Constitutions and the resource curse*

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Abstract

Utilizing the fact that natural resources are randomly distributed among countries, we investigate how public income shocks have different long run economic effects dependent on constitutional arrangements. We find that (i) the so-called 'resource curse' is present in democratic presidential countries—but not in democratic parliamentary countries, (ii) being parliamentary or presidential matters more for the growth effects of natural resources than being democratic or autocratic, and (iii) natural resources are more likely to reduce growth when proportional electoral systems are in place than when the electoral systems are majoritarian. The two first effects appear very robust, the last effect less so.

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1 Introduction

Recent contributions to the political economy literature demonstrate systematic effects of constitutional features, such as the electoral rules and the rules for legislation, on a wide range of economic policy outcomes (see, e.g., Persson and Tabellini, henceforth PT, 2003). Causal effects of constitutions on policies that are important for long run economic performance have been harder to identify, and there are no evidence in the literature of *direct* long run effects of constitutions.[1] We suggest an indirect, reduced form approach to test the long term effects of constitutional arrangements. Exploiting the fact that natural resources are randomly distributed among countries provides us with a quasi-natural experiment designed to measure and compare differences in performance among countries with different types of constitutions. We argue that if economic policies are determined by the constitutional arrangements we might expect countries with different constitutional arrangements to react differently to exogenously determined income shocks.

Using a cross-country sample of up to 90 countries from all continents, we empirically investigate whether constitutional features determine how natural resource abundance affects economic growth. By including democracies as well as nondemocratic regimes in the sample, we can separate the effects of democracy as such, from the effects of constitutional form. We find strong evidence in favour of the hypothesis that constitutions matter for the resource curse. The main point we make in this paper is illustrated in Figure 1 below. Figure 1 indicates that presidential regimes suffer from the resource curse but parliamentary regimes do not. In fact, we find that the overall resource curse identified by Sachs and Warner (1995, 1997a, 1997b, 2001), henceforth SW, is mainly driven by presidential countries and nondemocratic regimes. Moreover, the particular forms of democracy matter even more than democratic rule in itself.

[Figure 1]

The pattern in Figure 1 survives a number of robustness checks, such as different sample selections (e.g., inclusion/exclusion of non-democracies in the sample), inclusion of geographical and colonial dummies, robust estimation procedures, inference from different growth periods, using different model specifications, using different variables for resource abundance and using instrumental variable methods. Regarding electoral rules, we find suggestive evidence that countries with a proportional electoral formula are

[1] Using within-country variation and instrumenting for constitutional features, Persson (2005) shows that reforms from non-democracy or presidential democracy into parliamentary democracy leads to more growth promoting trade and regulation policies. In turn, better "structural policies" has been shown to lead to higher long term growth (Hall and Jones, 1999; Acemoglu *et al.*, 2001; replicated by Persson, 2005). The term "structural policies" in the literature of Persson and Tabellini (PT, 2003; Persson 2005) loosely corresponds to what Acemoglu *et al.*, 2001 refer to as "economic institutions" e.g., trade and regulation policies. See Persson (2005) for a further discussion.

more prone to the resource curse than are countries with a majoritarian voting rule.

We proceed as follows. In section 2 we briefly discuss the main findings of the literature on the economic effects of constitutions. This discussion will provide the basis for the hypotheses we take to the data. After these preliminaries, we formulate an empirical growth model in section 3. The empirical results are presented and discussed in section 4. Finally, in section 5, we sum up and conclude.

2 Natural resource abundance, institutional design and economic performance.

The literature on the resource curse seeks explanations to the paradoxical empirical pattern that countries rich in natural resources seem to be outperformed, in the long run, by countries with less, or even no, natural resources (SW, 1995; 1997a; 1997b; 2001).[2] The diverging experience of different countries has lead to an increasing focus on the importance of institutions. Significant interactions effects of institutional quality and natural resource abundance on long-term economic performance are established. However, using measures of institutional quality, as in Boschini *et al.* (2007) and in Mehlum *et al.* (2006), is problematic for at least two reasons. First, institutional performance indicators are likely to be endogenous to growth, resulting in serious econometric problems of simultaneity.[3] Second, it is unclear which aspects of institutional performance that are important for economic growth. We argue that investigating institutional *design*, as opposed to measures of institutional *performance*, is a key to solving some of the problems in the resource curse literature.[4] More importantly, the prop-

[2]The seminal theoretical literature on the resource curse focuses on the structural mechanisms of the so-called Dutch disease (see, e.g., Matsuyama, 1992; SW, 1999; Torvik, 2001). Subsequently, the rent-seeking approach has gained increased attention (see, e.g., Lane and Tornell, 1996; Tornell and Lane, 1999; Torvik, 2002.). In the rent seeking models economic performance is hurt because rent-seeking behavior implies that productive resources are allocated inefficiently. It now appears that there is little support for the Dutch disease explanation, as it fails explain the diverging experience of different economies (Bulte *et al.,* 2004; Auty, 2001). This critique also applies for the rent-seeking literature, with the exception of Mehlum *et al.* (2006) who show that the effect of natural resources on aggregate production may depend on the quality of institutions. The findings in Mehlum *et al.* are supported by Boschini *et al.* (2007).

[3]The measures of institutional quality that are applied in the resource curse literature are subjecive indicators like Political Risk Services, Corruption Perceptions, and the World Bank Governance Indicators. Such indexes are indeed likely to be endogenous to economic development.

[4]There are several reasons for this. First, the literature on the economic effect of constitutions shows that institutional design is a significant determinant of institutional performance (PT, 2003). Second, institutional designs rarely change, a property that political scientists often refer to as an "iron law". This property of inertia is useful because

erties of constitutions provides a foundation for a better understanding of which aspects of institutions that are most essential to growth.

Why would we expect to observe interaction effects between institutional design and natural resource abundance on economic growth? The remainder of this section propose an intuitive and non-technical answer to this question. This will constitute the main motivation of this paper, and provide the basis for the hypotheses that we take to the data.

Constitutional design is an important aspect of a country's institutional arrangements, and defines the formal rules of 'the political game'. Two of the most fundamental sets of rules are the rules for legislation and the electoral rules (PT, 2003). Different rules have been found to translate into different policies. Presidential forms of government should be associated with less rent extraction and lower levels of taxation than parliamentary forms of government (Persson, Roland and Tabellini,1997, 2000). The fear of government crises in parliamentary regimes creates strong incentives to maintain party discipline and induce the government to pursue the joint interests of its voters and thus create broad spending programs (Persson, Roland and Tabellini, 2000; Shugart and Carey, 1992; Huber, 1996). Presidential regimes, not being constrained by a confidence requirement, promote the allocation of spending to target powerful minorities within the constituencies of powerful officeholders, at the expense of broad spending programs.[5] Majority voting, combining small voting districts with plurality rule, tends to favor narrow spending programs, and are often associated with smaller overall government spending and taxes (PT, 2003).[6]

Persson (2005) argues that since constitutions do shape fiscal policy and other economic and institutional features, they are likely to be reflected also in the structural policies fostering economic development, such as regulations to preserve property rights and non-protectionistic trade policies. Hence, the specific political arrangements—the *form* of democracy, rather than democracy per se—may be one of the missing links between history, current policy and economic development. If structural policies are important for economic development, one would expect these regulations to be more conducive to growth when they apply to broad population groups rather than to small privileged groups. Persson's analysis suggests that introducing parliamentary democracy in a previously nondemocratic regime or, equivalently, in a presidential democracy, improves *structural policy* so as to raise long-run

it provides the analysis with a source of cross-country variation that is less sensitive to economic performance.

[5] There is much more to the dynamics of this class of models than we have space for in this paper; PT (2000, 2003) provide a detailed review of the literature of the economic effects of constitutions. PT (2003) also present extensive empirical research on whether the theoretical predictions of the political economy literature are supported by the data. For a brief overview of this literature's main predictions and findings, see Persson (2002).

[6] In Milesi-Ferretti *et.al.*, (2002) the reason for this association is a smaller district size, wheras in Austen-Smith (2000) the reason is plurality rule.

productivity by almost 50%. At a minimum, these estimates indicate that constitutional rules are systematically correlated with structural policies.

In addition, a growing body of literature investigates the relationship between constitutional arrangements and corruption. Gerring and Thacker (2004) examine the impact of territorial sovereignty (unitary or federal) and the composition of the executive (parliamentary or presidential) on levels of perceived political corruption. They find evidence indicating that parliamentary forms of government help reduce corruption. Kunicova and Rose-Ackerman (2005) show that proportional representation (PR) systems are more susceptible to corrupt political rent seeking than are plurality systems. They also examine the interaction between electoral rules and presidentialism, and find that PR systems, particularly when combined with presidentialism, are associated with higher levels of corrupt political rent seeking. Their results confirm PT's basic findings that proportional elections are associated with higher corruption levels, but contradict PT's findings on presidential systems.

