

Cursed by resources or institutions?¹

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Abstract

Natural resource abundant countries constitute both growth losers and growth winners, and the main difference between the success cases and the cases of failure lays in the quality of institutions. With grabber friendly institutions more natural resources push aggregate income down, while with producer friendly institutions more natural resources increase income. Such a theory finds strong support in data. A key question we also discuss is if resources in addition alter the quality of institutions. When that is the case, countries with bad institutions suffer a double resource curse - as the deterioration of institutions strenghtens the negative effect of more natural resources.

Keywords: *Natural resources, Institutional quality, Growth, Rent-seeking*

JEL: O4, Q0, F43

1 Introduction

Imagine that a valuable natural resource is suddenly discovered both in Afghanistan and Switzerland. What would the economic consequences in each of the two countries be? Would the new wealth turn out to be a curse or a blessing?

Resource booms often become a curse rather than a blessing. In many cases it hampers economic and political development. On average resource rich economies have lower growth¹, worse institutions, and more conflict than resource poor economies.² Thus empirically, being rich in natural resources is associated with being poor in material wealth – the 'paradox of plenty'.

Behind this pattern we find the usual suspects such as oil rich Angola, Nigeria, Sudan, and Venezuela; diamond rich Sierra Leone, Liberia, and Congo; in addition to narcotic states like Colombia and Afghanistan. Countries like these clearly perform poorly. Less attention is devoted to good performers among the resource rich countries. Several countries that are doing well today, became prosperous because of, rather than in spite of, their natural resources. The positive economic development of Australia, Canada, the US, New Zealand, Iceland, and the Scandinavian countries was stimulated by natural resource abundance. In a World Bank study five of the top eight countries, according to natural resource wealth, were also among the top 15 according to income.³

For example, by 1913 the US "was the world's dominant producer of virtually every one of the major industrial minerals of that era"; and "[r]esource abundance was a significant factor in shaping if not propelling the U.S. path to world leadership

¹This was demonstrated in the seminal paper by Sachs and Warner (1995). Further evidence can be found in Sachs and Warner (1997a,b), Gylfason et al. (1999), Auty (2001), and Papyrakis and Gerlagh (2004).

²On institutions see Karl (1997), Ross (2001a), Sala-i-Martin and Subramanian (2003), Bulte et al. (2005), Collier and Hoeffler (2005); on governance see Ross (2001b), Damania and Bulte (2003), Murshed (2003); on civil conflict see Collier and Hoeffler (2004), Ross (2004), Olsson (2004), Lujala et al. (2005).

³See World Bank (1994).

in manufacturing.”⁴ Similarly, ”late nineteenth century California was a resource based economy with limited manufacturing, largely because the local market was too small to support much industry. ..[T]he discovery of oil around the turn of the century raised California to critical mass, starting it on a process of explosive growth.”⁵

Also today there are growth winners among the resource rich countries.⁶ A prominent example of a growth winner is diamond rich Botswana with the world’s highest growth rate since 1960. Another growth winner is Norway, the world’s third largest oil exporter. Norway started its oil extraction as late as 1973, and has since had high economic growth also compared to the other Scandinavian countries.⁷ Chile, Brazil, and Australia are other recent examples where the mineral sector has contributed positively to the economy.⁸ Peru, Malaysia, and Thailand are developing countries that can be added to the list of resource rich countries that have avoided the curse.⁹

The variation in performance of resource rich countries is also evident from the Human Development Index (HDI). For example, there are close to forty countries in the world with oil revenues that constitute at least thirty per cent of their export earnings. Many of them have a substantially lower HDI rank than GDP rank. Yet such an underperformance in human development is not true for all, as close to half of these oil rich countries have a HDI rank equal to, or higher than, their GDP rank.¹⁰

⁴Wright and Czelusta (2002, p. 9).

⁵Based on observations of Paul Rhode (1980), cited from Krugman (1991, p. 28).

