The Resource Curse Revisited: Governance and Natural Resources

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Abstract

The paper analyses the impact of natural resource abundance on selected governance indicators. In contrast to earlier studies that are mainly confined to cross-sectional analysis, we use a panel data set with a large number of countries and an extended period of time. Moreover, we employ an instrumental variable technique to account for endogeneity. The results show that exports of natural resources have, above all, led to an increase in corruption. This result is robust to both different model specifications and an alternative indicator for natural resource abundance. For other governance indicators, such as law and order and bureaucratic quality, we either find no results or results that lack robustness.

JEL Classification: F10, O13, Q32

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1. Introduction

It is well known in the literature that natural resource abundance can be a curse for economic and social development rather than a blessing. Sachs and Warner (1995) find in their influential study that countries with great natural wealth tend to grow more slowly than resource-poor countries. Various other authors have identified the particular channels through which natural resources could lead to lower growth rates: The so-called resource curse could occur due to unfavourable long-term trends in commodity prices, high price volatility for these goods, the crowding out of manufacturing, the incidence of civil war, Dutch disease effects, or poor institutions and bad governance.[1] This paper focuses on the last aspect of the resource curse, that is, the potential negative impact of natural resource abundance on governance.

There are several causal mechanisms through which natural resources could have an impact on political outcomes. According to Ross (2001), "rentier effects" may occur if the government earns direct and considerable revenues from resource extraction.[2] These rents could have important implications for the quality of institutions and governance. First, they reduce the need for the government to tax the population, which may hinder the development of a representative political system (taxation effect). Low-taxed citizens may then demand less accountability of the government, in turn lowering the pressure to improve institutional quality.

Second, revenues easily extracted from the resource sector allow the government to mitigate dissent among the population, for example, by spending on patronage (spending effect). This is likely to dampen latent pressure for democratisation. At the same time, an increase in patronage could foster rent seeking activities and corruption among the population. The third effect is related to governments that use large funds from resources to prevent the formation of social or special interest groups (group formation effect). Since these independent groups

[1] See Frankel (2010) for a survey of the various strands of the literature.
[2] While Ross (2001) concentrates in his analysis on oil, the effects of other fuels and mineral resources can be quite similar.

can be powerful proponents of political rights, less pressure on the government to enhance these rights or to improve the accountability of the government will occur.

Apart from the rentier effect, two other main causal mechanisms between natural resources and political outcomes have been identified in the political science literature. In fact, there could be a repression effect related to natural wealth. With abundant natural resources, the government could generate the financial resources needed to suppress demands for changes in the political system or the functioning of the government in general. With higher spending on internal security, resource-rich governments could impede aspirations among the population for more democracy or better institutions and government services (Gause 1995, Clark 1997).

In a similar way, resource-dependent governments may delay the modernisation of the economic structure of the economy, since a large manufacturing sector would create alternative sources of economic and political power (Auty 2001, Ross 2001). If the industrial sector is rather small, labour organisations would not as likely be established or would be smaller and, thus, less effective in demanding political reforms. Governments with ample revenues from fuel and minerals also may spend less on improvements in education, as resource extraction requires only a few workers with sophisticated skills that can be acquired abroad (Isham et al. 2005). Lower education levels may then decrease the demand for political reforms as citizens are less able to formulate their demands effectively. To sum up, due to a variety of causal mechanisms the institutional setting and the quality of governance may be lower in resource-abundant countries in comparison to resource-poor countries.

Though the literature is anything but extensive, these three channels have been examined empirically.[3] Overall, the empirical literature can be divided into two main strands. The first one examines the impact of natural resources on democracy or democratic institutions. In one of the earlier contributions, Ross (2001) not only discussed the mechanisms and channels but examined them empirically as well. For a panel of 113 countries and the period 1971 to 1997, he shows that natural resources in the form of oil and mineral wealth are negatively associated with democracy measures. He also finds tentative support for the three causal mechanisms that link oil and authoritarian government, though the statistical evidence is not always robust.

[3] In our brief literature review, we focus on those studies that examine the impact of natural resources on political outcomes, that is, democracy and governance measures. To keep the review short, we neither report

Barro (1999), Aslaksen (2010), and Tsui (2011) support these results, even though they use different measures, samples, and/or econometric techniques. In a more recent study using a longer time series and more countries, Ross (1999) finds that oil wealth strongly inhibits democratic transitions in authoritarian states. However, the anti-democratic effects of oil seem to vary over time and across regions. He shows that they may have grown stronger over time, but do not hold in specific regions, such as Latin America.

The second strand of the empirical literature examines the impact of natural resources on governance measures, such as corruption. Ades and Di Tella (1999), for example, analyse empirically (and theoretically) the determinants of corruption, including the impact of natural resources. Using the share of fuel and mineral exports in total exports, they investigate whether an increase in this share leads to an increase in corruption levels in the 1980s and 1990s. While they find a close relationship between natural resource exports and corruption levels in their cross-sectional analysis for the 1980s, there is neither evidence for that association in the 1990s (also cross-section) nor support in a (short) panel analysis. This inconclusive outcome is supported by Treisman (2000) who finds very similar results. Also, Serra (2006) could not establish any close link between natural resource exports and corruption, using an extreme bound analysis and data for the 1990s.

Leite and Weidmann (2002), however, do find that exports of fuel and ores increase corruption in a cross-sectional setting using an instrumental variable approach. These contradictory results could be explained by the period Leite and Weidmann use. They employ data for the 1970s and 1980s to compare the results of their subsequent growth regressions with those reported by Sachs and Warner (1995), basically excluding the 1990s for which Ades and Di Tella (1999), Treisman (2000) and Serra (2006) could not verify the negative link between natural resource exports and corruption.[4]

Sala-i-Martin and Subramanian (2003) examine the impact of exports of fuel and minerals on different governance measures. Using a cross-sectional instrumental variable approach, they find that exports of these natural resources have a negative impact on governance, such as

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their results for other determinants nor for other dependent variables, for instance, growth rates. See Frankel (2010) for an extensive literature review of the respective studies.

corruption, the rule of law, government effectiveness, or political stability. Isham et al. (2005) compute different measures of exports of natural resources. They distinguish between "point" resources that are extracted from a narrow geographic area that can be controlled at relatively low costs, such as oil or minerals, and "diffuse" resources that are produced in a wider geographic area and can be less controlled by the government, such as food and agricultural products. In their cross-sectional regression analysis, they show that point resources are negatively associated with various governance measures, such as the rule of law, government effectiveness, corruption, or the regulatory framework. In a similar methodological approach, Bulte et al. (2005) also establish a negative impact of point resources and rule of law and government effectiveness.

More recently, Bhattacharyya and Hodler (2010) argue that natural resources can worsen corruption levels and how this impact depends on the quality of democratic institutions. Using a panel data set with more than 120 countries and the period 1980 to 2004, they establish this link only for non-democratic regimes. Yet these results do not hold if the authors employ country fixed-effects in their analysis, suggesting that the results are mainly driven by cross-country variations in the data. Bhattacharyya and Hodler show that once they control for various other country and regional characteristics in random-effects regressions, natural resources can still worsen corruption levels.[5] Aslaksen (2009) also uses a large panel data set for the period 1982-2006 and up to 132 countries. By employing pooled OLS and fixed-effects regressions, she finds that both oil extraction and mineral income are associated with more corruption. Importantly, the unfavourable impact of oil on corruption occurs in democratic and nondemocratic countries.