Given all these findings, it is reasonable to ask whether similar patterns can be found for the growth effect of the resource endowment. If the form of government and the electoral system shape a country's structural policies and level of corruption, it is plausible that the same constitutional features also affect the way countries respond to resource windfalls. A country's resource endowment has important implications for politicians' opportunities to design policy. A larger government budget provides politicians with more resources which can be used to influence the outcome of elections. More resources also raise the value of being in power, which in turn amplifies the political incentives to distribute resources and political favors in an inefficient manner.

Mehlum *et al.* (2006) assert that the variance in growth performance of resource-rich countries is primarily a result of how resource rents are distributed through institutional arrangements. Given that different forms of government create different incentives for distributing political favors, one would expect countries with different constitutions to respond differently to resource booms. Based on the insights from the theoretical literature (that presidential systems favour powerful minorities and that structural programs in parliamentary systems targets broader measures), and based on empirical evidence (supporting the theoretical predictions of the constitutions literature, and providing evidence of less corruption in parliamentary democracies), we would expect resource abundance to be less damaging for long run economic performance in parliamentary democracies than in presidential democracies. The subsequent sections provide evidence that this indeed seems to be the case. In addition, we provide suggestive evidence indicating that the electoral systems matter. Natural resources are more likely to reduce growth under proportional electoral rules than under majoritarian rules.

3 Data and Econometric Model

We construct two data sets based on different data sources, one covering the period 1970–1990, the second covering the period 1990–2000. Our 1970–1990 data set includes information on 90 countries.[7] In this data set countries are classified as democratic or nondemocratic regimes on the basis of the definition used by PT (2003). Countries with an average value of less than 5 for the Gastil Index for the period 1972–1990—i.e., countries that are classified as "partly free" by the Freedom House—are treated as democracies.[8]

We further separate our democracies into presidential democracies and parliamentary democracies, and into majoritarian and proportional electoral systems. Our constitutional variables are primarily borrowed from PT (2003) and Persson (2005). PT (2003) classify regimes as presidential if the confidence of the assembly is not needed for the executive to stay in power, even if an elected president is not the chief executive, or if there is no elected president. On the basis of this definition, most semipresidential and premier-presidential systems are classified as parliamentary regimes. PT (2003) classify regimes as majoritarian if all of the lower house is elected under plurality rule. Persson (2005) lists reform episodes—that is, exits from and entries into different forms of democracy—for the period 1962-1998. We combine these two sources in order to classify countries according to their form of government and electoral system in 1970.[9]

Our 1990–2000 data set includes information on 61 democracies.[10] This data set is also separated into presidential regimes and parliamentary regimes, and into majoritarian and proportional electoral systems. Our constitutional variables are identical to PT's (2003) classification.[11]

To compare our findings with the influential contributions of SW, and in particular SW (1995,1997a), we mainly use their model specification and control variables. SW (2001) show that their previous results (1995, 1997a) are robust to conditioning on previous growth rates rather than levels. For simplicity, we condition on initial levels in our specifications. Thus, we

[7] These are the countries included in SW's (1997a) main sample, with the exception of Hong Kong which is not classified in the Gastil Index (a democracy index) for the whole sample period (1970-1990).

[8] For a precise definition, consult: <http://www.freedomhouse.org/research/freeworld/2000/>. Note, however, that all our main findings are robust to a narrower categorization (i.e., when countries with a Gastil Index of < 3.5 are treated as democracies), although this respecification reduces the number of democracies in the sample. Thus, the democracy threshold is not critical for our main results.

[9] See Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for details.

[10] Also in this sample, as in PT (2003), countries are considered democratic if the GASTIL score is lower than an average of 5 for the 1990–1998 period. This rule permits 85 countries to be classified as democracies. We are able to utilize 61 out of these 85 countries due to missing data on some of the relevant variables.

[11] See PT (2003) for a precise definition.

expect average (log of) economic growth in country i between time $t = 0$ and time $t = T$ (in this case 1970–1990 or 1990–2000), $\frac{1}{t}\left(y_T^i - y_0^i\right)$, to be determined by (the log of) initial income, y_0^i, and a vector of country specific structural characteristics, Z^i, as follows.

$$\frac{1}{t}\left(y_T^i - y_0^i\right) = \alpha_0 + \alpha_1 y_0^i + \mathbf{Z}^i\boldsymbol{\beta} + u_i \tag{1}$$

SW (1995, 1997a) suggest that that initial natural resource abundance should be included in $\mathbf{Z}^i$. Given the recent contributions in the political economy literature relating structural, growth promoting policies to different constitutional arrangements, we investigate whether constitutional features are incorporated in $\mathbf{Z}^i$ as well. More importantly, however, we check whether there are any interaction effects between constitutional arrangements and natural resource abundance: If constitutional arrangements affect structural policies, as predicted by the political economy literature, and structural policies matter for how countries deal with natural resource wealth, one would expect to observe such interaction effects in the data. Hence, in addition to the controls in SW's most robust specifications, we include constitutional dummies and their interaction with natural resource abundance. In particular, we include dummies for the form of government (presidential versus parliamentary) and electoral rules (majoritarian versus proportional electoral system). Finally, we control for geographic location, colonial history, and the most robust significant determinants of growth according to Sala-i-Martin (1997). In the 1990–2000 data set we construct regressors using the same definitions as SW (1997a), but for different time periods.

4 Results

4.1 The form of government

The group of parliamentary democracies comprises 33 countries, two of which are in the top 10 percent of natural resource abundant countries and six of which are in the bottom 10 percent. The group of presidential democracies comprises 25 countries, two of which are located in the top 10 percent of natural resource abundant countries and two of which are in the bottom 10 percent. In our data set, initial resource abundance—measured as the ratio of primary exports to GNI in 1970—ranges from 0.6% to 54%. We find all regime types represented among both resource rich countries and resource poor countries. Among the one-third of the countries with the most abundant natural resources, there are 6 parliamentary democracies, 9 presidential democracies and 15 nondemocratic regimes. Among the one-third of the countries least abundant in natural resources, there are 18 parliamentary democracies, 7 presidential democracies and 5 nondemocratic regimes.

In the middle group, we find 9 parliamentary democracies, 9 presidential democracies and 12 nondemocratic regimes. Thus, there seems to be sufficient variation in resource abundance among all three categories of countries for statistical inference to be reliable. The summary statistics are displayed in Table A1.

To investigate whether the pattern found in Figure 1 holds when controlling for other factors that have been found to be important for growth, we use alternative model specifications. We begin by replicating the regression results of the main model specification in SW (1997a). Table 1, column (1), replicates the results in SW (1997a).[12] Our results are consistent with those of SW regarding both convergence and the effects on growth of openness, the rule of law index, investment and natural resource abundance. On average, countries that where abundant in natural resources in 1970 experienced lower growth in the following two decades, with an estimated coefficient of -8.17 and a t-statistic of -6.71. The cross-country mean of natural resource abundance in our data is 0.13 with a standard deviation of 0.10. The estimates in column (1) imply that a 10 percentage point increase—corresponding to an increase of one standard deviation—in the ratio of exports of natural resources to GNI in 1970 is associated with a reduction in annual average growth the two following decades of 0.82 percentage points ($-8.17 * 0.10 = -0.82$).

In column (2), we include dummies for the form of government, with the excluded category being parliamentary democracy. Including controls for the type of government (presidential democracy, parliamentary democracy and nondemocratic regime) does not change the effects of convergence, openness, rule of law, investment and natural resource abundance. However, presidential democracies are associated with lower growth than are parliamentary democracies.

So far, our estimates have added little to SW's findings. Column (3), however, provides new insights into the resource curse. In this regression, we include interaction terms between the form of government and resource abundance. The direct effect of resource abundance is no longer statistically or economically significant. This indicates that there is no significant resource curse in parliamentary democracies (our excluded category). Not surprisingly, nondemocratic regimes abundant in natural resources perform worse than resource abundant parliamentary democracies, with an estimated

[12] Note that SW exclude four outliers when estimating their main model specification. These countries are deemed to be outliers according to the procedure suggested by Besley *et al.,* (1980). SW identify the four outliers regressing growth only on initial natural resource abundance and on the average degree of openness between 1970-1990. However, the same countries will not necessarily be identified as outliers when additional controls for constitutional classification and its interaction with natural resource abundance are included. To estimate different specifications of the model consistently, we address the problem of possible outliers by applying different robust estimation techniques (discussed below).

interaction coefficient of -6.21 and a t-statistic of -1.98. More surprisingly, the performance of natural resource abundant presidential democracies is even worse.

