



## The Oil Curse Validated: Evidence from Eurasia and Latin America

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Received: 17 October 2020

Accepted: 08 March 2021

DOI: <https://doi.org/10.32479/ijeeep.10772>

### ABSTRACT

Many studies have found a negative relationship between oil abundance and democracy. However, recent studies have tried to upend this correlation by employing time-series techniques or finding a conditionality on other factors. This study contributes to the literature by employing an Arellano Bond model that corrects for fixed effects and adopts new variables from recent empirical studies. Comparing Eurasia and Latin America from the 1960s to 2010, we find that the theory of a negative relationship between an abundance of natural resources and democracy remains valid.

**Keywords:** Natural Resource Curse, Natural Resource Dependence, Democracy, Natural Resource Abundance

**JEL Classifications:** N50, H6, P28

### 1. INTRODUCTION

Studies on the natural resource curse attempt to identify whether an abundance of natural resources is an asset or hindrance to potential economic growth (Asif et al., 2020; Fosu and Gafa, 2019; Badeeb et al., 2017). To contribute to the literature, we propose a new econometric technique to consider this phenomenon in-depth. At one point in history, it was nearly universally accepted that dependence on natural resources could lead to adverse consequences. This agreement stems from the work of Sachs and Warner (1995), which indicated that dependence on natural resources hampers economic growth. Similarly, Ross (2001) and Mahdavy (1970) indicated that dependence on natural resources could lead to a lower level of democracy.

Several recent studies have challenged the term "natural resource curse" and the negative association that comes with it. Haber and Menaldo (2011) claimed that reliance on natural resources does not affect the level of democracy; they argued that most

studies have econometric issues. In response, we propose a new econometric technique modeled on the Arellano-Bond estimator. Our research focused on the regions of Eurasia and Latin America and concentrated on the association between natural resource rents and democracy. The results indicate that the negative association between the two variables is still valid. This result is valuable for policymakers; it could nudge them to avoid dependence on natural resources.

Beginning with Ross (2001), scholars have employed cross-country regression frameworks to examine the hypothesis that mineral-based wealth perpetuates authoritarianism (Aslaksen, 2010; Goldberg et al., 2008; Jensen and Wantchekon, 2004; Papaioannou and Siourounis, 2008; Ross, 2009, 2012; Smith, 2007; Wantchekon, 2002). Most have found that higher oil revenues lead to a lower probability of a country adopting a democratic institution. Boix (2003) argued that no country had ever transitioned successfully to democracy if oil generated more than one-third of its export earnings.

Only a few empirical studies have (a) found the opposite to be the case, (b) differentiated between degrees of the curse, or (c) found that the natural resource curse was conditional based on other factors. Herb (2005) reasoned that resource-reliant countries would have been substantially poorer if they had not found oil, and their lower GDPs would have caused them to be even less democratic. Dunning (2008) found that the effect of natural resources on regime type was conditional based on other factors. According to Ross (2009), neither Russia nor Venezuela seemed to display a direct correlation between resource rents and authoritarianism; instead, they fell into a middle category separate from the states in the Persian Gulf. Treisman (2010) calculated that, for countries like Russia with an established oil industry, even significant increases in the scale of mineral incomes had only a minor effect on the political regime. Luong and Weinthal (2010) pointed to the state ownership of the minerals (not the resource wealth) for limiting democracy. Haber and Menaldo (2011) critiqued the cross-country empirical studies for their lack of time-series methods and comparing resource-reliant countries with resource-poor countries. They concluded there was no discernible influence of oil on democracy. This study considers the criticism of Haber and Menaldo (2011) and proposes a new econometric technique to test whether natural resource dependence affects the level of democracy.

The study ascertains whether the recent empirical studies have reappraised the consensus held by scholars that increased oil revenue leads to less-democratic institutions. Our primary research question regards the effect of resource rents on democracy and the conditions under which this effect tends to increase in importance. To estimate the effects of the factors and interactions proposed in the literature, we employed a regression technique in which the dependent variable was democracy, and the explanatory variables included economic, political, ethnic, and religious factors. We adapted and modified Dunning's (2008) quantifiable model and employed it on five Latin American states and fifteen Eurasian states from 1960 to 2010. To control for country-specific factors, we employed an Arellano-Bond model that corrected for fixed effects critiqued by Haber and Menaldo (2011) in their use of time-series techniques. We added Loung and Weinthal's (2010) variable of state ownership as an intervening variable between wealth and the institutional outcome. This study further validated the theory that natural resource abundance hinders the level of democracy. There is a strong correlation between rising resource rents—that is, the percentage of oil revenue to GDP—and a decline in democracy. Meanwhile, countries with higher GDP (regardless of oil revenues) tended to have stronger democracies than the other countries, which is another valuable insight for policymakers around the world.