In one of the few case studies, Vicente (2010) finds evidence that oil discoveries in Sao Tome and Principe led to more (perceived) corruption across a wide range of public services and allocations, such as customs, vote buying, or education. In another case study, Brollo et al. (2010) examine the impact of external funds supplied by the federal government on corruption levels in Brazilian municipalities. Though not directly related to rents from natural resources, these external funds can have very similar effects. They show that an increase in funds increases corruption in municipalities.

[4] Using cross-sectional data for the year 2005, however, Treisman (2007) finds evidence for a negative impact of fuel exports on corruption.

In contrast, Brunnschweiler and Bulte (2008) and Brunnschweiler (2008) challenge the view that natural resource abundance worsens the quality of institutions and governance (and thus, has a negative impact on economic growth). They argue that the causality runs the other way, that is, bad institutions (or bad governance) are associated with high scores on the – Sachs and Warner (1995) – resource indicator (ratio of natural resource exports to GDP). They emphasise that this indicator should be interpreted as a proxy for resource dependence rather than resource abundance. They construct their own measures for resource abundance, based on total natural capital and mineral resource assets, which they call natural resource wealth. They then show that these indicators are positively associated with governance measures, such as the rule of law and government effectiveness, in a cross-sectional analysis. Finally, Alexeev and Conrad (2009) also cast doubt on the negative impact of oil and mineral wealth on both growth and institutions, using a cross-sectional analysis and different natural resource and governance indicators, such as the rule of law and corruption.

In our empirical investigation, we focus on the second strand of the literature and focus on the impact of natural resources on governance measures, including corruption. Though the mechanisms explained by Ross (2001) relate to the impact of natural resources on democracy, they are clearly relevant with respect to political institutions (in a broader sense) or governance (in a narrow sense) as well. For example, the rentier effect may not only lead to lower pressure to improve democracy in a resource-abundant country. It is likely to have an impact on corruption due to rent seeking activities as well. Also, the quality of institutions and governance, such as law and order or the quality of regulations (bureaucracy), could be affected as low-taxed citizens may again demand less comprehensive services and/or accept a lower quality of government services.

The inconclusive evidence of the various studies that examine the impact of natural resources on corruption can be attributed either to differences in the econometric techniques applied, the natural resource indicators used and/or the period under consideration. Importantly, many previous studies could not use a lengthy cross-country time series analysis due to a lack of data on government indicators. In our empirical investigation, we overcome the main limitations of earlier studies and extend the literature in two important ways. First, we re-

[5] In addition, they also find a negative impact of natural resources on corruption once they use a fixed effects

examine the effects of natural resources on corruption in a panel setting with nearly 130 countries and an extended period of time (1984 to 2007). So far, no previous study has established a negative impact of natural resources on corruption in a fixed effects regressions analysis that controls for reverse causality. Since they are likely to play an important role in the empirical investigation of that relationship we control for both country fixed-effects and endogeneity of the variables under consideration. More specifically, we apply a dynamic Generalised Method of Moments (GMM) panel estimator (system-GMM) proposed by Blundell and Bond (1998). Second, we extend the analysis and examine the impact of natural resources on further important governance areas, that is, the quality of the bureaucracy and law and order, in the same panel setting. To the best of our knowledge, no earlier study has done that in a panel setting.

Once we use an extended period of time and an appropriate aggregation of the data, we find that the within country variation is sufficient enough to establish a negative impact of natural resource exports on corruption. This finding is robust in several model specifications and for different indicators for natural resource abundance. Importantly, we find that the negative impact of natural resources on corruption is most pronounced in developing countries. For high-income countries, that link is either not robust or not existing. For bureaucracy quality, we find some evidence for a negative impact of natural resources but this result is not robust. Finally, for law and order we could not obtain any influence of natural resources.

The paper is structured as follows: In the next section, we will introduce the country sample covered, the governance indicators and the control variables used, and the econometric method employed in our analysis. Section 3 embraces the empirical results. We test the robustness of the results using different natural resource variables und several model specifications and country groupings. Also, since the impact of natural resources on governance may vary for different country groups, we run separate regressions for developing and developed countries. Finally, Section 4 concludes.

2. Data and Estimation Strategy

vector decomposition approach, which has been designed as an alternative to conventional fixed effects.

While there are many indicators available for quantifying or assessing governance, most of them are either restricted to recent years or do not measure governance precisely enough. For example, the comprehensive good governance indicators provided by the World Bank (Kaufmann et al. 2009) are available only since 1996, which is hardly sufficient for a panel analysis over time. The most detailed set of governance indicators for a longer period of time is compiled by Political Risk Services Group (PRS Group 2010a). In their International Country Risk Guide (ICRG), they provide detailed data on various aspects of political risk since 1984. Though the indicators are perception-based, they are considered as of high quality and are often used in the empirical literature.[6] We use three (out of a total of 12) ICRG components that are highly relevant for an assessment of the influence of natural resource exports on governance:[7]

- *Corruption* assesses the level of corruption within a political system and includes financial corruption (e.g., demands for special payments and bribes in connection with import and export licenses, exchange controls, or tax assessments), excessive patronage, nepotism, or secret party funding.

- *Bureaucracy Quality* measures the strength and quality of the bureaucracy, which may act, for example, as a shock absorber that tends to minimize revisions of policy when governments change.

- *Law and Order* quantifies the strength and impartiality of the legal system.

All three components are based on monthly data and are scaled (or rescaled) from 0 to 6, where higher values indicate less corruption, improved bureaucratic quality, and enhanced law and order. At a country level, these indicators can be relatively persistent. Neither do they change frequently nor abruptly apart from a few exceptional situations in central and eastern European countries after the end of the cold war. Since we are controlling for country fixed-effects in the analysis, we have to ensure that enough (within) variation in the governance data exists. Therefore, we compile four-year averages of the governance indicators and all

[6] Regarding the previous studies on governance and natural resources, these indicators have been widely used too, for example by Ades and Di Tella (1999), Treisman (2000), Leite and Weidmann (2002), and Bhattacharyya and Hodler (2010).
[7] See PRS Group (2010a) for details.

other variables.[8] Our analysis starts in the year 1984, the first period for which ICRG data are available, and ends in 2007, since we do not have consistent data (for all variables and countries) beyond that year. This leaves us with six time periods, that is, 1984-1987, 1988-1991, and so on.

To investigate the influence of natural resources on governance, we use *Exports of Natural Resources* as our principle resource variable.[9] It refers to the GDP share of natural resource exports and is computed as the share or resource exports in total exports times the GDP share of total exports times 100:

$$(1) \qquad \text{Exports of Natural Resources} = \frac{\text{Resource exports}}{\text{Total exports}} \frac{\text{Total exports}}{\text{GDP}} 100$$

In subsequent robustness checks, we also use the *Depletion Rate of Natural Resources*, defined as the product of unit resource rents and the physical quantities of minerals and energy extracted. It includes fuel and mineral natural resources, such as bauxite, copper, iron, lead, nickel, phosphate, tin, zinc, gold, silver, crude oil, natural gas, and coal. The indicator is expressed as a share of GNI.

