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Relationship Between Natural Resources and Institutions

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Abstract :

This article analyses through a rent seeking model, the relationship between institutions' quality and natural resources. Depending on the institutions quality, each country has a specific structural capacity to stand natural resources dependency. It is shown that for each country, a threshold exists, such that beyond this point, any additional amounts of natural resources begin to have a negative impact on institutions. As the stock of natural resources increases, this improves the expected profitability of rent seeking, which in turn lowers the quality of institutions. The mechanism comes from a new balance of power within the country. However, the institutional degradation's intensity is determined by social interactions and depends on both the resources nature and their appropriability level. The inverse U-shaped curve obtained from empirical studies presented in this article supports the natural resources non-monotonic effect on institutions found in the model.

Keywords : Natural Resources, Institutions, Rent Seeking

JEL : Q32, O43, O10, F10

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1 Introduction

From Sachs and Warner (1995) we have extensive literature studies the relationship between natural resources and growth. It explores the following standard interrogation : how is possible to explain that oil is a curse in Nigeria and a blessing in Norway ? What are the channels to explain this stylised fact ? Table 1 (in appendix) shows distinctly that countries with a high natural resource rent (columns 1 to 3) do not consistently have a weak Human Development Indicator (HDI) but a high natural resources dependence (columns 4 and 5) is highly correlated with a weak HDI.

Sachs and Warner (1995) offer one of the first explanations of this stylised fact. They found that natural resources dependence has a direct impact on growth. According to them this effect is more important than the indirect effect via the institutions and openness. Sala-i Martin and Subramanian (2003), Isham et al. (2005) and Boschini et al. (2007) conclude that the indirect effect via the institutions is more influent. They take into account the endogeneity problem for the institutions with some standard instrumental variables. [1] It introduces the institutions' importance for the natural resource abundant economies which is discussed in recent studies (e.g. Knack and Keefer (1995), Hall and Jones (1999), Acemoglu et al. (2002)) which show that institutional quality is a fundamental cause of economic growth and play a key role in explaining cross-country differences in economic growth. Indeed institutions affect economic incentives, notably incentives to invest in physical and human capital. Moreover Easterly and Levine (2003), Rodrik et al. (2004) estimated the contribution of trade, geography and institutions on income levels. This "race" to determine the prevailing factor revealed that the institutions are one of the major determinants of a country's income level.

The two following graphs represent the institutional level difference between two groups illustrating the institutions'importance for the natural resource abundant economies.[2] The institutional measure Polity IV (which varies from -10 to +10) gives a gap between 7 and 12 points between these groups (graph 1). It is the same conclusion with the ICRG measurement (ranging from 0 to 100) where the gap between these two groups varies between 10 and 35 (graph 2).

[1] They take *"Settler Mortality"* due to Acemoglu et al. (2001a) and the fraction of the population speaking English and European languages due to Hall and Jones (1999)

[2] Data from R.Feenstra and with own calculation from 1962 to 2000. The first group has a natural resources dependence (percentage of total exports from primary commodity exports) each year below 40% and also a dependency's mean along the period below 40%. The second group has a dependency over 90% each year and a dependency's mean along the period over 90%. The third group bring together all countries

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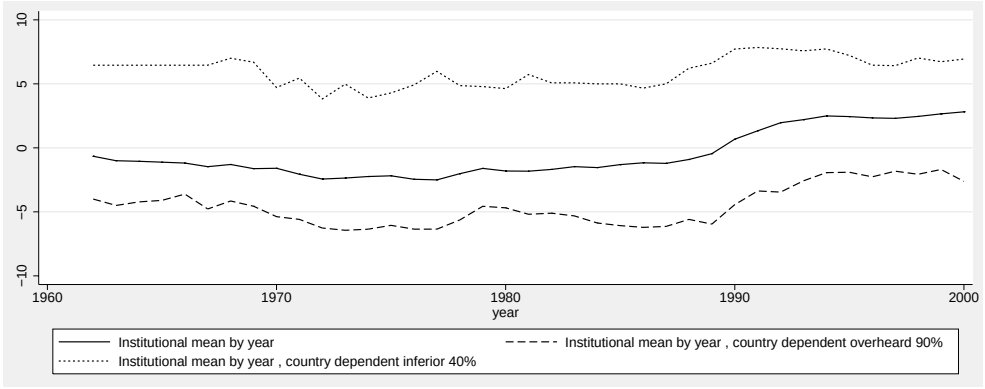

FIG. 1 – Deviation of the institutional level measured by PolityIV according to the natural resources dependency

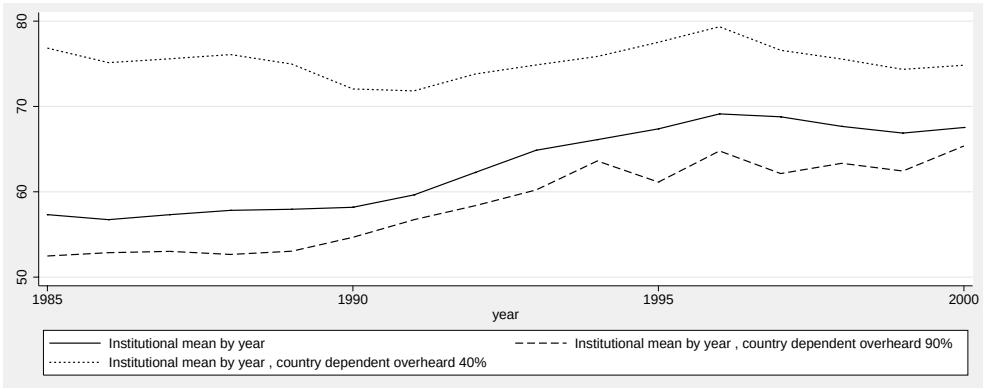

FIG. 2 – Deviation of the institutional level measured by ICRG according to the natural resources dependency

These stylized facts are confirmed by political sciences which distinguishes three mechanisms to explain the natural resources impact (more precisely the oil dependence) on the institutions : *"Rentier Effects", "Delayed Modernization" and "Entrenched Inequality"* (Ross (2001b) and Isham et al. (2005)). The first channel is certainly the most well known. The opportunity for a country's government to access financial windfall has various significant consequences, which depend on the balance of power between the government (relates to the elite) and the rest of society. Indeed the State does not need to levy heavy taxes in order to develop modern systems, and can avoid over-taxing the population. With weak institutions, as the population is less taxed, it will be de facto less inclined to protest, to organize and to develop a civil society able to overthrow the power in place (Beblawi and Luciani (1987)). In addition, the government could limit the ambitions of challenging its power. The financial windfall expected makes it possible to distribute some allocation to content the population (the roman principle of "Panem and

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circemses"), in order to corrupt political opposition. It also enables the establishment of a strong army which could use repression and violence. [3]

The second channel is *"Delayed Modernization"*. Modernization is also characterized by a growing role of education, urbanization, a specialization in production as well as greater openness (economic, political, cultural ...) which depends on the balance of power between different social groups within the society (Elite / Rest of the society, Rural / Urban ...) as well as on the country's history (such as the colonial origins, the settler mortality (Acemoglu et al. (2001a)), the legal origin...). It appears that any modernization process triggers inevitable changes in the country. Consequently, a government that heads a country with abundant natural resources will have a tendency to keep this privilege which gives it access to a financial windfall and will delay the modernization process which could weaken this power and his capacity to capture the rent. For example, large enrolment rates or education expenditures are not found in resources rich country (Gylfason (2001)).[4]

The third channel has mainly been developed by Engerman and Sokoloff (1997). *"Entrenched Inequality"* which draws a parallel between growth trajectories of North and South American countries. They explain development divergence through an interaction between the timing and the nature of decolonization, the natural resources endowment and agricultural capacity. This interaction results in some institutions which have an impact on long term growth. Some natural resource types appear to favor economic development and long-term growth through the social structure and has a significant influence on the institutional quality .

This paper focuses on institutions' formation and changes but more precisely on the preferences of different groups which have the power to build institutions . We borrow the meaningful definition given by North (1994) which defines institutions as *"...the humanly devised constraints that structure human interaction. They are made up of formal constraints, informal constraints and their enforcement characteristics. Together they define the incentive structure of societies and especially economies."*. We take into account their endogeneity through a model of balance of power. Aghion et al. (2004), Acemoglu (2006), Acemoglu and Robinson (2007), have developed endogenous institutional models based on two powerful groups (Elite and Citizens). The balance of power between these groups explains the institutional level. Incentives for different groups play a key role for the institutional change. Mehlum et al.

[3]Collier and Hoeffler (2005) already highlighted that the natural resources dependance accentuated the probability of civil war.

[4]Moreover the extractive activities do not require very intensive workers and the little which is required comes or forms often from foreign countries. In fact the country does not need a priori a very developed education system in order to continue to exploit its natural resources.

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(2006) consider this assumption to build their model and take natural resources as one financial incentive which impacts the balance of power inside a country and therefore influence institutional level. These authors highlight additional evidence : the resource curse could appear only in the countries with grabber institutions.[5] That means that natural resources' effect on growth depends on the quality of institutions (grabber friendly or producer friendly). This conclusion contrasts with the findings of Tornell and Lane (1999) and Torvik (2002) which exhibited a negative relationship between natural resources dependence and growth, without institutional condition.

Our analysis extends the literature in several dimensions and provides an answer for the standard question : why oil is a curse in Nigeria and a blessing in Norway. Our main contribution is to explain the relationship between institutions and natural resources rent. A good understanding of this relationship can allow comprehensive enhancement of natural resources' effect on growth. In order to identify a theoretical effect of a relationship between natural resources and institutions' evolution, we derive a new model from Mehlum et al. (2006). Our model is built on the balance of power between two groups, both belonging to the elite, which have unlike preferences over institutions. The group's constitution rides on the incentive, the payoff to belong or not to this group and the each group's payoff depends upon the natural resources rents. These rents are treated as the leading incentive in this model.

First, our main prediction from this model is that each country has a structural institutional capacity to bear some natural resource rent. National institutions determine a threshold in the amount of natural resources and beyond this point the resources positive impact on institutions becomes negative. Moreover, after a natural resource shocks prices, each country has a variant feedback according to its institutional quality which could deteriorate or improve the institutional quality. Lastly, all these results depend on the type of resource in abundance in each country.