## 2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### 2.1. Literature Review

Ross (2001) published a pivotal empirical study assessing the association between natural resource dependence and the level of democracy in a country. His primary explanatory variable of

oil dependence was derived from the ratio between the value of a country's oil exports and its GDP. He used the Polity IV index as a dependent variable to measure the level of democracy among countries. The study covered the 1971-1997 period. The data indicated that a country's oil dependence negatively correlates with its level of democracy. He concluded that a wealth of oil was a good indicator of a potentially authoritarian government. The study attracted several scholars, which helped in producing several studies that confirmed the negative correlation between natural resource dependence and the level of democracy (Adams et al., 2019; Dunn, 2017; Aslaksen, 2010; Goldberg et al., 2008; Jensen and Wantchekon, 2004; Papaioannou and Siourounis, 2008; Ross, 2009; 2012; Smith, 2007; Wantchekon, 2002; Sandbakken, 2006; van der Ploeg, 2011).

Herb (2005) is one of the early scholars who disagreed with Ross (2001). Herb also assessed the effect of natural resource dependence on the level of democracy. His sample was based on several countries in the Middle East and Africa. He used Freedom House's democracy score as a measurement on which his dependent variable was based. Freedom House is an independent index that assesses the level of democracy of most countries around the world. He measured a country's reliance on natural resources based on the ratio of its natural resource revenues to its total revenues. He also used Ross' (2001) dependent variable of net oil exports as a percentage of GDP while controlling for several economic, political, and religious variables. The results showed that natural resources have negative effects on the level of democracy. However, Herb clarified that his results do not necessarily support the natural resources curse theory. Herb (2005) stated that most of the resource-rich countries are located in politically and economically deficient regions. He elucidated that countries with higher dependency on oil and natural resources would still be less democratic if they had not known their lands contained those resources. Herb's (2005) fundamental observation is that the research methods and techniques studies employed are insufficient for making definitive conclusions that natural resources hinder a society's level of democracy.

Several recent studies have noted that techniques employed in the natural resource curse literature may yield biased results. Dunning (2008) attempted to address the possibility of conditional effects. He argued that, historically, Venezuela had a stronger democracy because of oil, particularly when oil prices were high, as rents mitigated the redistributive tensions in a highly unequal society. Dunning proposed two hypotheses: (a) there is a conditionally positive effect of natural resources on democracy when the degree of resource dependence is lower; and (b) there is a conditionally positive effect of natural resources on democracy when the degree of inequality in non-resource sectors of the economy is higher. It is the mitigation of inequality, rather than the desire to control the distribution of resource rents, that becomes the focus of the elite. This situation then lessens the elites' incentives to take power by force.

Dunning (2008) introduced an interaction of private inequality with resource wealth into his model, with resource wealth as the independent variable. His results show that resource wealth

negatively correlates with the level of democracy. The coefficient of the interaction term (resource rents and private inequality) was positive. This result indicates that the effect of resource wealth could be positive for some countries and negative for others. Dunning's finding challenges the theory that natural resources are a curse.

Haber and Menaldo (2011, p. 4) have, however, indicated that, by adding the capital share of non-oil value, these regressions employ a measure of inequality that omits the oil sector. This situation leads to a potential overestimation of the share of income earned by labor in oil-rich countries with undiversified economies, such those as in the Middle East. That is, the regressions in the literature may not account for a fixed effect associated with undiversified oil economies.

Treisman (2010) argued that fears of rising authoritarianism associated with rising energy prices had been exaggerated. He calculated that even large increases in the scale of mineral incomes had only minor effects on the political regime of countries with an established oil industry. He employed Polity IV scores (Marshall and Jaggers, 2010) and regression with fixed and random effects, thereby controlling for country, year, GDP (logged), and oil and gas income per capita (logged). Apart from the polity scores, the data in Treisman (2010) are from the Penn World Tables.

Treisman claimed his findings indicated that the volatility of Russia's petroleum income could explain no more than a small fraction of the changes in its political regime between the 1985 and 2010 period. However, a polity is not capable of generating a high, explainable variance (r-squared). Moreover, the data from the Penn World Tables are at 5-year intervals. Thus, while Treisman's sample size is larger than other studies, his model does not facilitate controlling for measured, explanatory factors capable of estimating the mediating effect of interaction between oil rents and other variables, such as state ownership.

