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The foreign direct investment-institution nexus in oil-abundant countries

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Abstract

The present work reassesses the link between natural resources, institutional quality and foreign direct investment (FDI). In particular, we focus on the impact of good governance and democracy on foreign direct investment in oil-abundant countries. To this end, we estimate the effect of host countries' institutions on the extensive margin (number of bilateral greenfield investment projects), using a gravity equation for a dataset that covers 182 countries during 2003-2012. Our findings confirm that compliance to rule of law, lack of corruption, political stability and democracy could boost new FDI links through the extensive margin. Our results could not rule out the "oil curse", meaning that oil producers attract fewer new greenfield projects than similar countries without oil. Unlike other studies, we show that the impact of institutions is not necessarily undermined by the presence of natural resources.

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1   Introduction

Recent decades have witnessed ups and downs in the prices of commodities, provoking economic and social instability in oil-abundant countries, serving as a reminder of how important it might be to diversify their economies. Foreign direct investment (FDI) would improve these countries' development as it can bring new technologies and skills, broaden access to new markets through exports, and diversify economic activity (De Ferranti et al., 2002).

The effect of natural resources is contentious in the literature since empirical evidence offers mixed results. Research has identified both a positive (e.g. Mohamed and Sidiropoulos, 2010; Teixeira et al., 2017) and negative (e.g. Mina, 2007; Poelhekke and van der Ploeg, 2013) relationship between FDI & natural-resource endowments. Most of this research focuses on a direct link between natural resources and FDI, for example through a natural resource seeking FDI. Several authors suggest that natural resources may moderate the link between institutions and FDI (e.g. Aleksynska and Havrylchyk, 2013; Asiedu and Lien, 2011).

On the institutional dimension, policy advisors advocate political stability and a legal and regulatory environment as the main factors influencing foreign investors' decisions (World Bank, 2018). However, evidence supporting this claim is not bulletproof. A growing strand of the literature suggests that better institutional quality and democracy is highly contextual and would not always foster FDI (e.g. Bellos and Subasat, 2012; Li and Resnick, 2003; Paniagua and Sapena, 2014).

Our research contributes to understanding how institutional quality and natural resources, namely oil, interact in their relationship with FDI. This issue has received little attention, with several notable exceptions that make the issue even more puzzling. Indeed, Asiedu and Lien (2011) show that natural resources weaken the positive impact of democracy on FDI. Similarly, other recent studies suggest that the presence of natural resources negatively alters the nexus between institutional quality and FDI (e.g. Yang et al., 2018). In contrast, others present evidence

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of the opposite (e.g. Asiedu, 2013).

A specific contribution to the subject of the impact of natural resources on the institution-FDI nexus is to provide solid empirical evidence in a broader panel setting. Previous studies have two shortcomings: they usually focus on single countries or a reduced subset and analyse aggregate FDI inflows, regardless of the bilateral nature of FDI. To hedge these limitations, we estimate bilateral greenfield FDI flows for 182 countries during 2003-2012 by means of the gravity equation. Greenfield investment, which represents more than half of the world's FDI projects and 72% of the total FDI projects received by developing countries[1], signifies a net increase of foreign capital, labour and knowledge for the recipient country.

Moreover, we focus on both the extensive (number of projects) and the intensive margin (volume of these projects). The extensive margin is particularly important to our context since its study reveals the factors that determine the creation of new investment links at the country level. This allows us to offer a better understanding of the question of whether there is a natural resource curse on FDI, which aspects of good governance matter most for attracting FDI in developing countries and, more specifically, in oil-producing countries.

Our results suggest that rule of law, lack of corruption, political stability and democracy are relevant dimensions in determining new greenfield investment projects. In addition, increasing the level of democracy is also found to foster capital inflows. Results also validate the hypothesis of an "*oil curse*" on new investment linkages. Based on this analysis, for different levels of oil production we illustrate how institutional reforms would affect a country's capacity for attracting greenfield FDI and show the level of institutional quality and democratization necessary to overcome the natural-resource curse on FDI. Remarkably, the evidence obtained indicates that the positive impact from improving the rule of law, reducing corruption, increasing

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[1]The world's total number of FDI projects is calculated as the sum of greenfield investment and merger and acquisitions projects. Shares are calculated by the authors based on the annex tables 11 and 22 from UNCTAD (2017).

political stability and democratization is positively moderated by oil production. In fact, institutional reforms could even cancel the oil curse on FDI.

The remainder of the paper proceeds as follows. The next section reviews the theoretical an empirical literature about the expected and contrasted impact of political systems and quality of institutions on FDI. Second, we detail how the abundance of natural resources may interfere in the institution-FDI nexus. Section III describes the methodology used and provides an overview of the quality of institutions in the different oil-producing regions and of the distribution of oil production across the world. Section IV presents the results, which are followed by a robustness analysis in Section V. Finally, Section VI concludes.

2 Theoretical and empirical review

2.1 Does the quality of institutions attract FDI?

According to North (1990), institutions represent "*the rules of the game*" that shape social interactions and, in particular, agents' economic behaviour. These rules may be embodied in formal or informal laws. There are several reasons why the quality of institutions matters for FDI. The economic growth literature suggests that better institutions may generate more economic growth through better incentives to invest and more efficient allocation of resources (Acemoglu and Johnson, 2005). In more detail, such good policies are likely to influence indirectly the rate of investment through improvements in human capital and infrastructure quality. In addition, high-quality institutions are also expected to reduce information asymmetries, providing information about market conditions, goods and participants, which in turn can encourage (domestic and foreign) investment in the country (World Trade Organization, 2004). In contrast, a "bad" institutional environment may increase the cost of doing business either by uncertainty brought about by political instability or corruption and poor compliance to the rule of law (Busse and Hefeker, 2007; Daude

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and Stein, 2007; Javorcik and Wei, 2009).

Even if the widespread conviction is that good governance tends to attract FDI, theoretical and empirical studies that examine more precise aspects of institutions draw a more ambiguous relationship. Globerman and Shapiro (2002) and Buchanan et al. (2012) obtain clear-cut results concerning the positive effect of overall good governance on FDI. In contrast, Blonigen and Piger (2014), using a Bayesian model, question the relevance of institutional variables for explaining bilateral FDI. Bellos and Subasat (2012, p. 306) conclude their extensive review of the theoretical framework by underlining that "*poor governance may be a source of rent not only for corrupt politicians and policy makers in the target countries but also for large MNCs*".

2.1.1 The effect of political stability

Political risk is related to the risk that a sovereign host government will unexpectedly change "*the rules of the game*" under which businesses operate (Busse and Hefeker, 2007), and is expected to deter investment from multinational enterprises (MNEs). Most studies confirm this hypothesis for different sets of countries[2] while others find no evidence linking political risks to FDI.[3] However, Li and Resnick (2003) and Shan et al. (2018) report a discrepant negative relationship between stability and FDI.

2.1.2 The effect of corruption and rule of law

The expected effects of corruption on FDI are particularly controversial. At first glance, corruption clearly increases the transactional costs of foreign firms and thus should deter FDI (Javorcik and Wei, 2009; Wei, 2000). This is the "*sand the wheels*" view, also referred to as the "*grabbing hand*" (Egger and Winner, 2005). Yet, cor-

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[2]See for example Aziz and Mishra (2016), Asiedu (2013), Berden et al. (2014), Busse and Hefeker (2007), Méon and Sekkat (2004),Mina (2017, 2012),Moon (2015),Sekkat and Veganzones-Varoudakis (2007) andWei (2000).

[3]See for example Asiedu (2002), Harms and Ursprung (2002), Noorbakhsh et al. (2001), Rogmans and Ebbers (2013) and Teixeira et al. (2017).

ruption is also seen to "*grease the wheels*" (or as the "*helping hand*"), at least at the firm level and despite the negative aggregate outcome on growth (see Bellos and Subasat, 2012). Indeed, in an institutional framework characterised by inefficient bureaucracy, these illegal practices may also be a way to circumvent an inefficient administration or influence government policies to the benefit of the MNE.