In addition to both natural resource variables, we include a set of further control variables that are likely to influence governance:[10]

- *GDP per Capita* stands for real income per person, measured in constant US Dollars. This variable is arguably the most important control variable, as citizens living in countries with higher income levels have strong preferences for better governance (Treisman 2000, Serra 2006). At the same time, richer countries have the financial resources to improve government regulations or to fight corruption. We thus expect a positive impact of income per capita on governance.

[8] Later on, we also use three-year averages to test the robustness of this approach.
[9] Unfortunately, we could not use the natural resource wealth indicators proposed by Brunnschweiler and Bulte (2008) and Brunnschweiler (2008) as the data is not available over time. However, we are most interested in the impact of rents that arise from natural resources on governance and less so on the impact of the existence of natural wealth.
[10] See Appendix A for data sources. Descriptive statistics for all variables can be found in Appendix B.

- *Population* refers to the total number of people in a country and acts as a proxy for the country size. It could be easier for a larger country to push through necessary reforms or required rules to improve governance, since it may have larger financial resources. Yet bigger countries might face more information asymmetry problems, higher transaction costs, and/or more intensive ethnical conflicts, which could impede improvements in governance. Therefore, the sign of this variable is unclear.

- *Conflict Intensity* quantifies the incidence of internal and external conflicts, ranging from political violence, cross-border conflicts or civil disorder to civil (internal) war or an all-out war with other countries. The variable takes the number of casualties as a measure for the intensity of a conflict. It varies between 0 (no conflict or a "minor" conflict with less than 25 casualties), 1 (number of casualties in the range from 25 to 999), and 2 (more than 1000 casualties). While these numbers are necessarily arbitrary, they are useful for any quantitative analysis as the intensity of each conflict is taken into account. Unsurprisingly, we expect a negative impact of conflicts on governance.[11]

- *Press Freedom* indicates the degree of freedom the press has; it takes the values 1 (no press freedom), 2 (partly free), or 3 (completely free). A higher degree of press freedom is expected to lead to better governance, since information is easier to access for the population. Press freedom can also act as a control for governmental policies and actions (Brunetti and Weder 2003, Freille et al. 2007).

- *Other Exports* refers to the share of non-resource exports in GDP. For three reasons, we could expect a positive association of openness to trade with governance. First, economic agents in open economies may learn from the experience in their trading partners' countries by adapting (or imitating) successful institutions and regulations. Second, international competition may force countries to improve their institutional and regulatory setting as domestic producers would go out of business without reforms. Finally, rent seeking and corruption might be harder in more open economies, as foreign firms increase the number of economic agents involved (Ades and Di Tella 1999, Ranjan and Zingales 2003, Rodrik et al. 2004).

[11] In extensions of the subsequent empirical analysis, we differentiated between internal and external conflicts, since it could matter for governance whether a country faces an internal or external conflict. However, the results hardly change. Like all other unreported results, they can be obtained from the first author upon request.

As for the country sample, we have incorporated all countries for which we obtained sufficient data for the dependent and independent variables. That leaves us with a total of 129 countries. We then split the total sample and run separate regressions for two groups: 43 developed and 86 developing countries.[12] We argue that the determinants of governance as well as the impact of natural resources might differ in the latter country grouping in contrary to the first subsample. In contrast to developing countries, richer countries should have the resources to ensure the natural-resource abundance may not lead to a worsening of governance.

Not surprisingly, the average scores for *Corruption*, *Bureaucracy Quality*, and *Law and Order* are lower in developing countries in comparison to high-income countries (Table 1). In addition, developing countries – on average – have a lower level of press freedom and are more affected by conflicts. As for the natural resources, both the GDP share of natural resource exports and depletion rates are lower in developing countries. Note, however, that this outcome is heavily influenced by a number of resource-abundant high-income countries from the Middle East.[13]

[12] We use the World Bank (2010) classification to distinguish between developed and developing countries. See Appendix C for the country sample.
[13] We explore that issue in more detail below.

Table 1: Mean for Main Variables and Country Groupings

Variable	Full sample	Developing countries	Developed countries
Corruption	3.17	2.57	4.20
Bureaucracy Quality	3.48	2.57	5.03
Law and Order	3.85	3.12	5.09
Press Freedom	2.13	1.86	2.59
Conflict Intensity	0.21	0.3	0.06
ln (Population)	16.24	16.58	15.68
ln (GDP per Capita)	7.95	6.97	9.62
Exports of Natural Resources	9.83	8.71	11.71
Other Exports	28.26	23.09	36.98
Depletion Rate of Natural Resources	4.8	4.94	4.55
No. of Countries	129	86	43

Notes: Figures refer to four-year averages of all variables and the entire period 1984-2007.

Apart from the population size, all independent variables are very likely to be endogenous, that is, they have an impact on both governance measures but they are influenced by them too. A large number of studies has shown that better governance will lead to enhanced growth rates, improved education, fewer conflicts (or better conflict management), more trade, lower inflation rates, and so on.[14] This calls for an appropriate instrumental variable approach. As indicated in the first section, we use a dynamic GMM panel estimator (system-GMM) introduced by Blundell and Bond (1998). More specifically, we use the two-step system-GMM estimator and Windmeijer's (2005) finite sample correction. This estimator effectively deals with reverse causality by using lagged levels and lagged differences as instruments for the endogenous variables and includes the lagged dependent variable to account for the persistence of the governance indicators.[15]

The econometric specification reads as follows:

$$(2) \quad \text{Governance}_{it} = \alpha_i + \beta_1 \text{Governance}_{it-1} + \beta_2 \text{Natural Resources}_{it} + \gamma' X_{it} + \lambda_t + \varepsilon_{it}$$

[14] See the literature reviews by Jütting (2003) and the World Bank (2005).
[15] In addition to the system GMM, we also used further estimators, such as a fixed-effects model. The results are broadly consistent with those reported below. However, we prefer to report the unbiased results, that is, those for the instrumental variable approach.

Where $Governance_{it}$ stands for the three governance indicators (*Corruption*, *Bureaucracy Quality*, and *Law and Order*) for country *i* in period *t*, α_i is the country fixed effect, $Natural\ Resources_{it}$ refers to two natural resource variables (*Exports of Natural Resources* and *Depletion Rate of Natural Resources*), X_{it} denotes the set of control variables, λ_t is a full set of time dummies which is supposed to capture period specific effects and changes in the governance variables over time, and ε_{it} stands for the error term.[16]

3. Empirical Results

Following the introduction of the variables and the econometric method used, we now turn to the empirical results. For a start, we focus on corruption and natural resource exports. We begin with four-year averages of the data, the entire sample of 129 countries, and incorporate only *Population, GDP per Capita*, *Other Exports*, and *Conflict Intensity* as explanatory variables in addition to *Exports of Natural Resources* (Column 1 in Table 2). The size of a country, proxied by the total population, has a negative influence on *Corruption*, though the estimated coefficient is slightly below the conventional 10 percent threshold level. As expected, a higher income per capita level leads to a higher score on the corruption indicator, that is, it is associated with lower corruption levels. Neither non-resource exports nor conflicts are significantly associated with corruption levels.