⁶Some authors even contest the claim that there is a negative relationship between resource abundance and average growth. See Stijns (2002) and Lederman and Maloney (2003).

⁷See for instance Røed Larsen (2003).

⁸See Wright and Czelusta (2002).

⁹See Abidin (2001).

¹⁰Bulte et al. (2005) argue that the negative effects of resource abundance carry over to undernourishment, poverty and other human development indicators.

How should we explain the diverging impact of natural resources on economic development across countries? Why are some countries blessed and others cursed by their resource wealth? We suggest that an important explanation can be found in institutional differences. Measured by institutional and political indicators resource rich countries again show huge variations. Those that do well economically, also tend to score high on institutional and political indicators, and vice versa. Growth winners, like Chile, Malaysia, and Thailand, rank ahead of growth losers as Algeria, Ecuador, Mexico, Nigeria, Trinidad & Tobago, Venezuela, and Zambia.¹¹ Moreover, Botswana has the best African score on the Groningen Corruption Perception Index. The economic consequences of discovering a new valuable resource are therefore likely to be quite different in warlord dominated Afghanistan and law obedient Switzerland. This implies that countries that need more resources the most might benefit the least from such new wealth.

The aim of this paper is to explore and quantify the relationship between economic growth, resource abundance, and institutional quality. The explanations we suggest focus on the allocation of rents from natural resources. Resource rents may be channeled into the productive economy, or they may be captured by the elite for personal enrichment. Whether the rents stimulate the productive economy or induce strategic jockeying among the elites, depends on the quality of institutions. We claim that the quality of institutions determines whether natural resource abundance is a blessing or a curse.

2 Links between institutions and the resource curse

The literature on the resource curse may be divided into three strands: One, where the quality of institutions are hurt by resource abundance and constitutes the intermediate causal link between resources and economic performance; another, where

¹¹Robinson et al. (2005).

the institutions do not play an important role; yet another, where resources interact with the quality of institutions such that resource abundance is a blessing when institutions are good and a curse when institutions are bad.

1. *Institutions as an intermediate causal link*: This strand includes a large number of recent papers claiming that the main reason for the resource curse is a decay of institutional quality in resource rich countries.

Concrete examples of destruction of institutions can be found in the many civil wars over the control of natural resources as in Sudan, Nigeria, Angola, and Congo – just to mention a few.¹² If not leading to civil war, high resource incomes can nevertheless lead to inferior political governance. Michael Ross, for example, shows that oil dependency tend to hinder democracy. Resources affect democracy over an above what is explained by factors such as national income, geographical position, religion etc.¹³ This research has been extended to cover other measures of institutional quality than the governance index used by Ross. Some studies have in addition identified the negative effect from resources, via institutional decay, to economic growth.¹⁴

Other authors make a distinction between types of resources and find that economies, relying heavily on exports of fuels, minerals, and plantation crops (sugar), score particularly low on a wide array of governance indicators. Similarly, resource booms may tempt politicians to dismantle state institutions in order to extract funds for own private purposes. Timber booms, for example, have led political insiders to dissolve state forestry management in many countries, in particular in South-East Asia.¹⁵ Something similar happened to the oil management in Venezuela.¹⁶

¹²Collier and Hoeffler (2004). The connection between resource abundance and civil conflict is among the most active research fields on the resource curse, see Ross (2004) for an overview.

¹³Ross 2001b.

¹⁴Murshed (2003) and Gylfason and Zoega (2004).

¹⁵Ross (2001a) shows how.

¹⁶Karl (1997).

While these cases are convincing enough, it is still an open question how much of the resource curse they explain. Authors within the second strand of the literature insists that institutional change explains very little of the resource curse.

