

# FDI AND PROPERTY RIGHTS IN RESOURCE-RICH COUNTRIES

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## Abstract

The literature on the drivers of FDI in resource-rich economies is poorly developed. Addressing this gap in knowledge, we investigate whether natural resources endowments moderate the property rights-FDI relationship. The results, based on a panel of 92 countries low and middle-income countries from 1996 to 2008, indicate that the sensitivity of foreign investors to local institutions varies both across countries and types of investments. Namely, we find novel evidence that, in resource-rich countries the positive effects of property rights on FDI is undermined. However the type of resources endowment matters. Out of the three resources analysed, oil, minerals and agricultural products, we find that only oil production has a significant moderating impact on the FDI-property rights relationship.

*Key Words: Foreign Direct Investment, Natural Resources, Institutions, Governance, Relation-Based*

## **1. Introduction**

International organisations and policy-makers have often promoted foreign direct investment (FDI) as a necessary instrument for economic development. The theoretical literature in support of this view argues that FDI can trigger growth and development by generating knowledge and technological spillovers. However, the empirical evidence on this is rather mixed (Alfaro et al., 2009). Scholars have shown that positive effects arising from FDI are likely to depend on host country characteristics, such as the level of human capital, financial markets and the institutional frameworks (De Mello, 1999; Blömstrom and Kokko, 2003). Moreover, the activities of multinational companies (MNCs) have aroused controversy and concern, especially in the case of the extractive industry and natural commodities sectors, where resources are often located in conflict-prone regions. Recent research has highlighted that in some cases foreign companies in extractive industry have aggravated violence and conflict, for example, by providing arms or finance (Ballentine, 2004). In such cases, the beneficial effect of FDI is likely to be limited due to the potential effects on the real exchange rate and loss of competitiveness (Sachs and Warner, 2001; Le Billon, 2005), worsening social inequality (Ross, 1999; Renner, 2002) and instability (Collier, 2004). In addition, recent research highlights that in resource- rich economies the role played by host country characteristics in attracting foreign investors differs compared to other economies. New empirical studies have shown that the relationship between democracy and FDI in the primary sector may be atypical (Aisedu and Lien, 2011; Shultz, 2007). In this instance, there is no evidence of the expected positive relation between foreign investment and democracy. However, the theoretical and empirical literature on the drivers of FDI in resource- rich economies remains limited. In light of the issues and concerns related to investments in natural resources, understanding the interplay between institutions and foreign investors in

resource-rich countries seems particularly important. To address this gap in knowledge, we focus on low- and middle-income countries, and examine the effect of property rights, as measured by the ‘Law and Order’ indicator from International Country Risk Guide (ICRG), on FDI inflows using a dataset of up to 92 developing and emerging countries from 1996 to 2008. A model of FDI determinants is estimated using the Blundell-Bond system GMM (Generalised Method of Moments) estimator (Blundell and Bond, 2000).

The contribution of this paper is threefold. This is the first study that focuses on the interplay between property rights, FDI and natural resources using aggregate data. The results provide broad support for the argument developed in the paper that the presence of natural resources affects the property rights–FDI relationship. Namely, in resource-rich countries, where investments are concentrated principally in the primary sector,<sup>1</sup> property rights are less important for attracting FDI. While existing research stresses that institutional weakness are negatively correlated with FDI, the proposition here is that the risk posed by frail institutions can be offset by the investment potential and by the MNCs’ ability to negotiate favourable entry conditions with the host government.

We also contribute to the discussion on the impact of different types of natural resources on economic development. We find that only oil, and not minerals or agricultural products, has a robust and significant moderating impact on the FDI-property rights relationship.

Finally, while existing studies focus on resource export intensity as a proxy of resource endowment, we make use of alternative measures of natural resources measures resources, namely resources production and rent relative to GDP.

The structure of the paper is as follows. Section 2 discusses the relationship between

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<sup>1</sup> The assumption that resource-rich economies attract mainly resource-seeking investment is confirmed by recent empirical research. For instance, Poelhekke and van der Ploeg (2010) find that natural resource production significantly decreases non-resource FDI.

property rights, FDI and natural resources and formulates the key hypothesis that is to be tested. The third and fourth sections present the econometric model and the data used in estimations. The final part discusses the results and draws some conclusions.

## **2. FDI, natural resources and institutions**

The economic literature has largely discussed how the characteristics of the legal system, in particular property rights, are vital components of a country's institutional set-up and therefore matter for both domestic and foreign investment (North, 1990; Demsetz, 1967; Libecap, 1989). This theoretical proposition has been tested empirically in a growing body of cross-country studies. While there seems to be some consensus that the overall institutional environment can significantly increase FDI inflows (Globerman and Shapiro, 2003; Bénassy-Quéré et al., 2007), the same cannot be said about specific aspects of that environment. For instance, while several empirical studies find that better property rights have a significant and positive effect on FDI (Gani, 2007; Biglaiser and Staats, 2010; Ali et al., 2010), others do not find robust evidence in support of this hypothesis (Jung and Sing 1996; Daude and Stein, 2007; Asiedu, 2002).