Comparing natural resource abundant democracies, presidential democracies perform much worse than parliamentary democracies, with an estimated interaction coefficient of -7.85 and a t-statistic of -2.69. Thus, among presidential democracies and nondemocratic regimes, higher natural resource abundance in 1970 is associated with lower growth in the following two decades, whereas, for parliamentary democracies, higher natural resource abundance in 1970 does not significantly affect subsequent growth. Finally, note that allowing interaction effects eliminate the separate effect of form of government on growth.

It is well known that the SW measure of resource abundance—primary exports divided by GNI—has been criticized for being a measure of resource dependence, or intensity, rather than resource abundance. In addition, one might question whether this measure is absolute exogenous to growth. While natural resource endowments are randomly distributed among countries, the SW variable captures something broader. First, it measures export rather than absolute quantities. Second, it measures resource abundance relative to the size of the economy. One concern is that economies with institutions not conductive to growth will have lower income, and hence appear resource abundant according to the SW measure. The focus of this paper is not to solve the problem of how to measure natural resources in growth regressions, but to show that different constitutional arrangements can explain some of the heterogeneity in the effect of resource abundance on growth. Nonetheless, to meet this critique, we replicate Table 1 with an alternative resource measure. In Table A2, the resource abundance measure is "cleansed" from its endogenous denominator by multiplying with GNI, and dividing by population. Hence, the new resource measure captures export of primary products per capita (in 1970 current US dollars). The results in Table A2 reveal the same pattern as Table 1, indicating that our results are not driven by economic growth per se.[13]

In Table 2, nondemocratic regimes are excluded from the sample. Column (1) exhibits the same qualitative results as in Table 1, regarding convergence, natural resource abundance, openness, investment, the rule of law, and changes in the external terms of trade. This indicates that the negative correlation between resource abundance and growth also applies among democracies. As in Table 1, including controls for the form of government does not significantly change the estimated effects of any of the other ex-

[13] We have also used the value of oil per capita as our resource measure. This reveals a similar pattern regarding the effect of natural recourses on growth. The effect on growth from having oil for parliamentary democracies is positive, and the effect is negative for presidential democracies and non democracies, but the results are not statistically significant at conventional levels.

planatory variables. In column (3), we include interaction terms between the form of government and resource abundance. Again, the direct effect of resource abundance is no longer significant, hence there is no evidence of a resource curse in parliamentary democracies. Among resource abundant democracies, presidential regimes perform much worse than parliamentary regimes, with a highly significant estimated interaction coefficient of -8.02 (for which the level of significance is 0.7 percent).

One critical objection to our findings so far is that our results may simply reflect that institutional quality are worse in presidential than in parliamentary countries. We already know from Boschini *et al.,* (2004) and Mehlum *et al.* (2006) that countries with worse institutional quality are more prone to experience a resource curse. To check whether the design of the institutions still matters when controlling for the performance of the institutions, we re-run our regressions allowing for interaction effects also between indexes of institutional quality and resource abundance. The results are displayed in Table A3. First note that institutional quality indeed matters for the resource curse, even when only considering democratic countries. Columns (1) and (2) suggest that the resource curse is significantly more severe in countries with a lower democracy score (i.e., a *higher* score on the Gastil index) and in countries with a lower score on the rule of law index. However, when we add these interactions to our base regression in columns (3) and (4), our results still go through—the resource curse is economically and statistically significant only in presidential countries. Moreover: comparing the adjusted r-squared of column (3) in Table 2 and of columns (1) and (2) in Table A3 we note that our base regression model explains more of the cross country growth variation than any of the two other interaction effects; considering columns (3) and (4) in Table A3, the explanatory power of our constitutional interaction effect is considerably higher than the explanatory power of any of the two measures of institutional quality; neither of the measures of institutional quality are statistically significant when our interaction term is added to the regression. Hence, the empirical evidence suggest that the form of government matters for the resource curse even when allowing for interactions between institutional quality and resource abundance.

Another objection to our interpretation of the results, namely that the resource curse seems to be determined by constitutional features, might be that constitutional classifications are merely proxies for geographic location and/or colonial history, which in turn are the real determinants of the curse. For example, the widespread use of presidentialism in the Americas has led political scientists to dub the Americas as the continent of presidentialism. We investigate this objection by including dummy variables for previous colonial rulers, continent and added interaction terms with resource abundance to see if this can explain the diverging growth performance among resource rich countries. Including these controls indicates that the resource curse occurs regardless of colonial history and location (table not shown).

In Table 3, we include additional controls to check whether our previous findings are robust to the inclusion of dummies for previous colonial rule and continent. The patterns evident in Tables 1 and 2 are confirmed. Presidential regimes suffer the most from being rich in natural resources, relative to both parliamentary democracies and nondemocratic regimes.

Throughout the paper, the number of observations are limited by the rule of law index. One could argue that the 73 countries that do not have missing values of the rule of law index in our main regressions are not randomly selected, and hence that the statistical inference is limited to these countries. In Table A4, we re-run our main regressions including the average value of the Gastil Index rather than the rule of law index.[14] This gives us a total sample of 90 countries. As shown in Table A4, replacing the rule of law variable with the average value of the Gastil Index does not significantly affect the qualitative results already obtained. In fact, the estimated interaction coefficients are larger in absolute value in the extended sample.

A potential limitation of OLS estimators in general is that they may be highly influenced by outliers located at leverage points. This limitation applies particularly in small samples. To make sure that our results are not driven by outliers, we re-run our regressions by using two alternative estimation methods that are robust to the presence of outliers. First, we use LAD regression, which is a special case of quantile regression, or more specifically, median regression (table not shown).[15] Minimizing the sum of absolute deviations makes the regression less sensitive to outliers than does minimizing the squared deviations. Thus, LAD estimates represent the bulk of the observations better than OLS estimates, particularly in small samples. Second, we use a reweighted least squares technique (table not shown). Reweighted least squares is recommended by Rosseeuw and Leroy (1987), among others. Under this procedure OLS regression is applied, gross outliers are excluded and, then, observations with large residuals are iteratively downweighted.[16] Outliers are dropped if Cook's distance measure exceeds unity. On this criterion, no outliers were dropped in our regressions. Both estimation procedures suggest that outlying observations do not materially affect our results. The estimated coefficients and their p-values are similar to the OLS estimates. If anything, the effects appear stronger.[17]

[14] The correlation coefficient between the two variables is -0.72, which suggests that there is a reasonably close relationship between democratic and institutional quality. Thus, democratic quality may serve as a (weak) proxy for institutional quality, at least when data on institutional quality is not available.

[15] See, e.g., Greene (2003) for an introduction to LAD estimation and for a small sample Monte Carlo study showing the advantages of LAD estimation over OLS in the presence of outliers.

[16] This technique corresponds to the *rreg* command in STATA. The actual algorithm may be found in the STATA (2003) manual.

[17] The quantile regression result indicate that the interaction term between *pres* and r*esource abundance* is -8.385, wheras the robust regression result indicate an interaction

In Figure 1a), Mauritius and Malaysia appear to be important for the regression line. One might be concerned if the conclusion about the resource curse not being present in parliamentary democracies holds when these two countries are excluded from the regressions. In Table A4 both these countries are included whereas in Table 1, 2 and 3 Mauritius is not included because of missing value on the rule of law variable. When we drop these two potential outliers from Table A4, the coefficient of the direct effect of resource abundance change from -1.76 to -5.89 in column (1) and from -1.88 to -5.82 in column (2). However, the effect remains insignificant at any conventional values. In Figure 1b) Guyana appear to be an outlier. Dropping Guyana from the regressions does not change the insight that resource abundant presidential democracies preform worse than resource abundant parliamentary democracies. The estimated interaction coefficient change from -8.32 to -6.28 in column (1) and from -8.41 to -6.70 in column (2), and it remains statistically significant.

Up to this point, our analysis suggests that different regime types generate different growth effects of natural resource abundance. In particular, we have found that parliamentary democracies seem to respond differently to their resource endowments than do other countries. For the whole sample, the variables for initial income, natural resource abundance, openness and the investment rate have the most explanatory power for growth. A related question is whether the effects of these other variables also differ systematically between parliamentary democracies and other regime types.[18] In Table 4, we report the SW growth regression separately for parliamentary democracies and all other countries to investigate whether parliamentary democracies respond differently to the other explanatory variables, or whether the difference is primarily the growth effects of resource abundance. Table 4 shows that the estimated coefficients on the initial income level variable, the openness variable, the investment rate and the rule of law index are within the same range when comparing parliamentary regimes to other countries.

term of -8.637 (both statistically significant at 1%). When only democrasies are included, the interaction term ranges from -7.488 (quantile regression) to -6.949 (robust regression), again significant at 1%. When interaction terms are included, the direct effect of resource abundance do not turn out significant in neither the quantile or the robust regressions.