2. *Institutions have a neutral role.* Within this strand we find the seminal contributions by Jeffrey Sachs and Andrew Warner analyzing data on resource availability, national incomes, investments, and institutional quality across countries in the period 1970-1989. Sachs and Warner reject the hypothesis that institutions (or bureaucratic quality) play a role in explaining the resource curse. When summarizing their findings they state that "the primary resource effect does **not** appear [sic] to work through the bureaucracy effect. There is only weak evidence that primary resource intensity is associated with poorer bureaucratic quality ..."¹⁷

What Sachs and Warner test is whether resource abundance leads to a deterioration of institutional quality, which in turn lowers growth. Failing to find empirical support for this mechanism, they conclude that institutional quality cannot explain the resource curse. They then revert to the 'Dutch disease' explanation of the curse as the empirically relevant one.

The conclusions of Sachs and Warner follow from the premise that the only alternative to the 'Dutch disease' hypothesis is the hypothesis that if institutions play a role they do so as an intermediate causal link. Their analysis, however, does not rule out the possibility that institutions play a role in the sense that resource abundance becomes a curse only when institutions are bad. This alternative is the third strand of the literature.

3. *Resources interact with the quality of institutions:* It may be that the presence of rich natural resources in a country does not necessarily cause institutional decay. Resource abundance may nevertheless put the institutional arrangements to a test.

¹⁷Sachs and Warner (1995, p. 19).

Examples can be found in the disappointing economic performances following the oil windfalls in Nigeria, Venezuela, and Mexico.¹⁸ Institutions may be persistent and at the same time be an important part of the resource curse mechanism. In a recent paper we show that what matters is the combination of resource abundance and institutional quality.¹⁹ In that paper we investigate how the growth effect of resource abundance varies with institutional quality. We predict that in countries with good institutions, resource abundance attracts entrepreneurs into production. In countries with weak institutions, however, entrepreneurs are diverted away from production and into unproductive rent appropriation.

3 A theory of institutions and the resource curse

In order to understand the impact of institutional quality we focus on the tension between production and special forms of rent-seeking. All forms of rent-seeking may be harmful to development, but not to the same degree. Here we make a distinction between cases where rent-seeking and production are competing activities, and cases where they are complimentary activities. Production and rent-seeking are competing if the most effective rent-seeking activities are located outside the productive part of the economy – say, in the hands of political insiders, bureaucrats, robber barons, or warlords.

Rent-seeking outside the productive economy pays off when institutions are bad: Dysfunctional democracies invite political rent appropriation; low transparency invites bureaucratic corruption; weak protection of property rights invite shady dealings, unfair takeovers, and expropriation; weak protection of citizens' rights invite fraud and venal practices; weak rule of law invites crime, extortions, and mafia ac-

¹⁸Lane and Tornell (1996) and Tornell and Lane (1999) explain the weak performance by rent seeking. Such rent seeking may also take the form of civil wars (Skaperdas 2002), see for instance Olsson and Congdon Fors (2004) on the case of Congo.

¹⁹Mehlum et al. (2005b).

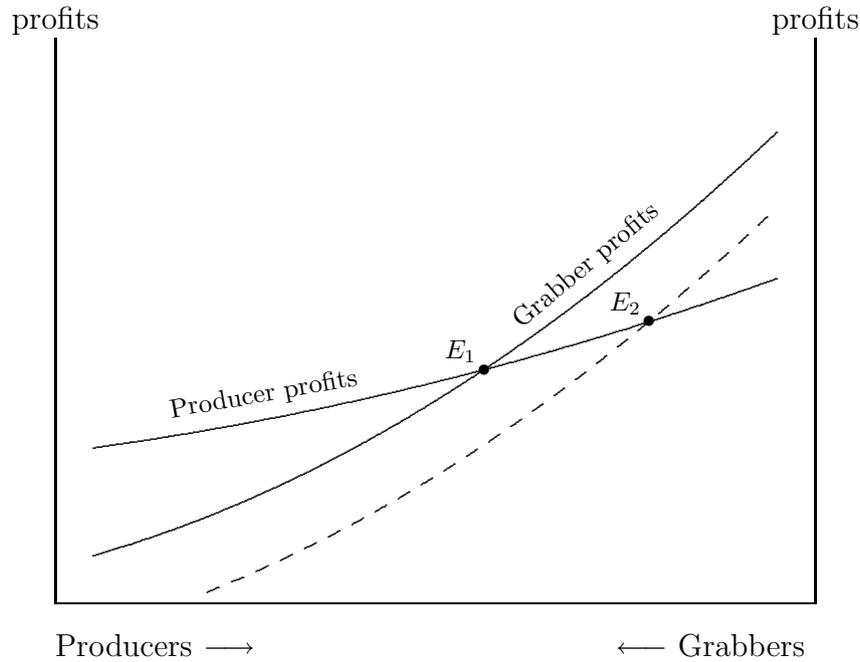
tivities; a weak state invites warlordism. All these forms of direct wealth grabbing are made possible by bad institutions — or 'grabber friendly' institutions as we call them. When institutions are grabber friendly, there is a disadvantage from being a producer in the competition for natural resource rents. Hence, production and rent-seeking are competing activities.