Conflicting findings on the effects of the efficiency of the legal system may be due to differences in time and country coverage, which in turn may reflect differences in the composition of FDI flows. In fact, FDI can be market-, efficiency- or resource-seeking (Caves, 1996) and this may affect the interactions between host countries' characteristics and FDI. The following section reviews the existing literature on foreign investments in natural resources and tries to establish whether the relationship between the host country's property rights and foreign investment is affected by the composition of FDI.

The first discussion on MNCs in natural resources stems from Vernon's (1971) obsolescing bargain model (OBM). This framework aimed at explaining the wave of expropriation of natural resources-based FDI that occurred in the 1970s in developing

countries by analysing the relationship between MNCs and the host country's bargaining power. Vernon (1971) and his followers (Moran, 1974 and Tugwell, 1975) argued that the bargaining power of MNCs in extractive industries is relatively weaker than that in other industries because these firms incur high fixed costs, which transfer bargaining power to the host country's government. A recent take on the OBM argues that the risk of expropriation is particularly important to MNCs in natural resources because of the high asset specificity of locations with large sunk costs and long gestation periods associated with these types of ventures (Asiedu and Lien, 2011; WRI, 2007; Nunnenkamp and Spatz, 2003). This view can be criticised on several grounds. First, it is only partly correct to assume that the government has a stronger position than the MNC, as the withdrawal of FDI and technical expertise may lead to disruption of income for the host government. Therefore, what we see is a mutual dependence where, using Williamson's (1987) terminology, the cost of breaking a transaction is high for both sides. Second, the OBS has overestimated the power of the local government because MNCs can put pressures on host countries' governments to protect their interests (Jenkins, 1986). Several case studies have shown that MNCs have been able to retain some bargaining power and prevent government expropriation (Eden et al., 2005).<sup>2</sup> Critics of Vernon's predictions have also noted that in recent times the MNC-host country relationship is more co-operative than conflictual, hence today the OBS framework is less relevant (Dunning, 1993; Luo, 2001).

Recently, a small but growing body of empirical studies has investigated the interplay between FDI, natural resources and institutions. Ali et al. (2010) analyse a panel of 45 developing countries between 1981 and 2005 and find that institutions, measured with the investment profile index and the 'law and order' indicator from ICRG, do not have a

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<sup>2</sup> For example, Kramer and von Tulder (2009) mentioned the agreement between the Libyan government and Mittal Steel as an example of a foreign investor having been able to negotiate favourable conditions. The agreement includes tax incentives and the facilitation of corporate rights over those of local communities, and forbids the application of new law to the company.

significant impact on primary sector FDI. Schulz (2007), using data on industry-level FDI, finds some evidence that the relationship between formal institutions (democracy vs. autocracy) is sector-dependent and that resource-seeking FDI is less sensitive to democracy. When sectoral data are not available, studies rely on the assumption that high resource endowment is associated with FDI concentrated in the primary sector (Asiedu and Lien, 2011). Asiedu and Lien (2011) find that democracy is positively correlated with FDI only if the share of minerals and oil in total exports is less than some critical value. Kolstad and Wiig (2012) analyse aggregate Chinese outward FDI over the period 2003-2006 and find that Chinese investors to non-OECD countries are driven by a combination of high natural resources and low institutional quality (as measured by the Rule of Law index from the World Bank Institute Governance Indicators). The finding that resources-seeking investors may display an inclination towards autocratic regimes can be explained in three ways. First, the stability that characterises autocracy facilitates the development of close relationships between investors and the host government (Asiedu and Lie, 2011). The development of close ties is a necessary condition to access natural resources, which are usually tightly controlled by the local government. In connection with this point, Li and Filer (2007) also note that deficiencies of the legal system do not necessarily prevent MNCs from setting up foreign operations. In fact, when societies lack a system of fair and transparent rules, investors often rely on relational capital to carry out economic transactions. This allows them to minimise the risk of expropriation and to circumvent institutional weaknesses. Second, some transaction costs induced by weak institutions may be balanced out by expected returns (Agarwal and Ramaswami, 1992; Asiedu, 2002). Hence, the institutional framework is not a precondition to attract investment: if the comparative advantage of the host country is high (e.g. because of abundant natural resources or because of a large domestic market), investors may be willing to accept the risks associated with a weak legal system and

institutions. Third, given the need to access resources that are not readily available in other countries, investors have no choice but to accept the host country institutions (Spar, 1999; Bayulgen, 2010). In connection to the latter point, it should be noted that FDI in natural resources tends to have few linkages to the local product and labour markets (Nunnenkamp and Spatz, 2003). This feature of natural resources-based FDI can explain the limited spillover from this type of investment (Poelhekke and van der Ploeg, 2010). However, a lack of linkages to other sectors of economic activity may also imply that FDI in the natural resource sector may be less sensitive to the general institutional framework shaping economic interactions in most of the economy.

To summarise, institutional weakness, such as frail property rights, should have less impact on FDI in natural resources because (i) the latter can be isolated from most of the other sectors in the economy; ii) institutional risk may be decreased by colluding with a local government; (iii) high transaction costs can be compensated for by higher returns results from participating in the resource rents.