For our main resource variable, we find that higher resource exports lead to more corruption, as indicated by the negative sign of the coefficient. The estimated coefficient for *Exports of Natural Resources* is highly significant at the 1 percent level. Importantly, this does not change if we control for a further determinant of corruption, that is, press freedom (which has the expected positive sign but is not significant), reported in Column 2. Since our sample shrinks by one country and 12 observations, we add *Press Freedom* in all respective second model specifications.[17]

[16] In all estimations, we treat the population size as exogenous and all other determinants of the three governance variables as endogenous.

[17] We also tested various other explanatory variables, such as foreign direct investment (FDI), the black-market premium for foreign currency, and educational attainment measures (results not reported). The results for the resource variable, however, do not change by much. Likewise, we tested the inclusion of a commonly used indicator for democracy, that is, the Polity 4 democracy measure, as a further control indicator. Again, the results

The quantitative effect of more natural resource exports on corruption is modest, but by no means negligible. Taking the estimated coefficient on *Exports of Natural Resources* for the full country sample and all control variables in Column 2 (-0.0158) at face value, a increase in the GDP share of resource exports by 14.01 percentage points (that is, by one standard deviation) would lead to an decrease in the corruption score by 0.221. While this increase may appear small at first sight, it should be taken into account that *Corruption* ranges from 0 to 6. Given the mean of *Corruption* of about 3.17, the quantitative effect amounts to some 7 percent of the corruption score. The long-run effect would still be more pronounced. The long-run effect can be calculated by dividing the coefficient of *Exports of Natural Resources* by one minus the coefficient of the lagged dependent variable. Based on the estimate reported in Column 2, the long-run impact on corruption of a decrease in resource exports by one standard deviation would be 14.6 percent of the corruption score.

Unsurprisingly, these estimated averages hide large fluctuations at a country level. To put the results into perspective, we apply the estimates to Nigeria, a developing country that is highly dependent on exports of natural resources and has high corruption levels. Assume for the moment that Nigeria's oil and gas resources would be depleted and the country stops to export any natural resources. Other things being equal, this would mean that the corruption score for Nigeria in the last period 2004-2007 would increase (in the long-run) by 1.41 points from 1.33 to 2.74, almost reaching the score of Estonia (3.0) or even Botswana (3.28) in the same period.[18] Wile this calculation is fairly simple and the results should not be stretched too much, it underlines the potential impact of exporting natural resources on an important governance area, such as corruption.

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are not significant. This also applies to the interaction terms (democracy * natural resources). Accordingly, we did not include them in our analysis.

[18] The figure for *Exports of Natural Resources* for Nigeria in the final period is equal to 42.69 percent of GDP.

Table 2: Determinants of Corruption

	Dependent variable: Corruption					
	All countries		Developing countries		Developed countries	
Lags	(2 to 6)	(2 to 6)	(2 to 6)	(2 to 5)	(2 to 3)	(2 to 3)
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Corruption (t-1)	0.567***	0.522***	0.508***	0.447***	0.745***	0.727***
	[7.467]	[7.433]	[6.525]	[6.513]	[7.844]	[7.006]
ln (GDP per Capita)	0.204***	0.201***	0.146	0.0700	0.155	0.188
	[3.214]	[3.542]	[1.510]	[0.925]	[0.622]	[1.236]
ln (Population)	-0.0481	-0.0468	-0.0316	-0.00984	-0.0800	-0.0298
	[-1.488]	[-1.367]	[-0.757]	[-0.317]	[-1.282]	[-0.578]
Exports of Natural	-0.016***	-0.0158***	-0.015***	-0.014***	-0.016**	-0.0123
Resources	[-3.629]	[-3.385]	[-2.595]	[-2.704]	[-2.381]	[-1.021]
Other Exports	-0.00201	-0.00165	-0.00707	-0.00708	-0.00340	0.00260
	[-0.811]	[-0.529]	[-1.445]	[-1.583]	[-1.244]	[0.692]
Conflict Intensity	-0.113	-0.168	-0.279*	-0.340***	0.300	0.248
	[-0.545]	[-1.167]	[-1.658]	[-2.650]	[0.631]	[0.501]
Press Freedom		0.0183		0.0796		-0.0981
		[0.215]		[0.629]		[-0.462]
Observations	528	516	336	331	192	185
Number of countries	129	128	86	86	43	42
Number of instruments	65	78	65	72	35	42
Sargan (p-value)[1]	0.39	0.81	0.38	0.77	0.36	0.98
AB 2 (p-value)[2]	0.13	0.14	0.45	0.54	0.20	0.13

Notes: Significance at the 10, 5, and 1 percent level is denoted by *, **, and ***, respectively. Estimation based on two-step system-GMM estimator using Windmeijer's (2005) finite sample correction; corresponding z-values are reported in parentheses. Constant terms and time dummies are always included but not reported.

[1] Sargan-test of overidentification.
[2] Arellano-Bond-test that second-order autocorrelation in residuals is 0; first-order autocorrelation is always present (not reported).

As mentioned in the previous section, these first results could be influenced by the fact that the sample consists of developing and developed countries which can be quite heterogeneous and therefore could bias size and significance levels of the coefficients. In a further set of regressions, we use the same two model specifications but split the sample into developing and high-income countries. As for the explanatory variables in the developing country sample, reported in columns 3 and 4, we find a few but not considerable differences in comparison to the full sample. While *GDP per Capita* has a smaller and not significant impact on corruption levels, the opposite is true for *Conflict Intensity*. This latter result is in

line with our expectations, since conflicts not only occur more often and are of higher intensity in developing countries; they are also more likely to have a stronger impact on governance, as the quality of the institutional framework is – on average – weaker in these countries. As for exports of natural resources, we still obtain negative and strongly significant coefficients for this variable in the reduced sample.[19] Hence, resource exports leading to enhanced corruption holds in developing countries too.

Next, we focus on high-income countries only (columns 5 and 6). We observe that the control variables do not have a significant impact on corruption. This result could be due to the relatively low number of countries (43) included in that sample. Since the system-GMM has been designed for a small "T" and large "N", a lower number of countries could affect the reliability of the results. Hence, we should take caution in the interpretation of the results in this subsample. On the other hand, natural resource exports is the only significant variable that affects corruption levels (negatively), though this outcome is not robust in the full model specification when we add press freedom.

Additional regressions (not reported) indicate that the potential negative impact of natural resources on corruption in developed countries is driven by the inclusion of resource-abundant high-income countries. These are countries with a very high GDP share of resource exports of 50 percent or higher in the period 2004-2007. Among the high-income countries included in our sample, five oil-rich countries in the Middle East (Bahrain, Kuwait, Oman, Saudi Arabia, and the United Arab Emirates) and one in Asia (Brunei) meet that criterion.[20] Once we exclude the oil-rich countries from this subsample, the negative and significant impact of natural resource exports on corruption disappears entirely.

