

## The Resource Curse: Which Institutions Matter?

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**WP 2007: 2**



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# 1. Introduction: Two theories of institutions and the resource curse<sup>\*</sup>

Countries rich in natural resources, on average grow more slowly than countries without such resources. This “resource curse” is an empirical regularity documented by a number of studies, starting with the seminal work of Sachs and Warner (1995).<sup>1</sup> A decade of theoretical and empirical work has brought out some of the nuances of the resource curse. The curse seems to be particularly related to so-called point resources such as petroleum and minerals, rather than diffuse resources such as land (Isham et al 2004; Sala-i-Martin and Subramanian 2003; Leite and Weidmann 1999). And while early theories focused on Dutch disease effects of resources, the problem has increasingly come to be identified as one of poor institutions leading to inoptimal social outcomes. This paper assesses the empirical merits of two different institutional approaches to the resource curse, rent-seeking models such as that of Mehlum et al (2006), and patronage models such as that of Robinson et al (2006).

In the model of Mehlum et al (2006), entrepreneurs choose between rent-seeking and productive activities. The relative profitability of productive activities depends on institutions such as the rule of law and bureaucratic efficiency. High institutional quality leads to an equilibrium where all entrepreneurs are producers, low institutional quality leads to one where a portion of entrepreneurs are rent-seekers (or grabbers, to use their term). More natural resources in turn lowers national income only in the latter state. The model thus predicts that resources are a curse only where institutional quality is poor. And institutions in their model are *private sector institutions*, governing the profitability of productive enterprise.

By contrast, the model of Robinson et al (2006) studies an incumbent politician seeking to secure re-election through patronage, i.e. the allocation of state resources and positions to clients to buy their votes and support. In this model, a resource boom leads to an improved path of resource extraction on the one hand, on the other it leads to more patronage and thus inefficiencies in the public sector. Which effect dominates, depends on the quality of institutions governing the use of public sector resources. Where these institutions are competent and ensure the accountability of politicians, a resource boom increases national income. Where institutional quality is poor, resource

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<sup>\*</sup> The author thanks Tina Søreide, Line Tøndel, Arne Wiig, and Espen Villanger for comments.

<sup>1</sup> See also Sala-i-Martin and Subramanian (2003) for a more extended test of robustness. However, Stijns (2005) shows that using reserve and production data on resources, rather than export shares, yields no effect of natural resources on growth.

booms decrease income. As above, the model predicts resources to be a problem only where institutions are poor. In contrast to the entrepreneurial rent-seeking approach, however, the institutions in question here are *public sector institutions* governing resource use and appointments in the public sector.

Though the rent-seeking and patronage models concur that institutions are important, they give different answers as to which institutions are important. The rent-seeking model of Mehlum et al (2006) stresses the importance of institutions of private sector efficiency such as the rule of law, bureaucratic efficiency, the risk of expropriation and repudiation of contracts. The patronage model of Robinson et al (2006) emphasizes institutions of public sector accountability. Which model best captures the reality of the resource curse, is an empirical question. The models may be complementary, in the sense that both types of institutions matter. Given constraints on the resources or space available for institutional reform, the question is then which type of institutions matters more. It is also possible, however, that only one or none of the institutions actually matter empirically.

Mehlum et al (2006) provide empirical evidence for their hypothesis. Using the dataset of Sachs and Warner (1997a, 1997b), they find that an interaction term of natural resources and a rule of law/institutional quality index, has a significantly positive effect on growth. Robinson et al (2006) also provide some case study evidence for their hypothesis, and econometric evidence for a similar hypothesis is found in Damania and Bulte (2003). However, none of these contributions test the competing hypotheses against each other, as institutional indices for the other type of institution are included in neither of the respective growth regressions.<sup>2</sup> This reflects a general problem in the resource curse literature, where a number of models and hypotheses are advanced and tested, but rarely in a way that directly excludes other hypotheses.

In the next section, we use a data set including indices of institutions of both private sector governance and public sector accountability, to directly test which type of institutions matters for avoiding the resource curse. As it turns out, only one type of institutions is robust to the inclusion of the other type. A final section of the paper concludes.

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<sup>2</sup> Damania and Bulte (2003) include an index of the rule of law in their regressions, however, they do not include the interaction between the rule of law and natural resources required to test the hypotheses against each other.



## 2. Empirical results: Which institutions matter?

To avoid differences in results from other studies being due to a different coverage in terms of countries and time period, or specification and estimation procedures, we replicate past studies, simply adding an additional institutional variable. We use the Sachs and Warner (1997a) data set, which is also used by Mehlum et al (2006).<sup>3</sup> The dependent variable is average GDP growth 1970-1990. Resource abundance is measured by the share of exports of primary products in GNP in 1970. Control variables include the initial income level of countries (GDP in 1970), openness (an index of the fraction of years 1970-1990 in which the economy is rated as an open one), and the investment rate (averaged 1970-1989).

Private sector institutions are captured by a rule of law index, taken from the Center for Institutional Reform and the Informal sector. To test the above hypotheses we also interact this variable with natural resource abundance. To the dataset of Sachs and Warner (1997a), we add the democracy index of the Polity IV dataset. This index is taken to reflect the public sector institutions of the countries in the sample, and was also used by Damania and Bulte (2003).<sup>4</sup> To avoid endogeneity problems (i.e. the possibility that growth affects institutions), we used 1970 values for this index.