When institutions are better — or more 'producer friendly' as we call them — it is difficult to be an effective rent-seeker unless you also are a producer. Rule of law, high bureaucratic quality, low corruption in government, and low risks of government repudiation of contracts imply that effective rent-seeking must be for a legitimate cause. In the competition for natural resource rents a large producer has an edge in his lobbying for subsidies, public support, and lucrative contracts in natural resource extraction. Hence, production and rent-seeking are complementary activities when institutions are producer friendly.

Grabber friendly institutions easily divert scarce entrepreneurial resources out of production and into unproductive activities as there are gains for entrepreneurs from specialization in unproductive activities. The interplay between entrepreneurial choice, institutional quality, and resource abundance can be illustrated by a simple model,²⁰ that starts out from the following premises: a) producers and rent-grabbers stem from the same limited pool of entrepreneurs; b) the entrepreneurs allocate themselves between production and grabbing until the return in both alternatives are equal; c) grabbers fight for natural resource rents and feed on the

²⁰Our model builds on relationships developed in Torvik (2002) and Mehlum et al. (2002, 2003, 2005b) and has implications that differ from earlier models of the resource curse. Dutch disease models, like those by van Wijnbergen (1984), Krugman (1987) and Sachs and Warner (1995) predict a monotonic relationship between resources and growth (see Torvik 2001 for a discussion of the Dutch disease models, and Matsen and Torvik 2005 for the optimal intertemporal use of resource income in such models). Other models explaining the resource curse with rent-seeking, such as those of Lane and Tornell (1996), Tornell and Lane (1999) and Torvik (2002) also predict a monotonic relationship between resource abundance and income. These models explain important aspects of the resource curse, but they do not explain why resource abundance retards growth in some countries but not in others.

Figure 1: The allocation of entrepreneurs



producers implying that the return to grabbers depend negatively on their number; d) in production there is joint economies implying that the return to producers depend positively on their number.

Figure 1 illustrates how the returns to producers and grabbers are related to the allocation of entrepreneurs. The total length of the horizontal axis is determined by the total number of entrepreneurs. The number of entrepreneurs that enter into production is measured from left to right while the number of entrepreneurs that enter grabbing is measured from right to left. Consider first the profits of an entrepreneur who starts up a productive firm. The demand for his products depends on the total income in the economy. If there are few other producers demand is low and the profitability in production is also low.²¹ Moreover, by the assumption of

²¹It is reasonable to assume that higher profits also lead to higher wages. Workers are likely to gain something when firms' profits increase, and higher profits mean higher demand for labor pushing wages up. Since higher profits imply higher wages, the level of profit in the model may

a fixed number of entrepreneurs, when the number of producers is large the extent of grabbing is low. For both reasons the profit curve for producers in Figure 1 is increasing in the number of producers.

Consider next the profits of a grabber. With many grabbers and few producers the return to a grabber is low – there are few producers to extort and many competing grabbers relative to targets. As the number of producers increases and the number of grabbers falls, there are more targets to extort and less grabbers to compete with, making profits for the remaining grabbers higher.