[18] The summary statistics in Table A1 indicate that the three forms of government have different average values for the important determinants of growth. Initial income levels are higher in parliamentary democracies than in the other two regimes. The overall sample mean for this variable is 8.31 with a standard deviation of 0.90. This indicates that the deviation in the regime-type mean is less than one standard deviation of the overall sample mean for all three categories. The measure of natural resource abundance is also lower in parliamentary democracies than in the other two regimes. The overall sample mean of natural resource abundance is 0.13 with a standard deviation of 0.10. Hence, the deviation in the regime-type mean is less than one standard deviation of the overall sample mean for all three categories. Presidential democracies and nondemocratic regimes are less open than parliamentary democracies and the investment rate is lower but, again, the difference from the overall sample mean is less than one standard deviation.

There is some deviation in the estimated effect of the growth in the external terms of trade. However, the *main difference* is in the estimated coefficient for the measure of natural resource abundance.

4.2 Electoral rules

We now consider electoral systems. Table 5 reports the same model specification as in Tables 1 and 2, but compares different forms of electoral system. Columns (1) and (3) show that differences between electoral systems—majoritarian democracy, proportional democracy and no democracy—do not matter decisively for growth (note that proportional electoral rule is the excluded category). Majoritarian electoral systems perform better than proportional electoral systems with natural resources. The estimated interaction coefficient is 5.56 and the t-statistic is 1.99. However, majoritarian democracies remain adversely affected by natural resources given that the direct effect exceeds the additional effect of resource abundance, conditional on being a majoritarian democracy. That is, the direct effect of -9.36 and the interaction effect of 5.56 combine to generate a negative effect of -3.80. The same pattern is confirmed by including only democracies. Among democracies, majoritarian electoral systems perform better when there are natural resources, with an estimated interaction coefficient of 8.40, which is significant at the 0.9 percent significance level. Including controls for colonial rule and continental location does not change the qualitative results from Table 5 (table not shown).

Again we use LAD estimation and reweighted least squares to check the effect of outliers on the results (tables not shown). The quantile regression results for the full sample indicate that there is no significant difference in the growth effect of resource abundance between different electoral systems. Among democracies, the interaction effect is statistically significant (at 0.3 percent). The robust regressions confirm the pattern found in Table 5, but the estimated interaction coefficient (between majoritarian electoral systems and resource abundance) is lower in magnitude and less significant than the OLS estimates.

4.3 Additional robustness checks

Our results support the primary idea behind the paper, which is that the well-documented systematic effects of constitutions on different measures of economic policy may also extend to growth promoting policies. However, can we interpret the estimates as reflecting a causal mechanism? This requires that the constitutional variables are exogenous with respect to economic performance. Although barely any reforms altering the PT (2003) classification of forms of government have occurred, this might not be sufficient for exogeneity. To deal with potential endogeneity problems, whether they are due

to reverse causality and/or omitted variables, we apply an IV approach. The question of which instruments are more valid when instrumenting for various institutional features is somewhat controversial in the literature.[19] To avoid that our inference is dependent on the particular choice of instruments, we separately employ two of the most commonly used sets of instruments in the constitutions literature. We begin by following Persson (2005), assuming that Western colonization affects current policies, and thereby growth, only through the form of political institutions. Evidence of greater Western influence is consistent with observing the same type of political arrangements in former colonies as those observed in Western Europe; i.e., parliamentary democracies. Suppose, in line with Acemoglu *et al.*, (2001), that settler mortality is a good measure of Western influence. Given the validity of the identifying assumption that the influence on current policies operates only through the form of political institutions, settler mortality is a valid instrument for parliamentary democracy. To be consistent with the rest of the paper, we define a new dummy variable, *non_parl*. The *non_parl* dummy is equal to unity if the country is classified as either a presidential regime or a nondemocratic regime and is equal to zero if the country is classified as a parliamentary regime. We use *settler mortality* as an instrument for *non_parl*. To implement this method we apply Wooldridge's approach to instrumentation of the endogenous interaction terms by first predicting *non_parl* from the following regression.[20]

$$non\_parl = \alpha_0 + \alpha_1 lsettler + \mathbf{Z}^i\boldsymbol{\beta} + u_i. \tag{2}$$

Then, we use the interaction term of the predicted variable and *resource abundance* as an instrumental variable in the IV estimation. The results are reported in Table A5, columns 1-6. As expected *a priori*, the likelihood of parliamentary democracy increases with Western influence, i.e., with lower values of *settler mortality*. Although there are data on settler mortality for only 44 countries in our main data set, the results from these 44 countries are similar to the OLS estimates in column 3. The difference between different forms of government is no longer significant, but the pattern is the same as that implied by the OLS estimates. The direct effect of initial resource abundance is neither economically nor statistically significant. As before, this implies that parliamentary regimes seem free of the resource curse. With only 44 countries, we have too few observations to further distinguish between democracies and nondemocratic regimes. Since the sample size is limited by the *rule of law* variable, one way of expanding the sample would be to use a different measure of institutional quality. SW (1997b) use an institutional quality index that is related to, but differs from, the rule of law

[19] See Acemoglu (2005) for a discussion of the use of different IV-approaches in the institutions and constitutions literature.

[20] See Wooldridge (2002), Chapters 9 and 18.

index. This index is an unweighted average of five indexes based on data from Political Risk Services and is available for a larger number of countries than is the rule of law index. In columns (4) and (5) we report IV estimates for democracies only, using the quality of institution variable rather than the rule of law index. This provides a sample of 34 democratic countries. In fact the estimated interaction effect is larger, when instrumented with settler mortality, compared with the OLS estimates.

As a robustness check that the IV-results above are not confined to the particular choice of instrument, we re-run the IV-regressions using the battery of instruments proposed by Persson and Tabellini (2003). These instruments include variables of constitutional age (*con*2150, *con*5180 and *con*81) and the Hall and Jones (1999) instruments (*lat*01, *engfrac* and *eurfrac*). Note that the variable *age*, also used by Persson and Tabellini and referring to the age of democracy, had no explanatory power in either stages and was dropped throughout. Our main findings were found to be robust to the choice of instruments. The results are displayed in Table A5, colums 7-10. Once again the results confirm that there is no evidence of a resource curse in parliamentary democracies, as opposed to both presidential democracies and non-democratic regime types.

One concern, which applies to the empirical literature on economic growth in general, is the basic concern of model specification. In particular, there is a significant degree of uncertainty attached to identifying which variables are robustly related to growth.[21] Among the most influential contributions addressing this question is Sala-i-Martin (1997). Sala-i-Martin choose a total of 62 variables from the growth literature and test their correlation with the rate of economic growth. He choose three fixed variables (i.e., the variables that appear in all regressions) that are assumed to be "good" *a priori*.[22] These three variables include the level of income in the beginning of the period, life expectancy and the primary school enrollment rate. Sala-i-Martin finds that 22 out of the remaining 59 tested variables appear to be significantly related to growth.[23] The most "significant" variables include: regional variables; political variables; religious variables; variables describing market distortions and market performance; variables for types of investment; primary sector production variables; openness; type of economic organization; and former Spanish colonies. Table 6 and 7 reports the results when we include the variables that emerges as the most robust

[21] Levine and Renelt (1992) is the first contribution in the growth literature that systematically adress this question. They do so by applying Leamer's (1985) *extreme-bounds* test to identify robust empirical relations in the growth literature.

[22] By this he mean that they have to be widely used in the literature, they have to be variables evaluated in the beginning of the period to avoid endogenity, and they have to be variables that are somewhat "robust" in the sense that they systematically seem to matter in all regressions run in the previous literature (Sala-i-Martin, (1997).

[23] See Sala-i-Martin (1997) for method and specification.

correlates of growth according to Sala-i-Martin (1997).[24] As reported in the tables, we observe the exact same pattern as before, regarding the effects of natural resource abundance, constitutional forms and the interaction effects: on average there seems to be a resource curse; form of government and electoral rule is not significantly related to growth; presidential regimes and regimes with a proportional electoral rule which are abundant in natural resources performs significantly worse in the long run (1970-1990) than their resource-abundant counterparts.[25]

Up to this point, we have investigated the heterogeneity in the long-term effects of resource abundance, by contrasting form of government and electoral systems. Of course, each form of government is combined with an electoral system. We now subdivide our constitutional classification into four separate groups to combine electoral systems and form of government (*parl_maj*, *parl_prop*, *pres_maj*, *pres_prop*) and interact them with resource abundance. The results are displayed in Table 8. Column (1) include the SW (1997) controls whereas Column (2) include the Sala-i-Martin (1997) controls. As seen from Table 8, the direct effect of resource abundance is not statistically significant (the excluded category being *parl_maj*).[26] Resource abundant presidential democracies with proportional electoral systems do worse than their resource abundant counterparts. The estimated effect of the interaction term between *pres_prop* and *resource abundance* ranges between -11.28 and -9.08 and is statistically significant at the 5% level.[27]

The final concern we address is that our findings may rely on the specific dataset, and in particular on whether the patterns are evident also in more recent periods of growth. Tables 9-11 report the regression results of our main model specification for the growth period 1990-2000.[28] We find evidence for the same patterns concerning the growth interactions of constitutions and natural resources as in the 1970-1990 regressions. There is no evidence of a resource curse in parliamentary regimes (Table 9, column 3) and in regimes with majoritarian elections (Table 10, column 2). Presidential regimes and regimes with proportional electoral rules initially endowed

[24] The Sala-i-Martin (1997) data is available at http://www.columbia.edu/~xs23/data.htm.