The consistency of the system-GMM estimator requires a lack of second-order serial correlation in the residuals. The regression statistics, reported at the bottom of Table 2, show that there is no second-order serial correlation in all six regressions, as the null-hypothesis has been rejected. To test the appropriateness of the instruments used, we report the results of a Sargan test of overidentifying restrictions in all tables. The *J*-statistics show that the applied instruments are valid. As we use lagged levels and lagged differences, the number of

[19] Calculations for the relative impact of resource exports on corruption in developing countries show that the relative impact using the percentage change is roughly similar (not displayed).

instruments can be quite large in a system-GMM estimator. Since too many instruments can overfit endogenous variables, fail to expunge their endogenous components, and weaken the power of the Sargan test to detect overidentification, we keep the number of instruments below the number of countries. Based on this criterion, we have reduced the number of instruments for developing countries in the full model specification (Column 4) and for developed countries in both regressions. To test whether the results are driven by the lag structure, we have also reduced the number of instruments used in all other regressions (not reported). Importantly, the results for our natural resource variable hardly change.[21]

Next, we use *Bureaucracy Quality* instead of *Corruption* as the governance indicator. Again, we employ the same two model specifications for the samples but include the second lag of the dependent variable in addition to the first lag to avoid second-order serial correlation. The results for the control variables show that income per capita is the most important determinant of the quality of the bureaucracy (Table 3). *GDP per Capita* is the only variable that has a positive and significant impact (at the 1 percent level) on *Bureaucracy Quality* in all model specifications apart from the developed country sample. Now, *Population* has a positive and significant impact on the quality of the bureaucracy, though this is restricted to the full model specification in the developing country subsample.

For natural resource exports, we obtain some evidence for a negative impact on the quality of the bureaucracy. For all three samples, we obtain a negative coefficient for *Exports of Natural Resources* at the 10 percent level or better in the first regression. Once we add *Press Freedom*, however, the resource variable is no longer significant. This result is not driven by the loss of one country and 12 observations, as *Exports of Natural Resources* would still be significant at the 5 percent level if we restrict the second model specification to those observations for which we have data for *Press Freedom* (not reported). Overall, the results indicate that there is some evidence for a negative impact of natural resources on the quality of the bureaucracy but the results are not robust.

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[20] The respective figures for high-income and resource-abundant OECD countries are either much lower (Australia: 9.2 percent, Canada: 10.4 percent) or somewhat lower (Norway: 32.6 percent).

[21] We have even reduced the number of instruments drastically in the regressions. Again, the results for the main variables of interest do not change much.

Table 3: Determinants of Bureaucracy Quality

	Dependent variable: Bureaucracy Quality					
	All countries		Developing countries		Developed countries	
Lags	(3 to 6)	(3 to 6)	(3 to 6)	(3 to 5)	(3 to 3)	(3 to 3)
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Bureaucracy Quality(t-1)	0.679***	0.740***	0.701***	0.756***	0.621***	0.686***
	[7.328]	[8.095]	[7.013]	[8.882]	[4.866]	[5.104]
Bureaucracy Quality(t-2)	-0.217***	-0.241***	-0.230***	-0.261***	0.0153	-0.0599
	[-2.920]	[-3.650]	[-2.718]	[-3.683]	[0.154]	[-0.614]
ln (GDP per Capita)	0.602***	0.470***	0.535***	0.333***	0.0971	0.268
	[5.734]	[4.398]	[3.703]	[4.232]	[0.387]	[1.539]
ln (Population)	0.0342	0.0750	0.0816	0.132***	-0.0557	-0.0236
	[0.524]	[1.575]	[1.312]	[3.064]	[-1.566]	[-0.834]
Exports of Natural	-0.0181**	-0.00780	-0.0164*	-0.00503	-0.0177**	-0.00950
Resources	[-2.207]	[-1.226]	[-1.653]	[-0.781]	[-2.451]	[-0.993]
Other Exports	0.000402	0.00377	0.000633	0.00650	-0.00190	0.00271*
	[0.126]	[1.143]	[0.124]	[1.337]	[-0.708]	[1.904]
Conflict Intensity	0.194	-0.0152	0.174	0.104	0.339	0.795
	[0.739]	[-0.0820]	[0.860]	[0.744]	[0.933]	[1.586]
Press Freedom		0.149		0.198		0.0197
		[1.031]		[1.558]		[0.0999]
Observations	430	420	279	275	151	145
Number of countries	128	127	85	85	43	42
Number of instruments	59	71	59	65	29	35
Sargan (p-value)	0.22	0.10	0.43	0.28	0.20	0.13
AB 2 (p-value)	0.13	0.14	0.21	0.22	0.05	0.09

Notes: Significance at the 10, 5, and 1 percent level is denoted by *, **, and ***, respectively. See Table 2 for further notes.

For the final indicator of the quality of governance, *Law and Order*, we use the same set up of the empirical analysis and the three country samples as before. As can be seen in Table 4, the results are even weaker in comparison to bureaucratic quality. We do not find any evidence in both samples for the hypothesis that natural resource exports have an impact on law and order.[22]

[22] Note that there is second-order autocorrelation in the regressions for both the full and developed samples of countries. While we could eliminate the autocorrelation by adding a third lag of the dependent variable, this does not have an impact on the significance level of the resource exports variable. The Sargan test of overidentification indicates that the instruments may not be valid in all regressions, but this outcome is restricted to the developing sample and the p-value is only slightly below 0.10.

Table 4: Determinants of Law and Order

	Dependent variable: Law and Order					
	All countries		Developing countries		Developed countries	
Lags	(3 to 6)	(3 to 6)	(3 to 6)	(3 to 5)	(3 to 3)	(3 to 3)
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Law and Order(t-1)	0.739***	0.740***	0.866***	0.892***	0.360***	0.411***
	[13.21]	[12.78]	[14.56]	[14.67]	[3.187]	[4.163]
Law and Order(t-2)	-0.176***	-0.177***	-0.282***	-0.271***	0.0266	0.0127
	[-3.251]	[-3.457]	[-4.859]	[-4.602]	[0.286]	[0.166]
ln (GDP per Capita)	0.114	0.130*	-0.0312	0.0219	0.619**	0.268*
	[1.568]	[1.689]	[-0.289]	[0.255]	[2.315]	[1.685]
ln (Population)	0.00524	0.0129	0.0575	0.0406	0.00684	-0.00547
	[0.106]	[0.290]	[1.305]	[0.961]	[0.113]	[-0.0904]
Exports of Natural	-0.00535	-0.00414	-0.00428	-0.00935	0.00492	0.00302
Resources	[-0.729]	[-0.612]	[-0.527]	[-1.242]	[0.725]	[0.201]
Other Exports	0.00486	0.00611*	0.00218	-0.000190	0.00501	0.00180
	[1.628]	[1.681]	[0.455]	[-0.0520]	[1.052]	[0.462]
Conflict Intensity	0.0271	0.000962	-0.115	-0.221	0.656	0.216
	[0.115]	[0.00416]	[-0.839]	[-1.178]	[1.117]	[0.554]
Press Freedom		-0.0378		-0.173		0.140
		[-0.334]		[-1.218]		[0.404]
Observations	430	420	279	275	151	145
Number of countries	128	127	85	85	43	42
Number of instruments	59	71	59	65	29	35
Sargan (p-value)	0.14	0.23	0.09	0.07	0.35	0.42
AB 2 (p-value)	0.03	0.04	0.21	0.26	0.03	0.03

Notes: Significance at the 10, 5, and 1 percent level is denoted by *, **, and ***, respectively. See Table 2 for further notes.