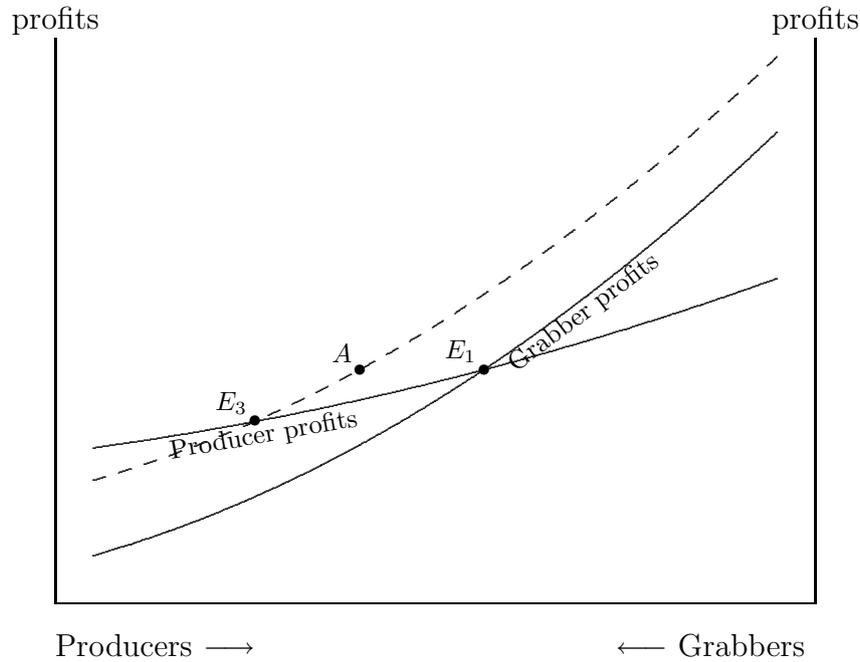
We assume that the profit curve for grabbers is steeper than that for producers. When the number of grabbers increases and the number of producers falls, grabbers increasingly compete with each other for a limited number of producers. Such an increased competition for targets is likely to be more harmful for the grabbers themselves than for the producers, for instance because the first grabber to approach a target may also provide protection against additional grabbers.

At the point where the curves intersect, at E_1 in Figure 1, the allocation of entrepreneurs between production and grabbing is such that no individual entrepreneur has incentives to move from grabbing to production, or vice versa. If an entrepreneur shifts from grabbing to production it induces another entrepreneur to shift from production to grabbing. Hence, the allocation of entrepreneurs E_1 is a stable equilibrium.

The better the quality of institutions, the less profitable it is to be engaged in grabbing – better institutions means that profits of grabbing at every level of production becomes lower. A move towards producer friendly institutions can thus be represented by a downward shift of the profit curve for grabbers in Figure 1 as indicated by the dashed line. In the new equilibrium E_2 there are more producers and less grabbers. Note that profits in production as well as in grabbing have

serve as a proxy for the level of income; the higher are profits the higher are income.

Figure 2: Resource rents with grabber friendly institutions



gone up. An institutional change that restrains grabbing has the paradoxical result that grabbers are better off. The reason for this is that good institutions induce entrepreneurs to shift from grabbing to production. As a result production and income in society go up and in the new equilibrium the profits are higher both to the producers and the remaining grabbers. This result is further strengthened if better institutions in itself also imply higher profitability in production, shifting the profit curve to producers upwards in Figure 1.

Grabber friendly institutions: Consider now an economy that discovers a valuable natural resource. With completely grabber friendly institutions the resource provides a new source of income for the grabbers, shifting their profit curve up while the location of the producers' profit curve is unchanged. As illustrated in Figure 2, the new equilibrium E_3 has fewer producers, more grabbers, and lower income for all. Thus we have a resource curse where a higher resource income reduces the total income – the rent is more than dissipated. The reason for this paradox of plenty

is that the reduction in production following the higher natural resource rents reduces the opportunity cost of grabbing. First the resource pulls entrepreneurs into grabbing. Then, as a result, the profits in production go down pushing even more entrepreneurs into grabbing.