The results of our econometric analysis are presented in table 1. The first two columns replicate the results of Sachs and Warner (1997a) and Mehlum et al (2006). As the second column indicates, the hypothesis of the rent-seeking models holds when tested individually. In other words, countries with better private sector institutions (rule of law) suffer less from the resource curse. The third column drops the rule of law index and its interaction with natural resource abundance, and includes the democracy index and its interaction. The results show that when tested individually, there appears to be support for the hypothesis from the patronage models. Better public sector institutions (more accountable government) appears to ameliorate the resource curse. Notice, however, that the adjusted R-squared drops from the previous two regressions, suggesting reduced fit.

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<sup>3</sup> Mehlum et al (2006) use data from Sachs and Warner (1997b) in their main text, and Sachs and Warner (1997a) in an appendix, but qualitatively the results are the same.

<sup>4</sup> Damania and Bulte (2003) include both the Polity IV Democracy and Autocracy indices simultaneously in their regressions. This is problematic since the two are highly correlated (0.915 for our sample, 1970 data). They argue that the resource curse is related more to autocracy than democracy, but given the multicollinearity problem, their material does not provide a basis for this conclusion. Nevertheless, we tested whether our results would be different if we used the autocracy index rather than the democracy index, and they were not.

**Table 1. Regression results. Dependent variable is GDP growth**

	Sachs and Warner (1997)	Mehlum et al (2006)	Regression 3	Regression 4
Initial income level	-1.76 (0.21)***	-1.82 (0.2)***	-1.44 (0.2)***	-1.79 (0.22)***
Resource abundance	-10.57 (1.51)***	-16.36 (3.23)***	-9.84 (1.81)***	-20.11 (3.58)***
Openness	1.33 (0.4)***	1.53 (0.4)***	2.29 (0.34)***	1.56 (0.39)***
Investments	1.02 (0.29)***	0.95 (0.29)***	1.33 (0.22)***	0.68 (0.33)**
Rule of law	0.36 (0.1)***	0.18 (0.13)		0.11 (0.15)
Rule of Law*Resource abundance		1.96 (0.97)**		2.64 (1.26)**
Democracy			-0.05 (0.05)	-0.04 (0.05)
Democracy*Resource Abundance			0.71 (0.32)**	0.26 (0.47)
Constant	12.9 (1.6)***	14.17 (1.68)***	9.82 (1.49)***	15.24 (1.88)***
Observations	71	71	82	67
Adjusted R-sq.	0.72	0.74	0.69	0.75

Standard errors in parentheses. \*\*\* indicates significance at 1%, \*\* at 5%.

The final column of table 1 tests the two hypotheses simultaneously.<sup>5</sup> When adding both institutional indices and their interaction terms, only the rule of law interaction term is statistically significant. In other words, when controlling for the impact of private sector institutions, public sector institutions have no additional explanatory power. Our results thus suggest that only private sector institutions are important in avoiding the resource curse.

### 3. Conclusions

Rent-seeking models and patronage models of the resource curse suggest that good institutions are vital for averting a negative impact of natural resources. However, while rent-seeking models stress institutions governing the private sector, patronage models stress institutions governing the public sector. This paper has tested both hypotheses simultaneously, and finds that only private sector institutions matter empirically. Policy makers and donors in poor resource rich institutions should therefore prioritize the development of institutions governing the private sector. Future research should study more closely exactly how private sector institutions matter, and which of these institutions are essential.

<sup>5</sup> Multicollinearity problems in including both institutional indices do not appear too severe, cf. the correlation matrix in the appendix.

## Appendix

**Table 2. Correlation matrix, N=67**

	Initial income level	Resource abundance	Openness	Investments	Rule of law	Rule of Law* Resource abundance	Democracy	Democracy* Resource Abundance
<b>Initial income level</b>	1							
<b>Resource abundance</b>	-0.4214	1						
<b>Openness</b>	0.558	-0.4742	1					
<b>Investments</b>	0.6032	-0.4052	0.6003	1				
<b>Rule of law</b>	0.7306	-0.3993	0.7297	0.6454	1			
<b>Rule of Law* Resource abundance</b>	0.1754	0.6487	0.0212	0.1478	0.334	1		
<b>Democracy</b>	0.669	-0.215	0.4332	0.4148	0.6021	0.283	1	
<b>Democracy* Resource Abundance</b>	0.3415	0.4127	0.0487	0.1388	0.2569	0.7248	0.6507	1

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## SUMMARY

Two types of models are dominant in the current resource curse literature. One type of model studies the selection of entrepreneurs into rent-seeking versus productive activities. The other type analyzes the use of patronage by politicians seeking re-election. The policy implications of the two models are quite different. The first model suggests that institutions governing the private sector ought to be improved. The second that institutions governing the public sector should be emphasized. This paper empirically tests the impact of the private versus public sector institutions on the resource curse, using cross-country data from Sachs and Warner (1997a) and Polity IV. The main result is that only improved private sector institutions ameliorate the resource curse.

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