-0.29
Oil production	0.88	1.09	0.48	0.65	0.74	0.27	0.92	0.81	1.10	1.08	0.55	0.73
Exchange Rate	-	1.53	-	1.56	1.59	1.67*	-	5.43***	-	5.13***	4.24***	3.91***
Oil Rents	-	-	-0.96	-0.90	-	-1.36	-	-	-0.39	-0.39	-	0.62
Taxes	-	-	-	-	3.30***	2.87***	-	-	-	-	4.47***	3.95***
Timetrend (year)	-2.49**	-3.13***	-1.87*	-2.39**	-1.50	-1.00	1.17	1.59	0.91	0.79	2.22***	1.22
Number of	343	331	312	302	189	161	737	692	624	611	411	335
Chi-Squared (p-	0.04	0.00	0.07	0.02	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00

*This table shows the results of Equation 7 ($Cor_{t,i} = \beta_0 + \beta_1 FDI_{t-1,i} + \beta_2 Oilprod_{t-1,i} + \beta_3 Oilprod_{t-1,i} * Oilprice_{t-1,i} + \beta_4 rents_{t,i} + \beta_5 v_{t,i} + \epsilon_{t,i}$) for the stratified sample. The panel on the left shows results for countries which are deemed to be low productivity (GDP per worker less $3,000 per year. The panel on the right show results for countries which are deemed to be high productivity (GDP per worker greater than $3,000 per year. The number of observations for each model is shown in the table. The numbers shown in the cells are t-statistics for the variables. The symbols *, ** and *** denote significance at 10%, 5% and 1% level, respectively.*

CONCLUDING COMMENTS

The paper's results suggest an interesting, complex relationship between foreign direct investment and corruption. This relationship varies significantly based on whether or not the receiving country has oil. High rates of corruption may make it difficult for countries to attract FDI. However, the more oil a country produces, the less impact corruption has on FDI flowing into that country so much so that if a country is a major oil producer then corruption becomes insignificant. If a country is successful in attracting FDI this appears to help reduce corruption but not in all cases. It appears that FDI attracted by either seeking access to large oil deposits does not reduce corruption.

We also need to take account of the income level of the receiving country. Firms seeking to produce in low productivity/income countries may feel more comfortable working with corrupt regimes. Firms interested in producing in poorer countries are often producing labor intensive, low value, low margin products. For these firms, a corrupt regime may offer them lower environmental standards and/or reduced worker rights. The FDI from these firms may then increase the corruption level in these poor countries as officials receive higher payouts.

So, one cannot state a priori whether FDI is a positive or a negative factor regarding corruption for a country. Having large amounts of oil and FDI does not necessarily mean increased corruption in your country. Being poor may make FDI more hazardous to the honesty of your government. Moreover, the large spillover gains from FDI regarding reduced corruption appear to be going to countries that have achieved at least middle-income status and are not motivated by access to oil. The same group of countries benefitting from FDI reducing corruption also has the most potential to lose from being corrupt. Results also suggest that poor non-oil countries fighting corruption may actually lose FDI. This in turn suggests that along with anti-corruption campaigns, they need to be investing in other factors to attract FDI.

These results have implications not only for firms engaged in FDI but also for governments and international organizations that have been promoting investments. In particular, resource extraction based FDI have become popular projects among international organizations such as the World Bank. For example, the World Bank provided funding and guaranteed loans for ExxonMobil's investments in Chad-Cameroon oil pipeline project. These types of public-private partnerships can potentially yield great economic gains for the countries involved. Unfortunately, the Chad-Cameroon pipeline case is a vivid illustration of the pitfalls highlighted by our paper's empirical analysis. When dealing with oil producers and/or poor countries without oil, FDI may increase corruption. When sponsoring these types of projects, international organizations such as the World Bank need to maintain proper conditionality and auditing to ensure that this FDI does not increase corruption in the receiving country. Socially responsible firms should do the same.

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