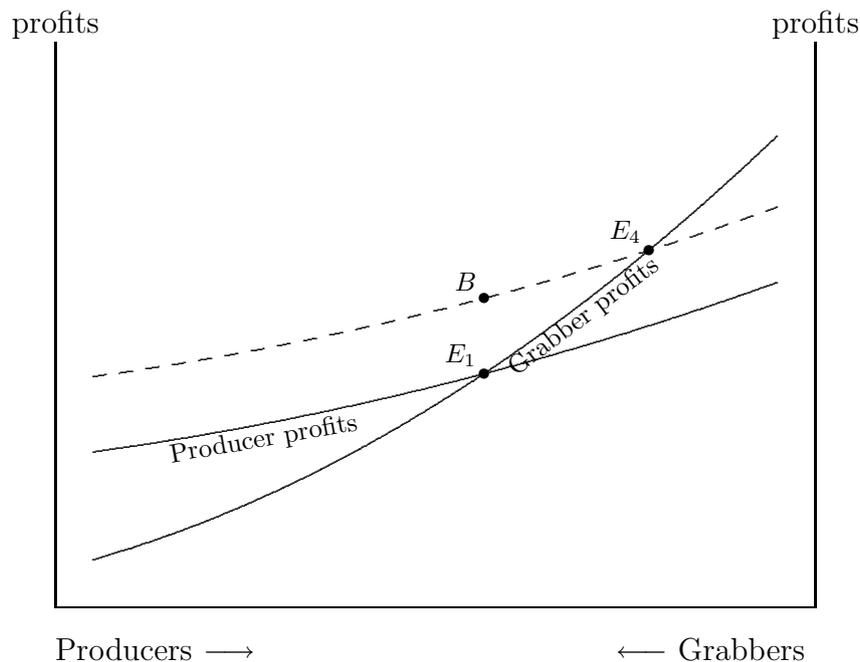
This push effect is seen in Figure 2. Assume that a sufficient number of entrepreneurs has switched from production to grabbing so that the profit of grabbing is unchanged - at point A. However, at this point profits in production have fallen below the original level, and for this reason the profit for a grabber is still higher than for a producer. Thus, to reestablish equilibrium even more entrepreneurs become grabbers, and the point where profits in grabbing and production are equalized must be at a lower profit level than the original one.

With bad institutions more resources attracts entrepreneurs into grabbing, further undermining the incentives to undertake production. Grabbers generate negative externalities and producers positive externalities. This explains why the negative income effect from this reallocation of entrepreneurs dominates the direct positive income effect of more resources.

Producer friendly institutions: Consider now the opposite case. When institutions are completely producer friendly natural resources provide an additional source of income for producers, shifting up the profits in production. As seen in Figure 3 after the shift the new equilibrium E_4 has more producers and fewer grabbers. Moreover, the total rise in profits is higher than the natural resource income. The initial rise in profits for each producer is equal to the distance from E_1 to B in Figure 3, while the equilibrium rise in profits for all entrepreneurs is the vertical difference between E_1 and E_4 . Since the latter distance E_1E_4 is larger than E_1B , and since all entrepreneurs receive the profits E_4 in equilibrium, the total rise in profits is higher than the natural resource rent itself.