Hence the hypothesis that we wish to test is the following:

H1) When FDI is concentrated in the primary sector this is expected to attenuate the effect of property rights on FDI.

### 3. Data and methodology

#### 3.1 Model Estimated and Data

To test the effect of natural resources on the FDI-property rights relation, we estimate the following model:

$$LFDI_{it} = \beta_0 + \beta_1 LFDI_{it-1} + \beta_2 propertyrights_{it} + \beta_3 resources_{it} + \beta_4 propertyrights_{it} * resources_{it} + \beta_k X_{kit} + e_{it} \quad (1)$$

where  $LFDI_{it}$  is the logarithm of FDI inflow as share of GDP, in country  $i$  at time  $t$ ,

'*propertyrights*' and '*resources*' are two indicators of the effectiveness of the legal system and the level of resource endowment and  $X_{kit}$  is a matrix of  $k$  control variables which are thought to affect FDI. To test H1 we are interested in the parameter  $\beta_4$ , which captures the effect of property rights conditional on the value of natural resources. Equation (1) models the inflow of FDI as a dynamic process where the dependent variable in year  $t$  depends in part on its value in year  $t-1$ <sup>3</sup>.

The empirical analysis uses a panel data of 92 low- and middle-income countries over the period 1996-2009.<sup>4</sup> Details of the variables and the sources of data can be found in the appendix in table A1<sup>5</sup>.

For the period analysed (1996-2009), a number of institutional indicators are available from the International Country Risk Guide (ICRG). Amongst other institutional measures, the dataset supplies one index of the effectiveness of the legal system. Our property rights indicator is the ICRG's 'law and order', which measures both the strength and impartiality of the legal system, and the extent to which the law is observed. Moving to natural resources, the economics literature has traditionally measured resource endowments using the amount of natural resources produced or exported (Hodler, 2005). As the main measure of natural resources we use the shares of three primary commodities in merchandise exports: ores and metals, fuels and agricultural goods (Sachs and Warner, 1995; Asiedu and Lien, 2011). As a robustness check we also employ resources production and resources rent as share of GDP. Data on oil production, oil rent and mineral rent are available from the World Bank adjusted net saving dataset.<sup>6</sup> Oil production, calculated as the unit price multiplied by total production, provides a

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<sup>3</sup> This follows Cheng and Kwan (2000) and Noorbakhsh et al (2001).

<sup>4</sup> We defined low- and middle-income countries using the distribution of GDP per capita in PPP. Low-income countries are those in the lower 20% of the income distribution; lower-middle-income countries are between the 20% and 50% of the income distribution; and symmetrically, upper-middle-income countries are between the 50% and the 80% of the income distribution.

<sup>5</sup> Descriptive statistics and correlation table are available from the author on request

<sup>6</sup> Minerals included in the calculations of rent are the following: tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite and phosphate.



measure of the economic importance of resource extraction. Natural resources rent is calculated as the unit rent, that is, price net of cost, multiplied by the amount of resource extracted. Some scholars argue that rents are a better measure than resource export, especially when analysing the interplay between institutions and resources (de Soysa and Neumayer, 2007). This is because rents are a direct measure of the gains from natural resources. Moreover, resource rents are strongly correlated with the value of reserves, in which case rents can be taken as a good proxy for sub-soil asset (Poelhekke and van der Ploeg, 2010).

The choice of the control variables is based on the existing empirical literature. The empirical literature on FDI inflows determinants is large and the evidence on the effects of many variables is mixed. Where consensus has emerged it is around the finding that country-level variables such as GDP (Chakrabarti, 2001; Globerman and Shapiro, 2003; Lipsey, 1999; Brewer, 1993; Crenshaw, 1991; Grosse, 1997), GDP per capita (Bénassy-Quéré et al., 2007), inflation (Satyanath and Subramanian, 2004), trade openness (Stone and Jeon, 2000; Liu, Wang and Wei, 2001) and institutions (Globerman and Shapiro, 2002) are important determinants of FDI inflows. For what concerns institutions, we control for democracy and political stability. Legal system, political stability and democracy are closely interrelated, so not taking the latter into account may cause an omitted variable problem.

### *3.2 Estimation Strategy*

The empirical estimation of the model presented above is problematic as the lagged dependent variables as well as some regressors are endogenous. We therefore estimate the model with System GMM, a method designed for fixed effects-idiosyncratic errors that are heteroskedastic and correlated within but not across individuals. When implementing GMM estimates particular attention should be given to the Arellano-Bond

test for autocorrelation in the differenced residuals and to the Sargan and Hansen tests for over-identifying restrictions. In the estimates reported below use two sets of instruments: ‘GMM’ style instruments, which can be predetermined variables (i.e. correlated with the past but not the present values of the error term), and ‘IV’ style instruments, which should be strictly exogenous variables. External instruments are not used. We estimate two models. In the first model, all variables except the lag dependent variable are assumed to be exogenous and used as IV instruments. The second model relaxes the exogeneity assumption and it allows all the regressors, except the year dummies, to be endogenous. In this instance, all endogenous variables are included as GMM instruments. This is clearly a realistic assumption, as all independent variables (GDP, inflation, trade, resource export and institutions) suffer from reverse causality. It is well-known that foreign investors are not passive agents but they can affect the economic and institutional characteristics of the host countries. However, introducing many variables as GMM instruments has the drawback of creating a large number of instruments, which can cause concerns (Roodman, 2006). In order to limit the number of instruments, the estimates have been performed using the “collapse” option where one instrument is created for each variable and lag distance, instead of one for each time period, variable and lag distance. For consistency, we limit the number of instruments also when assuming the explanatory variables to be exogenous. Finally, we control for heteroscedasticity between countries using the robust option in Stata 12.