Second, we confirm this prediction by an empirical study. We found empirically a non linear effect of natural resources on institutions. In most cases, this effect stands for an inverse U-Shape. This result rests on a new natural resources database from the World Bank which allows a panel study. We also control for a variety of variables used in the literature. To confirm our empirical results, following Koenker and Hallock (2001), we also use a simultaneous quantiles regressions and confirm the presence of an inverse U-Shape thanks to Lind and Mehlum (2007)'s test. We use two other estimating procedures to check our prediction : a Hausman-Taylor regression and the methodology of *Fixed Effects Vector Decomposition* (Plümper and Troeger (2007)).

[5] Grabber institutions are the same that extractive institutions favoring the rent seeking activity (Acemoglu et al. (2001b)).

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The remainder of the paper is organized as follows. Section 2 develops the model. Section 3 provides the estimation method and the data used. Section 4 presents the empirical results and section 5 concludes.

2 Baseline Model

2.1 Assumptions

We consider a homogeneous population of entrepreneurs (denoted N), like the elite which has the power to build institutions. Inside this population, there are two interest groups, the grabbers and the producers. Both of them have the power to modify the institutional level according to a balance of power between them (Aghion et al. (2004) , Acemoglu (2006), Acemoglu and Robinson (2007)).

We have n_g the grabbers' number and n_f the producers' number with $N = n_g + n_f$ and α the fraction of producers : $\alpha = \frac{n_f}{N}$. In contrast with Tornell and Lane (1999), we treat the numbers of grabbers and producers as endogenous.

The grabbers target rents from the natural resources. They use their entire effort for the rent-seeking activity. Our notation for natural resources is more precise and allows us to observe more precisely a shock price impact on balance of power according to the type of resource and the quantity of the resource being traded. The rent from one natural resource i is calculated by the difference between the price (p_i) and the cost (c_i) times by the quantity (q_i). Natural resources rent is the sum of all the natural products (from i=1 to i=V) extracted and exported by the country. Each natural resource is weighted by his appropriability's level ($0 < \gamma_i < 1$) (Boschini et al. (2007)).[6] This makes it possible to give more weight for the natural resources who are highly appropriable (γ_i close to 0) than other who are less appropriable (γ_i close to 1). For each grabber, the payoff is π_g :

$$\pi_g = \frac{s}{N} \sum_{i=1}^{V} \frac{1}{\gamma_i} q_i (p_i - c_i) \tag{1}$$

The grabber's payoff function is decreasing with elite's size (N). Indeed, the more the power is concentrated in hands of a minority, the higher the potential rent is for each agent belonging to this elite. Moreover, the grabber's payoff function increases with the parameter s. It is a very important parameter

[6]Boschini et al. (2007) uphold the concept of appropriability for a natural resource. A resource is highly appropriable if it has a highly intrinsic value and is easily transportable and stockable. Precious stones for exemple are highly appropriable whereas oil and gas are not if we just take into account non renewable resources. According to them, the more appropriable a resource is, the higher the probability that the resource lead to rent-seeking, corruption or conflict is great. Isham et al. (2005) and Sala-i Martin and Subramanian (2003) also introduce a difference between the type of resource and their impact.

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often used in the conflict literature or rent-seeking literature (Mehlum et al. (2006)) and that brings into play a modified function of Tullock (1975) :

$$s = \frac{1}{1 - \alpha + \alpha\lambda} \tag{2}$$

This expression of s, which comes from the effort from producers and grabbers, introduces the institutions (0< λ <1) where institutional quality is high when λ is close to 1, and low when λ is close to 0 (see the appendix for more explanation). s decreases in the institution's level and increases in α. It means that the lower institutional quality is, the higher the grabber's payoff is, ceteris paribus. Hence grabbers want institutions that permit rent seeking, like "extractive" institutions (Acemoglu et al. (2001b)) : they are in support of an institution's deterioration . Moreover the grabber's payoff is increasing in n_f or decreasing, by definition, in n_g. The bigger the grabbers numbers is, the less each of them gets paid.

The producer group is institution friendly. For production side, as Mehlum et al. (2006), we follow Murphy et al. (1989) with L workers (the equilibrium wage is set to unity) and M different goods. The payoff of each producer (π_f , f for friendship) is the sum of the profit from production (π) and a share of the natural resource rent :

$$\pi_f = \pi + \lambda\pi_g \tag{3}$$

This share of the natural resource rent depends on the producer's effort in the rent-seeking activity. This effort is lower than the grabber's effort and depends on the institutional level. The better the institutional quality is, the more efficient the effort to capture a part of rent is.

We use a very simple form for the profit from production :

$$\pi = y(1 - \frac{1}{\beta}) - F \,, \tag{4}$$

where y is the quantity with a price equal to one, β the productivity. F is the fixed cost.

In Mehlum et al. (2006), the fixed cost doesn't depend on the institutional quality. But since Anderson and Marcouiller (2002) a large literature has demonstrated the institutional quality does matter in trade. Berkowitz et al. (2006) argue that a high institutional level permits a country to produce and export more complex goods. In the same way, in Do and Levchenko (2007) the fixed cost could express the quality of institutions like corruption, the investment climate or the judicial system inefficiency. In our framework we introduce a decreasing fixed cost with the institutional level ($\frac{\delta F}{\delta \lambda} < 0$).

Combining equations (1) and (3), we obtain :

$$\pi_f = y(1 - \frac{1}{\beta}) - F + \lambda\frac{s}{N}\sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i - c_i) \tag{5}$$

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This function increases with institutional quality, confirming that producer is institutional friendly. We then express the total income Y in order to determine the impact of the share of producer on the profit function. The total income is a sum of the total of natural resources sales and the production of the M differentiates goods at the same quantities y :

$$Y = \sum_{i=1}^{V} \frac{1}{\gamma_i} q_i (p_i - c_i) + My \tag{6}$$

At the equilibrium all is spent, hence total income is also the sum of wage income(L) and the sum of profits. Taking into account equations (1) to (3) and the equation (6) may be combined as follows :

$$Y = L + N(\alpha\pi_f + \pi_g(1-\alpha)) = L + N\alpha\pi + \sum_{i=1}^{V} \frac{1}{\gamma_i} q_i (p_i - c_i) \tag{7}$$

After having found the expression of y, we can express π : [7]

$$\pi = \frac{\beta(L - FM) - L}{\beta(M - n_f) + n_f} \tag{8}$$

It appears that π increases in n_f and consequently π_f is also increasing in n_f. The model is solved according to a 3-stage game :

- At the initial period ($t = 0$), we have an initial institutional level (λ_0). The initial institutional level comes from a balance of power in previous period between producers and grabbers, if there are. In our case, we avoid a previous institutional formation and we consider λ_0 as given. We have also a natural resource rent ($\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0})$) which defines with the initial institutional level, the payoffs of producers and grabbers ($\pi_{f,0}$ and $\pi_{g,0}$).
- At $t = 1$, each agent observes the two payoffs and chooses to be producer or grabber. An equilibrium is found with or without grabbers inside the economy. This defines two different cases ($\alpha_1 = 1$ or $\alpha_1 < 1$). At this period, the institutional level is always the same as at $t = 0$ ($\lambda_0 = \lambda_1$).
- At $t = 2$, the interaction, the balance of power between producers and grabbers, if there are, yields an institutional level (λ_2).[8]

[7] See the appendix for more explanation

[8] Our model don't take into account the direct relationship between α_1 and λ_2. This third stage leans upon seminal work on the building of endogenous institutions (Aghion et al. (2004), Acemoglu (2006), Acemoglu and Robinson (2007)). These one are building on a balance of power between groups. According the power of each groups appears a sure type of institution.

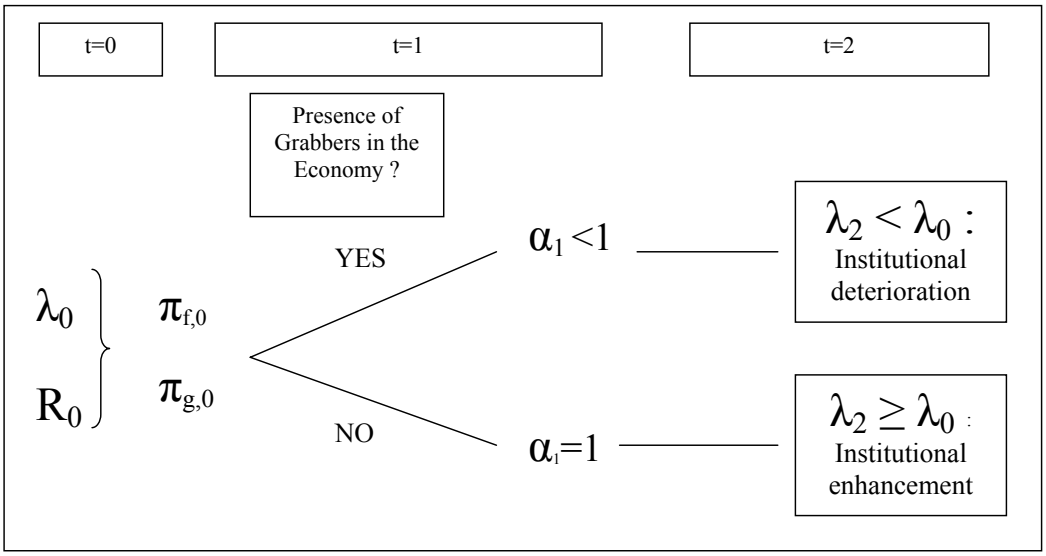

FIG. 3 – 3-Stage Game

Both payoff π_f and π_g are increasing in the share of producers. Figure 4 shows the different possibilities of equilibrium according to producer and grabber's payoffs. The dashed line represents grabber's profit. We can distinguish two different cases :

The first case : $\pi_{f,0} > \pi_{g,0}$

The producer's profit is above the grabber's profit ($\pi_{f,0} > \pi_{g,0}$). In this case, all agents make the choice to be producer, $\alpha_1 = 1$, whatever α_0.[9] In the second step of the game, we have always $\pi_{f,1} > \pi_{g,1}$. For a given institutional quality, rents are not high enough to create incentives to become grabber. In the same way, the institutional level is above the following threshold for a given natural resource rent :

$$\lambda_0 > \frac{(\alpha_0 - 1)N\pi_o + \sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0})}{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0}) + \alpha_0 N\pi_0} \tag{9}$$

Here, the institutional level is high enough to bear this natural resources rent. With these institutional and natural resource rent levels, nobody has an incentives to become a grabber.[10]

The extreme specification in this case is the point A (fig. 4) where $\pi_{f,0} = \pi_{g,0}$. The institutional level is high enough to support the natural resource rent but now :

$$\lambda_0^A = \frac{(\alpha_0 - 1)N\pi_o + \sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0})}{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0}) + \alpha_0 N\pi_0} \tag{10}$$

[9] α_0 is the fraction of producers at the game's beginning.