Since our results could be driven by the particular resource variable used in our empirical analysis, we test the robustness of our results by employing a second variable for resource intensity, that is, the depletion rate of natural resources in an economy. In comparison to exports of natural resources, the outcome for that natural resource indicator is broadly similar across the three governance indicators. An increase in the natural resource depletion rate leads to higher corruption levels (Table 5), as the coefficients in both model specifications and all three samples are significant at the 10 percent level or better.[23] Again, we find that the size of the coefficients and the significance levels for the depletion rates in the developed country sample decline considerably, once we exclude the group of six oil-rich high-income countries from this sample (not reported).

Finally, there is neither a statistically significant effect of the depletion rates on the quality of the bureaucracy nor on law and order (Tables 6 and 7). For bureaucracy, the results are even weaker in comparison to the previous natural resource indicator. Now, we obtain a negative and significant coefficient in only one out of six model specifications.

[23] In the full country sample, we had to add the second lag of the dependent variable to avoid second-order autocorrelation.

Table 5: Determinants of Corruption

	Dependent variable: Corruption					
	All countries		Developing countries		Developed countries	
Lags	(3 to 6)	(3 to 6)	(2 to 6)	(2 to 6)	(2 to 4)	(2 to 3)
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Corruption (t-1)	0.671***	0.613***	0.616***	0.583***	0.785***	0.703***
	[8.816]	[8.487]	[9.946]	[8.565]	[17.83]	[10.84]
Corruption (t-2)	-0.0814*	-0.0875*				
	[-1.680]	[-1.909]				
ln (GDP per Capita)	0.183***	0.135**	0.00385	-0.0531	0.0165	0.104
	[3.277]	[2.336]	[0.0468]	[-0.796]	[0.0933]	[0.860]
ln (Population)	-0.0329	-0.0390	-0.0185	-0.00519	-0.0485**	-0.0373
	[-1.021]	[-1.052]	[-0.737]	[-0.164]	[-1.973]	[-1.384]
Depletion Rate of Natural Resources	-0.020***	-0.020***	-0.011**	-0.0087*	-0.019***	-0.020**
	[-4.596]	[-3.365]	[-2.065]	[-1.692]	[-5.198]	[-2.145]
Conflict Intensity	0.189	0.104	-0.0312	-0.126	0.577	0.138
	[0.942]	[0.505]	[-0.188]	[-0.751]	[0.846]	[0.292]
Press Freedom		0.0887		0.0621		0.0792
		[0.724]		[0.499]		[0.652]
Observations	429	419	335	330	192	185
Number of countries	127	126	85	85	43	42
Number of instruments	47	59	52	65	40	35
Sargan (p-value)	0.12	0.20	0.52	0.70	0.27	0.28
AB 2 (p-value)	0.19	0.30	0.17	0.22	0.27	0.16

Notes: Significance at the 10, 5, and 1 percent level is denoted by *, **, and ***, respectively. See Table 2 for further notes.

Table 6: Determinants of Bureaucracy Quality

	Dependent variable: Bureaucracy Quality					
	All countries		Developing countries		Developed countries	
Lags	(3 to 6)	(3 to 6)	(3 to 6)	(3 to 5)	(3 to 4)	(3 to 3)
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Bureaucracy Quality(t-1)	0.716***	0.712***	0.686***	0.738***	0.745***	0.749***
	[6.694]	[7.124]	[7.408]	[7.944]	[6.588]	[4.787]
Bureaucracy Quality(t-2)	-0.26***	-0.26***	-0.27***	-0.29***	-0.0232	-0.101
	[-3.575]	[-3.486]	[-3.665]	[-3.759]	[-0.237]	[-0.821]
ln (GDP per Capita)	0.600***	0.538***	0.702***	0.505***	0.253	0.227*
	[5.730]	[5.073]	[4.997]	[4.214]	[1.224]	[1.873]
ln (Population)	0.0795	0.105**	0.124	0.141***	-0.0272	-0.0190
	[1.471]	[1.988]	[1.633]	[3.141]	[-1.039]	[-0.534]
Depletion Rate of Natural Resources	-0.00910	-0.00484	-0.00968	-0.00044	-0.014**	-0.0102
	[-1.197]	[-0.759]	[-1.148]	[-0.0744]	[-2.494]	[-1.073]
Conflict Intensity	0.174	-0.00180	0.245	0.121	0.704	0.441
	[0.707]	[-0.0116]	[1.128]	[0.841]	[1.632]	[0.979]
Press Freedom		0.223*		0.253		0.163
		[1.661]		[1.534]		[1.076]
Observations	429	419	278	274	151	145
Number of countries	127	126	84	84	43	42
Number of instruments	47	59	47	54	35	29
Sargan (p-value)	0.08	0.09	0.26	0.58	0.09	0.03
AB 2 (p-value)	0.36	0.31	0.62	0.58	0.07	0.16

Notes: Significance at the 10, 5, and 1 percent level is denoted by *, **, and ***, respectively. See Table 2 for further notes.

Table 7: Determinants of Law and Order

	Dependent variable: Law and Order					
	All countries		Developing countries		Developed Countries	
Lags	(3 to 6)	(3 to 6)	(3 to 6)	(3 to 5)	(3 to 4)	(3 to 3)
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Law and Order(t-1)	0.687***	0.712***	0.810***	0.897***	0.381***	0.398***
	[9.286]	[9.634]	[10.15]	[12.03]	[3.484]	[3.753]
Law and Order(t-2)	-0.184***	-0.196***	-0.288***	-0.313***	-0.0593	-0.0218
	[-3.364]	[-3.644]	[-4.435]	[-4.645]	[-0.801]	[-0.277]
ln (GDP per Capita)	0.181***	0.198**	-0.0539	-0.0673	0.657**	0.363**
	[2.743]	[2.439]	[-0.611]	[-0.721]	[2.071]	[2.307]
ln (Population)	-0.0179	-0.00807	0.0225	0.0532	-0.0164	-0.00320
	[-0.395]	[-0.184]	[0.399]	[1.145]	[-0.434]	[-0.0784]
Depletion Rate of Natural Resources	-0.0105*	-0.0102	-0.00564	-0.00361	-0.00752	-0.00437
	[-1.776]	[-1.506]	[-0.897]	[-0.725]	[-0.752]	[-0.315]
Conflict Intensity	0.155	0.0418	0.0271	-0.207	-0.131	-0.00439
	[0.722]	[0.199]	[0.158]	[-1.150]	[-0.352]	[-0.0116]
Press Freedom		-0.0794		-0.183		0.0259
		[-0.602]		[-1.153]		[0.138]
Observations	429	419	278	274	151	145
Number of countries	127	126	84	84	43	42
Number of instruments	47	59	47	54	35	44
Sargan (p-value)	0.12	0.03	0.09	0.10	0.11	0.90
AB 2 (p-value)	0.06	0.05	0.38	0.34	0.04	0.04

Notes: Significance at the 10, 5, and 1 percent level is denoted by *, **, and ***, respectively. See Table 2 for further notes.

We then apply a set of further checks on the robustness of our main findings. As indicated above, we now use three-year instead of four-year averages for all variables. In this setting, we have more periods (eight instead of six), but somewhat less within-country variation over time. We obtain again a negative and highly significant impact of natural resource exports on corruption for the full country sample, reported in the first row and the first two columns of Table 8. To allow for an easier grasp of the most important results, we only report the coefficients for *Exports of Natural Resources* and *Depletion Rate* as the main indicators of interest in that table. For the developing and developed country subsamples, we observe a very similar pattern in comparison to using four-year averages. While the results are robust for the first subsample, that is not the case for the latter subsample. For the quality of the bureaucracy and law and order, the results hardly change as well (rows 2 and 3).