Mirroring these contradicting predictions, empirical analysis has reached mixed results. Wei (2000) is seminal in studying the issue and found that corruption clearly discourages FDI. This conclusion is validated by several studies.[4] Studies that include indicators of corruption usually also study the impact of the compliance to the rule of law. The quality of contract enforcement to attract FDI seems more robust.[5] Conversely, other analyses offer support to the "*helping hand*"[6] theory while some authors fail to evidence any significant relationship between corruption and FDI.[7] Recently, firm-level analyses have complemented this evidence. For 22 transition countries, Javorcik and Wei (2009) show that corruption reduces the probability of receiving FDI, but provided that FDI takes place, it increases the likelihood of joint ventures with local firms. They also indicate that joint venture partners help MNEs to reduce increased transaction costs. Williams et al. (2016), using a firm-level dataset for 132 developing countries, show that bribery enhances firm performance. Along the same lines, Couttenier and Toubal (2017), for the case of German foreign affiliates' sales, find that corruption has a negative effect on new entrants, but it can even have a positive impact on incumbent ones.

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[4]For instance, Asiedu (2006, 2013), Aziz and Mishra (2016),Bénassy-Quéré et al. (2007), Helmy (2013), Mina (2012),Mohamed and Sidiropoulos (2010), Teixeira et al. (2017),Williams et al. (2016) and Wu (2006).

[5]For example, Anyanwu (2012),Asiedu (2006, 2013),Bénassy-Quéré et al. (2007),Busse and Hefeker (2007), Mathur and Singh (2013), Mina (2007, 2017) and Teixeira et al. (2017) report a positive link between compliance to rule of law and FDI. Akhtaruzzaman et al. (2017), Bayar and Alakbarov (2016), Méon and Sekkat (2004) and Shan et al. (2018) find a non-significant relationship. Paniagua and Sapena (2014) find that legal rights foster greenfield investment into less developed countries but not in more developed countries.

[6]See Adam and Filippaios (2007), Bellos and Subasat (2012) and Egger and Winner (2005).

[7]As in Ali et al. (2010), Anyanwu (2012), Bayar and Alakbarov (2016), Berden et al. (2014), Busse and Hefeker (2007), Li and Resnick (2003), Méon and Sekkat (2004) and Shan et al. (2018).

2.1.3   The effect of the political system

Institutions are in turn shaped by the political system, namely, the degree of democracy or autocracy (Jensen, 2008). Democracies tend to be more predictable and make their preferences clear (Desbordes and Verardi, 2017), thus reducing investment uncertainty. Additionally, democracies may be accompanied by countries' openness to the world economy (Guerin and Manzocchi, 2009). The lack of democracy boosts social tensions that increase the likelihood of bringing severe political and social crisis to a country (Alesina and Perotti, 1996). Moreover, autocratic rulers have incentives to exploit their position for extracting as much as possible from society's surplus for their own benefit. Consequently, in the long run, autocracies are less likely to respect law and private property rights and to be credible and transparent when it comes to politics and policy (Jensen, 2008, 2003; Olson, 1993; Sung, 2004). Furthermore, due to the lack of control by citizens, authoritarian regimes are more prone to creating inefficient policies and outcomes (Adam and Filippaios, 2007).

However, some characteristics of democracies may be seen as drawbacks for MNEs. For instance, changes of governments and policies in democratic regimes may increase uncertainty. Another potential issue concerns domestic lobbies that may support policies that discriminate against foreign firms. Moreover, economic, political and civil liberties enjoyed by the citizens under democratic regimes may give rise to more powerful labour unions that can translate into an increase in labour costs (Adam and Filippaios, 2007). Similarly, open media can also prevent foreign firms from colluding with officials in order to obtain generous entry deals or to decrease market competition (Desbordes and Verardi, 2017). Conversely, an autocratic government may hold a better position to offer favourable treatment to foreign investors (Jensen, 2008; Li and Resnick, 2003; Oneal, 1994). Furthermore, strong and autonomous governments might be more successful at applying economic reforms Rodrik (1996), while a higher degree of democracy may not always guarantee a

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higher quality of institutions (Charron and Lapuente, 2010; Sung, 2004).

The scant existing empirical evidence supports both opposing hypotheses. Asiedu and Lien (2011) and many others[8] point out a positive relationship between democracy and FDI. In contrast, Adam and Filippaios (2007), Li and Resnick (2003), Mathur and Singh (2013) and Paniagua and Sapena (2014) evidence a negative relationship, while others fail to find a significant effect (Akhtaruzzaman et al., 2017; Bellos and Subasat, 2012; Noorbakhsh et al., 2001; Oneal, 1994).

2.2 The Role of Natural Resources

As highlighted in the previous section, the nexus between institutions and FDI is not straightforward. In particular, in countries abundant in natural resources, autocracies may offer more advantages than disadvantages to those foreign firms interested in investing in the resource sector for rent-seeking motives. This is mainly due to the fact that natural resources are controlled by local authorities. Asiedu and Lien (2011) suggest that MNEs in the extractive industry wish to avoid frequent changes of governments, since governments that have long-term stability favour closer ties. Moreover, Adam and Filippaios (2007) argue that when investment seeks to access natural resources, MNEs may prefer slight civil repression.

Similarly, MNEs may be encouraged by lower institutional quality when natural resources are at stake since in this way they are able to appropriate a larger share of its rents and enjoy greater bargaining power (Burger et al., 2015; Poelhekke and van der Ploeg, 2013). In this regard, Hajzler (2014) states that countries rich in natural resources could attract a larger share of FDI by offering cheap access to natural resources, even if there is a high expropriation risk. The author suggests that the penalty for host countries' governments lessens as the value of foreign assets in the sector increases and the royalties for exploiting natural resources paid by

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[8]See for example, Busse and Hefeker (2007), Desbordes and Verardi (2017), Gossel (2017), Guerin and Manzocchi (2009), Harms and Ursprung (2002), Jensen (2003) and Kucera and Principi (2017).

MNEs decrease. Yang et al. (2018) conclude that MNEs always exhibit institutional risk aversion, although investment returns in countries with low capital intensities but with abundance in natural resources may outweigh the costs associated with institutional risk. Nevertheless, MNEs operating in this sector are constrained by the limited availability of the natural resources, converting this specificity into a pre-condition of their location choice, regardless of the institutional framework (Amighini et al., 2013; Burger et al., 2015).

The empirical validations of the above hypotheses are scarce. Asiedu and Lien (2011) find that democracy has a positive impact for FDI but that natural resources undermine the positive effect of democracy on FDI. Similarly, Desbordes and Verardi (2017) find that media freedom has a negative influence on FDI that outweighs the positive impact of other democratic attributes when both natural resources and income inequality are high. Kucera and Principi (2017) report a strong link between democracy and FDI among all industries except mining and oil and gas extraction.

Nuancing the above studies, Aleksynska and Havrylchyk (2013) show that for FDI originating from developing countries the negative impact of "*bad*" institutions on FDI inflows is lower when the host country is abundant in natural resources. Amighini et al. (2013), Buckley et al. (2007) and Yang et al. (2018) find similar results for Chinese outward FDI, explaining that Chinese FDI is not attracted by bad institutions *per se* but rather by natural resources that correlate with bad institutions. In a similar vein, Ali et al. (2010) report that property rights do not have a significant impact on FDI directed towards the primary sector.

The above reviewed research is linked to the extensive strand of the literature studying the negative effects of substantial natural-resource endowment on countries' performance. This paradoxical phenomenon that may turn the "*blessing*" of natural resources into a "*curse*" is also often referred to as the Dutch disease. Resource discoveries may have a negative effect on growth since it generates a large increase in exports which in turn leads to an appreciation of the local currency. This

makes the country's exports less competitive at world prices, and thereby crowds out investments in non-natural-resource tradable sectors. Productive activities that boost growth decline in favour of the natural-resource sector for rent-seeking purposes (Sachs and Warner, 2001).