Loung and Weinthal (2010) criticized the resource curse literature for failing to specify the causal mechanisms that link resource wealth to negative economic and political outcomes. They argue that ownership and control of the mineral sector is the crucial intervening variable between wealth and the institutional outcome. Their work focused on five petroleum-rich states that were former members of the Soviet Union—Azerbaijan, Kazakhstan, Russia, Turkmenistan, and Uzbekistan. Their data (from 1990 to 2005) indicated that ownership structure is not endogenous to fiscal regimes and is not a universal principle; however, it is a variable in the analysis of developmental prospects for mineral-rich states. Their work highlights the importance of including a variable controlling for the ownership of the country's mineral industry.

Dunning (2008) and Treisman (2010) employed regressions, of which Haber and Menaldo (2011) criticized because countries differ from each other based on fixed, unobserved characteristics. Haber and Menaldo (2011) studied records from 168 countries for the 1800 to 2006 period, constructing four unique measures of natural resource reliance and two popular measures of regime type. They wanted to detect and estimate time-series relationships to determine whether a wealth of natural resources always gives rise to autocracy or whether this only occurs under certain conditions.

They categorized countries according to income level, inequality, the threshold level of resource reliance, period, and region and estimated separate regressions on these subsamples. Hypothesizing a counterfactual path that a resource-reliant country's regime type would have followed in the absence of those resources, they compared this path to the actual path to see whether any divergence of the paths correlated with increased resource reliance. The only statistically significant relationship they found was that increased natural resource incomes are positively correlated with an increased level of democracy.

By using the *polity* score that correlates over time in a dynamic relationship, Haber and Menaldo (2011) argued that the fixed characteristics could a) lead to higher or lower polity scores, b) include oil and natural resources, and c) create apparent correlations which are devoid of causal interpretation. The dynamic relationship results in 1 year's polity score will imperfectly predict the next year's, as factors change over time.

Haber and Menaldo (2011) primarily used an error correction model. As the name implies, this model is used to describe a time series in which the equilibrium, or investment level, is sought over several periods and found by correcting errors. Their equilibrium polity is attained over several periods and is possibly affected by fiscal reliance (percentage of government revenues from oil, gas, or minerals) on oil income, civil war, regional democratic diffusion, world democratic diffusion, or country fixed effects. Explanatory variables are entered as levels, changes, and lagged changes. However, grouping countries in this manner misses the effects of own-country lags and fixed effects. The apparent resource curse is, thus, a downward adjustment of polity scores over time toward equilibrium—the lagged *polity* score term—which has a statistically significant and negative effect in every model. Thus, resources are reducing that downward trend.

## 2.2. Hypothesis Development

Given the literature, there are two streams of findings: one finds that natural resources can affect the level of democracy negatively, and the other finds that there is no association between natural resource dependence and the level of democracy. This study bridges between the two streams by using a new econometric technique that accounts for much of the criticism that different authors have raised. With this new econometric technique, we aimed to determine whether natural resource dependence affects a country's level of democracy? Based on the results of most papers in the literature, we hypothesized that natural resource dependence would indeed affect the democracy level, and the effects would negatively correlate with the level of natural resource dependence. More succinctly, we hypothesized that the dependence on natural resources leads to a lower level of democracy (H1).

*H1: Dependence on natural resources leads to a lower level of democracy.*

## 3. MATERIALS AND METHODS

We follow the extant literature in four ways. We consider Dunning's (2008) study on the resource curse in Latin America and compare



it to Eurasian countries. This consideration allows us to observe whether there is something particular to Latin America, specifically whether Venezuela is an outlier to the consensus that more oil means low-level democracy. We also expand the period from 1960 to 2010, enabling us to estimate the longer-term effect of natural resources on a country's regime type. We start with an enhanced version of Dunning's model with econometrics, controlling for country fixed effects. Finally, we introduce a new variable of state ownership, previously applied only to Eurasian countries, which tests whether the timing and role of the government affect the tendency for natural resources to hamper democratic systems.

Studies have used either graphical analysis or estimation, separately, for each of several countries, sets of countries, or periods to control for country fixed effects. Tests of co-integration between fiscal reliance and polity (i.e., whether there is a long-term, equilibrium relationship) have generally failed to find evidence for such a relationship. This situation implies, in macroeconomics, that a regression in levels might be subject to a correlation of trends, such as spurious correlation, thus signifying no real relationship at all.

We added fixed effects to the Dunning (2008) model to control for fixed characteristics of countries and changes in the explanatory variables such as natural resource rents. Fixed effects cannot control for changing but unobserved characteristics of countries, and neither can any other technique. We minimize that problem by controlling for various factors that do change. We also estimate random effects, mostly as a robustness check, because we do not believe that fixed effects are uncorrelated with the explanatory variables, which is an assumption that random effects impose.