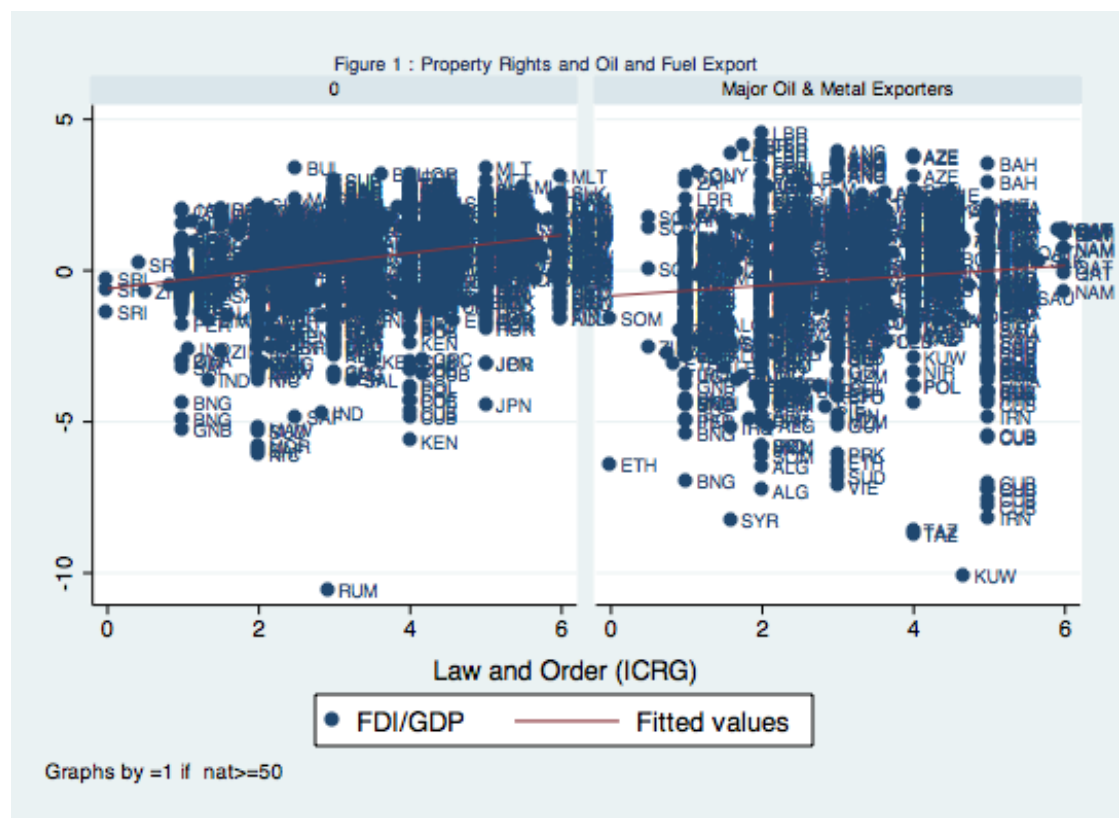
### *3.3 Descriptive Statistics*

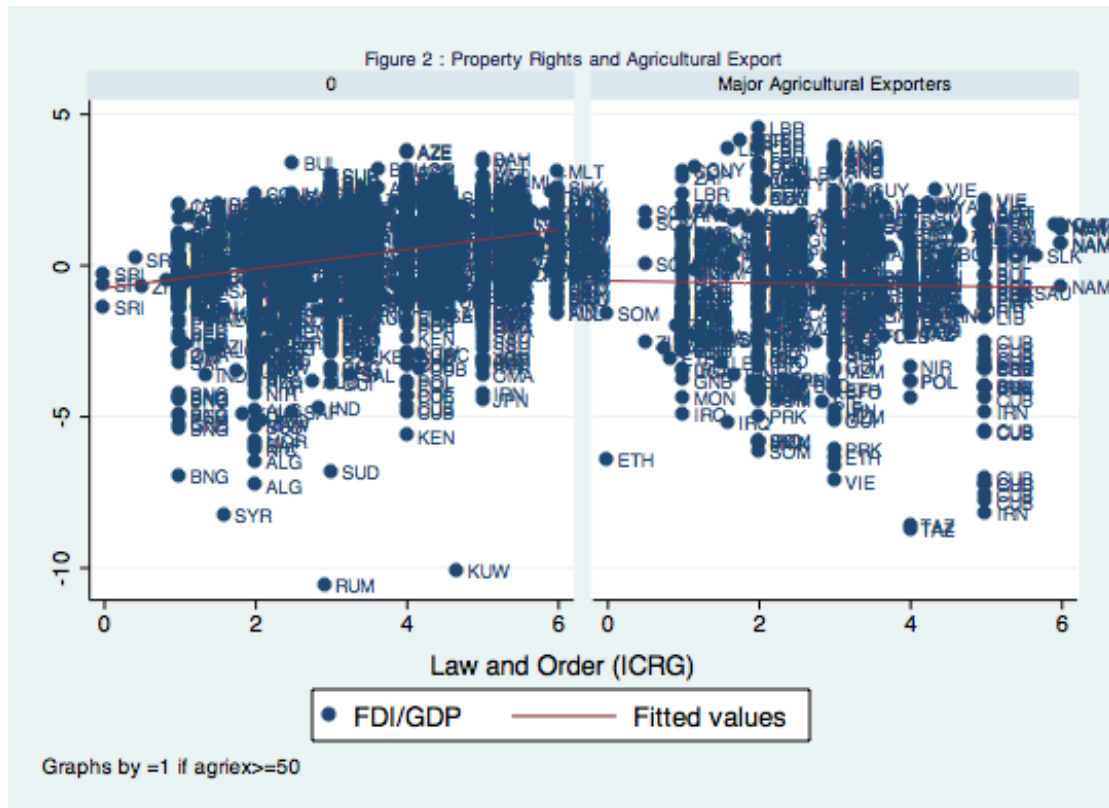
Unconditional correlations provide a first glance of the relationship between FDI and property rights. FDI and the ‘Law and Order’ indicator have a correlation of 0.106<sup>7</sup>, which is positive and significant as expected. We then ask whether this correlation is

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<sup>7</sup> Full correlation table available on request

affected by the presence of natural resources. We divide countries according to the export intensity of two types of natural resources: oil and metal; and agricultural raw materials. Following UNCTAD (2011), countries are defined as major natural-resource exporters if the share of natural resource export to total export is greater than 50%. In our sample, this corresponds roughly to the 80 percentile of the distribution of the export intensity variables (e.g. oil and metal to total export; agricultural raw material to total export).





Figures 1 and 2 indicate that there is a significant difference in the correlation between FDI and 'Law and Order' depending on the degree of export intensity. For major natural-resource exporters, the correlation between FDI and institutions seems much weaker compared to other countries. The preliminary analysis confirms that the relation between the strength of the legal system and foreign investors is conditional on natural resource endowments, here proxied by resource export intensity. This point will be further investigated in the following econometric analysis.

## 5. Results

The regression analysis aims to shed some light on how natural resources endowments – here, measured by natural resource export intensity – affect the FDI-property rights relationship. We distinguish between export intensity in oil, metal and agricultural raw material. Table 1 analyses the effect of oil and metal export on FDI. In columns 1 and 2 all variables except the lag dependent variables are exogenous, while the specifications