[10] If $\alpha_0 = 1$ also $\lambda_0 > \frac{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0})}{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0}) + N\pi_0}$

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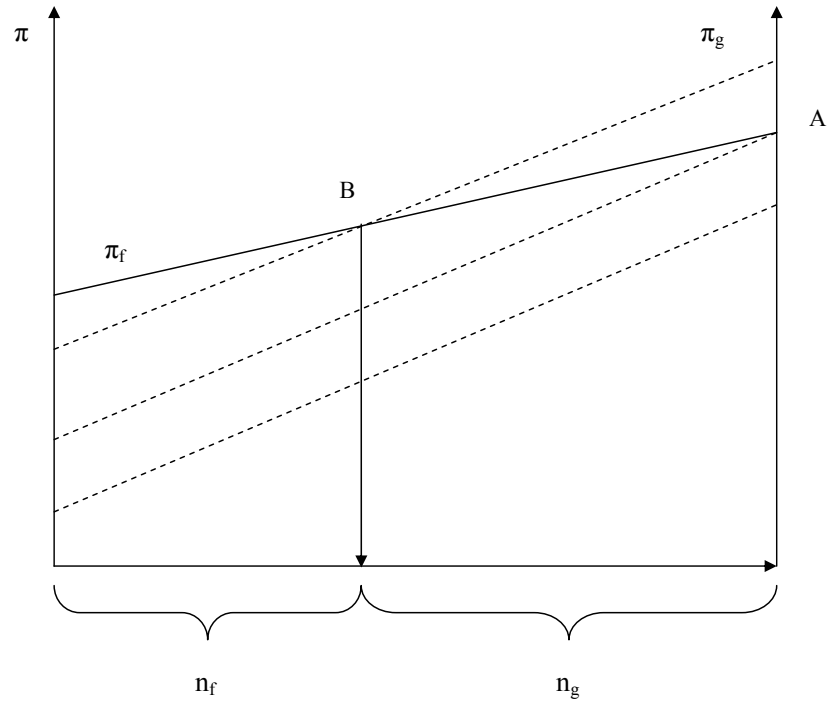

FIG. 4 – Payoffs and grabbers appearance

At this point A (with $\alpha_0 = 1$), there are no incentives to become grabber, all agents make the choice to stay producer but it's the turning point from where some grabbers could appear.[11] This turning point is defined by the initial institutional level and more precisely by the institutional capacity to bear some natural resources rent.

The second case : $\pi_{f,0} < \pi_{g,0}$

Here, the grabbers's profit is above the producer's profit ($\pi_{f,0} < \pi_{g,0}$) , there is an incentive to become grabber. At t=0, the producer's number is above the following threshold and doesn't allow them to equalize the profits :

$$\alpha_0 > \frac{(\lambda_0 - 1)\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0}) + N\pi_0}{(1 - \lambda_0)N\pi_0} \tag{11}$$

This incentive implies $\alpha_1 < \alpha_0 < 1$ such as this defines the point B which is a single equilibrium where $\pi_{f,1} = \pi_{g,1}$ for a given rent's level and institutional quality. The grabbers number allows the

[11] If $\alpha_0 = 1$ also $\lambda_0^A = \frac{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0})}{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0}) + N\pi_0}$

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adjustment between payoffs : [12]

$$\alpha_1 = \frac{(\lambda_0 - 1)\sum_{i=1}^{V} \frac{1}{\gamma_i} q_{i,0}(p_{i,0} - c_{i,0}) + N\pi_0}{(1-\lambda_0)N\pi_0} < \alpha_0 \tag{12}$$

The grabber group is powerful and damages the institutional quality to obtain more rents from natural resources. The new power redistribution inside the country leads to an new institutional level where ($\lambda_0 > \lambda_2$). The institutional deterioration is intensify by the fixed cost in the production side increasing ($F_2 > F_0$).

At $t = 1$, the equilibrium is found thanks to the equality between the profits. But it arises from a social interaction. We refer to the definition of the social interaction by Brock and Durlauf (2001) : *"By social interactions, we refer to the idea that the utility or payoff an individual receives from a given action depends directly on the choice of others..."*. In this model, it appears clearly that the payoff for everybody depends on the choice of others in the sense that π_f and π_g increase with α.

The figure 4 provides a proof that the equilibrium is unique and stable. If we are on the right side of the point B, $\pi_g > \pi_f$. There is a difference between both payoffs and creates an incentive for some producers to switch to the grabber status. This incentive leads to a shift which implies a decreasing grabber's profit and a increasing producer's profit. This play leads again on the equality between π_g and π_f. The explanation is the same if we are on the left if the point B. Moreover, at point B, there is no incentive to shift to another activity because the profit's variation is negative.

2.2 A price shock

What happens if we have a positive exogenous price shock on one natural resource ?[13] Results will be different according to the presence of grabbers inside the society when shock occurs.

The first case : No grabbers before the shock

Here we assume that $\alpha_0 = 1$. The natural resource rent is growing with p_i. Despite π_g grows faster than π_f[14] and that the gap between π_g and π_f decreases, $\pi_f > \pi_g$ could hold. There are no incentives to become a grabber, the balance of power inside the country does not change. Therefore, this positive price shock has no negative effect on institutions. Moreover the effect could be positive. Indeed, this sudden increase in natural resource rent can supply an significant windfall, which could be used to enhance

[12] Like by assumption α_1<1, it occurs $\lambda_0 < \frac{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_i(p_i - c_i)}{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_i(p_i - c_i) + N\pi}$

[13] The exogenous shock could be an increasing price or quantity of a natural resource or a decreasing cost of research.

[14] Actually, $\frac{\delta \pi_f}{\delta p_i} > \frac{\delta \pi_g}{\delta p_i}$, only if $\lambda > 1$ or $0<\lambda<1$.

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institutions, all the more since fixed cost decreases with institutional quality. Consequently, to anticipate another positive shock which could involve an incentive for somebody to become a grabber, in this case, producers have a better interests to promote institutions, reduce the fixed cost and then increasing their payoff. This conclusion is useful until the turning point A, where $\pi_g = \pi_f$.

Another effect could happen even if at the beginning $\alpha_0 = 1$. Indeed, if the price shock is very large, the grabber profit could be above the producer profit ($\pi_g > \pi_f$). Some grabbers appear inside the economy because the institutional level (λ_0) is not high enough to bear this new windfall. The rent is also beyond the threshold defined by the institutional level (λ_0). It appears even if the initial institutional level is high enough at $t = 0$ that a big price shock could create an incentive to become grabber, involving an institutional deterioration.

The second case : In the presence of grabbers before the shock

Now, we assume that some grabbers settle in society ($\alpha_0 < 1$) . Taking into account the equation (12), it appears that an increasing rent decreases α_1 given a new balance of power and so damaging the institutions :

$$\frac{\delta\alpha_1}{\delta p_i} = \frac{\frac{q_i}{\gamma_i}(\lambda_0 - 1)}{(1-\lambda_0)N\pi} < 0 \tag{13}$$

Equation (13) explains the impact of a price's increase when there are some grabbers in the economy. For the same variation of the resource's price i, the quantitative impact is different according to the appropriability level, the quantities of the product i or the initial institutional level. Note that the sign is always negative, inducing 3 conclusions.

Firstly, the more appropriable the resource i is (i.e γ_i is low) the more important its impact on α_1 becomes. The resource's appropriability is an important factor in determining the effect of an increasing commodity price on the balance of power inside the society and therefore on the institutional level. The fact that the natural resource is very appropriable entails more rent opportunity because the resource has a highly intrinsic value and is easily transportable and stockable.

Secondly, the larger the quantities (q_i) of the product i is, the larger the quantitative impact will be. This means that a country which produces a lot of natural resource i is more sensitive on a price variation than a country with a weak production of the natural resource i .

The last conclusion concerns the initial institutional level. At the beginning, the worse the institutions are, the more an increasing price shock involves a bigger increase in the grabbers' number. It is logical in the sense that, poor institutions allow a larger grabber's profit. The decreasing fixed cost with institu-

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tional quality reinforces this effect because the production profit (π) decreases with the fixed cost.

To make a long story short, an increase in price could have some positive or negative effect depending on the initial institutional level (λ_0)(Figure 5). Indeed, each country (here country i, j, k) with its own initial institutional level has the capacity to bear a specific natural resources rent. This initial institutional level determines a natural resources threshold $\overline{R}_0$, which is different for each country . $\overline{R}_0$ is as well an indicator rent level or natural resource dependance.

If $R_0 < \overline{R}_0$, we could have an increase in the institutional quality. Because the incentive is not enough for a producer to switch to become a grabber, there is not an institutional degradation ($\alpha = 1$). The rent is an income for the country which could permit to increase the public expenditures to improve for example the infrastructures, the education or the institutions. Producers benefits from this improvement notably because the fixed cost decreases with the higher institutional level.

If $R_0 > \overline{R}_0$, the incentives to pursue rent-seeking is too strong and the institutional level too weak to bear this rent. More grabbers then appear, which by definition, have an interest to degrade the institutions.