As a final robustness check, we still use three-year averages but focus on depletion rates instead of natural resource exports (rows 4 to 6 in Table 8). The results still show that natural resources lead to higher corruption levels, though significance levels are slightly weaker for the developing country sample in comparison to previous estimates. While the results for *Bureaucracy Quality* barely change, we now observe some (weak) evidence for a negative impact of depletion rates on *Law and Order* in the full sample of countries. Yet that outcome cannot be confirmed for both subsamples.

Table 8: Robustness Checks for Three-year Averages, Summarised

		All countries		Developing countries		Developed countries	
		(1)	(2)	(3)	(4)	(5)	(6)
Exports of Natural Resources	Corruption	-0.0144***	-0.0125***	-0.00879**	-0.00713*	-0.0120***	-0.00380
		[-4.885]	[-3.551]	[-2.101]	[-1.650]	[-3.373]	[-0.627]
	Bureaucracy Quality	-0.00610*	-0.00253	-0.00226	-0.00225	-0.00673***	-0.00266
		[-1.918]	[-0.792]	[-0.396]	[-0.532]	[-3.760]	[-0.723]
	Law and Order	-0.00504	-0.00743*	0.00128	-0.000287	-0.00589*	-0.00928
		[-1.335]	[-1.738]	[0.169]	[-0.0527]	[-1.945]	[-1.591]
Depletion Rate of Natural Resources	Corruption	-0.0175***	-0.0161***	-0.00759*	-0.00628	-0.0217***	-0.017**
		[-3.905]	[-3.368]	[-1.712]	[-1.280]	[-3.765]	[-2.210]
	Bureaucracy Quality	-0.00770	-0.00383	-0.00412	-0.000612	-0.0105***	-0.00553
		[-1.567]	[-0.852]	[-0.656]	[-0.116]	[-3.125]	[-1.193]
	Law and Order	-0.00820**	-0.0100***	-0.00014	-0.00261	-0.00556	-0.00959
		[-2.061]	[-2.627]	[-0.00235]	[-0.505]	[-1.155]	[-1.302]

4. Conclusion

We have analysed the impact of natural resources on selected governance indicators as one important channel through which natural resources can have an impact on economic development. Above all, we find that natural resources are enhancing corruption levels. This outcome is robust to different model specifications and a different resource variable. While this link is quite robust for the total sample and the developing country subsample, we do not obtain robust results once we focus on developed countries only. For other governance areas, we find some evidence for a negative impact of natural resource exports on the quality of the

bureaucracy; though this outcome is not robust to different model specifications or if we use the depletion rates as an alternative resource indicator. For law and order, we hardly obtain any significant impact of natural resources at all.

While we could not test the impact of natural resources on a broader set of institutional variables due to a lack of data for an extended period of time, the results imply that the resource curse with respect to governance is largely restricted to corruption. There is strong evidence that the "rentier effects" from resource extraction, as discussed in the first section, may foster rent seeking activities and corruption among the population.

From a policy perspective, our results are highly relevant to many resource-rich countries, in particular developing countries. Since the effects are of a sizable dimension, these countries may pursue an unfavourable development trajectory by worsening corruption levels. Even more worryingly, many developing countries, in particular in Africa, seem to be eager to elevate the exploitation of natural resources in their countries. Partly due to an increase in demand for resources and the corresponding increase in price level of resources, production and exports have already increased or will increase in the years to come.

Any efforts to mitigate the resource curse effects depend on policy makers in the countries concerned. Given the large amounts of money involved, however, it is questionable how to persuade them to change their behaviour. While increased transparency of the money spent by both national governments and international investors could help, initiatives in this area have not gathered considerable momentum so far. As of June 2010, only two countries (Azerbaijan and Liberia), have reached the compliant status of the Extractive Industries Transparency Initiative (EITI 2010). Whether this or similar initiatives for more transparency are becoming more widespread in the future is quite uncertain.[24] Still, they are most welcome and can be quite helpful in trying to reduce the negative effects of natural resources in many resource-rich countries.

[24] See also the Natural Resource Charter (2010).

References

Ades, A., & Di Tella, R. (1999). Rents, competition and corruption. *American Economic Review*, 89(4), 982-993.

Alexeev, M., & Conrad, R. (2009). The elusive curse of oil. *Review of Economics and Statistics*, 91(3), 586-598.

Aslaksen, S. (2009). *Corruption and oil: Evidence from panel data*. Mimeo (Working Paper) available at: http://folk.uio.no/siljeasl/Corruption.pdf. Accessed 28 December 2010.

Aslaksen, S. (2010). Oil and democracy - More than a cross-country correlation? *Journal of Peace Research*, 47(4), 421–431.

Auty, R. (2001). The political economy of resource-driven growth. *European Economic Review*, 45(4-6), 839-846.

Barro, R. (1999). Determinants of democracy. Journal of Political Economy, 107(S6), S158-183.

Bhattacharyya, S., & Hodler, R. (2010). Natural resources, democracy and corruption. *European Economic Review*, 54(4), 608-621.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143.

Brollo, F., Nannicini, T. , Perotti, R., & Tabellini, G. (2010). *The political resource curse* (NBER Working Paper 15705).

Brunetti, A., & Weder, B. (2003). A free press is bad for corruption. *Journal of Public Economics*, 87(7-8), 1801-1824.

Brunnschweiler, C. (2008). Cursing the blessings? Natural resource abundance, institutions, and economic growth. *World Development*, 36(3), 399-419.

Brunnschweiler, C., & Bulte, E. (2008). The resource curse revisited and revised: A tale of paradoxes and red herrings. *Journal of Environmental Economics and Management*, 55(3), 248-264.

Bulte, E., Damania, R., & Deacon, R. (2005). Resource intensity, institutions, and development. *World Development*, 33(7), 1029-1044.

Clark, J. (1997). Pretro-politics in Congo. *Journal of Democracy*, 8(3), 62-76.

CSCW (2010). UCDP/PRIO armed conflict dataset, version 4-2009. Centre for the Study of Civil Wars (CSCW), International Peace Research Institute, Oslo (PRIO), available at: http://www.prio.no/cscw. Accessed 2 May 2010.

EITI (2010). Extractive industries transparency initiative, available at: http://eiti.org/. Accessed 10 June 2010.

Frankel, J. (2010). *The natural resource curse: A survey* (NBER Working Paper 15836).

Freedom House (2010). Freedom in the world, available at: http://www.freedomhouse.org. Accessed 10 April 2010.

Freille, S., Haque, E., & Kneller, R. (2007). A contribution to the empirics of press freedom and corruption. *European Journal of Political Economy*, 23(4), 838-862.

Gause, G. (1995). Regional influences on experiments in political liberalization in the Arab world. In R. Brynen, B. Korany, & P. Noble (Eds.), *Political liberalization and democratization in the Arab world, Vol. 1: Theoretical perspectives* (pp. 283-306). Boulder: Lynne Rienner.