[25] Sala-i-Martin *et al.* (2004) find that the strongest evidence for growth is for the relative price of investments, primary school enrollment and the initial level of GDP per capita. Including the relative price of investment do not significantly change our results.

[26] When the three constitutional dummies are included (but not their interactions with resource abundance), the direct effect of resource abundance ranges between -7.35 and -3.70 (significant at the 1% level with the SW(1997) controls, and significant at the 10% level with the Sala-i-Martin (1997) controls .

[27] As in the previous spesifications, the constitutional dummies turn out statistically insignificant when interaction terms between the constitutional variables and resource abundance are not included.

[28] As the SW dataset does not contain many of the variables required in the 1990's regressions, these had to be constructed. The data have been constructed in a similar way as possible to the SW data, in order to compare all our results. See Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.

with abundant natural resources, on the other hand, experience lower growth on average in the subsequent decade, 1990-2000. In the regressions reported in Table 11 (column 2), we reproduce the results for the 1970-1990 sample (Table 10), that the worst combination of constitutional regimes, when it comes to attracting the resource curse, is the combination of a presidential form of government and a proportional electoral system.

5 Conclusion

The empirical results of this paper suggest that economies' long-run abilities to deal with natural resource abundance depend largely on country specific constitutional arrangements. We find that the form of government seems to matter more than being nondemocratic in relation to whether a country is afflicted by the so-called resource curse. Revisiting the seminal growth analysis of Sachs and Warner (1995, 1997a), we find that the resource curse is explained by the poor performance of resource abundant presidential and nondemocratic regimes—there is no resource curse in democracies with a parliamentary form of government. This empirical finding is consistent with recent contributions to the political economy literature, which suggests that presidential regimes pursue inferior growth-promoting structural policies compared with parliamentary regimes. Interestingly, constitutions do not significantly affect growth directly, they simply have a negative interaction with resource abundance. We tentatively interpret this result as a budget constraint effect—the negative growth dynamics of presidential regimes, through inappropriate structural policies, seem to play a quantitatively significant role only when governments face a less rigid budget constraints. We also find patterns in the data suggesting that the electoral system may matter for the resource curse. Proportional electoral systems seem more likely to be afflicted by the resource curse. This last effect may suggest that the negative effects of proportional electoral rules on the level of corruption found by Kunicova and Rose-Ackerman (2005) dominate the prospective positive effects of favouring representativeness (as opposed to the accountability, and hence the narrow spending programs, of majoritarian systems) when interacted with resource abundance.

Although our results seem fairly robust, there is always the concern of omitted variables in cross-country regressions. The concern that our results reflect the influence of variables not included in the regressions affecting both growth, constitutional arrangements and primary resource export, calls for panel fixed-effect estimation. The constitutional classification we focus on in this paper does not have enough constitutional time variation for meaningful estimates from fixed-effect. Future empirical research should try to solve this issue by, e.g., focusing on different constitutional aspects or exploiting the new wave of democracies in the eastern Europe. There is also the possible

problem of endogeneity, that resource endowments determine institutions and, possibly, constitutions. Some researchers (see, e.g., Sokoloff and Engerman (2000)) discuss the possibility that initial factor conditions could have had profound and enduring impacts on long-run paths of institutional and economic development. Future work should seek ways to deal with this possibility in empirical work. In addition, the underlying mechanisms are unclear and require future research. In particular, theory should be developed to distinguish different potential interactions between natural resource abundance and different dimensions of a country's political constitution.

6 References

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6.1 Variable definitions, 1970-1990 Sample.[30]

change in tot

Average annual growth in the log of the external terms of trade between 1970 and 1990. The external terms of trade is the ratio of an export price index to an import price index. Source: SW (1997a).

dem

[29] We refer to Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a complete discussion of constitutional classification, included countries and their constitutional classification, definitions of all the variables and all the sources.

[30] Only the variables in Table 1 are included in this section. See Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a complete defenition of variables and sources. 1970-1990 sample correspond to Table 1 through Table 10 and Table A1 through Table A4.

Dummy variable that is equal to 1 if the average of indexes for civil liberties and political rights for the period 1972–1990 is lower than 5 (corresponding to the definition "partly free" based on ratings for 2003). *Dem* = 1 if *avgastil7290* < 5, and is 0 otherwise.

dem_maj

Dummy variable for electoral system, equal to 1 if the country was classified as having a majoritarian electoral system in 1970 (conditional on the country being a democracy), and 0 otherwise. Source: PT (2003); Persson (2005); International Institute for Democracy and Electoral Assistance (1997).

dem_parl

Dummy variable for forms of government, equal to 1 if the county was non classified as a presidential regime in 1970 (conditional that the country is classified as democracy), and 0 otherwise. Source: PT (2003), Shugart and Carey (1992), World Bank DPI data set, and national sources.

dem_pres

Dummy variable for forms of government, equal to 1 if the county was classified as a presidential regime in 1970 (conditional on the country being a democracy), and 0 otherwise. Source: PT (2003), Shugart and Carey (1992), World Bank DPI data set, and national sources.

dem_prop

Dummy variable for electoral system, equal to 1 if the country was classified as not having majoritarian electoral system in 1970 (conditional that the country is classified as democracy), and 0 otherwise. Source: PT (2003), Persson (2005), International Institute for Democracy and Electoral Assistance (1997).

growth7090

Average annual growth in real GDP divided by the economically active population between the 1970 and 1990. Source: SW (1997a).

initial income70

Natural log of real GDP divided by the economically-active population in 1970. Source: SW (1997a)

invest7089

The logarithm of average investment to GDP ratio during the two decades. Source: SW (1997a).

non_dem

Dummy variable equal to 1 if the average of the indexes for civil liberties and political rights for the period 1972–1990 is higher than or equal to 5 (corresponding to the definition "not free", based on ratings for 2003). *non_dem* = 1 if *avgastil7290* $\geqslant 5$, and 0 otherwise.

openness

Openness variable measuring the fraction of years between 1970 and 1990 that the country was integrated in the global economy. Source: SW (1997a).

resource abundance70

Share of exports of primary products in GNP in 1970. Source: SW (1997a).

rule of law

The variable "reflects the degree to which the citizens of a country are willing to accept the established institutions to make and implements laws and adjudicate disputes". Ranges from 0 (low) to 6 (high). Measured as of 1982. Source: SW (1997a).

6.2 Variable definitions, 1990-2000 Sample.[31]

GROWTH9000

Average annual growth in real GDP divided by the economically active population between the 1990 and 2000. Exact calculation is

100*(1/10)*ln(*GDPEA00/GDPEA90).*

LGDPEA90

Natural log of real GDP divided by the economically-active population in 1990.

LINVEST9099

Natural log of the ratio of real gross domestic investment to real GDP, averaged over the period 1990-1999. Penn World Tables Version 6.1

MAJ

Dummy variable for electoral system, equal to 1 if all the lower house in a country is elected under plurality rule, 0 otherwise. See PT (2003) for definition.

PRES

Dummy variable for forms of government, equal to 1 in presidential regimes, 0 otherwise. See PT (2003) for definition.

RESOURCE ABUNDANCE80

Share of exports of primary products in GNP in 1980. Source: SW (1997a).

RULE OF LAW

Point estimate of "Rule of Law", the fifth cluster of Kaufmann et al. (2005) governance indicators, measured in 1996. Source: Kaufmann et al. (2005).

YEARSOPEN

Index for openness to international trade in a country, complied by SW (1995), measuring the fraction of years during 1950-1994 that the economy in the country has been open. Ranges between 0 and 1. Source: PT (2003)

[31] Only the variables in Table 11 are included in this section. See Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a complete defenition of variables and sources. 1990-2000 sample correspond to Table 11, through Table 13.