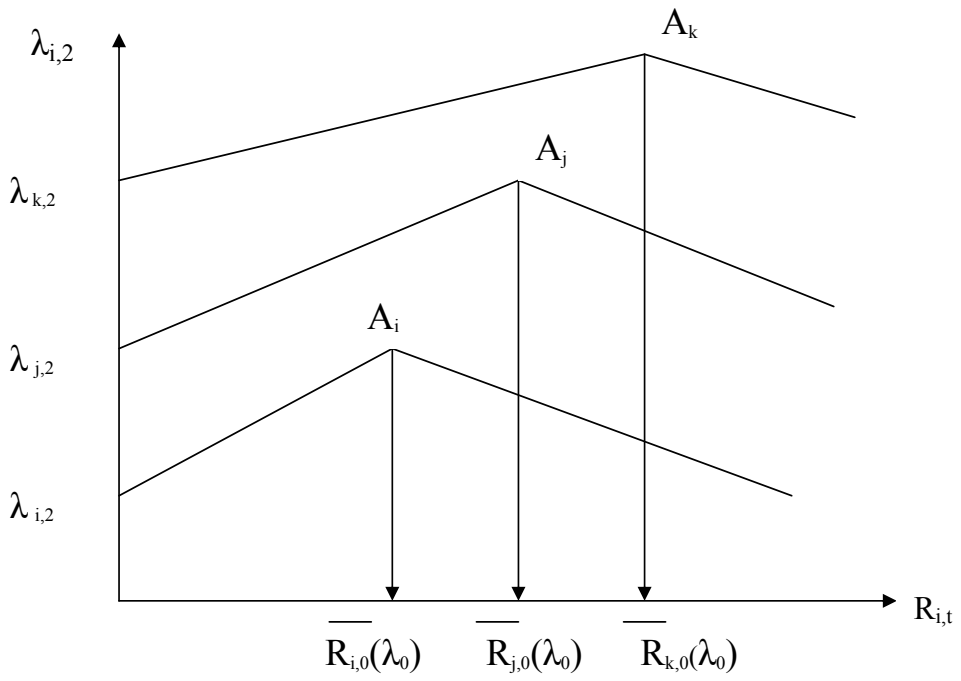

FIG. 5 – Different turning point according the initial institutional level

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2.3 Natural resource dependance

The conclusion could be extended for the natural resource dependance. Indeed, we show that the natural resource rent have a non linear effect according to the institutional level. But much previous research did not take rents, but rather natural resources dependence as a natural resources variable. Hence, we introduce this measurement in the model.

We define : $X_a = \frac{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_i(p_i - c_i)}{Y}$ and $X_b = \frac{\sum_{i=1}^{V} \frac{1}{\gamma_i} q_i(p_i - c_i)}{n_f \pi}$ .The new variable X_a represents the resource dependance on the GDP (Y). X_b could be seen as a production specialization measurement. This indicator compares natural resources production and manufacturing production inside a country. If α_0 = 1 the equation (9) become :

$$\lambda_a > \frac{X_a}{X_a + N\pi/Y} \tag{14}$$

$$\lambda_b > \frac{X_b}{1 + X_b} \tag{15}$$

Here, an increase in dependence has a positive effect on the institutional level($\frac{\delta \lambda_a}{\delta X_a} > 0$ and $\frac{\delta \lambda_b}{\delta X_b} > 0$) .

At the point B, with α_0 < 1, X_a, X_b and equation (12), we have :

$$\alpha_{a,1} = \frac{(\lambda_a - 1)X_a + N\pi/Y}{(1 - \lambda_a)N\pi/Y} \tag{16}$$

$$\alpha_{b,1} = \frac{(\lambda_b - 1)X_b + N/n_f}{N/n_f(1 - \lambda_b)} \tag{17}$$

But, in this case, an increased dependence leads to an increase in grabbers' number and an institutional deterioration($\frac{\delta \alpha_{a,1}}{\delta X_a} < 0$ and $\frac{\delta \alpha_{b,1}}{\delta X_b} < 0$).

There exists also a threshold, a turning point for the natural dependence which is determined by institutional level inside the country. On the other hand we find theoretical evidence contrasting with the literature concerning the impact of the natural resource dependence. Our conclusion is a non-linear effect. Under the threshold defined by the institutional level, the dependence's impact is positive on the institutions. But above this threshold, the impact is negative. In this case the institutions do not bear this dependence level and the producer switches to grabber status.

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3 Estimation Method and Data

3.1 Regression Specification

In this section, we intend to test empirically some of our theoretical conclusions and develop panel studies with the following equation :

$$\lambda_t = \beta_0 + \beta_1 RN_{t-n} + \beta_2 RN_{t-n}^2 + \sum_{i=1} \beta_i X_{ti} + \xi_{ti} \tag{18}$$

where λ_t is an institutional measurement at time t. RN_{t-n} is the variable which represents natural resources, with a lag n. It could be either the percentage of national income from primary commodity exports, the percentage of total exports from primary commodity exports or the natural resources rents. In this paper, we restrict ourselves to the natural resources rents (cf infra). RN_{t-n}^2 tries to capture the natural resources' non-linear effect on institutions. So we expect $\beta_1 > 0$ and $\beta_2 < 0$ to find an inverted U-Shape curve (Fig. 5).

X_i is a set of control variables used in the literature to explain the institutional level. We have 6 main variables. The first one is the Log of GDP per capita in 1990 or 1980 according to the institutional variable we use. The second one is the distance to equator in Rigobon and Rodrik (2005).[15] The third one is the Economic Openness with a lag of 5 years.[16] We use also the secondary school enrollment in 1965 and the fraction of the population who speaks an European language or English (Hall and Jones (1999)).

3.2 Data

3.2.1 Natural Resources Data

Two main criticisms could be raised on the natural resources measurement used in academic research. First, many studies just take one measurement for only one year for the natural resources dependency [17] and don't make any difference according to the natural resources type[18]. It could have some bias with a single measurement for one year. In fact the measurement rides on natural resources prices and produced quantities and are measured only for one year. If natural resources prices increase for example, the ratio

[15] The calculation for distance to equator is : $abs(Latitude)/90$.

[16] Results are not sensitive to the lag's modification.

[17] Sachs and Warner (1995), Bulte et al. (2004), take a dependence for 1970, Boschini a dependence for 1971 and Isham et al. (2005) a dependence for 1980 for exemple

[18] Isham et al. (2005), Sala-i Martin and Subramanian (2003) and Boschini et al. (2007) are first to introduce a difference between the natural resources type. They conclude, according the natural resource type, that impacts on their interests variables are not the same.

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grows artificially. In the same way, there could be a problem for the natural resources extraction (Climatic matters, political matters...) and by definition dependence would be under-evaluated. Secondly, many authors use World Bank measurement (SXP) which reflects the GDP dependence, which allows us to understand the natural resources economic importance for a country. But it does not include precious stones which could have a great influence, in the sense that these natural resources are very appropriable (e.g. diamond) (Fearon (2005)). Moreover, this ratio does not give any information about the country's specialization.

An additional criticism of this natural resources measurement is that in our case this one must be the most exogenous towards outdoor institutions. The percentage of total exports from primary commodity exports and the percentage of national income from primary commodity exports could be influenced by the institutional level. Indeed, GDP as well as total exports are related to economic development, economic policies and institutions (Brunnschweiler (2008), Brunnschweiler and Bulte (2008)). Consequently we face of a potential problem of endogeneity.

To avoid this problem we use an alternative measure of natural resources rents calculated by the World Bank.[19]First, this measurement allows a panel study. Data are available from 1970 to 2004 for 15 different commodities.[20] Secondly, rents are derived by taking the difference between world prices and the average unit extraction or harvest costs (including a 'normal' return on capital). The cost is calculated by regions.[21]. For some resources (e.g., Oil, Gas...) there are different world prices. The unique price is calculated as the weighted average of all available prices.

Natural resources rents allow an exogenous measurement from the national institutional level. Indeed, we could assume that national institutions have no effect on world prices. In other words, countries are price takers. It is true that in a few markets, national institutions could have some power and could influence the world price. It is the case in the oil's market with the Organization of the Petroleum Exporting Countries (OPEC). But in the long term, we argue that price depends only on the market's power. In the same way, the amount sold could be impacted by institutional levels if the extraction or harvest is done by a national firm. We make the assumption that even these firms make their product choice according to world prices. We could then consider natural resources rents more exogenous like other natural resources measurements.[22]

[19]See website for more explanation :`http://web.worldbank.org`

[20]Gas, oil, hard coal, brown coal, bauxite, copper, gold, iron, lead, nickel, phosphate, silver, tin, zinc and forest

[21]Rent = (National Production Volume) (International Market Price - Average Unit Production Cost)

[22]For another reason, we do not take indicator which reflects natural resources abundance (The World Bank 1994, 2000). Indeed, data are available only for two years. Yet our empirical procedure consists on panel study and we have not enough

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We also build from natural resources rents three new indicators according to the appropriability level. For this classification, we follow the standard classification on these topics used in the literature according SITC classification. We aggregate rents from gas, oil, hard coal, brown coal on a single variable (named rents 3) ; bauxite, copper, gold, iron, lead, nickel, phosphate, silver, tin, zinc in an another variable (named rents 6). A third variable is created with forest. We separate this one because it is the only natural resource which is renewable.

3.2.2 Institutional Data

A new far-reaching literature uses institutional data. We use some different indicators to test empirically our theory through a panel analysis.

PolityIV provides a measurement from 1960 to 2004. We take Polity2 as measurement from PolityIV. This one is computed by subtracting an autocracy score from a democracy score and measures a balance of the “Competitiveness of executive recruitment”, the “Openness of executive recruitment”, the “ Constraint on chief executive”, the “Competitiveness of political participation” and the "Regulation of participation”. This measurement is clearly a political score.

The PRS Group has been producing the International Country Risk Guide (ICRG) since 1984. This provides a synthetic indicator that could be distinguished between political, economic and financial risks. These measurements range from 0 (Low Institutions) to 100 (Good Institutions).

To complete institutions data with a large time series, we take a measurement for corruption (cri). It comes from *Risk International* and ranges from 0 (High Corruption) to 8 (Weak Corruption).

Kaufman’s data provides interesting details with indicators which are more precise than ICRG or PolityIV. We use 6 variables : “Voice and Accountability” (VA) which measures political, civil and Human rights ; “Political Stability” (PS) which gives the probability to reverse a government ; “Government Effectiveness” (GE) is a quality government measurement ; “Regulatory Quality” (RQ) takes into account politics against the economy market ; “Rule of Law” (RL) and “Control of corruption” (CC). They range from -2.5 (Bad Institutions) to 2.5 (Good Institutions) and are available from 1996 to 2004.[23] This dataset are very helpful because it provides different measurements according to various institutional characteristics and allows observation of whether natural resources impacts are the same through the institutional measurements. Heritage’s data concerns economic freedom. Composite indicator and its components are available. They capture trade freedom, business freedom, property rights and corruption. The temporal availability is larger than that of Kaufman’s data and concerns years from 1995 to 2007. Each component

variation in this data.