reported in columns 3 and 4 allow all independent variables, except the year dummies, to be endogenous. In all columns the lagged values of FDI and trade openness are positive and highly significant, confirming that FDI and trade are very much complements rather than substitutes, and also that FDI is a dynamic process, characterised by persistence. GDP and GDP per capita are positive, while inflation, as expected, is consistently negative, although these variables are not significant. The variable ‘nat’, which stands for oil and metal export intensity, has a positive and at times significant effect on FDI flows. The estimates reported show that property rights, political stability (ICRG), and democracy (polity2) are positively correlated with FDI. ‘Law and Order’ and the democracy indicator have a robust and significant effect, while political stability is significant in only one instance. In columns 2 and 4, we explore whether the relationship between FDI and institutions is affected by the natural resources endowment by introducing an interactive term. The results indicate that the interaction between natural resources and ‘Law and Order’ is negative and significant. This result indicates that for increasing levels of oil and metal exports the impact of the legal system on FDI decreases, thus confirming our hypothesis that an increasing level of natural resources decreases the positive effect of property rights on FDI.

**Table 1**

VARIABLES	(1)	(2)	(3)	(4)
L.LFDI	0.335*** (0.0734)	0.347*** (0.0743)	0.388*** (0.0879)	0.425*** (0.0936)
Ltrade	0.378*** (0.128)	0.347*** (0.125)	0.717 (0.897)	0.673 (1.119)
LGDP	-0.0352 (0.0361)	-0.0417 (0.0323)	0.313* (0.166)	0.297* (0.179)
LGDP per capita	-0.00913 (0.0669)	0.0107 (0.0594)	-0.575** (0.280)	-0.589* (0.309)