Figure1a) Growth 1970-1990: Parliamentary democracies

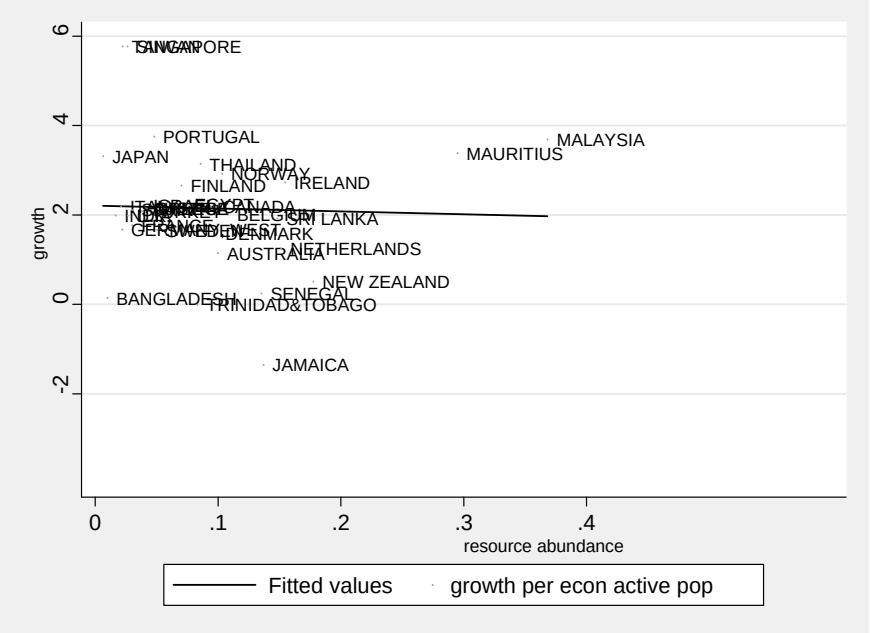

Figure1b) Growth 1970-1990: Presidential democracies

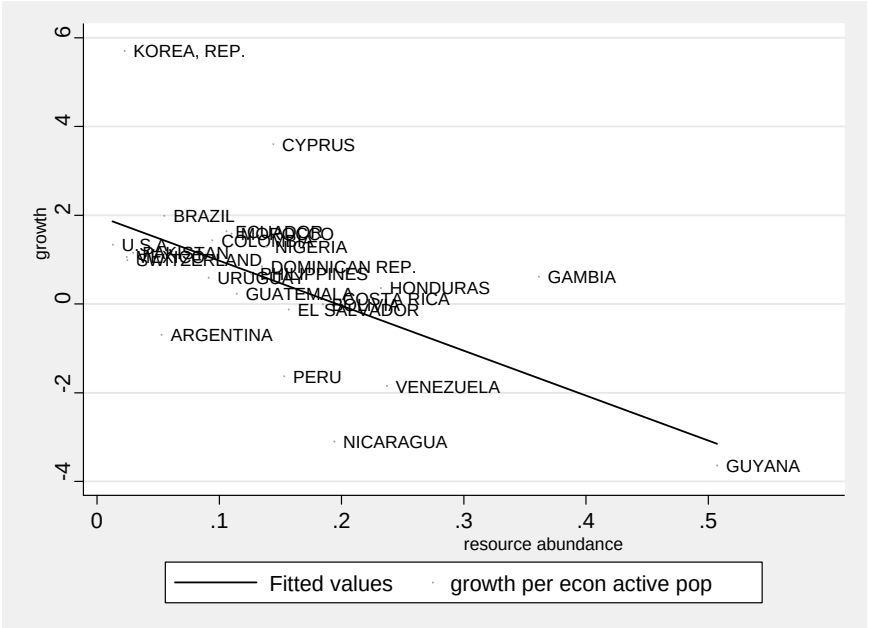

Table 1: Growth 1970-1990: Forms of government and resource interactions, all countries

	(1)	(2)	(3)
initial income70	-1.776	-1.79	-1.781
	(0.206)***	(0.217)***	(0.209)***
resource abundance70	-8.167	-7.952	-2.836
	(1.217)***	(1.246)***	(2.258)
openness	1.534	1.329	1.244
	(0.388)***	(0.399)***	(0.389)***
invest7089	0.867	0.993	1.064
	(0.316)***	(0.320)***	(0.309)***
rule of law	0.383	0.333	0.315
	(0.103)***	(0.106)***	(0.108)***
change in tot	0.117	0.113	0.100
	(0.045)**	(0.047)**	(0.045)**
dem_pres		-0.57	0.131
		(0.310)*	(0.399)
non_dem		-0.452	0.112
		(0.370)	(0.568)
dem_pres_ra			-7.854
			(2.925)***
non_dem_ra			-6.205
			(3.139)*
Constant	13.067	13.337	12.774
	(1.590)***	(1.716)***	(1.663)***
Observations	73	73	73
Adjusted R-squared	0.73	0.73	0.76

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
The numbers in parentheses are standard errors.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 2: Growth 1970-1990: Forms of government and resource interactions, only democracies

	(1)	(2)	(3)
initial income70	-1.922	-1.906	-1.87
	(0.270)***	(0.264)***	(0.246)***
resource abundance70	-7.299	-7.214	-2.645
	(1.635)***	(1.593)***	(2.199)
openness	1.475	1.186	1.123
	(0.477)***	(0.490)**	(0.458)**
invest7089	0.838	1.058	1.194
	(0.416)**	(0.421)**	(0.396)***
rule of law	0.458	0.397	0.342
	(0.135)***	(0.135)***	(0.128)**
change in tot	0.038	0.041	0.035
	(0.072)	(0.070)	(0.065)
dem_pres		-0.601	0.111
		(0.319)*	(0.390)
dem_pres_ra			-8.022
			(2.843)***
Constant	14.08	13.915	13.114
	(2.109)***	(2.057)***	(1.941)***
Observations	55	55	55
Adjusted R-squared	0.73	0.74	0.77

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
The numbers in parentheses are standard errors.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3: Growth 1970-1990: Forms of government and resource interactions, controlling for colonial history and continent

	All countries		Democracies	
initial income70	-1.527***	(0.262)	-1.558***	(0.331)
resource abundance70	-2.533	(2.277)	-2.754	(2.323)
openness	1.274***	(0.400)	1.138**	(0.498)
invest7089	0.751**	(0.320)	1.002**	(0.443)
rule of law	0.368***	(0.104)	0.413***	(0.126)
change in tot	0.080	(0.050)	0.003	(0.077)
dem_pres	0.246	(0.432)	0.212	(0.442)
dem_pres_ra	-6.947**	(2.894)	-6.569**	(2.922)
non_dem	0.245	(0.548)		
non_dem_ra	-6.361**	(3.072)		
col_esp	0.401	(0.469)	0.330	(0.497)
col_uk	0.465	(1.034)	0.444	(0.858)
col_oth	1.034***	(0.288)	0.858**	(0.326)
asiae	0.245	(0.503)	0.344	(0.580)
laam	-0.188	(0.544)	-0.094	(0.571)
africa	0.005	(0.712)	0.728	(0.878)
Constant	10.674***	(2.498)	10.073***	(3.115)
Observations	73		55	
Adjusted R-squared	0.792		0.798	

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
The numbers in parentheses are standard errors.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Growth 1970-1990: Parliamentary democracies and all other countries estimated separately

	Parliamentary dem.	All other countries
	(1)	(2)
initial income70	-1.871	-1.830
	(0.301)***	(0.268)***
resource abundance70	-3.586	-9.730
	(2.215)	(1.543)***
openness	1.267	1.218
	(0.592)**	(0.552)**
invest7089	1.121	0.938
	(0.434)**	(0.445)**
rule of law	0.300	0.341
	(0.152)*	(0.146)**
change in tot	0.323	0.102
	(0.184)*	(0.051)*
Constant	13.592	13.578
	(2.338)***	(2.073)***
Observations	32	41
Adjusted R-squared	0.66	0.72

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
The numbers in parentheses are standard errors.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Growth 1970-1990: Electoral systems and resource interactions

	All countries		Democracies	
	(1)	(2)	(3)	(4)
initial income70	-1.785	-1.762	-1.907	-1.833
	(0.224)***	(0.222)***	(0.275)***	(0.260)***
resource abundance70	-8.045	-9.360	-7.287	-9.958
	(1.276)***	(1.796)***	(1.649)***	(1.832)***
openness	1.524	1.460	1.466	1.408
	(0.394)***	(0.392)***	(0.482)***	(0.453)***
invest7089	0.886	0.790	0.870	0.736
	(0.323)***	(0.322)**	(0.427)**	(0.403)*
rule of law	0.378	0.392	0.450	0.438
	(0.106)***	(0.110)***	(0.137)***	(0.129)***
change in tot	0.119	0.120	0.038	0.015
	(0.048)**	(0.048)**	(0.073)	(0.069)
dem_maj	0.135	-0.395	0.116	-0.687
	(0.279)	(0.383)	(0.284)	(0.398)*
non_dem	-0.039	-0.091		
	(0.338)	(0.590)		
dem_maj_ra		5.558		8.401
		(2.787)*		(3.086)***
non_dem_ra		0.519		
		(2.929)		
Constant	13.065	13.270	13.842	13.938
	(1.804)***	(1.777)***	(2.206)***	(2.070)***
Observations	73	73	55	55
Adjusted R-squared	0.72	0.73	0.72	0.75