[23] Data are missing for 1997, 1999, 2001.

ranges from 0 (Bad Economic Freedom) to 100 (Good Economic Freedom). To complete the institutional dataset, we introduce two measures from Heritage, the first a is composite variable (heri) and the second is a variable which measures the property rights (pr). Each variable is ranked from 0 (Low Institutions) to 100 (Good Institutions) and are available from 1995 to 2007.

To check the robustness of our empirical work, we used some others variables which could influence institutions. We provide the list of these variables in the appendix.

4 Results and Estimating Procedures

In this section we test equation 18. Each section uses different estimating procedures to provide empirical proof on the theoretical conclusion.

4.1 Results with Random-effects

For tables 3 to 5, we use a panel with random-effects. For some specifications, Hausman test indicates that the model with fixed effect is the best. But for four main reasons we take into account a model with random-effects. First, descriptive statistics for main variables indicate clearly that standard deviation between is bigger than within. Second, most of the specifications have a weak time dimension. Third, classical institutional determinants are mostly invariant. Fourth, for each specification, we make a Breusch Pagan Lagrange-multiplier test. In all our cases random-effects are significant. These four reasons give a motivation to use GLS random-effects.

Table 3 stands for the baseline results. We have 8 different institutional measurements which are endogenously determined by natural resources rents and control variables.

Table 3 here.

All equations give the expected results, $\beta_1 > 0$ and $\beta_2 < 0$. These results seem to be robust whatever the institutional measurement. This provides a support for the theoretical result. For low rent levels, the effect on the institutional level is positive and after the turning point the effect is negative, producing the predicted inverted U-shape curve.

We calculate the turning point for each equation. It appears to be different according to the institutional nature which is measured. Voice and Accountability (equation 1) breaks up with a great amount of rents (Turning point at 26.2 Millions dollars) as Rule of Law (Turning point at 8.9 Millions dollars). With Kaufman's data, Government Effectiveness and Control of Corruption exhibit the same turning point.

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The natural resources impact has a different intensity according to institutional nature measurements.

The literature considers that if the quadratic terms are significant (positive or negative) we have a non linear effect (respectively U-shaped or inverted U-shape curve). Lind and Mehlum (2007) supply a new theory which permits confirmation of the non linear effect. Indeed they find that a significant quadratic term is too weak a criteria. According to them, we must estimate if the turning point is in the data-range and test slopes on the interval's beginning and ending. In our case (for an inverse U-shape), we must find for the lower bound, a positive slope and for the upper bound, a negative slope. They adopt a test which has been developed by Sasabuchi (1980). The Sasabuchi Test indicates whether we have an inverted U-Shape curve or not.

Table 4 here.

Table 4 summarizes all results with this methodology for the first eight specifications. Specifications (1), (2), (4) and (8) are strongly significant and confirm natural resources non linear effect on institutions with an inverted U-Shape curve.
Results for specifications (3), (5), (6) and (7) suggest some different interpretations. Indeed the slope at the lower bound is less significant (but always positive), Sasabuchi Test is significant but only at 5% or 10%. For these specifications, the lower bound of the interval confidence with Fieller method is very quite or lower at the lower bound of Log rent's interval. The turning point could be outside the data range even though Sasabuchi test is significant. But, if the turning point is near the lower bound of the Log rent interval, the significance inverse hump shaped relationship is weak. Therefore, we could reconsider the natural resources positive effect on institutions quality. The inverted U-shape curve is not always identified, and for some special institutional measurements, we could only have a negative effect.

4.2 Results for Different Turning Point

One of our main predictions is that the turning point should be different between countries according to country's institutional quality (see fig. 5).

Table 5 here.

Table 5 shows that this theoretical assumption is confirmed by data and even using a panel with random-effects. We take 4 institutional measurements to test this prediction, always with random-effects.

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We split the sample in two parts according to the institutional level at the initial period. We take the institutional level mean in 1996 for each measurement. Specification (1) and (2) show that the turning point is different if we consider the full sample (26.2 Million dollars) or if we just take countries which have an initial institutional level lower than the mean (20.4 Millions dollars). It appears clearly that for countries with a low institutional level, natural resources degrade the institutional level more quickly. Specifications (3) to (8) confirm this hypothesis. The turning point for countries with an initial institutional level superior to the mean is higher than the turning point for the sample as a whole.

To provide additional proof we carry out a simultaneous quantile regression (Table 6). This methodology considers the errors correlation between different quantiles. It enables comparison between coefficients in the different quantiles (Koenker and Hallock (2001)).

Table 6 here.

In our case, it allows observation of the evolution and the intensity of the impact to β_1 and β_2. We split the sample in seven groups according to the Polity 2 measurement. It appears clearly that the turning point increases with quantiles. The higher the quantile is, the higher the turning point. This means that natural resources' positive impacts prevail less for a country with weak institutions than for a country with a high institutional level. Intensity for β_1 and β_2 between specifications (5) and (6) fail. We test if β_1 between equations (5) and (6) are significantly different. We cannot reject the hypothesis according to which β_1's in each equations are equal. It allows to minimize for specification (6) the turning point and that's the turning point is lower for the last quantile than for the next to last quantile . We also observe that for high quantile, the model's power of explanation is reduced. Indeed, countries with a high institutional level are less influenced by rents or by the *Distance to Equator*, which are significant for the first four quantiles. Table 6 confirms one of our predictions about the different turning points according to the institutional level.

4.3 Results with the *"Fixed Effects Vector Decomposition"* Method

We choose a panel with random-effects to avoid the estimation problem with fixed effets and time-invariant variables. Plümper and Troeger (2007) provide a new methodology, *Fixed Effects Vector Decomposition"* (FEVD), which enables estimation of models with time-invariant variable with fixed effects and to provide a new robustness check. The *FEVD* estimation procedure consists of a three-step estimation. The first step consists in estimating the fixed effects with a panel regression without time-invariant

variable. The second step provides the regression of the fixed effects on the time-invariant variable using OLS. The residual part of this regression is the unexplainable part of fixed effects by the time-invariant variable. The third and last step is an estimation of a pooled OLS that includes time-varying and time-invariant variables, and the unexplained part of fixed effects .

Table 7 here.

The table 7 contains *Fixed Effects Vector Decomposition* which assumes problems with a random-effect model yields $\beta_1 > 0$ and $\beta_2 < 0$. Even results with random-effects, even seem to be robust.

4.4 Results with the Hausman-Taylor Procedure

According to Plümper and Troeger (2007), the *FEVD* seems to perform better than a panel with random-effects or the Hausman-Taylor procedure. Nevertheless, in our case, the Hausman-Taylor procedure is able to overcome the endogeneity problem which could appear in our main specification and the time-invariant variable with a fixed effects problem. Indeed a panel with random-effects assumes that random individual effects are exogenous with others variables. Hausman and Taylor (1981) assume that some regressors could be correlated with individual random effects. Therefore they use the various dimensions of variation in the panel to build instruments and estimate a 2SLS regression. In our specification, we consider that GDP per capita and Economic Openness are the potential endogenous time-invariant variable and endogenous time-variant variable. Table 8 provides further proof about the robustness of our main specification.

Table 8 here.

It is the same conclusion with the table 8. Hausman-Taylor procedure allows to overcome the endogeneity problem which could appear with the random individual effect and the time-invariant variable with fixed effets problem. Except for the specification (3) and (7) we regain $\beta_1 > 0$ and $\beta_2 < 0$ and confirm our results about the non linear natural resources effect on institutions.

4.5 Results According to the Appropriability's Level

Table 9, with random-effects, illustrates another theoretical prediction about the appropriability level. The effect on institutions is not the same according the natural resources type.

Table 9 here.

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Specification (1) is the baseline and gives for a global rent the non linear effect on ICRG (Panel with random-effects is always using). Specifications (2) to (4) take into account the different natural resources types. The effects are different. Indeed, specification (2) indicates a U-Shape which is confirmed by Lind and Mehlum (2007)'s theory even though Fieller interval is near the lower bound of the dataset. With this closeness between the turning point and the Fieller interval, if the negative effect exists, we have quickly a positive effect. This particular case could be explained by the nature of the natural resource. In fact, the variable *Rents 4* includes only a measurement for forest. Although it is a renewable resource and all our predictions and the literature about this topic are about non-renewable natural resources.

For products ranking in the class 3, we find again the inverted U-shape curve which is confirmed by Lind and Mehlum (2007)'s test. On the other hand, specification (4) indicates a U-Shape with a Turning Point at 98.5 Millions Dollars but the test does not find the presence of a U-Shape. We could suppose that there is just a negative effect without a Turning Point. Specifications (5) and (6) refine this assumption. If we split the sample between those that belong to the High Income OECD Countries and those that don't, we observe two distinct effects. For the richest countries, we found again an inverted U-Shape curve which is confirmed by the test. For poorer countries, we have a U-Shape but the test indicates clearly that the turning point is not. *De facto*, with this test, we could have only a negative effect. According to the natural resources type, the effect on institutional level measured by ICRG could be different. If we do not have an inverted U-Shape curve, it appears that the effect is negative which is developed by the literature on this topics. We explain this permanent negative effect by a very weak institutional quality which is not able to bear natural resources rents.

4.6 Robustness Check

Table 10 provides a robustness check with ICRG used as the institutional measurement. Indeed, with ICRG we have a large panel and with these data we are clearly in the presence of an inverted U-Shape curve. Following the literature, we test some variables which have some explanation power on the institutional level.

Table 10 here.

The first specification is the baseline using panel data with random-effects. We introduce ethnic fractionalization, malaria in 1994 and the part of population which lives on a temperate zone in 1995. The estimated coefficient of these three variables are not significant and natural resources effects don't vary. Ethnic fractionalization is non-significant as Alesina et al. (2003), Hodler (2006) found once they control

for distance to equator.