Fixed effects are differenced out of the model, changing all variables to differences over time. The differencing automatically controls for the lack of equilibrium in levels, which presents another challenge. It is important to note that the fixed effects might be inadequate (Haber and Menaldo, 2011), and the strongest correction would be to include a lagged dependent variable controlling for many unobserved aspects of the country. This situation immediately creates a larger problem: the fixed effect correlates with the lagged dependent variable and its differences. The solution to this basic problem in the estimation of time series over panels of countries, people, or businesses is the Arellano-Bond estimation (Holtz-Eakin et al., 1988; Arellano and Bond, 1991; 1995; Blundell and Bond, 1998). The estimation offers an alternative to standard fixed effects that could help improve the Dunning (2008) model and accounts for Haber and Menaldo's (2011) critique of the standard fixed effects.

In the Arellano-Bond estimation, the lags and levels are not exogenous to the Polity determination. Thus, either the specification is faulty, or some explanatory variable is endogenous. We changed the state ownership to endogenous (i.e., jointly determined with polity), which solved the problem. While we did not anticipate this, it is the only change we made to the specification.

### 3.1. Measuring Regime Types

The dependent variable in our study is the democracy score, measured from the Polity IV data set, which is referred to as polity

(Marshall and Jaggers, 2010). This standard measure of democracy employed in the resource curse literature is an index of a) the competitiveness of political participation, b) the openness and competitiveness of executive recruitment, and c) the constraints on the chief executive; coded for all countries worldwide, from 1800 to date. The scale runs from -10 to +10. Scores of -10 to -6 represent autocracies, and scores of 6 to 10 represent democracies. We decided to use the polity index to measure democracy because it is the standard way employed by most studies.

### 3.2. Control Variables and Instrumental Variables

We replicated Dunning's Latin model, compared with Eurasian countries, and employed a different econometric method. Our sample consisted of 15 Eurasian states (former Soviet republics), compared to 5 Latin American states. We have addressed Luong and Weinthal's (2010) criticism of the resource curse literature as being too narrow in scope and duration (primarily covering 1970 to 1990) by expanding our timeframe beyond Dunning's work to cover the 1960-2010 period. We have also addressed the second criticism of Luong and Weinthal (2010) by including a variable controlling for oil ownership. Haber and Menaldo's (2011) criticism of the use of standard fixed effects was also considered.

The Soviet Union collapsed into individual states in 1991; thus, the number of countries increased after this year. Before then, where available, the individual Soviet Socialist Republics were considered. We have corrected for this situation with fixed effects, which identify the individual countries. To estimate the mediating effect of interaction with oil rents and the effect of state ownership, we used a smaller set of countries than Treisman (2010) and incorporated a larger set of explanatory variables. Moreover, rather than the 5-year intervals in the Penn World Tables, the data are annual. Although our approach utilized a smaller sample size than Treisman (2010), this provided the ability to control for measured, explanatory factors. To compare Dunning's (2008, p. 130) findings in Latin America with Eurasia, we replicated all of his variables, except capital share. Our estimation equation was as follows:

$$D_{it} = \alpha + \beta_1 R_{it} + \beta_2 \theta_{it} + \beta_3 (R_{it} * \theta_{it}) + X_{it} \gamma + \lambda_i + \varepsilon_{it} \quad (1)$$

$D_{it}$  refers to a country's democracy level in country  $i$  and year  $t$ .  $R_{it}$  is the resource rents per capita in a country.  $\theta$  is the total natural resource rents over GDP.  $\beta_3$  represents the coefficient of the interaction term between the resource rents per capita and the total natural resource rents over GDP.  $X$  is a vector of control variables.  $\lambda$  represents the fixed effects, and  $\varepsilon$  is a random error.

We did not include Dunning's capital variable, given that the data were only available for Latin America. We created our own variable, *Oil Rents Per Capita*, in \$1 million units. We divided the oil rents as a percentage of GDP by population from 1970 to 2010. We replaced Dunning's *Capital Share* and *Oil Rents \* Capital Share* (Interaction term) variable with *Total Natural Resource Rents as a Percentage of GDP* and *Oil Rents \* Total Natural Resource Rents as a Percentage of GDP* (interaction term). Data came from the World Bank's *World Development Indicators* database online. The total natural resource rents represent GDP dependence on natural resource wealth within the country.

Dunning argued that the capital share variable provides a useful indicator of private inequality. Although a relatively poor majority obtains most of its income from labor in many countries, capital income tends to accrue to a relatively small elite (Acemoglu and Robinson, 2006a, p. 58-9, in Dunning, 2008, p. 117).