With producer friendly institutions natural resources stimulate production. With

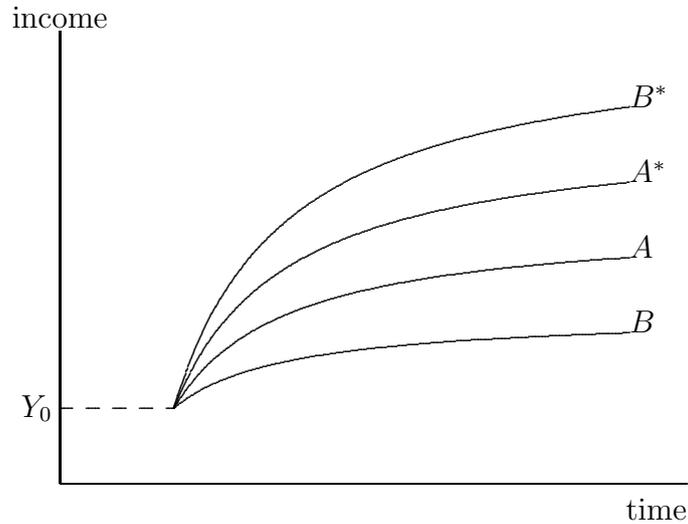
Figure 3: Resource rents with producer friendly institutions



grabber friendly institutions natural resources hamper production. As there are positive complementarities between producers there is a multiplier effect so that any impulse - positive or negative - is amplified.

Growth paths: As an illustration of the growth implications we compare four hypothetical countries. Countries A and A* are resource poor, with country A having grabber friendly institutions and country A* having producer friendly institutions. Countries B and B* are resource abundant, with B having grabber friendly and B* producer friendly institutions. The four countries have initially the same income level Y_0 . As illustrated in Figure 4, of the resource poor countries the one with producer friendly institutions A* outperforms the country with grabber friendly institutions A. We have seen in Figure 2 and Figure 3 that, other things equal, countries with producer friendly institutions converge to a higher income level than countries with grabber friendly institutions. Thus, in the same way, country B* outperforms country B.

Figure 4: Growth paths



The key thing to note, however, is the difference in growth paths between the two countries with producer friendly institutions A^* and B^* , and the difference between the countries with grabber friendly institutions A and B . We have seen in Figure 2 that for countries with bad institutions more natural resources is a curse – more natural resources push income down. Thus, starting out at the same income level resource poor country A outperforms resource rich country B . For countries with good institutions, however, more natural resources is a blessing – the more natural resources, the higher income will be. Thus the picture is the opposite to that for countries with bad institutions – starting out at the same income level resource abundant country B^* outgrows resource poor country A^* .

In this model resource abundant countries constitute both growth winners and growth losers. If the model is relevant we should expect to see more diverging experiences among resource abundant than among resource poor countries.

There may also be additional reasons for why institutions are key to understanding the resource curse than illustrated by our model. A political economy theory of the resource curse that highlights this is developed by Robinson et al. (2005).

They construct a model where the costs and benefits of buying votes through inefficient redistribution, for instance by bribing voters by offering them well paid but unproductive public sector jobs, depend on the interaction between resource income and institutional quality. With high public resource income and bad institutions the political incentives to undertake inefficient redistribution are strong. In such a situation the personal benefits of staying in power are high. More resource income may increase the extent of inefficient redistribution sufficiently for aggregate income to go down. Countries with good institutions, on the other hand, tend to benefit from resource abundance since these institutions mitigate the perverse political incentives resource abundance creates.

4 Empirical testing of institutions and the resource curse

In order to test our hypothesis we use the same data and the same methodology as Sachs and Warner with one addition. We extend their analysis to account for the potential interaction between resource abundance and institutional quality. The institutional quality index that we use is an unweighted average of five indices from Political Risk Services: rule of law, bureaucratic quality, corruption in government, risk of expropriation, and risk of government repudiation of contracts.²²

The index runs from one to zero. When the index is zero, there is a weak rule of law and a high risk of expropriation, malfunctioning bureaucracy, and corruption in the government; all of which favor grabbers and deter producers. The growth impact of an increase in resources – the strength of the resource curse – is negative for most countries. The magnitude of the effect, however, depends on the institutional quality. The result from Mehlum et al. (2005b) can be summarized in the following key equation, where the left hand side is the derivative of the growth rate with

²²A more detailed description of the index is provided by Knack and Keefer (1995).

respect to the share of resource exports in national income:

$$\frac{d[\textit{growth}]}{d[\textit{resource abundance}]} = -14.34 + 15.40 [\textit{institutional quality}]$$