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
The numbers in parentheses are standard errors.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Growth 1970-1990: Forms of government and the controls of Sala-i-Martin (1997)

	All Countries			Denocracies		
	(1)	(2)	(3)	(4)	(5)	(6)
initial income70	-2.296***	-2.291***	-2.334***	-2.001***	-2.052***	-2.043***
resource abundance70	-4.591***	-4.570***	-0.569	-3.915*	-3.754*	-1.332
lifee	0.090***	0.096***	0.085***	0.055	0.062	0.051
school enrollment	1.925*	1.895*	1.861*	2.439	2.247	2.572*
safrica	0.077	0.228	-0.182	1.337*	1.465*	1.104
laam	-0.361	-0.423	-0.731	-0.008	-0.013	-0.236
civlibb	-0.081	-0.003	-0.057	-0.064	-0.076	-0.105
confuc	4.783***	4.181**	3.988**	4.345**	4.100**	3.550**
muslim	1.616***	1.571***	1.247**	1.625**	1.611**	1.514*
rerd	-0.002	-0.002	0.000	-0.009	-0.010*	0.005
eqinv	15.083***	15.485***	18.746***	17.038***	18.236***	20.354***
mining	3.685	4.082	3.888	2.316	2.453	1.751
sopen	1.652***	1.684***	1.422***	2.195***	2.271***	2.114***
ecorg	0.085	0.086	0.053	-0.117	-0.137	-0.262
spain	0.447	0.376	0.683	0.273	0.121	0.473
dem_pres		0.185	0.828		0.324	0.880*
non_dem		-0.274	0.382			
dem_pres_ra			-7.905*			-7.441*
non_dem_ra			-5.956*			
Constant	13.049***	12.416***	13.297***	12.963***	13.227***	13.475***
Observations	73	73	73	54	54	54
Adjusted R-squared	0.746	0.741	0.753	0.783	0.782	0.793

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).

See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.

* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7: Growth 1970-1990: Electoral systems and the controls of Sala-i-Martin (1997)

	All Countries		Democracies	
	(1)	(2)	(3)	(4)
initial income70	-2.286***	-2.272***	-2.030***	-1.966***
resource abundance70	-4.568***	-5.283*	-3.858*	-8.590***
lifee	0.094***	0.094***	0.054	0.045
school enrollment	1.884*	1.127	2.339	1.469
safrica	0.193	-0.145	1.363*	0.947
laam	-0.418	-0.546	-0.058	-0.033
civlibb	0.011	-0.040	-0.055	-0.215
confuc	4.169**	4.489**	4.195**	4.611***
muslim	1.532***	1.257**	1.501*	1.431*
rerd	-0.002	-0.002	-0.010*	-0.008
eqinv	15.081***	17.611***	17.300***	21.067***
mining	4.351	4.528	3.177	0.737
sopen	1.656***	1.455***	2.168***	1.989***
ecorg	0.095	0.096	-0.080	-0.195
spain	0.383	0.469	0.195	0.521
dem_maj	-0.133	-0.527	-0.172	-0.809*
non_dem	-0.464	-0.106		
dem_maj_ra		4.469		9.334**
non_dem_ra		-1.042		
Constant	12.597***	13.377***	13.431***	15.064***
Observations	73	73	54	54
Adjusted R-squared	0.740	0.744	0.779	0.798

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8: Growth 1970-1990: Combining forms of government and electoral systems

	(1)	(2)
resource abundance70	-1.834	-1.105
	(2.691)	(3.080)
parl_prop	0.354	0.595
	(0.559)	(0.545)
pres_maj	0.120	0.303
	(0.849)	(0.802)
pres_prop	0.340	1.415
	(0.498)	(0.646)**
parl_prop_ra	-3.177	-7.118
	(5.795)	(5.729)
pres_maj_ra	-11.791	-0.966
	(9.349)	(7.939)
pres_prop_ra	-9.077	-11.285
	(3.251)***	(5.375)**
Constant	13.439	14.482
	(2.039)***	(3.218)***
Observations	55	54
Adjusted R-squared	0.758	0.786

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables. Column (1) include the same controls as Table 1 (*initial income70*, *openness*, *invest7089*, *rule of law*, and *change in tot*), whereas column (2) include the same controls as Table 5 (*initial income70*, *lifee*, *school enrollment*, *safrica*, *laam*, *civlibb*, *confuc*, *muslim*, *rerd*, *eqinv*, *miningm*, *sopen, ecorg*, and *spain*).
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 9: Growth 1990-2000: Forms of government and resource interactions, only democracies

	(1)	(2)	(3)
LGDPEA90	-0.905	-0.913	-1.031
	(0.407)**	(0.411)**	(0.409)**
LINVEST9099	0.075	0.090	0.052
	(0.586)	(0.595)	(0.584)
YEARSOPEN	0.279	0.258	0.319
	(0.376)	(0.391)	(0.385)
RESOURCE ABUNDANCE 80	0.183	0.188	2.913
	(2.175)	(2.194)	(2.639)
RULE OF LAW	1.218	1.190	1.156
	(0.390)***	(0.413)***	(0.405)***
PRES		-0.116	0.847
		(0.513)	(0.742)
PRES_RA			-8.014
			(4.541)*
Constant	8.847	8.954	9.885
	(3.678)**	(3.740)**	(3.706)**
Adjusted R-squared	0.136	0.120	0.154
Observations	61	61	61

Dependent variable is average annual growth in real GDP divided by the economically active population between 1990 and 2000 (*GROWTH9000*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 10: Growth 1990-2000: Electoral systems and resource interactions, only democracies

	(1)	(2)
LGDPEA90	-0.855	-0.893
	(0.435)*	(0.428)**
LINVEST9099	0.104	0.126
	(0.597)	(0.587)
YEARSOPEN	0.259	0.375
	(0.383)	(0.383)
RESOURCE ABUNDANCE80	0.142	-3.821
	(2.196)	(1.113)
RULE OF LAW	1.174	1.113
	(0.413)***	(0.408)***
MAJ	0.160	-0.828
	(0.463)	(0.739)
MAJ_RA		7.251
		(4.270)*
Constant	8.283	9.050
	(4.052)**	(4.008)**
Adjusted R-squared	0.136	0.120
Observations	61	61

Dependent variable is average annual growth in real GDP divided by the economically active population between 1990 and 299 (*GROWTH9000*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
* Significant at 10%; ** significant at 5%; *** significant at 1%..

Table 11: Growth 1990-2000: Combining forms of government and electoral systems, only democracies

	(1)	(2)
LGDPEA90	-1.005	-0.953
	(0.473)**	(0.499)*
LINVEST9099	-0.003	0.123
	(0.620)	(0.622)
YEARSOPEN	0.179	0.351
	(0.405)	(0.403)
RESOURCE ABUNDANCE80	-0.109	-2.910
	(2.241)	(3.195)
RULE OF LAW	1.355	1.130
	(0.487)***	(0.507)**
PARL_PROP	-0.451	-0.141
	(0.594)	(0.924)
PRES_MAJ	-0.620	-0.983
	(0.813)	(1.324)
PRES_PROP	-0.190	1.320
	(0.643)	(0.983)
PARL_PROP_RA		-0.682
		(6.355)
PRES_MAJ_RA		2.967
		(8.550)
PRES_PROP_RA		-10.911
		(5.294)**
Constant	10.280	9.048
	(4.465)**	(4.736)*
Adjusted R-squared	0.101	0.142
Observations	61	61

Dependent variable is average annual growth in real GDP divided by the economically active population between 1990 and 299 (*GROWTH9000*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
* Significant at 10%; ** significant at 5%; *** significant at 1%