Natural-resource abundance is also likely to favour bad institutions in detriment of pro-growth behaviour. The rents provided by the exploitation of natural resources are easily appropriated generating a "*rentier effect*" (Aleksynska and Havrylchyk, 2013). Furthermore, revenues from the export of fuels and minerals allow governments to quieten critics and avoid accountability pressures. Natural-resource abundance breeds corruption (Aleksynska and Havrylchyk, 2013) and raises expropriation risks (Hajzler, 2014). However, De Ferranti et al. (2002), Mehlum et al. (2006) and Van der Ploeg (2011) argue that good governance could potentially turn the natural-resources curse into a blessing by investing the capital brought by natural resources into productive activities or promoting knowledge-intensive economic activities, hence promoting economic growth.

The mechanisms described above may have a direct effect on FDI. Indeed, FDI inflows are attracted by high expected returns in the resource sector, and decrease in the non-resource sector. The likelihood of an overall negative effect is high and referred to as a "*FDI-resource curse*" (Asiedu, 2013).[9] Surprisingly, very few studies back this hypothesis. Poelhekke and van der Ploeg (2013) show, for Dutch FDI into 183 host countries, that FDI flows to the natural-resource sector do not compensate for the disinvestments in the non-resource sector. Similar results are reached by Rogmans and Ebbers (2013) for 16 Middle East and North Africa (MENA) countries and by Mina (2007) for Gulf Cooperation Council countries. Nonetheless, the

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[9]Other indirect effects are also liable to deter FDI. For instance, macroeconomic instability could increase since the volatility of the exchange rate is expected to rise due to the booms and busts that characterise natural-resource prices (Sachs and Warner, 2001) and due to the lower trade diversification makes a country more vulnerable to external shocks. This adverse context may deter FDI. Asiedu and Lien (2011) also argue that FDI in natural resources is expected to stagger after the initial phase since less capital is needed to continue the exploration that is needed to start it.

majority of studies focusing on small datasets acknowledge that the availability of natural resources has a positive and significant effect on FDI in developing countries.[10] However, for larger datasets the evidence is scant and mixed. Aleksynska and Havrylchyk (2013) find a non-significant effect of resources on bilateral FDI flows.[11] Asiedu and Lien (2011), Asiedu (2013) and Blonigen and Piger (2014) conclude that natural resources have an adverse effect on FDI.[12] In contrast, Teixeira et al. (2017) find that natural resources foster inward FDI.[13]

Poelhekke and van der Ploeg (2013) address the question of the role of quality institutions as a mediator in the natural resources-FDI nexus but reject the hypothesis of a significant influence. In turn, Asiedu (2013) confirms that institutional quality may be able to reduce, but not fully cancel, the effect of natural resources on FDI. Gossel (2017) demonstrates that FDI is positively moderated by the accumulation of democratic capital, and shows that the association between FDI and democracy is not affected by resource dependence.

3 Methodology and data overview

3.1 Empirical model

Unlike most of the studies reviewed, our empirical model explores the bilateral dimension of FDI. As demonstrated by Blonigen and Piger (2014), traditional gravity variables are better candidates for explaining FDI activity than merely host-country

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[10]See for instance Anyanwu (2012) for 53 African countries, Asiedu (2006) for 22 countries in Sub-Saharan Africa (SSA), Aziz and Mishra (2016) for 16 Arab economies, Mina (2012) for 8 MENA countries, Mohamed and Sidiropoulos (2010) using a panel of 36 countries (12 MENA countries and other 24 developing countries), Moon (2015) for 108 autocratic countries, Rodríguez-Pose and Cols (2017) for 22 Sub-Saharan African countries and Sichei and Kinyondo (2012) for 45 African countries.

[11]Their dataset includes 60 developing and 22 developed economies between 1996 and 2007.

[12]Asiedu and Lien (2011) study a sample of 112 developing countries over the period 1982–2007, Asiedu (2013) focuses on 99 developing countries over the period 1984-2011 and Blonigen and Piger (2014) analyses bilateral FDI stocks, foreign affiliates sales and mergers and acquisitions for different country samples and periods.

[13]The authors study 125 developing countries during the 1995-2012 period.

characteristics. Another decision regards the choice of the dependent variable. Most studies focus on the amount of FDI flows or FDI stocks, measuring therefore the intensive margin of FDI. Very few are able to measure the extensive margin of FDI since they work with macro data. Indeed, there are several advantages to working on the number of projects rather than flows. First, due to the existence of fixed FDI costs, selection of firms into FDI is limited (Helpman et al., 2004), in analogy with the export behaviour underlined by Melitz (2003). Hence, as long as the institutional framework reduces or increases these sunk investing costs, the quality of institutions is more likely to influence the preliminary decision to develop new projects of investments (Javorcik and Wei, 2009) than the invested amount. Second, flows are sometimes dependent on one or two large investment projects, especially in relatively small countries, so relying on the amount of FDI may be misleading (Bénassy-Quéré et al., 2007; Garrett, 2016). Following these arguments, we estimate the effect of several indicators of host-country institutions on the number of bilateral greenfield investment projects, using a standard gravity equation.

The gravity model was first developed to study the determinants of bilateral trade flows (for an overview see Anderson (2011) and Head and Mayer (2014)). Following trade developments, studies such as Head and Ries (2008), Kleinert and Toubal (2010) and De Sousa and Lochard (2011) have developed theoretical models that result in empirical equations for the case of FDI. To address the FDI-institutions nexus, our baseline specification extends that used by Paniagua and Sapena (2014):

$$FDI_{ijt} = e^{\left(\begin{array}{c} \beta_1 ln(GDP_{it} x GDP_{jt}) + \beta_2 ln(Distance_{ij}) + \beta_3 BORDER_{ij} \\ +\beta_4 LANGUAGE_{ij} + \beta_5 COLONY_{ij} + \beta_6 SMCNTRY_{ij} + \beta_7 Religion_{ij} \\ +\beta_8 FTA_{ijt} + \beta_9 BIT_{ijt} + \beta_{10} Inst_{jt} + \beta_{11} Inst_{jt} x COUNTRY_j + FE \end{array}\right)} + \epsilon_{ijt} \qquad (1)$$

where i, j and t stand respectively for the source, the host country and the year. FDI_{ijt} is the number of greenfield projects undertaken by firms from country i in the host country j, in year t; GDP_{it} and GDP_{jt} are the GDPs of home and host

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countries, respectively; $Distance_{ij}$ is the distance in kilometres between country capitals; $BORDER_{ij}$ is a dummy that indicates whether a pair of countries share a common border; $LANGUAGE_{ij}$ takes positive value if both countries share the same official language; $COLONY_{ij}$ is set to one if the two countries have ever had a colonial link; $Religion_{ij}$ is a composite index that measures the religious affinity between country pairs with values from zero to one; $SMCNTRY_{ij}$ indicates if both countries were part of the same country in the past; FTA_{ijt} is a dummy that indicates whether both countries have a free trade agreement in force; BIT_{ijt} is a dummy that takes a value of one if the country pair has a bilateral investment treaty in force. Next, $Inst_{jt}$ stands for institutions, $COUNTRY$ for dummies that represent developing countries (LDC_j) or developing countries that are significant oil producers ($OLDC_j$). Lastly, FE stands for the host and home country, and year fixed effects (respectively, λ_i, λ_j, λ_t) and ϵ_{ijt} represents the stochastic error term. Following Silva and Tenreyro (2006), we account for null flows in bilateral FDI data by using a Poisson Pseudo-Maximum Likelihood estimator.

Additionally, equation 1 is modified to address the impact of oil production on FDI (β_{10}) and how different levels of oil production alter the FDI-institutions nexus (β_{12}):

$$FDI_{ijt} = e^{\left(\begin{array}{c} \beta_1 ln(GDP_{it}xGDP_{jt}) + \beta_2 ln(Distance_{ij}) + \beta_3 BORDER_{ij} \\ +\beta_4 LANGUAGE_{ij} + \beta_5 COLONY_{ij} + \beta_6 SMCNTRY_{ij} + \beta_7 Religion_{ij} \\ +\beta_8 FTA_{ijt} + \beta_9 BIT_{ijt} + \beta_{10} Oil_{jt} + \beta_{11} Inst_{jt} + \beta_{12} Oil_{jt}xInst_{jt} + FE \end{array}\right)} + \epsilon_{ijt} \qquad (2)$$

where Oil_{jt} stands for either the share of oil rents over GDP ($OilRents_{jt}$) or the share of oil production of world output ($OilShare_{jt}$). Due to the high correlation between institutional variables (see Table 4), namely rule of law, lack of corruption, political stability and democracy, they are estimated separately.