We see that the resource curse is weaker the higher the institutional quality. The interaction term is highly significant, with a p-value of 0.017. Moreover, for countries with high institutional quality (higher than the threshold $14.34/15.40 = 0.93$) the resource curse does not apply. Among the 87 countries in the sample, 15 have the institutional quality sufficient to nullify the resource curse. Thus, institutional quality is the key to understanding the resource curse: *When institutions are bad, resource abundance is a growth curse; when institutions are good resource abundance is a blessing.*

That the resource curse depends on institutional quality has been confirmed robust to a number of specifications in Mehlum et al. (2005b), including controls for the level of human capital and ethnic fractionalization. Also, the result holds when excluding all African countries. Thus the connection between the resource curse and institutional quality is not an artifact stemming from systematic differences between African and Non-African countries.

One possible critique of our result is that resource abundance might be correlated with some measure of underdevelopment not included in our analysis. For instance, underdevelopment can be associated with specialization in agricultural exports, and this may drive the empirical results. Our mechanism of resource grabbing is less likely to apply in agrarian societies, as land is less lootable and taxable than most natural resources. However, using an alternative resource measure that concentrate on lootable resources, the share of mineral production in national income, our result

is strengthened:

$$\frac{d[\textit{growth}]}{d[\textit{mineral abundance}]} = -17.71 + 29.43 [\textit{institutional quality}]$$

The regression result shows that the direct negative effect of natural resources becomes stronger and that the interaction effect increases substantially. Since resources that are easily lootable appear to be particularly harmful for growth in countries with weak institutions, our grabbing story receives additional support. The threshold level of institutional quality that nullifies the resource curse falls from 0.93 to 0.60, implying that 33 out of the 87 countries in our sample have an institutional quality sufficient to avoid the resource curse.²³

5 Concluding remarks

Countries rich in natural resources constitute both growth losers and growth winners. Our hypothesis is that the main reasons for these diverging experiences are differences in the quality of institutions. With grabber friendly institutions we have seen that more natural resources push aggregate income down, while with producer friendly institutions more natural resources increase income. Our main hypothesis – that only countries with grabber friendly institutions are captured by the resource curse, while countries with producer friendly institutions escape the resource curse – is confirmed by using the same data that Sachs and Warner earlier claimed showed a robust negative association between resource abundance and growth.

Our theory, that shows how countries with different institutions react differently to higher resource income, explains why one observes such huge differences in resource abundant countries. Taking into account that institutions may be endogenous to resource income is likely to strengthen this divergent pattern even more – if insti-

²³See Boschini et al. (2004) for more detailed analysis on different types of resources and their interaction with institutions.

tutions are easier to dismantle when they are bad in the first place, countries with a low institutional quality face a double burden. More resources decreases income when institutions are grabber friendly, and this effect is reinforced if institutions become even worse than they were in the first place.

Institutions are decisive regardless of whether they are endogenous to resource income or not. Nevertheless, the effect of resource abundance on institutional quality is a challenging area of future research. A worrying feature of the data currently used to discuss this is that they show large variations in countries over quite limited periods of time – while one would think that the quality of institutions changed only very slowly. This accentuates the problem of reverse causality and omitted variables. If people tend to think that institutions and policy are bad when times are bad, and vice versa, the measures of institutional quality is endogenous to the economic situation. In that case there is a tendency for the share of resource exports in GDP – the most used measure of resource abundance – to go up and for institutional measures to worsen when growth is bad. But this is not the same as saying that resource abundance *causes* bad institutions. A main priority of future research should be to unravel the causality between (the measures of) resource abundance and the quality of institutions, and to check more carefully for omitted variables.

Whether resource abundance leads to institutional decay or not is not a key question in our explanation of the curse, however. In our theory, even when institutions are completely persistent and therefore unaffected by the discovery of new natural resources such as oil and natural gas, the quality of these institutions are decisive.

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