As noted above, Haber and Menaldo (2011, p. 4) have critiqued Dunning (2008) for employing the capital share of non-oil value-added as a measure of inequality that omits the oil sector. Like Dunning (2008), we employed log GDP. However, unlike Dunning (2008), we employed a quadratic term for GDP. Lower levels of GDP do not show a significant effect. A larger GDP helped our analysis. Even though it is significant, it is still not linearly related. In all regressions, we controlled for the natural log of the countries' GDP per capita (at purchasing power parity from the Penn World Tables) to control for the assumption that developed countries tend to be more democratic. All regressions were run on panels that included all countries for which data was available for the period from 1960 to 2010.

Alesina et al. (2003) served as the data source for the *Ethnolinguistic Fractionalization*, *Muslim Percentage 2001*, *Catholic Percentage 2001*, and *Orthodox Percentage 2001* variables. We assumed 2001 figures and equivalencies from 1960 through to 2010. We excluded the *British Colony* variable, as it does not pertain to Eurasia, nor was it a significant variable in Dunning's (2008) modeling of Latin America. We also did not include the *Sum of Transitions to Authoritarianism* (adopted by Dunning from Cheibub and Gandhi, 2004; see Przeworski et al., 2000), which some researchers use because they believe democracy is best measured as a binary variable. Haber and Menaldo (2011) employed *Regime* (Przeworski et al., 2000), which extends from 1800 to 2000. However, we adopted the aforementioned polity as our measure of democracy.

We introduced the *State Fragility Index* variable available from the polity and Fragility Index (Marshall and Jaggers, 2010) to control for the effectiveness and the performance of each country. Following Luong and Weinthal's (2010) research, we adopted their variable of ownership structure, extracting the Eurasian and Latin American countries under review from the cross-sectional dataset compiled on all relevant countries from 1900 to 2005. They disaggregated ownership and control into four possible resource development strategies: state ownership with control (S1), state ownership without control (S2), private domestic ownership (P1), and private foreign ownership (P2). Table 1 provides descriptive statistics of the variables of our study.

## 4. RESULTS

Polity, theoretically ranging from -10 to +10, comprised the dependent variable for this study. The countries in this study had a polity score of -9-10, with a mean of 2.3, a modal average of -9 and +8, and a standard deviation of 6.6. Table 1 shows descriptive statistics for the regression distribution and all other variables, and Table 2 shows the coefficient estimates and tests of various hypotheses.

**Table 1: Descriptive statistics**

Variable	Mean	Standard deviation	Min.	Max
Polity	2.318	6.615	-9	10
Oil Rents per capita in \$1,000,000 units	0.025	0.044	0	0.3
Total natural resource over GDP	14.782	28.283	0	214.5
Oil rent per capita * Total natural resource over GDP (interaction terms)	0.784	2.282	0	20.8
Log GDP	24.074	1.872	20.6	28.1
Square of Log GDP	583.042	90.604	423.3	791.8
Ethnolinguistic Fractionalization 2001	0.288	0.216	0.0193	0.6621
Fragility 2010	7.144	4.418	0	14
Muslim percentage 2001	19.100	33.549	0	93.41
Catholic percentage 2001	38.228	40.790	0	92.72
Orthodox percentage 2001	12.652	22.126	0	89.04
State ownership of oil	1.633	1.520	0	4

State ownership is a scale 0-4 with a distribution

There is statistically significant evidence of country effects, and their correlation with the fitted values, -0.449, is a correlation whose standard error is the square root of 1/490 (or about 0.045). Random effects cannot account for the statistical correlation, as it is too far from zero. Nevertheless, the random-effects model is not much different from the fixed effects model in its parameters (available upon request) despite the misspecification that can happen.

Consistent with Dunning (2008), the fixed effects model has a statistically significant effect on the main two variables of the model: oil rents per capita and their interaction with total natural resources. The level of democracy is negatively associated with oil rents per capita and positively associated with the interaction term. These results account for only the Latin countries for a proper comparison to Dunning's (2008) model. Our results indicated a negative association between oil rents per capita (see the second column of Table 2). However, Dunning's study (2008) indicated oil rents per capita as positively associated with the level of democracy. One reason for this discrepancy may be that the results shown in Table 2 are based on panel-fixed effects regressions, in contrast with Dunning's (2008) OLS regression.

Results similar to Dunning's (2008) were expected; this study, in part, replicated his work. However, our study utilized what we believe to be a better estimation technique. Our results focus on fixed effects, though it is likely that polity correlates over time, thus the need for employing an Arellano-Bond estimation technique. In other words, the fixed-effects model overestimates the results, but the Arellano-Bond estimates more statistically significant results (see column 4, Table 2).