3.2 Data overview

Our analysis covers 182 countries during 2003-2012. Statistics for the variables used are available in Table 1. The countries included in the sample are reported in Table A in the appendix. We classify them as developing countries following UNCTAD's classification[14], and in regions in accordance with the World Bank. Data for bilateral greenfield investments are gathered from FDI Markets. GDP (in constant year 2000 USD) is retrieved from the World Bank. Distance, common language, colony, and border are from the CEPII dataset and religious affinity is obtained from the CIA World Factbook. BIT variable is constructed based on UNCTAD's International Investment Agreements database and FTA comes from Head et al. (2010).

To measure institutional quality, we consider three different indices: *rule of law*, *lack of corruption* and *political stability* from the World Bank's Worldwide Governance Indicators. The choice of the source of these indicators is based on their wide country coverage and use in previous works (e.g. Aleksynska and Havrylchyk, 2013; Amighini et al., 2013; Buchanan et al., 2012; Javorcik and Wei, 2009). These variables range approximately from -2.5 to +2.5 (Kaufmann et al., 2011). To facilitate interpretation in the econometric analysis, we convert them into non-negative values equal or larger than 1. Higher values suggest respectively better rule of law, less corruption and a more stable political environment.

Regarding countries' political systems, we use the *Polity2* index from the Polity IV dataset retrieved from Systemic Peace (see Marshall et al., 2017). The *Polity2* index, which we name Democracy, ranges from -10 (full autocracy) to 10 (full democracy).[15] Democracy and autocracy are measured independently without sharing categories in common. The degree of both are based on how a country scores in: competitiveness of executive recruitment, openness of executive recruitment, constraint on chief executives and competitiveness of political participation. Neverthe-

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[14]We also classify transition countries as developing countries.

[15]Again, for the econometric analysis this variable is re-scaled so that it takes values between 0 and 20, 0 representing a full autocracy, and 20 a full democracy.

less, the items that define these variables are different. For instance, when measuring the openness of executive recruitment, a democratic country will score one point if elections are held, or one point as autocracy if chief executives are determined by hereditary succession. The *Polity2* score is computed by subtracting the score obtained by the index autocracy score from the democracy score.[16] We consider this measure as appropriate since it is based on objective information and because the political system of a country is not a one-dimensional characteristic, but probably includes several dimensions (Adam and Filippaios, 2007). Moreover, the *Polity2* index has been extensively used in the literature (e.g. Asiedu and Lien, 2011; Gossel, 2017; Li and Resnick, 2003).

To identify the developing countries in which oil production represents a significant share of domestic economy, we use the indicator named Oil Rents from the World Bank. It represents the difference between the value of crude oil production at world prices and total costs of production over GDP. We consider oil production as relevant for a country when Oil Rents represent at least 7.65% of the country's GDP in at least one year; this threshold stands for the top quintile of countries in our sample. In this way, our sample is divided into countries in which oil production does have a relevant role throughout our period, and those in which its relevance is anecdotic and limited. Finally, countries' share of World oil production is measured by the figures for oil-barrel production from Thomson Reuters Eikon.

(Insert Table 1 here)

3.3   Oil production

As a prelude to the econometric analysis, we dive into the distribution of oil production at world level, FDI performance and countries' institutional characteristics. Figure 1 presents the correlation between countries' oil rents over GDP and their

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[16] *Polity2* index enables us to take into account intermediate situations between full autocracy and democracy. For instance, according to the classification used by Systemic Peace, Saudi Arabia is an autocracy, Egypt is a closed anocracy, Algeria is an open anocracy, Lebanon a democracy and Israel a full democracy. For further insight see Marshall et al. (2017).

share of world oil-barrel production. As can be gathered, a significant weight of oil rents over GDP does not imply that a given country is a major oil supplier at the world level, as this occurs for countries such as the Republic of the Congo (COG), Chad (TCD), Gabon (GAB), Ecuador (ECU) or Yemen (YEM). Conversely, some countries have a relevant contribution to World output while oil production represents a low share of their GDP, as is the case of the United States (USA), China (CHN), Canada (CAN), Brazil (BRA), Mexico (MEX) and India (IND). Additionally, there are countries in which oil production represents a significant share both of their domestic economy and of World output, such as Saudi Arabia (SAU), Russia (RUS), Iraq (IRQ), Iran (IRN), Algeria (DZA) and Libya (LBY). Moreover, it is worth highlighting that the top quintile of countries in terms of oil rents over GDP, except for Norway, are developing countries, while several advanced economies are present among the main world oil producers.

(Insert Figure 1 here)

Turning to the link between inward FDI and oil production, the correlation is not clear. The weight of FDI and oil production by region is reported in Table 2, while Table 4 shows the correlation between greenfield investment projects and oil production. Within regions, there is no clear pattern showing that an oil producer would attract more or less inward FDI than their neighbours, except for MENA oil producers, which represent a clear case of oil curse on FDI: on average, oil rents represent 32% of their domestic economic activity and are responsible for 35.31% of the world's oil-barrel production. In parallel, they clearly score low in terms of inward FDI, which represents less than 3% of their GDP, one of the lowest shares among developing countries. These countries also have one of the lowest ratios of foreign firms among large firms, while having a high presence of SOEs (see Table 2). In line with the natural-resource curse on FDI, for the whole sample the number of greenfield investment projects a country receives is negatively correlated with the relevance of Oil rents. In addition, within regions oil producers seem to have lower

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institutional quality and be less democratic (Table 3). Accordingly, for the whole sample, Table 4 shows a negative and significant correlation between institutional quality (or democracy) with Oil rents (or Oil share). In contrast, not in line with the natural-resource curse on FDI, the number of greenfield projects is positively correlated with Oil share.

(Insert Tables 2, 3 and 4 here)

4   Results

4.1   The FDI-institutions nexus

Results from our baseline model are reported in Table 5. As is usual in the literature, the gravity equation performs well, explaining more than 80% of the variation of the dependent variables. The results for distance and FTA support the hypothesis of complementarity between trade and FDI. In addition, the lack of significance of the combined home and host countries' economic sizes indicates that greenfield investment projects are driven by fragmentation of production[17] (Kleinert and Toubal, 2010). Likewise, sharing a common border deters FDI, implying that MNEs may prefer to serve neighbour countries through exports. As expected, sharing a language, religious affinities and historical ties have a positive impact on the number of greenfield projects consistent with a reduction of sunk costs. Finally, BIT lacks significance. This finding is not surprising, as previous studies indicate that the significance of BIT depends on the quality of interstate relations and host countries' institutional quality (Desbordes and Vicard, 2009), the level of development of signing countries (Berger et al., 2011), intensity of bilateral FDI flows (Paniagua et al., 2015) or the sector of investment (Colen et al., 2016).

Results concerning the impact of institutions on the number of greenfield in-

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[17]The factor-proportion theory predicts the host country's demand to increase the likelihood of production fragmentation, while for the home countries the opposite is expected.

vestment projects are reported in Table 5, in which columns 1, 3, 5 and 7 distinguish the impact of institutions by developed ($Inst_{jt}$) and developing countries ($Inst_{jt}xLDC_j$). The results show a positive impact of the compliance to rule of law and of the reduction of corruption on the capacity to attract new projects in developing countries, thus providing support for the "*grabbing hand*" hypothesis. On the other hand, for developed countries, rule of law does not play a relevant role and reducing corruption is expected to decrease their capacity for attracting new greenfield projects. This last finding supports the "*helping hand*" hypothesis only for advanced economies, in contrast to Adam and Filippaios (2007) and Egger and Winner (2005), who find this holds true independently of the level of development.

Therefore, political stability appears to be crucial to increase the number of foreign projects for both group of countries. Political instability, that is, politically-motivated violence and terrorism, might not be easily compensated for by countries' level of economic development. Above all, political instability appears as the major worry for foreign investors considering whether to set up new firms abroad.