We test the robustness of our results with the civil war lagged for one year. It appears that civil war damages the institutional level but we still find our natural resources non linear effect on institutional quality, but its less significant. This point could be explained by the literature about the conflict and notably by Collier and Hoeffler (2004). They found that natural resource dependence increases civil war probability because rents provide a financial opportunity for rebelion. Indeed, without natural resources dependence, civil war probability is near 0.5% and with a percentage of national income from primary commodity exports at 23%, the probability climbs to 26%. Fearon (2005) offers a new interpretation. He thinks that rebels could finance themselves with natural resources only marginally. Civil war probability grows because there is an institutional degradation and the country chooses "extractive" institutions.[24] These authors found a negative relationship between natural resource and civil war which could explain our specification (4).

To check the robustness on our results, we control for the geographic localization by regions. We test for 8 diverse areas but we present just two specifications (6) and (7).[25] However in all cases, the natural resources effect is robust. The two last robustness checks concern legal origin matter. Again, we test for 4 diverse legal origins and we find for each one that natural resources effect is robust. Specifications (8) and (9) show regression with French and German legal Origin.

5 Conclusion

This paper examines the natural resources effect on institutions. Our conclusion about a hump shaped or negative effects on institutions partially confirm the view provided by various authors such Ross (2001a), Leite and Weidmann (1999), Sala-i Martin and Subramanian (2003), Isham et al. (2005), Bulte et al. (2004) . But these authors do not contemplate a positive effect. Brunnschweiler (2008) finds that *"Natural resource abundance does not necessarily lead to worse institutions..."*. Moreover, why Norway has strong institutions whereas Nigeria has weak institutions ? Our results offer a response to this puzzle. Each country has a structural institutional capacity to bear some natural resource rent. National institutions determine a threshold in the amount of natural resources and beyond which this point the resources positive impact on institutions becomes negative.

Further interesting research could take into account this finding about the non linear effect to explain an

[24] Acemoglu et al. (2001b) consider "extractive" institutions as a main cause of bad economic performance.

[25] Others are available upon request

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another discord within the literature on rent-seeking. Indeed there is a debate on natural resources impact on growth. Since Sachs and Warner (1995), many authors found a negative relationship but some authors (Stijns (2003), Brunnschweiler (2008)) reject this negative relationship. Mehlum et al. (2006) provide a first response on this debate : natural resources could be a blessing for countries with good institutions or a curse if country has bad institutions. But authors do not weigh the natural resources non linear effect on institutions. Our findings furnish one complementary explanation in this debate.

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6 Technical Appendix

6.1 Proof for s value

To find s we must take into account the shares of resources for each group (like Mehlum et al. (2006)). Grabbers use their entire effort for the rent-seeking activity, that's why we have a proportion $(1-\alpha)$ with the effort normalized to one. Producer's effort is lower than the grabber's effort and depends on the institutional level. The better the institutional quality, the more efficient is the effort to capture a part of rent. The sum of shares cannot exceed one. It comes : $\alpha\lambda s + (1-\alpha)s \leq 1$. If the constraint is saturated (no waste), it is implying : $s = \frac{1}{(1-\alpha)+\alpha\lambda}$

6.2 Proof for π

First : $\pi = y(1-\frac{1}{\beta}) - F$ then we have : $n_f\pi = yn_f(1-\frac{1}{\beta}) - n_fF$. We express GDP like :

$$Y = L + N(\alpha\pi_f + \pi_g(1-\alpha)) = L + N\alpha\pi + \sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i - c_i) \tag{19}$$

Which gives : $n_f\pi = My - L$. With a factorization, we found : $y = \frac{\beta(L-n_fF)}{\beta(M-n_f)+n_f}$.We have an expression for π that does not depend on the institutional level : $\pi = \frac{\beta(L-FM)-L}{\beta(M-n_f)+n_f}$

If $\pi_f > \pi_g$ then,

$$\lambda > \frac{(\alpha-1)N\pi + \sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i-c_i)}{\sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i-c_i) + \alpha N\pi} \tag{20}$$

and if α =1,

$$\lambda > \frac{\sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i-c_i)}{\sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i-c_i) + N\pi} \tag{21}$$

If $\pi_f = \pi_g$ then,

$$\alpha = \frac{(\lambda-1)\sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i-c_i) + N\pi}{(1-\lambda)N\pi} \tag{22}$$

6.3 The turning point A

On the point A, we have $\pi_f = \pi_g$ and no grabbers in the economy ($\alpha = 1$). If the price increasing, we can stay on the same point A and have some improvements on the institutional quality :

$$\lambda = \frac{\frac{s}{N}\sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i - c_i)}{\frac{s}{N}\sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i - c_i) + N\pi} \tag{23}$$

$$\frac{\delta\lambda}{\delta p_i} = \frac{\frac{q_i}{\gamma_i}N\pi}{(\sum_{i=1}^{V}\frac{1}{\gamma_i}q_i(p_i - c_i) + \alpha N\pi)^2} > 0 \tag{24}$$

with the assumption that $\pi > 0$.

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TAB. 1 – Natural Resources and Human Development Indicator

Average Rent	Rent per capita	Rent/GDP	Resource dependence on total exportation	Resource dependence on GDP
U.S. (10)	Qatar (40)	Turmenistan (97)	Iraq (.)	Oman (71)
Saudi Arabia (77)	Kuwait (44)	Iraq (.)	Angola (160)	Equatorial Guinea (121)
Russia (62)	United Arab Emirates (41)	Liberia	Equatorial Guinea (121)	Angola (160)
China (85)	Saudi Arabia (77)	Kuwait (44)	Yemen. Rep. (151)	Saudi Arabia (77)
Iran (99)	Bahrain (43)	Saudi Arabia (77)	Congo (142)	Gabon (123)
Mexico (53)	Oman (71)	Nigeria (158)	Nigeria (158)	Iraq (.)
Canada (5)	Libya (58)	Libya (58)	Mauritania (152)	Congo (142)
Venezuela (75)	Trinidad and Tobago (57)	Iran (99)	Cameroon (148)	Qatar (40)
India (127)	Norway (1)	Qatar (40)	Gabon (123)	Kazakstan (80)
Kuwait (44)	Venezuela (75)	Oman (71)	Central Afr. Rep. (171)	Nigeria(158)
Iraq (.)	Gabon (123)	Azerbaijan (101)	Congo. Dem. Rep. (142)	Liberia (.)
Nigeria (158)	Turkmenistan (97)	Bahrain (43)	Guinea (156)	Congo. Dem. Rep. (142)
Indonesia (110)	Canada (5)	Russia (62)	Burundi (169)	Kuwait (44)
United Arab Emirates (41)	Iraq (.)	Papua New Guinea (137)	Rwanda (159)	Papua New Guinea (137)
U.K. (15)	Australia (3)	Trinidad and Tobago (57)	Iran (99)	Iran (99)
Algeria (103)	Iran (99)	Algeria (103)	Libya (58)	Suriname (86)
Libya (58)	Russia (62)	Angola (160)	Algeria (103)	United Arab Emirates (41)
Australia (3)	U.S (10)	Gabon (123)	Kuwait(44)	Algeria (103)
Brazil (63)	Algeria (103)	Congo (142)	Uganda (144)	Libya (58)
South Africa (120)	Malaysia (61)	Kazakhstan (80)	Ivory Coast (163)	Ecuador(82)
Norway (1)	Kazakhstan (80)	Mauritania (152)	Chad (173)	Estonia(38)
Malaysia (61)	Mexico (53)	United Arab Emirates (41)	Cuba (52)	Tajikistan (122)
Oman (71)	Chile (37)	Uzbekistan (111)	Saudi Arabia (77)	Russia (62)
Qatar (40)	Suriname (86)	Syria (106)	Oman (71)	Yemen. Rep. (151)
Egypt (119)	Syria (106)	Venezuela (75)	Tanzania (164)	Mongolia (114)
High Human Development : 10	High Human Development : 10	High Human Development : 4	High Human Development : 2	High Human Development : 4
Medium Human Development : 13	Medium Human Development : 14	Medium Human Development : 16	Medium Human Development : 11	Medium Human Development : 17
Low Human Development : 1	Low Human Development : 0	Low Human Development : 3	Low Human Development : 11	Low Human Development : 3
Missing HDI : 0	Missing HDI : 1	Missing HDI : 2	Missing HDI : 1	Missing HDI : 1

Note : It is an decreasing ranking. We make the mean on the dependency ratio on natural resources (or the rent) from 1962 to 2000. Inside the brackets we have the ranking for the human development index from Human Development Report 2005. PNUD ranks countries on three categories : High Human Development (1 to 57) ; Medium Human Development (58 to 145) Low Human Development (146 to 177).

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TAB. 2 – Variables and Sources

Variable	Definition	Source
Log GDP/cap	Log of GDP per capita. GDP is measured in constant dollar for the year 2000	The World Bank
Openness	It is the sum between exportations and importations for a country for one year divised by GDP	Dataset from Robert Feenstra
Distance to Equator	We calculate the distance for each country such as Distance to Equator = abs(Latitude)/90	The World Bank and own calculation
Fraction European/English Speaking	It is the fraction of the population speaking English and the fraction speaking one of the major languages of Western Europe : English, French, German, Portuguese, or Spanish	Hall and Jones (1999)
Secondary Schooling 1965	The rate of Secondary Schooling Enrollment for 1965	The World Development Indicator
Ethnic Fractionalization	Index of Ethnic Fractionalization. It is ranking from 0 (least fractionalized) to 1 (extremely fractionalized)	Alesina *et al.* (2003)
Malaria 1994	Percentage of population which could be infect by Malaria	Dataset from A.Shleifer
Population Temperate Zone 1995	Part of population living in temperate zone	Dataset from A.Shleifer
Civil War	It is a binomial variable coded 1 if there are at least 1000 deaths by year. This civil war must be an organized military act and dummy doesn't take into account "external war' and "extra-systemic war"	Correlate of War (COW)
Geographical Variable	Middle East and North Africa, East Asia and Pacific	The World Bank
Legal Origin	We distinguish five diverse legal Origins : British, French, Socialist, German, Scandinavian.	The World Bank
Dummy Income Level	We have six dummies to narrow countries through our income : low, lower-middle, upper-middle, highoecd, high non oecd and developing	The World bank