Table A1. Summary Statistics

	All Countries					Maj. Dem.					Prop. Dem.				
Variable	Obs	Mean	Std Dev	Min	Max	Obs	Mean	Std Dev	Min	Max	Obs	Mean	Std Dev	Min	Max
growth7090	90	1.13	1.87	-3.64	5.77	22	1.84	1.56	-1.35	5.77	36	1.24	1.95	-3.64	5.77
initial income70	90	8.31	0.90	6.43	9.95	22	8.55	0.93	7.17	9.95	36	8.78	0.64	7.67	9.89
resource abundance70	90	0.13	0.10	0.01	0.54	22	0.11	0.11	0.01	0.37	36	0.11	0.09	0.02	0.51
openness	90	0.37	0.44	0.00	1.00	22	0.55	0.46	0.00	1.00	36	0.52	0.46	0.00	1.00
invest7089	90	2.66	0.70	0.31	3.58	22	2.76	0.63	1.14	3.58	36	2.95	0.40	1.63	3.52
rule of law	73	3.16	2.05	0.00	6.00	19	3.68	2.24	1.00	6.00	36	3.58	2.05	0.00	6.00
change in tot	90	-0.32	2.77	-6.46	7.97	22	-0.55	1.97	-3.18	5.95	36	-0.38	1.89	-3.61	5.37
	Parliamentary Dem					Presidential Dem.					Non Dem.				
Variable	Obs	Mean	Std Dev	Min	Max	Obs	Mean	Std Dev	Min	Max	Obs	Mean	Std Dev	Min	Max
growth7090	33	2.15	1.44	-1.35	5.77	25	0.57	1.90	-3.64	5.71	32	0.52	1.82	-2.40	4.56
initial income70	33	8.91	0.74	7.27	9.75	25	8.81	0.71	7.17	9.95	32	7.62	0.68	6.43	9.16
resource abundance70	33	0.09	0.08	0.01	0.37	25	0.14	0.11	0.01	0.51	32	0.16	0.11	0.02	0.54
openness	33	0.73	0.43	0.00	1.00	25	0.27	0.36	0.00	1.00	32	0.09	0.24	0.00	1.00
invest7089	33	2.97	0.57	1.14	3.58	25	2.76	0.39	1.80	3.36	32	2.25	0.83	0.31	3.34
rule of law	32	4.50	1.93	1.00	6.00	23	2.39	1.76	0.00	6.00	18	1.78	1.11	1.00	5.00
change in tot	33	-0.25	0.96	2.75	1.73	25	-0.71	2.69	-3.61	5.95	32	-0.08	3.90	6.46	7.98

Table A2. Alternative Table 1.
Primary exports per capita as an alternative measure of resource abundance

	(1)	(2)	(3)
initial income70	-1.227	-1.282	-1.123
	(0.283)***	(0.301)***	(0.283)***
resource abundance per capita	-0.006	-0.006	-0.003
	(0.002)***	(0.002)***	(0.002)
openness	2.030	1.670	1.201
	(0.498)***	(0.511)***	(0.492)**
invest7089	0.557	0.678	0.909
	(0.426)	(0.420)	(0.395)**
rule of law	0.474	0.420	0.389
	(0.135)***	(0.134)***	(0.125)***
change in tot	0.133	0.135	0.127
	(0.056)**	(0.057)**	(0.053)**
dem_pres		-0.817	-0.008
		(0.392)**	(0.450)
non_dem		-0.847	-0.088
		(0.453)*	(0.517)
dem_pres(ra per capita)*			-0.013
			(0.004)***
non_dem(ra per capita)*			-0.011
			(0.005)**
Constant	8.265	9.216	7.245
	(2.142)***	(2.361)***	(2.249)***
Observations	67	67	67
Adjusted R-squared	0.575	0.596	0.656

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).
See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
The numbers in parentheses are standard errors.
* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table A3. Forms of government versus the level of democracy and the quality of institutions
Only democracies included

	(1)	(2)	(3)	(4)
resource abundance70	2.438	-11.314	2.817	-4.441
	(4.486)	(2.195)***	(4.117)	(4.660)
avgastil7290	0.489		0.468	
	(0.204)**		(0.204)**	
rule of law	0.418	0.244	0.347	0.301
	(0.137)***	(0.152)	(0.128)***	(0.159)*
avgastil7290_ra	-2.795		-1.757	
	(1.233)**		(1.206)	
rule of law_ra		1.702		0.424
		(0.660)***		(0.967)
dem_pres			-0.131	0.019
			(0.389)	(0.446)
dem_pres_ra			-6.552	-6.632
			(2.916)**	(4.276)
Observations	55	55	55	55
Adjusted R-squared	0.75	0.75	0.79	0.77

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*). All regressions include the same controls as in Table 2 (*initial income70*, *openness*, *invest7089*, and *change in tot*). See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables. The numbers in parentheses are standard errors. * Significant at 10%; ** significant at 5%; *** significant at 1%.

Table A4. Growth 1970-1990: Controlling for the level of democracy rather than the rule of law index.

	Form of government		Electoral system	
	(1)	(2)	(3)	(4)
initial income70	-1.465	-1.569	-1.384	-1.249
	(0.227)***	(0.325)***	(0.234)***	(0.333)***
resource abundance70	-1.755	-1.884	-10.379	-11.640
	(2.265)	(2.267)	(1.836)***	(1.925)***
openness	1.981	2.201	2.251	2.304
	(0.369)***	(0.445)***	(0.353)***	(0.424)***
invest7089	1.383	1.143	1.269	1.016
	(0.220)***	(0.401)***	(0.223)***	(0.397)**
avgastil7290	0.050	0.011	0.035	0.064
	(0.142)	(0.166)	(0.142)	(0.165)
change in tot	0.053	0.015	0.073	0.032
	(0.044)	(0.073)	(0.045)	(0.073)
non_dem	-0.651		-0.883	
	(0.572)		(0.573)	
non_dem_ra	-4.261		4.649	
	(2.937)		(2.590)*	
dem_pres	0.097	0.139		
	(0.438)	(0.440)		
dem_pres_ra	-8.318	-8.413		
	(2.935)***	(2.934)***		
dem_maj			-0.222	-0.582
			(0.391)	(0.414)
dem_maj_ra			6.467	9.477
			(2.423)***	(2.886)***
Constant	9.716	11.285	9.536	9.114
	(2.219)***	(2.969)***	(2.306)***	(3.103)***
Observations	90	58	90	58
Adjusted R^2	0.71	0.70	0.69	0.70

Dependent variable is average annual growth in real GDP divided by the economically active population between 1970 and 1990 (*growth7090*).

See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.

The numbers in parentheses are standard errors.

* Significant at 10%; ** significant at 5%; *** significant at 1%.

Table A5. Growth 1970-1990: Instrumental-variable approach.

	Settler mortality instrument						PT (2003) instruments			
	All countries			Democracies			All countries		Democracies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1. Stage	2. Stage	OLS	1. Stage	2. Stage	OLS	1. Stage	2. Stage	1. Stage	2. Stage
Dep. var.	Non_parl	growth7090	growth7090	Non_parl	growth7090	growth7090	Non_parl	growth7090	Non_parl	growth7090
lsettler	0.18			0.19						
	(0.08)**			(0.10)*						
con2150							-0.38		-0.34	
							(0.16)**		(0.16)**	
con5180							-0.45		-0.44	
							(0.15)***		(0.15)***	
con81							-0.20		-0.23	
							(0.18)		(0.18)	
engfrac							-0.66		-0.73	
							(0.20)***		(0.20)***	
eurfrac							0.61		0.67	
							(0.14)***		(0.15)***	
lat01							-0.97		-1.07	
							(0.42)**		(0.44)**	
ra70		-1.28	-2.81		0.90	-3.19		-2.62		-2.10
		(6.03)	(2.24)		(4.97)	(2.20)		(3.51)		(3.60)
non_parl		-1.69	0.11		-0.10	0.37		0.02		0.22
		(2.03)	(0.37)		(1.91)	(0.39)		(0.70)		(0.92)
non_parl_ra		-6.36	-6.85		-10.12	-6.20		-6.47		-7.88
		(7.40)	(2.60)***		(5.93)*	(2.75)**		(4.61)		(6.50)
Obs.	44	44	73	34	34	57	52	52	45	45

Columns 1-6: Settler mortality instruments. Columns 7-10: Instruments borrowed from PT (2003). Second stage (columns 2 and 8) includes *initial income70, resource abundance70, invest7089, openness, rule of law* and change in tot, in addition to the ones shown in Table A5. First stage (columns 1 and 7) includes the same exogenous second-stage variables as columns 2 and 8 and instrument as shown in columns 1 and 7. Second stage (columns 5 and 10) includes *initial income70, resource abundance70, invest7089, openness, institutional quality* and change in tot, in addition to the ones shown in Table A5. First stage (columns 4 and 9) includes the same exogenous second-stage variables as column 5 and 10 and instrument as shown in columns 4 and 9. Columns (3) and (6) represent the corresponding OLS regressions. See Constitutions and the Resource Curse Data Appendix at http://www.svt.ntnu.no/iso/Silje.Aslaksen/crcdp.pdf for a precise definition of variables.
The numbers in parentheses are standard errors.
* Significant at 10%; ** significant at 5%; *** significant at 1%.