In contrast, the degree of democracy enhances countries' capacity to attract new projects, but to a lower extent in developing countries. As indicated previously, most studies tend to conclude that basic democratic rights are positively associated with FDI inflows. However, some authors, like Li and Resnick (2003), reach the opposite conclusion.

Yet, unlike most studies focusing on aggregate FDI, we explain bilateral projects. This enables us to control for country pair characteristics such as cultural and geographical and economic distance. These differences might explain part of the divergence with some of the findings reported by previous studies that use unilateral FDI flows (e.g. Adam and Filippaios, 2007; Egger and Winner, 2005; Li and Resnick, 2003) and the few studies using bilateral data for FDI to study the nexus between institutions and FDI intensive margin, which usually find a less significant effect (Berden et al., 2014; Blonigen and Piger, 2014; Paniagua and Sapena, 2014), or a

positive effect of the quality of institutions when they focus on a smaller country sample.[18]

(Insert Table 5 here)

4.1.1 Do institutions have a different impact in OIL-producing countries than in other LDC?

The impacts institutions may have on significant oil producers within developing countries ($Inst_{jt}xOLDC_j$) are reported in columns 2, 4, 6 and 8 of Table 5. Reducing corruption would attract new greenfield projects in all LDC regardless of whether they produce oil or not. These results echo those from Javorcik and Wei (2009), which show that the level of corruption reduces a country's probability of receiving FDI, or the results of Couttenier and Toubal (2017), who find that corruption affects new entrants in a more obvious negative way than incumbent ones. Additionally, these estimates are in line with Asiedu (2013), who reports a positive interaction between natural resources and institutional quality when explaining FDI. Our findings confirm that corruption in oil-producing developing countries is perceived as a "*grabbing hand*" on new foreign projects rather than a "*helping hand*".

Compliance to rule of law does not really matter on average for new projects in oil-producing countries, unlike for other developing countries. This finding echoes that reported by Ali et al. (2010) for property rights. Likewise, the overall positive effect of political stability in oil countries is lower than for other countries. This lower impact might be supporting the view of a higher tolerance by MNEs to instability in countries abundant in natural resources (Amighini et al., 2013; Buckley et al., 2007; Burger et al., 2015; Yang et al., 2018).

The impact of democracy is positive and larger for oil producers than for other countries, as in Desbordes and Verardi (2017), but unlike Asiedu and Lien (2011). Again, a possible explanation for this divergence could come from the fact that

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[18]See for example Bellos and Subasat (2012), Daude and Stein (2007), Disdier and Mayer (2004) and Wei (2000).

Asiedu and Lien (2011) focus on net inflows FDI, while we perform an analysis of new greenfield projects, on a larger sample and taking into account bilateral relationships.

4.2 Oil production and institutions

In this section, we further inquire into the role of natural resources in the Institution-FDI relationship. As we have already mentioned, Table 5 reports the average expected impact of institutions for significant oil producers. We now look into how different levels of oil production affect FDI and alter the FDI-Institutions nexus. To this end, we estimate equation (2). Table 6 shows the impact of oil rents over GDP ($OilRents_{jt}$) on FDI, the expected impact of institutions ($Inst_{jt}$) and the impact of the combined effect of institutions and oil rents ($OilRents_{jt}xInst_{jt}$), which respectively have associated coefficients β_{10}, β_{11} and β_{12}. Table 7 repeats the same analysis but considering countries' share of World oil-barrel production ($OilShare_{jt}$).

4.2.1 Is there an FDI-resource curse?

Both sets of results support the hypothesis of an "*oil curse*" on FDI's extensive margin: that is, the higher the oil production, the lower the number of greenfield investment projects. Again, our results are in line with those of Asiedu and Lien (2011), Asiedu (2013) and Poelhekke and van der Ploeg (2013), who claim the existence of an oil curse on the capacity of attracting FDI. According to the estimates, one percentage point increase in the share of oil rents over GDP can reduce the number of projects by nearly 3% on average (Table 6), while in the case of the world's oil-barrel production the drop would be of 34% (Table 7).

(Insert Tables 6 and 7 here)

4.2.2 Does the presence of oil undermine the effect of institutions on FDI?

Among all the institutional indicators, independently of the level of production (i.e. $\hat{\beta}_{11}$), only political stability would improve the extensive margin while rule of law and lack of corruption have no effect (see tables 6 and 7). Then, democracy has only a significant and positive impact in Table 6. Alternatively, we register positive and significant coefficients for $Inst_{jt}xoil_{jt}$ ($\hat{\beta}_{12}$), indicating that the importance of natural resources magnifies the impact of the institution index on FDI. The exception is coefficient $\hat{\beta}_{12}$ associated with $Democracy_{jt}xOilRents_{jt}$ in Table 6, which is null and non-significant. Thus, these results confirm those given above indicating that institutions would on average have a positive impact for countries that are significant oil producers. In addition, they show that the gains from improvements in institutional quality, and to a lesser extent democracy, are positively conditioned by countries' oil production.

These results contradict those of Asiedu and Lien (2011) who acknowledge that the relationship between FDI and democracy depends negatively on the "*size*" of natural resources measured by the share of fuel and minerals in total merchandise exports. However, the results are in line with Asiedu (2013) for institutional quality.

4.2.3 How large are the benefits to be obtained from better institutions?

As in Asiedu and Lien (2011), we assess the magnitude of the benefits, in terms of new greenfield investments, that could be expected from an improvement in institutions. Based on equation 2[19], we calculate the percentage change in the number of greenfield projects as a consequence of a one-point change in the institutional

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[19]Although equation 2 is a non-linear equation, its interpretation is equivalent to a log-linearized equation (Silva and Tenreyro, 2006).

indicator ($Inst$) given the average level of oil production ($OilRents$ or $OilShare$):

$$\frac{\partial ln(FDI)}{\partial Inst} = \hat{\beta}_{11} + \hat{\beta}_{12}\overline{Oil} \tag{3}$$

where ($\overline{Oil}$) is the average level of oil rents over GDP or the share of world oil-barrel production, during the period 2003-2012.

Tables 8 and 9 illustrate the expected average change in the number of greenfield projects for countries belonging to different percentiles according to their oil production (Oil rents and oil share respectively). The insights provided by the results are twofold. First, oil producers belonging to the top percentiles in terms of oil rents (Table 8) would greatly benefit from improving rule of law and reducing corruption. For a country like Azerbaijan, a one-point improvement in the rule of law and lack of corruption indices would augment the number of greenfield projects by 65% and 46% respectively. This would mean rallying to a level similar to that registered by Croatia. However, the gains from reducing corruption are not clear for all countries. For those countries in which oil rents are below the sample's median (1.35%), reducing corruption can deter new greenfield projects. The gains to be obtained from advancement towards political stability are also substantial while lower than for the above-mentioned indicators. For a country that does not produce oil (e.g. Paraguay), a progress of one point would translate into an increment of 24% in the number of projects, and similar gains are expected for those countries close to the sample's median. Alternatively, for a country like Syria, the gains would be of 35%.

(Insert Table 8 here)

Second, countries in which oil rents are not particularly relevant in their economy but represent a significant share of the world's production would also benefit to a greater extent from institutional reforms and democratization. This is the case with Brazil, whose oil rents on average represented 1.86% of its GDP (near the median, as indicated in Table 8), but it is among the world's top producers (see

Table 9). In this case, a one-point improvement in rule of law, political stability and democracy would increase the number of projects by almost 36%, 27% and 4.35% respectively. It is interesting to highlight that reducing corruption only appears to favour inward greenfield investment in those countries that belong to the top 10% of world producers.