Isham, J., Woolcock, M., Pritchett, L., & Busby, G. (2005). The varieties of resource experience: Natural resource export structures and the political economy of economic growth. *World Bank Economic Review*, 19(2), 141-174.

Jütting, J. (2003). *Institutions and development: A critical review* (OECD Development Centre Working Paper 210).

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). *Governance matters VIII: Aggregate and individual governance indicators, 1996-2008* (World Bank Policy Research Working Paper 4978).

Leite, C., & Weidmann, J. (2002). Does mother nature corrupt? Natural resources, corruption, and economic growth. In G. Abed & S. Gupta (Eds.), *Governance, corruption, and economic performance* (pp. 159-196). Washington, DC: International Monetary Fund.

Natural Resource Charter (2010). The natural resource charter, available at: http://www.naturalresourcecharter.org/. Accessed 21 December 2010.

PRS Group (2010a). About ICRG: The political risk rating, available at: http://www.icrgonline.com/page.aspx?page=icrgmethods. Accessed 8 March 2010.

PRS Group (2010b). International country risk guide: Political risk, available at: http://www.icrgonline.com/default.aspx. Accessed 8 March 2010.

Ranjan, R., & Zingales, L. (2003). The great reversal: The politics of financial development in the twentieth century. *Journal of Financial Economics*, 69(1), 5-50.

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: The primacy of institutions over geography and integration in economic development. *Journal of Economic Growth*, 9(2), 131-165.

Ross, M. (2001). Does oil hinder democracy? *World Politics*, 53(3), 325-361.

Ross, M. (2009). *Oil and democracy revisited*. Mimeo (Working Paper), available at: http://www.sscnet.ucla.edu/polisci/faculty/ross/Oil%20and%20Democracy%20Revisited.pdf. Accessed 12 December 2010.

Sala-i-Martin, X., & Subramanian, A. (2003). *Addressing the natural resource curse: An illustration from Nigeria* (NBER Working Paper 9804).

Sachs, J., & Warner, A. (1995). *Natural resource abundance and economic growth* (NBER Working Paper 5398).

Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126(1), 225-256.

Treisman, D. (2000). The causes of corruption: A cross-national study. *Journal of Public Economics*, 76(3), 399-457.

Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research? *Annual Review of Political Science*, 10(1), 211-244.

Tsui, K. (2011) More oil, less democracy: Evidence from worldwide crude oil discoveries. *Economic Journal*, doi: 10.1111/j.1468-0297.2009.02327.x.

UNCTAD (2010). UN COMTRADE database, available at: http://comtrade.un.org/. Accessed 2 April 2010.

Vicente, P. (2010). Does oil corrupt? Evidence from a natural experiment in West Africa. *Journal of Development Economics*, 92(1), 28-38.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics*, 126(1), 25-51.

World Bank (2005). *World development report 2006: Equity and development.* New York and Washington, DC: Oxford University Press and World Bank.

World Bank (2010). World development indicators, available at: http://data.worldbank.org/data-catalog. Accessed 30 April 2010.

Appendix A: Definition of Variables and Data Sources

Variable	Definition	Range	Source
Corruption	Corruption within the political system. A high value indicates a system less prone to influences from corruption.	0 to 6	PRS Group (2010b)
Bureaucracy Quality	Institutional strength and quality of the bureaucracy. High points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services.	0 to 6	PRS Group (2010b)
Law and Order	Strength and impartiality of the legal system	0 to 6	PRS Group (2010b)
GDP per Capita	Gross Domestic Product (GDP) per capita, measured in constant US Dollars (in logs).	continuous	World Bank (2010)
Population	Total population (in logs).	continuous	World Bank (2010)
Conflict Intensity	Measures the occurrence and intensity of internal and external conflicts; coded threefold: 0 signifies no or less than 25 battle-related deaths in a given year, 1 stands for "minor" conflicts with 25 and 999 battle-related deaths, and 2 reflects a war situation with at least 1,000 battle-related deaths.	0 to 2	CSCW (2010)
Press Freedom	Freedom of the press. A larger value indicates a higher degree of freedom; coded as 3 (free), 2 (partly free), and 1 (not free).	1, 2, 3	Freedom House (2010)
Exports of Natural Resources	GDP share of natural resource exports. Natural resources include mineral fuels (SITC section 3), ores and metals (27), metalliferous ores (28), and non-ferrous metals (68).	Share of GDP	World Bank (2010) and UNCTAD (2010)
Other Exports	Total exports minus exports of natural resources (both measured as a share of GDP).	Share of GDP	World Bank (2010) and UNCTAD (2010)
Depletion Rate of Natural Resources	Defined as the product of unit resource rents and the physical quantities of minerals and energy extracted. It refers to bauxite, copper, iron, lead, nickel, phosphate, tin, zinc, gold, and silver as well as crude oil, natural gas, and coal. It is expressed as a share of Gross National Income (GNI).	Share of GNI	World Bank (2010)

Appendix B: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Corruption	634	3.17	1.34	0.00	6.00
Bureaucracy Quality	634	3.48	1.67	0.00	6.00
Law and Order	634	3.85	1.43	0.21	6.00
ln (GDP per capita)	634	7.95	1.57	4.71	10.86
ln (Population)	634	16.24	1.61	12.37	20.99
Conflict Intensity	634	0.21	0.45	0.00	2.00
Press Freedom	622	2.13	0.78	1.00	3.00
Other Exports	634	28.26	24.95	0.10	201.84
Exports of Natural Resources	634	9.83	14.01	0.00	89.64
Depletion Rate of Natural Resources	634	4.80	8.34	0.00	45.25

Note: Figures refer to the full country sample and the period 1984-2007, using 4-year averages.

Appendix C: Country Sample

Albania, Algeria, Angola, Argentina, Armenia, *Australia, Austria*, Azerbaijan, *Bahamas*, *Bahrain*, Bangladesh, Belarus, *Belgium*, Bolivia, Botswana, Brazil, *Brunei*, Bulgaria, Burkina Faso, Cameroon, *Canada*, Chile, China, Colombia, Congo, Costa Rica, Cote d'Ivoire, *Croatia*, *Cyprus*, *Czech Republic*, *Denmark*, Dominican Republic, Ecuador, Egypt, El Salvador, *Estonia*, Ethiopia, *Finland, France*, Gabon, Gambia, *Germany*, Ghana, *Greece*, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, *Hong Kong*, *Hungary*, *Iceland*, India, Indonesia, Iran, *Ireland, Israel, Italy*, Jamaica, *Japan*, Jordan, Kazakhstan, Kenya, *Rep. of Korea*, *Kuwait*, Latvia, Lebanon, Libya, Lithuania, *Luxembourg*, Madagascar, Malawi, Malaysia, Mali, *Malta*, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, *Netherlands, New Zealand,* Nicaragua, Niger, Nigeria, *Norway*, *Oman*, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, *Portugal*, Romania, Russia, *Saudi Arabia*, Senegal, *Singapore*, *Slovak Republic, Slovenia*, South Africa, *Spain*, Sri Lanka, Sudan, Suriname, *Sweden, Switzerland*, Syria, Tanzania, Thailand, Togo, *Trinidad and Tobago*, Tunisia, Turkey, Uganda, Ukraine, *United Arab Emirates*, *United Kingdom, United States*, Uruguay, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe

Note: Developed countries in *italics*.