Inflation	1.44e-05	7.94e-05	8.03e-05	5.66e-05
	(0.000583)	(0.000548)	(0.000713)	(0.000783)
Nat	0.000724	0.0126**	-0.0129	0.0547**
	(0.00213)	(0.00544)	(0.00877)	(0.0240)
Political Stability	0.00869	0.0275	0.00277	-0.119
	(0.0331)	(0.0331)	(0.0904)	(0.119)
Law and order	0.532*	0.934***	1.796*	4.521***
	(0.305)	(0.324)	(0.940)	(1.540)
Polity2	0.0203**	0.0152*	0.0518	0.0505
	(0.00965)	(0.00886)	(0.0465)	(0.0491)
Nat*law		-0.0210**		-0.122***
		(0.00969)		(0.0451)
Constant	-0.162	-0.247	-5.844	-6.692
	(0.970)	(0.921)	(4.452)	(5.851)
Observations	895	895	895	895
Number of ID	92	92	92	92
AR(1)- pvalue	5.14e-08	9.02e-08	5.10e-06	1.34e-05
AR(2)-p value	0.325	0.336	0.209	0.401
Hansen- p value	0.263	0.308	0.666	0.624
Instrument Number	43	44	39	42

Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Year dummies included but not reported. Dependent variable is the log of FDI as share of GDP. Nat is the share of fuel and metal export to total export. In column 1 and 2 all regressors expect the lag dependent variables are exogenous. In column 3 and 4 all regressors are endogenous except the year controls.

We are also interested in exploring in greater depth how different levels of export intensity affect the interrelationship between the institutions analysed and natural resources. Table 2 reports the effect of ‘Law and Order’ on FDI inflow for meaningful levels of oil and metal export intensity. The calculations show that an increasing level of natural resource export has a substantial effect on the impact of property rights on FDI. For instance, an increase in oil and metal export intensity from 4%, the level of Thailand,

to 36%, the level of South Africa, decreases the impact of ‘Law and Order’ from 0.84 to 0.16. The calculations also show that at very high levels of natural resource export the relationship between institutions and natural resource is reversed.

**Table 2**

Value of Oil and Metal Export Intensity	Quantile	Corresponding Country	Law & Order*
1.651257	10 <sup>th</sup>	Paraguay	0.906357065
4.441002	25 <sup>th</sup>	Thailand	0.847055176
11.29105	50 <sup>th</sup>	Honduras	0.701443021
36.67997	75 <sup>th</sup>	South Africa	0.16174821
74.38813	90 <sup>th</sup>	Russia	-0.639817918

This is the effect of Law and Order conditional on the value of resources export intensity, which is:  $\delta LFDI / \delta Lawandorder = \hat{\beta}_3 + \hat{\beta}_4 * oilandmetal\ exp\ ort$

The calculations are based on the coefficient estimated in table 1 in column 4.

Table 3 analyses whether the impact of property rights on FDI is conditional on the type of resources exported. Recent discussion has shown that the impact of resources on economic development depends on the type of resources produced (Boschini et al., 2007). Namely, resources that are highly appropriable (due, for example, to ease of transportation) may have a negative impact on economic growth, while this may not be the case for other types of resources. As such, minerals and oil tend to be more problematic than agricultural products, as the former are more lootable.<sup>8</sup> Table 3 analyses the effect of different types of resources on FDI, so we include three measures of export intensity: one for oil, one for metal and one for agricultural products.

<sup>8</sup> Several theories can explain the negative impact of extractive industry on development. The main explanations are centred on the negative impact of oils and metal on the following: conflict (Collier and Hoeffler, 2004), state institutions (Fearon & Laitin, 2003; Snyder & Bhavnani, 2005) and trade shocks (Humphreys, 2005).

Table 3

VARIABLES	(1)	(2)	(3)	(3)	(4)	(6)
Oresex	0.00597** (0.00263)	-0.00971 (0.0108)		0.00450 (0.0170)	0.0159 (0.0633)	
Fuelex	-0.00115 (0.00266)	0.0130** (0.00539)		-0.0156 (0.0103)	0.0526** (0.0230)	
Agriex			-0.00472 (0.0290)			-0.138 (0.0926)
	(0.0324)	(0.0313)	(0.0667)	(0.101)	(0.115)	(0.0780)
Law	0.481 (0.302)	0.649** (0.318)	1.113 (0.938)	1.970** (0.913)	4.073** (1.582)	-0.120 (0.856)
Oresex*Law		0.0276 (0.0181)			-0.0165 (0.103)	
Fuelex*Law		- 0.0251*** (0.00904)			-0.118*** (0.0454)	
Agriex*Law			-0.0125 (0.0574)			0.246 (0.156)
Observations	895	895	1,172	895	895	1,172
Number of ID	92	92	113	92	92	113
AR(1)- pvalue	5.12e-08	1.02e-07	2.72e-07	8.35e-06	2.05e-05	2.26e-06
AR(2)-p value	0.335	0.318	0.161	0.219	0.383	0.209
Hansen- p value	0.291	0.339	0.732	0.695	0.587	0.730
Instrument Number	44	46	23	42	48	39

Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Year dummies and constant included but not reported. The table reports estimates for the main parameters of interest from specification (1). Dependent variable is the log of /GDP. In column 1, 2 and all regressors except the lagged dependent variable are exogenous. In column 4,5 and 6 all regressors are endogenous except the year controls.