The Arellano-Bond estimates employ many lags of levels and differences as instrumental variables, and their exogeneity must be tested. The generalized methods of moments tests allowed us to run our exogeneity test. With one lag of polity (shocks to polity require 2 years to sort through the system), the test rejects exogeneity ( $P < 1\%$ ) (results available upon request). As noted above, our study determined state ownership jointly with polity; that is, it was

**Table 2: The fixed-effects model**

Variable	Fixed Effects model (Latin Countries Model)	Fixed Effects Model (Full Sample)	Arellano-Bond Model with 2 Lags and Robust (Full Sample)
Polity lag 1	-	-	0.7947351** (0.0468131)
Polity lag 2	-	-	-0.0859603 (0.04479)
Oil Rents per capita in \$1,000,000 units	-111.0392** (22.86739)	-62.90901** (11.23303)	-19.90192** (6.889187)
Total natural resource over GDP	0.0580197 (0.0664899)	-0.0029702 (0.0154568)	-0.0043624 (0.0091771)
Oil rent per capita * Total natural resource over GDP (interaction terms)	1.675617** (0.579682)	0.5076285* (0.201352)	0.224422* (0.1238923)
Log GDP	-58.95418** (7.785759)	-25.96136** (3.803872)	-8.905981** (2.449826)
Square of Log GDP	1.240288** (0.1526189)	0.5909871** (0.0775912)	0.1965821** (0.0505975)
State ownership of oil	-1.796906** (0.4677404)	-0.7683562* (0.2990474)	-0.195149 (0.1744664)
Constant term	706.3166** (99.38653)	284.9869** (46.58565)	101.2006** (29.69831)

\*Means  $P < 0.05$ , and \*\*means  $P < 0.01$ . The numbers in parenthesis are the standard errors. The dependent variable is a polity score (democracy level)

endogenous with polity. It also employed two lags of polity, resulting in a marginal P-value of 5.5% in the second lag. In the interest of caution in modeling, we kept the second lag. Moreover, it forces acceptable lags of levels and changes in other variables further into the past. Thus, the exogeneity is no longer rejected ( $P = 19.5\%$ ).

The Arellano-Bond model, with two lags and a robust standard error, shows that the estimated effect of one standard deviation change of oil rents per capita (0.032) on polity is about -20 times 0.032, or -6.4 points. That is an entire standard deviation of polity and a substantial effect on a scale from -10 to +10. All estimations find that GDP has a non-linear effect on polity, reducing it to the level of log GDP, which is equal to the linear term divided by twice the negative of the quadratic term,  $8.906/(0.394)$ , or about 22.6. The range of log GDP is 20.57 to 28.37, and about one-fourth of the observations are below 22.6. Thus, the effect of GDP is only slightly negative for the poorest countries and positive for most countries. From 20.57 to 22.6, the effect is a drop of less than one point of polity, but the increase is over six points, approaching 28.37 (The constant term corrects for the mean of log GDP). The estimates of the effect of GDP are greater with fixed effects only, but the lack of lagged polity effects overstates those estimates.

The fixed covariates, ethnolinguistic fractionalization in 2001, fragility in 2010, Muslim, Catholic, and Orthodox percentage of the population in 2001 can be tested only in the random-effects model (the random effect model is available upon request). They are collinear and statistically significant as a group ( $P = 1\%$ ), which might result from the correlation with the fixed effects, which these variables appear to be part of. In any case, they are controlled for in the fixed effects and the Arellano-Bond estimation.

Our study found that having a higher GDP is good for a country. These findings agree with the majority of the literature: high oil profits tend to result in poor economic performance, unbalanced growth, weakly institutionalized states, and authoritarian regimes. More succinctly: oil is indeed a curse. Thus, we disagree with Dunning's (2008) claim of an observed variation mediating the relationships between resource rents and political regime types. However, we do agree with Dunning's (2008) second hypothesis that a high ratio of total natural resource rents to total GDP leads to dependence. We also agree with Dunning (2008) that the total amount of natural resource rents is a weaker factor than its ratio to total GDP. However, Dunning (2008) nor we directly support

the hypothesis that there is a conditionally positive effect of natural resources on democracy when the degree of dependence is lower. Instead, we address the same primary question as Dunning regarding the relationship between the ratio of total natural resources rents and the total GDP, using a different econometric approach with countries across Latin America and Eurasia.

## 5. DISCUSSION

Dunning's (2008) work compliments the later critiques of the rentier state literature. He argued that there are conditional factors that determine the impact of natural resources on a state. First, there is a conditionally positive effect of natural resources on democracy when the degree of resource dependence is low. Authoritarianism is heightened, not necessarily by resource wealth (not all oil states are authoritarian) but by the extent of the dependence on these rents. When resources are the only economical source, conflict over the distribution of rents is more influential than the redistribution of non-resource wealth.