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TAB. 3 – Natural Resources Impact on Institutional Quality

Model :	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depvar :	VA	RL	GE	CC	pr	heri	PS	icrg
$LogRent_{t-1}$	0.205**	0.224***	0.155*	0.248***	4.724**	2.180**		
	(0.081)	(0.072)	(0.080)	(0.080)	(2.226)	(1.034)		
$LogRent^2_{t-1}$	-0.006***	-0.007***	-0.005**	-0.008***	-0.177***	-0.066**		
	(0.002)	(0.002)	(0.002)	(0.002)	(0.061)	(0.029)		
$LogRent_{t-3}$							0.169*	3.059**
							(0.103)	(1.312)
$LogRent^2_{t-3}$							-0.006**	-0.091**
							(0.003)	(0.037)
Log GDP/cap 1990	0.105	0.329***	0.313***	0.349***	8.807***	3.469***		
	(0.065)	(0.058)	(0.061)	(0.060)	(1.663)	(1.102)		
Distance to Equator	0.325	0.979**	1.108**	1.003**	-7.676	-5.162	1.022*	12.170 *
	(0.472)	(0.423)	(0.439)	(0.431)	(11.941)	(7.982)	(0.547)	(6.825)
Openness_{t-5}	0.164***	-0.080*	0.040	-0.148***	-2.577	1.609**	0.083	4.614***
	(0.054)	(0.048)	(0.054)	(0.053)	(1.646)	(0.707)	(0.079)	(1.119)
Fraction European Speaking	0.700***	0.061	0.196	0.067	0.831	6.994***	0.408**	3.279
	(0.155)	(0.139)	(0.144)	(0.141)	(3.921)	(2.622)	(0.184)	(2.238)
Fraction English Speaking	-0.186	0.260	0.306	0.410*	9.989	3.145	0.082	-0.469
	(0.256)	(0.229)	(0.238)	(0.233)	(6.458)	(4.329)	(0.306)	(3.875)
Secondary Schooling 1965	0.022***	0.012***	0.011**	0.011***	0.287**	0.105	0.011**	0.178***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.116)	(0.077)	(0.005)	(0.066)
Log GDP/cap 1980							0.228***	4.365***
							(0.081)	(1.004)
N	597	597	594	588	918	918	555	1564
R^2	0.7251	0.8004	0.8019	0.8078	0.6447	0.5290	0.6176	0.7332
Turning Point (Millions Dollars)	26.2	8.9	5.4	5.4	0.6	14.9	1.3	19.9

Note : Standard errors in parentheses with ***, ** and * respectively denoting significance at the 1%, 5% and 10% levels. Sample : Algeria, Argentina, Australia, Austria, Bangladesh, Barbados, Belgium, Bénin, Bolivia, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Chile, Colombia, Congo, Costa Rica, Ivory Coast, Cyprus, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Ghana, Greece, Guatemala, Guinea, Haiti, Honduras, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Kuwait, Laos, Liberia, Madagascar, Malawi, Malaysia, Mauritania, Mauritius, Mexico, Morocco, Mozambique, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Papua New Guinea, Peru, Philippines, Poland, Portugal, Romania, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Somalia, South Africa, South Korea, Spain, Sri Lanka, Sudan, Suriname, Sweden, Switzerland, Syria, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, United Kingdom, Uruguay, Venezuela, Yemen, Zambia, Zimbabwe.

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TAB. 4 – Test for U-Shaped (Lind and Mehlum (2007))

Model :	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depvar :	VA	RL	GE	CC	pr	heri	PS	icrg
Interval :	[6.36 ; 26.03]	[6.36 ; 26.03]	[6.36 ; 26.03]	[6.36 ; 26.03]	[6.36 ; 26.03]	[6.36 ; 26.03]	[6.36 ; 26.03]	[6.36 ; 26.03]
Slope at Lower Bound :	0.127^{***}	0.135^{***}	0.093^{**}	0.151^{***}	2.46^{**}	1.33^{**}	0.088^{*}	1.89^{**}
Slope at Upper Bound :	-0.111^{***}	-0.138^{***}	-0.095^{***}	-0.146^{***}	-4.51^{***}	-1.27^{***}	-0.161^{***}	-1.69^{***}
Sasabuchi Test for inverse U-shaped :	2.39^{***}	2.87^{***}	1.77^{**}	2.90^{***}	1.69^{**}	1.97^{**}	1.33^{*}	2.25^{**}
Turning Point :	17.08	16	15.5	15.5	13.3	16.51	14.07	16.8
95% confidence interval for extreme point : (Fieller method)	[12.32 ; 18.98]	[12.86 ; 17.64]	[-3 ; 18.59]	[13.28 ; 17.9]	[3 ; 15.74]	[6.52 ; 19.32]	[-21.04 ; 16.17]	[11.84 ; 19.51]

Note : With ***, ** and * respectively denoting significance at the 1%, 5% and 10% levels

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TAB. 5 – Diverse Turning Point

Model :	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depvar :	VA	VA	RL	RL	CC	CC	heri	heri
$LogRent_{t-1}$	0.205**	0.303***	0.224***	0.410***	0.248***	0.276**	2.180**	3.063*
	(0.081)	(0.116)	(0.072)	(0.107)	(0.080)	(0.108)	(1.034)	(1.690)
$LogRent^2_{t-1}$	-0.006***	-0.009***	-0.007***	-0.012***	-0.008***	-0.008***	-0.066**	-0.090**
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.029)	(0.043)
Log GDP/cap 1990	0.105	-0.001	0.329***	0.342***	0.349***	0.338***	3.469***	1.788**
	(0.065)	(0.083)	(0.058)	(0.073)	(0.060)	(0.093)	(1.102)	(0.809)
Distance to Equator	0.325	-0.703	0.979**	0.402	1.003**	0.954	-5.162	2.113
	(0.472)	(0.551)	(0.423)	(0.526)	(0.431)	(0.598)	(7.982)	(5.452)
$Openness_{t-5}$	0.164***	0.220***	-0.080*	-0.115**	-0.148***	-0.175**	1.609**	2.021*
	(0.054)	(0.067)	(0.048)	(0.045)	(0.053)	(0.070)	(0.707)	(1.128)
Fraction European Speaking	0.700***	0.815***	0.061	0.112	0.067	0.325*	6.994***	3.554**
	(0.155)	(0.228)	(0.139)	(0.153)	(0.141)	(0.188)	(2.622)	(1.623)
Fraction English Speaking	-0.186	-6.071	0.260	0.316	0.410*	0.252	3.145	4.921**
	(0.256)	(5.592)	(0.229)	(0.229)	(0.233)	(0.264)	(4.329)	(2.318)
Secondary Schooling 1965	0.022***	0.014**	0.012***	0.007*	0.011***	0.009	0.105	0.011
	(0.005)	(0.007)	(0.004)	(0.004)	(0.004)	(0.006)	(0.077)	(0.045)
N	597	333	597	237	588	250	918	495
Sample	All countries	VA96< Mean VA96	All Countries	RL96> Mean RL96	All Countries	CC96> Mean CC96	All Countries	heri96> Mean heri96
R^2	0.7251	0.3924	0.8004	0.7553	0.8078	0.8440	0.5290	0.5741
Turning Point (Millions Dollars)	26.2	20.4	8.9	26.2	5.4	31	14.9	16.9

Note : Standard errors in parentheses with ***, ** and * respectively denoting significance at the 1%, 5% and 10% levels

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TAB. 6 – Impacts on Pol2 With Quantiles

Model :	(1)	(2)	(3)	(4)	(5)	(6)
Depvar :	pol2	pol2	pol2	pol2	pol2	pol2
Quantiles :	q15	q30	q45	q60	q75	q90
$LogRent_{t-1}$	0.556*	0.671***	0.915**	1.80***	1.121*	0.708***
	(0.323)	(0.192)	(0.441)	(0.284)	(0.654)	(0.213)
$LogRent^2_{t-1}$	-0.023*	-0.025***	-0.028*	-0.048***	-0.029*	-0.019***
	(0.012)	(0.006)	(0.015)	(0.008)	(0.016)	(0.006)
Log GDP/cap 1962	-0.876**	0.457	0.603	0.805**	-0.130	0.475***
	(0.428)	(0.414)	(0.804)	(0.348)	(0.212)	(0.136)
Distance to Equator	-1.078	-4.506***	-6.591***	-5.270***	0.230	-0.333
	(1.107)	(1.125)	(1.584)	(1.129)	(0.898)	(0.252)
Openness_{t-5}	-0.279	-0.781***	-0.516	-0.944*	0.177	-0.112
	(0.254)	(0.260)	(0.643)	(0.527)	(0.405)	(0.143)
Fraction European Speaking	5.098***	6.589***	8.290***	5.015***	3.783***	0.759***
	(1.018)	(0.726)	(0.725)	(0.469)	(0.499)	(0.123)
Fraction English Speaking	7.406***	-1.091*	-3.962***	-3.385***	-2.486***	-0.572***
	(2.677)	(0.652)	(0.763)	(0.451)	(0.506)	(0.172)
Secondary Schooling 1965	0.143***	0.225***	0.217***	0.184***	0.121***	0.023***
	(0.037)	(0.010)	(0.031)	(0.013)	(0.016)	(0.009)
R^2	0.1992	0.3557	0.3780	0.2871	0.1813	0.0605
Turning Point (Millions Dollars)	0.17	0.67	12.47	139	247.7	123.47

Note : Standard errors in parentheses with ***, ** and * respectively denoting significance at the 1%, 5% and 10% levels

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TAB. 7 – Fixed Effects Vector Decomposition