To save space, Table 3 reports estimates for the main parameters of interest from specification (1) ( $\beta_2, \beta_3$  and  $\beta_4$ ). In column 1, the interaction between the property



rights indicator and fuel export is negative and significant, indicating that an increasing intensity in fuel export decreases the positive effect of property rights on FDI. However, in column 2, the interaction between 'Law and Order' and metal export is not significant. The variable is jointly significant with the property rights indicator, although it does not have the expected sign. The results in columns 4 and 5, where we allow the regressors to be endogenous, seem to broadly confirm that only fuel, but not metal export intensity, has a significant influence the property rights-FDI relationship. Column 3 and 6 explore the role of agricultural export intensity and show that agricultural exports do not moderate the impact of property rights on FDI.

Overall, the results highlight that high resources endowments undermine the positive effect of property rights on FDI. By analysing the interaction terms between different types of natural resource export intensity and property rights, we are able to explore whether the effect of institutions on FDI is conditional on the type of resources produced. We find strong evidence that in oil-rich countries the effects of efficient property rights are undermined. The results also show that the effect of metal export intensity, on its own, is less robust than the impact of oil export intensity. This may be puzzling since scholars have recently discussed that the oil and metal industry may have similar (negative) impact on economic development (Sala-i-Martin and Subramanian, 2003; Asiedu and Lien, 2011). However, scholars have pointed out that the measure 'ores and metal export' may be a poor proxy for the importance of extractive industry. In fact, this indicator includes items such as crude fertilizer and scrap metal that are not part of extractive industry (de Soysa and Neumayer, 2007), and it fails to include diamonds and other precious gems which can notably have a deleterious effect on economic outcome (Fearon, 2005). Interestingly, columns 3 and 6 show that agricultural export intensity does not significantly affect the institutions-FDI relationship, confirming recent

discussion that the agricultural sector, compared to extractive industries, has a less detrimental effect on economic development (Isham et al., 2005).

### 5.1 Robustness

In order to give some credibility to our results, we carry out a number of robustness checks. First, we use alternative measures of natural resources. Again, we estimate two sets of models. In the first one, only the lagged dependent variable is taken as endogenous; in the second set of specifications, all regressors, except the year dummies, are treated as endogenous. Panel A in Table 4 analyses the impact of oil production and oil rent relative to GDP on the interplay between FDI and institutions. When using alternative measures of natural resources, our results confirm that the extraction of oil, but not of mineral, has a significant impact on the interplay between property rights and FDI.

As a second check, we divide the sample into low- and middle-income countries. The results are reported in Panel B in table 4. In columns 1 and 2 we measure natural resource endowment with the share of ores, metal and fuel export to total export, while in columns 3 and 4 we measure it with oil production as share of GDP. Our results show that the interactive term between the chosen measure of natural resources and “law and order” is significant in all except column 1.

**Table 4**

Panel A				
VARIABLES	(1)	(2)	(3)	(4)
Law	0.670*** (0.242)	2.388** (0.938)	0.585** (0.252)	2.388** (0.938)
Oil production	19.79*** (5.137)	37.82*** (13.52)		
Oil production*law	-28.17***	-59.65**		

	(9.763)	(25.35)		
Oil rent			3.169***	37.82***
			(0.887)	(13.52)
Oil rent*law			-4.582***	-59.65**
			(1.377)	(25.35)
Observations	881	881	881	881
Number of ID	88	88	88	88
AR(1)- pvalue	2.13e-07	3.59e-06	2.99e-07	3.59e-06
AR(2)-p value	0.459	0.423	0.489	0.423
Hansen- p value	0.165	0.458	0.167	0.458
Instrument Number	43	42	44	42
	(1)	(2)	(3)	(4)

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Panel B

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VARIABLES	Low Income Countries	Middle Income Countries	Low Income Countries	Middle Income Countries
law	2.044**	0.544*	0.985	0.493*
	(0.928)	(0.311)	(0.785)	(0.264)
nat*law	0.0123	-0.0173*		
	(0.0101)	(0.00960)		
Oil production			33.58***	17.97***
			(10.97)	(5.336)
Oil production*law			-38.65*	-25.33**
			(20.43)	(10.17)
Observations	195	700	154	727
Number of ID	21	77	16	78
AR(1)- pvalue	0.00965	2.99e-06	0.00421	5.74e-06
AR(2)-p value	0.397	0.131	0.133	0.159
Hansen- p value	1	0.256	1	0.219
Instrument Number	44	44	45	45

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Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Year dummies and constant included but not reported. The table reports estimates for the main parameters of interest from specification (1). Dependent variable is the log of FDI/GDP. Law is the law and order indicator from ICRG, normalised between 0 and 1.

Panel A: in columns 1 and 2 all regressors except the lag dependent variable are exogenous; in columns 3 and 4 all regressors are endogenous except the year controls.

As a final check, in table 5, we split the sample into resource-rich and non-resource-rich countries, and we investigate whether this affects the significance of ‘Law and Order’ . We use the UNCATD (2011) definition and split countries according to their level of resource export intensity, so resource-rich economies are those whose export intensity is greater than 50%<sup>9</sup>. In Table 5 the property rights indicator is positive and significant only in non-resource-rich countries, while it is positive but not significant in resource- rich economies. The last robustness check thus further confirms the hypothesis that resource endowment affects the impact of the quality of institutions, in this instance the legal system, on the inflow of foreign investments.