(Insert Table 9 here)

4.2.4 Can institutional improvements and democratization cancel out the oil curse on FDI?

Yes, *ceteris paribus*, even if oil production overall hampers FDI, these barriers could be overcome through institutional reforms. As in Asiedu (2013), we calculate the average level of institutional quality and democratization necessary to cancel out the oil curse on FDI. Based on equation 2, this threshold is computed as follows:

$$\frac{\partial ln(FDI)}{\partial oil} = \hat{\beta}_{10} + \hat{\beta}_{12}\overline{Inst}_{threshold} = 0; \overline{Inst}_{threshold} = -\frac{\hat{\beta}_{10}}{\hat{\beta}_{12}} \qquad (4)$$

Results are reported in Table 10 where examples are also provided. The institutional improvements required to cancel out the negative impact oil dependence has on FDI would imply attaining levels of other developing countries such as the Republic of Macedonia, Georgia or China. The progress required is attainable; for countries like Algeria, Nigeria and Russia an increase inferior to one point in the indices would be sufficient to ensure that oil dependence does not hamper FDI. In addition, based on the estimates (equation 4), these institutional reforms could boost new greenfield projects in Algeria, Nigeria and Russia by 14.32%, 23.88% and 15.56%, respectively.

Nevertheless, counterbalancing the oil curse seems more challenging for the main players in the world oil market. To subdue this curse, institutional quality should

catch up with developed countries such as USA, Malta or Finland, while democratization should reach a level similar to that of Thailand. This last reform is particularly relevant for the MENA region which contributes to more than one third of the world's oil-barrel production, as anocracies and autocracies are the political systems predominant among the oil producers in the region. It is also worth highlighting that developing countries with a large contribution to world oil production, but a low relevance of oil rents in their economy (e.g. Brazil, China), should also seek to improve institutional quality and the level of democracy to overcome the oil curse on FDI.

(Insert Table 10 here)

4.3 Robustness analysis

Results from the robustness analysis are available in the on-line appendix. To conserve space, we only comment on the key estimates from equation 2, namely the coefficients of *OilRents* or *OilShare*, Institutions and their interaction (β_{10}, β_{11} and β_{12} respectively).

4.3.1 Greenfield investment volume

As regards the intensive margin (Tables A.3 and A.4), we do not find evidence supporting the hypothesis that oil production affects the amount of greenfield investments: the coefficient is only significant and negative in one of the 8 estimated models. In terms of institutions, only democracy appears to have a positive significant impact, while the remaining indicators and all the interactions are not significant.

4.3.2 Alternative measures of natural resources

Following Asiedu and Lien (2011) and Asiedu (2013), we consider the share of fuel in merchandise exports as an alternative measure of oil abundance. A natural resource curse on the extensive margin of greenfield investments is confirmed in two out of four

models (Table A.5). Results buttress our previous results obtained with *OilRents* or *OilShare* showing that natural resources magnify the impact of institutions on FDI. Regarding the intensive margin (Table A.6), the positive effect of political stability would be undermined by fuel exports while the positive effects of democracy would be amplified. Finally, we also estimate equation 3 using the absolute number of oil-barrel production (Tables A.7 and A.8). Our conclusions remain basically unchanged.

5   Conclusions

The present article, by estimating a gravity equation, addresses how oil abundance, institutions and the interaction between both affect countries' capacity to attract greenfield investment. To this end, we exploit a greenfield investment bilateral database which covers 182 countries during the period 2003-2012. We use alternative measures of oil production to take into account the dependence of the host on oil production and the dependence of the world on the host's production. Moreover, we tackle institutions in a broad manner by considering rule of law, corruption, political stability and democracy.

According to our results, particularly for developing countries and after controlling for a comprehensive set of bilateral economic determinants and transaction costs, institutional quality and democracy appear to be a crucial dimension in defining a country's capacity for attracting new greenfield projects. In addition, democracy attracts larger amounts of investments.

Regarding a possible "*oil curse*" on FDI, our results confirm that overall, oil-abundant countries attract fewer greenfield projects than others. In addition, the evidence obtained suggests that countries with better governance and more democracy would attract more greenfield investments, with this effect being larger for countries highly dependent on oil and for main players in the world oil market.

Thus, for oil producers, institutional reforms can significantly improve their capacity for attracting new investment projects and may raise the opportunity to diversify their economy, reducing the likelihood of escaping from the oil curse on FDI.

Our conjecture for this apparently puzzling result is that when national production is heavily dependent on oil, the government might well be heavily dependent on these resources but may lack the capital to exploit these resources, which makes governments more willing to attract foreign projects. For these countries with high economic dependence on oil but with the lack of capital to exploit it, institutional reforms are likely to increase their capacity to attract foreign capital. When the host-country production represents a significant share of the world's output, the host government is empowered, allowing it to sustain closed-economy policies combined with rent-seeking behaviour by the domestic oligarchy and does not need foreign investors. Rogmans and Ebbers (2013) argue that countries with large reserves of oil and gas have enough financial resources and foreign currency available to finance their own economic development. They may prefer to contract expertise services rather than incentivise FDI. Oil-rich countries have typically not actively encouraged FDI and have stipulated local ownership requirements in many, if not all, industry sectors (Lopez-Claros and Schwab, 2005). In this way, similar to the conclusions reached by Méon and Sekkat (2004) for the MENA region or Guerin and Manzocchi (2009) in the analysis of democracy, the overall improvement of institutional quality and democracy favours countries' integration into the world economy. For those countries that enjoy an oligopolistic position in oil production, significant institutional reforms would imply withdrawing these barriers to FDI.

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Figures

Figure 1: Oil relevance at the domestic and world level
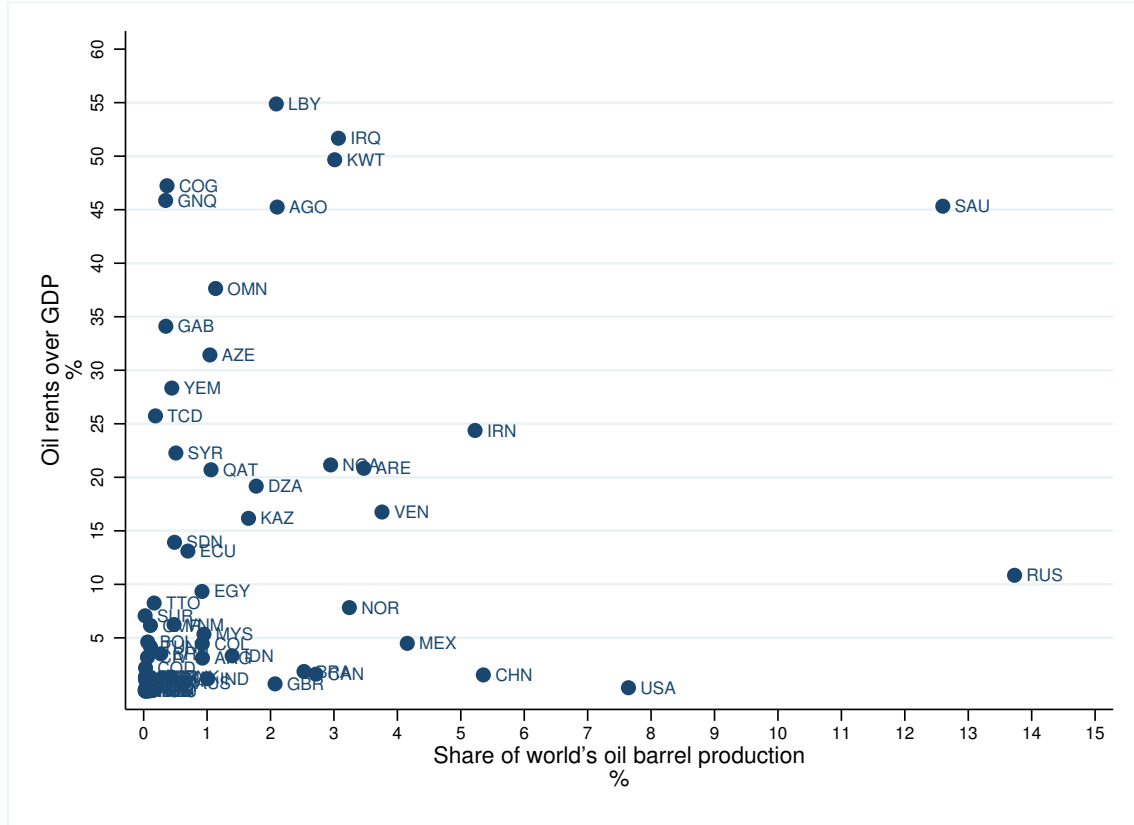
Note: Oil barrel production is retrieved from Thomson Reuters Eikon and oil rents over GDP from World Bank Development Indicators. Average for the period 2003-2012. Countries that produce more than 0.023% of the world's oil barrels, country codes are available in Table A from the appendix. Authors' own calculations.