Model :	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depvar :	VA	RL	GE	CC	pr	heri	icrg	PS
$LogRent_{t-1}$	0.252***	0.294***	0.180***	0.352***	9.792***	2.463***		
	(0.0296)	(0.0304)	(0.0263)	(0.0311)	(0.745)	(0.295)		
$LogRent^2_{t-1}$	-0.00595***	-0.00875***	-0.00496***	-0.00970***	-0.357***	-0.0717***		
	(0.000775)	(0.000777)	(0.000688)	(0.000812)	(0.0203)	(0.00785)		
$LogRent_{t-3}$							0.206***	4.950***
							(0.0432)	(0.640)
$LogRent^2_{t-3}$							-0.00607***	-0.152***
							(0.00114)	(0.0177)
Openness_{t-5}	0.160***	-0.143***	-0.0202	-0.223***	-5.013***	1.250***	-0.0841***	4.215***
	(0.0212)	(0.0216)	(0.0272)	(0.0228)	(0.690)	(0.291)	(0.0314)	(0.538)
Log GDP/cap 1990	0.0597***	0.327***	0.292***	0.331***	10.28***	3.075***		
	(0.0101)	(0.00838)	(0.0108)	(0.0121)	(0.371)	(0.127)		
Distance to Equator	0.200**	0.891***	0.995***	0.880***	-8.343***	-4.738***	0.845***	11.00***
	(0.0776)	(0.0702)	(0.0787)	(0.0754)	(2.467)	(1.019)	(0.115)	(1.693)
Fraction European Speaking	0.692***	0.0381**	0.170***	0.0434**	-0.124	6.311***	0.369***	2.818***
	(0.0230)	(0.0181)	(0.0242)	(0.0216)	(0.715)	(0.304)	(0.0345)	(0.579)
Fraction English Speaking	-0.213***	0.283***	0.311***	0.410***	12.61***	3.772***	0.0437	0.532
	(0.0314)	(0.0454)	(0.0377)	(0.0289)	(1.305)	(0.483)	(0.0484)	(0.746)
Secondary Schooling 1965	0.0247***	0.0127***	0.0125***	0.0132***	0.213***	0.114***	0.0141***	0.164***
	(0.000648)	(0.000602)	(0.000705)	(0.000678)	(0.0282)	(0.00979)	(0.00122)	(0.0170)
Log GDP/cap 1980							0.190***	4.907***
							(0.0202)	(0.304)
Residuals	1***	1***	1***	1***	1***	1***	1***	1***
	(0.0155)	(0.0153)	(0.0209)	(0.0186)	(0.0178)	(0.0127)	(0.0247)	(0.0315)
N	597	597	594	588	918	918	1564	555
R^2	0.959	0.971	0.962	0.966	0.894	0.932	0.75	0.919

Note : Standard errors in parentheses with ***, ** and * respectively denoting significance at the 1%, 5% and 10% levels

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TAB. 8 – Hausman Taylor

Model :	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depvar :	VA	RL	GE	CC	pr	heri	PS	icrg
$LogRent_{t-1}$	0.238**	0.283***	0.160	0.323***	9.942***	2.60**		
	(0.097)	(0.085)	(0.098)	(0.098)	(2.754)	(1.155)		
$LogRent^2_{t-1}$	-0.006**	-0.009***	-0.005*	-0.009***	-0.358***	-0.074**		
	(0.003)	(0.002)	(0.003)	(0.003)	(0.077)	(0.032)		
$LogRent_{t-3}$							0.150	4.951***
							(0.122)	(1.573)
$LogRent^2_{t-3}$							-0.005	-0.153***
							(0.004)	(0.047)
Openness_{t-5}	0.161***	-0.142***	-0.018	-0.219***	-5.015***	1.247*	-0.080	4.242***
	(0.057)	(0.050)	(0.057)	(0.055)	(1.770)	(0.747)	(0.084)	(1.217)
Distance to Equator	2.738*	0.743	1.442	1.153	-90.870	6.201	1.412	-1.463
	(1.571)	(0.890)	(0.959)	(0.922)	(58.152)	(14.408)	(0.859)	(10.826)
Fraction European Speaking	1.387***	-0.008	0.293	0.113	-22.890	9.683**	0.565*	-0.999
	(0.468)	(0.263)	(0.283)	(0.274)	(17.192)	(4.231)	(0.299)	(3.444)
Fraction English Speaking	-0.403	0.293	0.288	0.414	18.147	2.706	-0.027	2.614
	(0.503)	(0.261)	(0.290)	(0.290)	(19.213)	(4.460)	(0.409)	(5.042)
Secondary Schooling 1965	0.059***	0.009	0.017	0.015	-1.031	0.286	0.023*	-0.044
	(0.021)	(0.013)	(0.014)	(0.013)	(0.785)	(0.203)	(0.013)	(0.142)
Log GDP/cap 1990	-0.864*	0.414	0.154	0.274	43.061**	-1.221		
	(0.523)	(0.314)	(0.334)	(0.315)	(19.107)	(4.975)		
Log GDP/cap 1980							-0.068	11.253***
							(0.314)	(3.721)
N	597	597	594	588	918	918	555	1564
R^2	0.	0.	0.	0.	0.	0.	0.	0.

Note : Standard errors in parentheses with ***, ** and * respectively denoting significance at the 1%, 5% and 10% levels

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TAB. 9 – Impact on Institutional Quality According Natural Resource Types

Model :	(1)	(2)	(3)	(4)	(5)	(6)
Depvar :	icrg	icrg	icrg	icrg	icrg	icrg
$LogRent_{t-3}$	3.059**					
	(1.312)					
$LogRent^2_{t-3}$	-0.091**					
	(0.037)					
$LogRent_{t-3}$ 4		-10.797***				
		(3.016)				
$LogRent^2_{t-3}$ 4		0.456***				
		(0.094)				
$LogRent_{t-3}$ 3			2.929*			
			(1.561)			
$LogRent^2_{t-3}$ 3			-0.112***			
			(0.043)			
$LogRent_{t-3}$ 6				-2.540**	5.966***	-3.228**
				(1.243)	(2.021)	(1.474)
$LogRent^2_{t-3}$ 6				0.069*	-0.171***	0.092*
				(0.039)	(0.060)	(0.047)
Log GDP/cap 1980	4.365***	10.153***	4.748***	3.480***	6.762**	2.847**
	(1.004)	(1.777)	(1.125)	(1.243)	(3.290)	(1.370)
Distance to Equator	12.170*	-0.248	8.934	9.833	-11.806	3.977
	(6.825)	(11.296)	(7.010)	(7.218)	(12.543)	(8.556)
Openness_{t-5}	4.614***	6.546***	3.648***	5.302***	12.754***	5.147***
	(1.119)	(1.629)	(1.322)	(1.304)	(1.910)	(1.548)
Fraction European Speaking	3.279	-0.531	4.593*	3.406	2.219	2.357
	(2.238)	(4.308)	(2.541)	(2.413)	(3.081)	(2.954)
Fraction English Speaking	-0.469	-144.778*	1.227	-0.873	-0.850	-3.936
	(3.875)	(80.806)	(4.099)	(4.213)	(3.302)	(8.483)
Secondary Schooling 1965	0.178***	-0.056	0.157**	0.268***	0.123	0.245**
	(0.066)	(0.097)	(0.070)	(0.071)	(0.099)	(0.095)
N	1564	566	1146	1253	298	955
Sample	All countries	All countries	All countries	All countries	High Income OECD Countries	Non OECD Countries
R^2	0.7332	0.563	0.699	0.7219	0.4487	0.3930
Turning Point (Millions Dollars)	19.9	0.14	0.47	98.5	37.7	41.6

Note : Standard errors in parentheses with ***, ** and * respectively denoting significance at the 1%, 5% and 10% levels

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TAB. 10 – Robustness Check With ICRG

Model :	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Depvar :	icrg	icrg	icrg	icrg	icrg	icrg	icrg	icrg	icrg
$LogRent_{t-3}$	3.059**	3.280**	3.073**	2.464*	2.780**	3.180**	2.510*	3.105**	2.889**
	(1.312)	(1.314)	(1.314)	(1.295)	(1.326)	(1.292)	(1.283)	(1.305)	(1.297)
$LogRent^2_{t-3}$	-0.091**	-0.099***	-0.092**	-0.075**	-0.082**	-0.096***	-0.071*	-0.091**	-0.084**
	(0.037)	(0.038)	(0.037)	(0.037)	(0.038)	(0.037)	(0.036)	(0.037)	(0.037)
Log GDP/cap 1980	4.365***	4.588***	4.239***	3.717***	4.176***	4.359***	4.914***	4.509***	4.135***
	(1.004)	(1.056)	(1.062)	(0.915)	(1.017)	(0.948)	(0.938)	(0.988)	(0.966)
Distance to Equator	12.170*	12.538*	11.296	10.928*	5.428	20.168***	17.604***	12.283*	11.531*
	(6.825)	(7.398)	(7.212)	(6.154)	(8.744)	(6.802)	(6.414)	(6.688)	(6.540)
$Openness_{t-5}$	4.614***	4.672***	4.607***	3.923***	4.668***	4.662***	5.018***	4.695***	4.782***
	(1.119)	(1.199)	(1.119)	(1.154)	(1.119)	(1.107)	(1.107)	(1.115)	(1.112)
Fraction European Speaking	3.279	3.871	2.957	3.557*	3.267	5.027**	1.179	5.036**	2.822
	(2.238)	(2.421)	(2.392)	(2.022)	(2.230)	(2.162)	(2.134)	(2.349)	(2.152)
Fraction English Speaking	-0.469	-1.604	-0.316	-1.318	-0.577	-2.289	-0.187	-3.999	1.203
	(3.875)	(4.036)	(3.915)	(3.491)	(3.839)	(3.679)	(3.533)	(4.156)	(3.767)
Secondary Schooling 1965	0.178***	0.195***	0.175***	0.201***	0.155**	0.106	0.121*	0.160**	0.165***
	(0.066)	(0.068)	(0.067)	(0.060)	(0.069)	(0.066)	(0.063)	(0.065)	(0.064)
Ethnic Fractionalization		0.037							
		(0.033)							
malaria 94			-1.190						
			(3.022)						
Civil War t-1				-8.505***					
				(0.901)					
Population Temperate Zone 95					4.879				
					(3.902)				
East Asia and Pacific						9.038***			
						(2.535)			
Middle East and North Africa							-8.432***		
							(2.418)		
French Legal Origin								-3.624**	
								(1.747)	
German Legal Origin									9.698***
									(3.722)
N	1564	1524	1564	1480	1561	1564	1564	1564	1564
R^2	0.733	0.736	0.733	0.775	0.739	0.768	0.771	0.747	0.755

Note : Standard errors in parentheses with ***, ** and * respectively denoting significance at the 1%, 5% and 10 > % levels

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