Table 5

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Resource Rich Countries	Non Resource Rich Countries	Resource Rich Countries	Non Resource Rich Countries	Resource Rich Countries	Non Resource Rich Countries
Nat	-0.00245 (0.00481)	0.00904** (0.00429)				
Law	1.179 (0.613)	0.761** (0.336)	0.464 (0.413)	0.731** (0.340)	0.739 (0.478)	0.694** (0.345)
Oil production			6.036*** (2.089)	21.92*** (7.954)		
Oil rent					1.391** (0.659)	3.987** (1.850)

<sup>9</sup> We have also carried out a similar check splitting the sample between countries that exploit resources and those that do not. Following Poelhekke and van der Ploeg (2010), we create a dummy variable equal 1 when oil rents are positive. This measure allows capturing the effect of a resource discovery by assuming that when rents are zero resources are not extractable (for instance, if there is a civil war). The results are in line with what is reported in table 6, hence they are not reported but are available on request.

Observations	166	729	244	637	244	637
Number of ID	25	80	38	71	38	71
AR(1)- pvalue	0.0637	2.09e-06	0.0566	3.36e-07	0.0578	3.33e-07
AR(2)-p value	0.574	0.519	0.426	0.551	0.307	0.551
Hansen- p value	1.000	0.657	0.520	0.183	0.637	0.226
Instrument Number	43	43	43	43	43	43

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Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Year dummies and constant included but not reported. Dependent variable is the log of FDI/GDP. The table reports estimates for the main parameters of interest from specification (1).

## 6. Concluding Remarks

This paper investigates whether the presence of natural resources plays a moderating role in the property rights-FDI relationship. The existing theoretical and empirical literature has emphasised that good institutions are important for both foreign and domestic investors. Accordingly, we should expect property rights to be positively correlated with FDI. However, there are at least three reasons why this may not be the case for MNCs in natural resources. First, such companies have few linkages with the rest of the economy, which can decrease the sensitivity to the external environment. Second, institutional risk may be avoided by colluding with a local government. Third, high transaction costs can be compensated for by higher returns from participating in the resource rents. Our econometrics results show clearly that institutions do not act in isolation and that their effect on FDI is influenced by natural resources. We find novel evidence that natural resources significantly affect the impact of property rights on FDI. However the type of resources endowment matter, in fact only oil has a significant moderating impact on the FDI-property rights relationship. The existing literature on the effect of different types of natural resources on economic outcomes has shown that lootable resources may be more harmful than diffuse ones, such as agricultural products. The economics literature has traditionally considered the effect of oil to be similar to that of minerals; however,

political scientists have argued that oil-rich countries are different to other resource-rich countries. In particular, recent studies have found that the institutional environment of oil-producing economies does not reflect the country's level of development, as measured by per capita income; they are weaker than expected and this in turn can have a negative impact on political instability and conflict (Fearon and Laitin, 2003; Fearon, 2005). This study therefore shows how the distorted institutional setting of oil-rich countries may have a negative effect on development. Namely, we find that in oil-based economies investors are less sensitive to weak property rights protection. If this is the case, the influence of FDI on the host country institutional environment may be of concern. What explains the different effects of oil as contrasted with that of metal ores may be that the former generates particularly strong economic rents given the current trend in energy prices. Thus, this paper gives indirect support to a recent body of the literature arguing that it is the amount of rent generated rather than the presence of natural resources that is a key factor in how natural resources affect development (Fearon, 2005).

The findings presented in this paper have two important policy implications. First, the results demonstrate that in resource-rich economies institutional reforms may not be an effective tool to attract foreign investments. Second, even if these countries were committed to institutional reforms, progress could be hampered by the presence of foreign investors. If MNCs rely on informal and corrupt practices to protect their assets and to avoid the risk of expropriation, it is likely that the government would not receive any external pressure to improve the existing institutional setting.

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## Appendix

**Table A1**

Variable name	Variable Label	Source
LFDI	Log FDI inflow as % of GDP	UNCTAD
LGDP	Log GDP in constant us \$	World Bank (WB)- World Development indicators (WDI)
LGDP per capita	Log GDP per capita in constant us \$	WB- WDI
Inflation	Inflation, consumer price annual %	WB- WDI
Ltrade	Log trade (import and export as percentage of GDP)	WB- WDI
Nat	Fuel and Metal Export as percentage of total export	WB- WDI
Fuelex	Fuel Export as percentage of total export	WB- WDI
Oresex	Ores and metal export as percentage of total export	
Agriex	Agricultural Export as percentage of total export	WB- WDI
Political Stability	Political stability (principal component of internal/external	International Country Risk Guide (ICRG)

	conflict, government stability and ethnic tension). Normalised between 0 and 1	
Law	Law and Order. normalised between 0 and 1	ICRG
Polity2	Democracy indicator	PolityIV
Oilprod	Oil production/GDP	WB
Oilrent	Oil rent/GDP	WB
Minrent	Mineral rent/GDP	WB

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