Tables

Table 1: Descriptive statistics

	Mean	Std. Dev.	Min	Max
FDI	1.77	8.26	0	319
$ln(GDP_{it} x GDP_{jt})$	27.09	1.51	20.12	30.40
$ln(Distance)$	8.31	1.00	4.09	9.88
$BORDER$	0.06	0.24	0	1
$LANGUAGE$	0.16	0.37	0	1
$COLONY$	0.05	0.21	0	1
$SMCNTRY$	0.02	0.14	0	1
$Religion$	0.33	0.32	0	1
FTA	0.26	0.44	0	1
BIT	0.42	0.49	0	1
$OilRents$	5.67	13.61	0	343.74
$OilShare$	1.15	2.54	0	14.49
$Ruleoflaw$	3.85	1.01	1.71	5.67
$Lackofcorruption$	3.12	1.06	1.11	5.48
$Politicalstability$	4.28	0.94	1.14	5.99
$Democracy$	14.64	6.50	0	20

Note: authors' own calculations.

Table 2: FDI and Oil production in developing countries

	Net Inward FDI (% GDP)	Foreign owned firms	Percentage of SOEs	Oil rents (% GDP)	Oil barrels over World's output
MENA (Oil)	2.44%	7.77%	16.35%	32.07%	35.31%
MENA (Non oil)	7.37%	14.76%	9.07%	1.53%	0.38%
Sub Sahara Africa (Oil)	6.18%	23.24%	10.65%	28.04%	6.90%
Sub Sahara Africa (Non oil)	5.34%	29.64%	7.78%	0.43%	0.14%
Latin America (Oil)	1.30%	21.21%	9.03%	11.30%	4.64%
Latin America (Non oil)	7.69%	17.24%	7.02%	1.21%	8.74%
Central Asia (Oil)	10.70%	21.14%	22.78%	18.64%	16.43%
Central Asia (Non oil)	5.40%	10.09%	5.86%	0.34%	0.06%
East Asia and Pacific (Oil)	2.99%	7.98%	7.80%	12.47%	0.70%
East Asia and Pacific (Non oil)	7.76%	12.54%	10.02%	1.40%	8.06%
South Asia	2.15%	7.38%	5.02%	0.34%	1.11%
Europe	7.09%	15.88%	25.26%	0.66%	0.17%

Note: In this table the sample is restricted to developing countries only. Foreign-owned firms and SOEs are retrieved from ORBIS 29/06/2017 update for large firms only. Oil-barrel production is retrieved from Thomson Reuters Eikon and the remaining indicators from World Bank Development Indicators. South Asia and Europe are not divided into oil and non-oil producers, since there are no significant oil producers in our sample located in these regions. Authors' own calculations.

Table 3: Institutions in developing countries

	Rule of law	Lack of corruption	Political stability	Democracy
MENA (Oil)	-0.29	-0.28	-0.47	-5.65
MENA (Non oil)	-0.09	-0.17	-0.44	-1.88
Sub Sahara Africa (Oil)	-1.15	-1.11	-0.85	-2.33
Sub Sahara Africa (Non oil)	-0.64	-0.52	-0.46	3.28
Latin America (Oil)	-0.72	-0.56	-0.48	5.65
Latin America (Non oil)	-0.08	0.12	0.07	7.17
Central Asia (Oil)	-0.99	-1.08	-0.33	-4.3
Central Asia (Non oil)	-0.68	-0.69	-0.75	2.57
East Asia and Pacific (Oil)	-0.29	-0.43	0.22	-1.45
East Asia and Pacific (Non oil)	0.02	-0.08	-0.08	2.43
South Asia	-0.51	-0.59	-1.14	3.05
Europe	-0.58	-0.49	-0.22	5.35

Note: In this table the sample is restricted to developing countries only. Developing countries from South Asia and Europe are not divided into oil and non-oil producers, since there are no significant oil producers in our sample located in these regions. Authors' own calculations.

Table 4: Correlation matrix

	Greenfield Investment projects	Oil rents	Oil share	Rule of law	Lack of corruption	Political stability
Oil rents	-0.119***	1				
Oil share	0.397***	0.374***	1			
Rule of law	0.278***	-0.271***	-0.043*	1		
Lack of corruption	0.242***	-0.277***	-0.048*	0.953***	1	
Political stability	0.095***	-0.149***	-0.113***	0.785***	0.757***	1
Democracy	0.118***	-0.549***	-0.208***	0.464***	0.434***	0.288***

Note: Authors' own calculation.

Table 5: The FDI-institution nexus

FDI	Rule of law		Lack of corruption		Political stability		Democracy	
Extensive margin	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$ln(GDP_{it}xGDP_{jt})$	-0.089	-0.078	-0.017	-0.078	-0.049	-0.034	-0.089	-0.082
	(0.18)	(0.18)	(0.18)	(0.18)	(0.17)	(0.17)	(0.18)	(0.18)
$ln(Distance_{ij})$	-0.389***	-0.389***	-0.388***	-0.389***	-0.388***	-0.388***	-0.390***	-0.390***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
$BORDER_{ij}$	-0.135*	-0.135*	-0.135*	-0.135*	-0.135*	-0.135*	-0.128	-0.128
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
$LANGUAGE_{ij}$	0.508***	0.508***	0.508***	0.508***	0.508***	0.508***	0.502***	0.502***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$COLONY_{ij}$	0.596***	0.596***	0.596***	0.595***	0.596***	0.595***	0.586***	0.586***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
$SMCNTRY_{ij}$	0.566***	0.566***	0.566***	0.566***	0.566***	0.566***	0.568***	0.567***
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.16)	(0.16)
$Religion_{ij}$	0.389***	0.389***	0.389***	0.388***	0.389***	0.389***	0.410***	0.410***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
FTA_{ijt}	0.195***	0.195***	0.195***	0.192***	0.196***	0.196***	0.189***	0.188***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
BIT_{ijt}	-0.029	-0.028	-0.029	-0.029	-0.027	-0.027	-0.03	-0.031
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$Inst_{jt}$	-0.261	0.117	-0.290***	-0.073	0.207**	0.295***	0.112**	0.012
	(0.19)	(0.14)	(0.11)	(0.09)	(0.10)	(0.06)	(0.05)	(0.01)
$Inst_{jt}xLDC_j$	0.576**		0.659***		0.086		-0.090*	
	(0.26)		(0.15)		(0.11)		(0.05)	
$Inst_{jt}xOLDC_j$		0.296		0.645***		-0.242**		0.078***
		(0.25)		(0.16)		(0.12)		(0.03)
Fixed Effects	$\lambda_i, \lambda_j, \lambda_t$							
Observations	39151	39151	39151	39151	39118	39118	37163	37163
R^2	0.844	0.845	0.846	0.845	0.847	0.846	0.845	0.845

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Institutions and oil rents over GDP

FDI	Rule of law	Lack of corruption	Political stability	Democracy
Extensive margin	(1)	(2)	(3)	(4)
$OilRents_{jt}$	-0.056***	-0.042***	-0.019*	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)
$Inst_{jt}$	0.116	-0.038	0.243***	0.022***
	(0.13)	(0.08)	(0.06)	(0.01)
$OilRents_{jt}xInst_{jt}$	0.017***	0.016***	0.005**	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Fixed effects	$\lambda_i, \lambda_j, \lambda_t$			
Control variables	YES	YES	YES	YES
Observations	36037	36037	36004	34920
R2	0.846	0.846	0.848	0.847

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Coefficients of control variables displayed in the appendix (Table A.1)