Second, there is a conditionally positive effect of natural resources on democracy when the degree of inequality in non-resource sectors of the economy is high. Rents can mitigate the redistributive tensions in a highly unequal society. It is the mitigation of inequality rather than the desire to control the distribution of resource rents that becomes the focus of the elite. This situation then lessens the elites' incentives to take power by force.

We disagree with Dunning (2008) that other variables mediate the relationship between resource rents and the political regime type; thus, we, consequently, explain variation in observed outcomes across resource-rich states. We agree with Treisman (2010) that, for countries like Russia with an established oil industry, significant increases in the scale of mineral incomes have only a minor effect on the political regime. We agree with Ross (2009) that there are degrees of being cursed and natural resources other than oil affect democracy to a lesser degree in comparison.

Treisman concluded that "controlling for country characteristics, and looking at the full period, it is only among very poor countries that oil and gas income correlates over time with less democracy" (2010, p. 8-9). We agree; extremely poor countries demonstrate a greater variance and provide for more pronounced results than



more affluent countries, which is why our model controls for total GDP. We also disagree with Loung and Weinthal (2010), who argue that state ownership (instead of natural resource wealth) is the main factor affecting democracy levels. Loung and Weinthal did not provide robust and empirical support for their argument, but we tested the validity of their argument and could not find support for it. The variable of state ownership is statistically significant in the fixed effects model, which deals with it as an exogenous variable. However, we did not find state ownership to be statistically significant using the Arellano-Bond model, where we dealt with it as an endogenous variable.

It is also important to indicate that our results contradict the findings of some studies in the natural resource curse literature that have used panel research designs. For instance, Lederman and Maloney (2008) argued that the negative effects of natural resources could disappear by including fixed effects. Torres et al. (2012) have also provided evidence that the negative effects could disappear in a panel design. However, using neither a fixed-effects model nor our Arellano-Bond model provided results that correlate with these arguments.

If one examines the intercountry variation, the strongest correlation is among countries at intermediate levels of development, with GDP per capita at Purchasing Power Parity (PPP) between \$5,000 and \$15,000. Ross (2009) noted that the association between higher resource wealth and less democracy does not appear in data from before the early 1980s. Until then, oil and gas did not appear to have any effect on democracy. It was in the “Third Wave” of democracy, which culminated in the East European transition from communism, that major oil producers started to stand out, democratizing less than their oil-poor neighbors. Fixed effects regressions show no effect of oil on democracy before 1985, and random effects models indicate that earlier periods demonstrated weaker effects, compared to more recent periods. Note that random effect models might be misperceived, as discussed above. Oil rent per capita consistently has negative effects, and the interaction term is also statistically significant.

## 6. CONCLUSION

There has been much debate in the natural resource curse literature on finding the answer to whether natural resources affect the level of democracy within a country. Starting with Ross (2001), numerous studies have suggested a negative correlation between natural resource dependence and the level of democracy. However, Haber and Menaldo (2011) published an influential study to rebut this trend. Haber and Menaldo (2011) claim that most studies finding a negative association suffer from serious econometric issues. Their findings strongly reject a resource curse, but the results still depend on specification.

This study utilized both a fixed-effects model and a lagged Polity effects model for Latin American and Eurasian countries. It has, again, found support for the resource curse theory. Our study has accounted for the criticisms raised by Haber and Menaldo (2011) by using an Arellano-Bond model. We have also accounted for Loung and Weinthal’s (2010) criticisms by adding a variable to

control for state ownership of the natural resources. Our results from both the standard, fixed-effect model, and the Arellano-Bond model show that a) oil wealth negatively affects the level of democracy, and b) there is a negative correlation between oil rents per capita and Polity.

This study supports the theory that the more oil revenues a state accrues, the less likely it is to experience a democratic system. The generalized method of moments estimation employs lags and levels as instrumental variables, allowing for both fixed-effects and lagged dependent variables. Thus, our findings allow us to state that natural resource dependence is really a curse.

## 7. ACKNOWLEDGMENTS

We thank all of our colleagues, the editorial board, and the anonymous referees for their suggestions in helping to improve this paper.