Table 7: Institutions and oil barrels production share of world's output

FDI	Rule of law	Lack of corruption	Political stability	Democracy
Extensive margin	(1)	(2)	(3)	(4)
$OilShare_jt$	-0.722***	-0.143**	-0.218**	-0.274***
	(0.13)	(0.07)	(0.09)	(0.06)
$Inst_{jt}$	-0.01	-0.094	0.180***	-0.002
	(0.13)	(0.09)	(0.05)	(0.01)
$OilShare_{jt}xInst_{jt}$	0.147***	0.037***	0.037**	0.018***
	(0.03)	(0.01)	(0.02)	(0.00)
Fixed effects	$\lambda_i, \lambda_j, \lambda_t$			
Control variables	YES	YES	YES	YES
Observations	35632	35878	35877	34017
R2	0.846	0.847	0.850	0.850

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Coefficients of control variables displayed in the appendix (Table A.2)

Table 8: Impact of institutional reform given the level of oil rents over GDP

Percentile of Oil rents	Oil rents	As in	Rule of law	Lack of corruption	Political stability
10	0.01%	Jordan	11.62%	-3.78%	24.31%
25	0.17%	Philippines	11.90%	-3.52%	24.39%
50	1.35%	Myanmar (Burma)	13.90%	-1.63%	24.98%
75	7.07%	Suriname	23.61%	7.50%	27.83%
90	22.27%	Syria	49.46%	31.83%	35.43%
95	31.43%	Azerbaijan	65.04%	46.49%	40.02%
100	45.86%	Saudi Arabia	89.56%	69.58%	47.23%
Average	8.74%	Papua New Guinea	26.46%	10.18%	28.67%

Note: Authors' own calculations, based on estimates from Table 6 and the average level of oil rents over GDP during the period 2003-2012 for those countries in which oil rents are higher than 0%.

Table 9: Impact of institutional reform given the level of world's oil production share

Percentile of Oil share	Oil share	As in	Rule of law	Lack of corruption	Political stability	Democracy
10	0.001%	Bangladesh	-0.98%	-9.39%	18.01%	-0.20%
25	0.02%	South Africa	-0.68%	-9.32%	18.08%	-0.16%
50	0.14%	Romania	1.00%	-8.90%	18.50%	0.05%
75	1.04%	Qatar	14.35%	-5.54%	21.86%	1.68%
90	2.53%	Brazil	36.15%	-0.05%	27.35%	4.35%
95	3.24%	Iraq	46.67%	2.60%	30.00%	5.64%
100	5.22%	Iran	75.80%	9.93%	37.33%	9.20%
Average	1.12%	Oman	15.52%	-5.24%	22.16%	1.82%

Authors' own calculations, based on estimates from Table 7 and the average share of world oil-barrel production during the period 2003-2012 for those countries in which oil-barrel share is higher than 0%.

Table 10: Impact of institutional reform given the level of oil production

	Level required to cancel out the oil curse	As in	Country with lower institutional quality	Improvement in institution required to cancel out the oil curse
Oil GDP				
Rule of law	3.29	Republic of Macedonia	Algeria	0.32
Lack of corruption	2.63	Georgia	Nigeria	0.80
Political stability	3.80	China	Russia	0.49
Oil barrels share of world's production				
Rule of law	5.24	USA	Algeria	2.27
Lack of corruption	3.86	Malta	Nigeria	2.03
Political stability	5.89	Finland	Russia	2.58
Democracy	14.22	Thailand	Venezuela	2.12

Note: Authors' own calculations, based on estimates from Tables 6 and 7 and the average level of institutions of countries during the period 2003-2012. As in the econometric analysis, institutional variables are converted in a way that they equal or are larger than 1.

Appendix

Table A: Country classification

Country	Code	Country	Code	Country	Code
Developed countries		Equatorial Guinea	GNQ	El Salvador	SLV
Australia	AUS	Gabon	GAB	Grenada	GRD
Austria	AUT	Mauritania	MRT	Guatemala	GTM
Belgium	BEL	Nigeria	NGA	Guyana	GUY
Bermuda	BMU	Republic of the Congo	COG	Haiti	HTI
Bulgaria	BGR	Sudan	SDN	Honduras	HND
Canada	CAN	**Sub-Sahara Africa non-oil**		Jamaica	JAM
Croatia	HRV	Benin	BEN	Mexico	MEX
Cyprus	CYP	Botswana	BWA	Nicaragua	NIC
Czech Republic	CZE	Burkina Faso	BFA	Panama	PAN
Denmark	DNK	Burundi	BDI	Paraguay	PRY
Estonia	EST	Cape Verde	CPV	Peru	PER
Finland	FIN	Central African Republic	CAF	St Vincent and Grenadines	VCT
France	FRA	Comoros	COM	St Lucia	LCA
Germany	DEU	Democratic Republic of Congo	ZAR	Uruguay	URY
Greece	GRC	Côte d'Ivoire	CIV	**Central Asia oil**	
Greenland	GRL	Eritrea	ERI	Azerbaijan	AZE
Hungary	HUN	Ethiopia	ETH	Russia	RUS
Iceland	ISL	Gambia	GMB	Turkmenistan	TKM
Ireland	IRL	Ghana	GHA	**Central Asia non-oil**	
Israel	ISR	Guinea	GIN	Armenia	ARM
Italy	ITA	Guinea Bissau	GNB	Georgia	GEO
Japan	JPN	Kenya	KEN	Kyrgyzstan	KGZ
Latvia	LVA	Lesotho	LSO	Moldova	MDA
Lithuania	LTU	Liberia	LBR	Tajikistan	TJK
Luxembourg	LUX	Madagascar	MDG	Turkey	TUR
Malta	MLT	Malawi	MWI	Uzbekistan	UZB
Martinique	MTQ	Mali	MLI	**East Asia and Pacific oil**	
Monaco	MCO	Mauritius	MUS	Brunei	BRN
Netherlands	NLD	Mozambique	MOZ	Papua New Guinea	PNG
New Zealand	NZL	Namibia	NAM	Vietnam	VNM
Norway	NOR	Niger	NER	**East Asia and Pacific non-oil**	
Poland	POL	Rwanda	RWA	Cambodia	KHM
Portugal	PRT	Senegal	SEN	China	CHN
Romania	ROM	Seychelles	SYC	Fiji	FJI
Slovakia	SVK	Sierra Leone	SLE	Hong Kong	HKG
Slovenia	SVN	Somalia	SOM	Indonesia	IDN
Spain	ESP	South Africa	ZAF	Laos	LAO
Sweden	SWE	Swaziland	SWZ	Macau	MAC
Switzerland	CHE	São Tomé and Príncipe	STP	Malaysia	MYS
United Kingdom	GBR	Tanzania	TZA	Mongolia	MNG
United States	USA	Togo	TGO	Myanmar (Burma)	MMR
MENA oil	AAA	Uganda	UGA	Philippines	PHL
Algeria	DZA	Zambia	ZMB	Singapore	SGP
Egypt	EGY	Zimbabwe	ZWE	South Korea	KOR
Iran	IRN	**Latin America oil**		Taiwan	TWN
Iraq	IRQ	Ecuador	ECU	Thailand	THA
Kuwait	KWT	Suriname	SUR	**South Asia**	AAA
Libya	LBY	Trinidad and Tobago	TTO	Afghanistan	AFG
Oman	OMN	Venezuela	VEN	Bangladesh	BGD
Qatar	QAT	**Latin America non-oil**		Bhutan	BTN
Saudi Arabia	SAU	Antigua and Barbuda	ATG	India	IND
Syria	SYR	Argentina	ARG	Maldives	MDV
UAE	ARE	Bahamas	BHS	Nepal	NPL
Yemen	YEM	Barbados	BRB	Pakistan	PAK
MENA non-oil	AAA	Belize	BLZ	Sri Lanka	LKA
Bahrain	BHR	Bolivia	BOL	**Europe**	AAA
Djibouti	DJI	Brazil	BRA	Albania	ALB
Lebanon	LBN	Cayman Islands	CYM	Belarus	BLR
Morocco	MAR	Chile	CHL	Bosnia-Herzegovina	BIH
Tunisia	TUN	Colombia	COL	Macedonia FYR	MKD
Sub-Sahara Africa oil		Costa Rica	CRI	Montenegro	MNE
Angola	AGO	Cuba	CUB	Serbia	SRB
Cameroon	CMR	Dominica	DMA		
Chad	TCD	Dominican Republic	DOM		