## REFERENCES

- Adams, D., Ullah, S., Akhtar, P., Adams, K., Saidi, S. (2019), The role of country-level institutional factors in escaping the natural resource curse: Insights from Ghana. *Resources Policy*, 61, 433-440.
- Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., Wacziarg, R. (2003), Fractionalization. *Journal of Economic Growth*, 8(2), 155-194.
- Arellano, M., Bond, S. (1991), Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277-297.
- Arellano, M., Bover, O. (1995), Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51.
- Asif, M., Khan, K.B., Anser, M.K., Nassani, A.A., Abro, M.M.Q., Zaman, K. (2020), Dynamic interaction between financial development and natural resources: Evaluating the ‘resource curse’ hypothesis. *Resources Policy*, 65, 101566.
- Aslaksen, S. (2010), Oil and democracy: More than a cross-country correlation? *Journal of Peace Research*, 47(4), 421-431.
- Badeeb, R.A., Lean, H.H., Clark, J. (2017), The evolution of the natural resource curse thesis: A critical literature survey. *Resources Policy*, 51, 123-134.
- Blundell, R., Bond, S. (1998), Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143.
- Boix, C. (2003), *Democracy and Redistribution*. Cambridge: Cambridge University Press.
- Dunn, M.E. (2017), Natural resource wealth-a blessing or a curse for democracy? *Newcastle Business School Student Journal*, 1(1), 2-9.
- Dunning, T. (2008), *Crude Democracy: Natural Resource Wealth and Political Regimes*. Vol. 7. Cambridge: Cambridge University Press.
- Fosu, A., Gafa, D. (2019), Natural resources, institutions and economic development in Africa. *African Review of Economics and Finance*, 11(1), 29-52.
- Goldberg, E., Wibbels, E., Myukiyeh, E. (2008), Lessons from strange cases: Democracy, development, and the resource curse in the U.S. states. *Comparative Political Studies*, 41, 477-514.
- Haber, S., Menaldo, V. (2011), Do natural resources fuel authoritarianism? A reappraisal of the resource curse. *American Political Science Review*, 105(1), 1-26.
- Herb, M. (2005), No representation without taxation? Rents, development, and democracy. *Comparative Politics*, 37(3), 297-316.

- Holtz-Eakin, D., Newey, W., Rosen, H.S. (1988), Estimating vector auto-regressions with panel data. *Econometrica: Journal of the Econometric Society*, 56(6), 1371-1395.
- Jensen, N., Wantchekon, L. (2004), Resource wealth and political regimes in Africa. *Comparative Political Studies*, 37, 816-841.
- Lederman, D., Maloney, W.F. (2008), In Search of the Missing Resource Curse. Policy Research Working Paper No. WPS4766. Washington, DC: World Bank.
- Luong, P.J., Weinthal, E. (2010), Oil is Not a Curse: Ownership Structure and Institutions in Soviet Successor States. United Kingdom: Cambridge University Press. p1-425.
- Mahdavy, H. (1970), The patterns and problems of economic development in Rentier states: The case of Iran. In: Cook, M.A., editor. *Studies in Economic History of the Middle East*. United Kingdom: Oxford University Press.
- Marshall, M.G., Jaggers, K., Gurr, T.R. (2010), Polity IV project: Political regime characteristics and transitions, 1800-2010. *Center for Systemic Peace*, 10, 24-37.
- Papaioannou, E., Siourounis, G. (2008), Economic and social factors driving the third wave of democratization. *Journal of Comparative Economics*, 36, 365-387.
- Przeworski, A., Alvarez, M.E., Cheibub, J.A., Limongi, F. (2000), *Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990*. Vol. 3. Cambridge: Cambridge University Press.
- Ross, M.L. (1999), The political economy of the resource curse. *World Politics*, 51(2), 297-322.
- Ross, M.L. (2001), Does oil hinder democracy? *World Politics*, 53(3), 325-361.
- Ross, M.L. (2009), *Oil and Democracy Revisited*. New York: University of California-Los Angeles, Mimeo.
- Sachs, J.D., Warner, A.M. (1995), Natural Resource Abundance and Economic Growth. NBER Working Paper No. 5398. United States: National Bureau of Economic Research.
- Sandbakken, C. (2006), The limits to democracy posed by oil Rentier states: The cases of Algeria, Nigeria, and Libya. *Democratization*, 13(1), 135-152.
- Smith, B. (2007), *Hard Times in the Lands of Plenty: Oil Politics in Iran and Indonesia*. United States: Cornell University Press.
- Torres, N., Afonso, O., Soares, I. (2012), Oil abundance and economic growth-a panel data analysis. *Energy Journal*, 33(2), 119-148.
- Treisman, D. (2010), Oil and Democracy in Russia. NBER Working Paper No. 15667. United States: National Bureau of Economic Research.
- van der Ploeg, F. (2011), Natural resources: Curse or blessing? *Journal of Economic Literature*, 49(2), 366-420.
- Wantchekon, L. (2002), Why do resource dependent countries have authoritarian governments? *Journal of African Finance and Economic Development*, 2, 57-77.