**Resource Revenue and Democratic Politics Across Commodities**

***Abstract***

The “resource curse” is the theory that large quantities of natural resources adversely affect a country’s governance, economy, and social structures. Yet many scholars exclusively apply the theory to one resource: oil. Few have studied whether the political characteristics associated with oil hold true for other resources. The aim of this study is twofold. It first involves an inquiry into the effects of different resources on metrics of democracy, government effectiveness, and political stability. More specifically, I conduct a time series observational study in order to understand if the negative effects of oil wealth on democracy and open political institutions hold true for other resources such as coal and natural gas. Then I distinguish between proposed mechanisms to determine the most valid explanation. Oil harms democratic development because of the mechanisms behind its extraction, production, sale, revenue stream, and rents captured. The influx of money associated with oil appears to have poor effects for democracy. The results indicate oil to be unique in its democratic corruption due to its comparatively larger value, subsequent rents, labor structure surrounding its extraction, and its multiple purposes. Oil rents harm democracy, but coal and natural gas rents do not. The importance of this investigation is that it helps in our understanding of the political consequences of future resource extraction. It distinguishes between proposed mechanisms of influence, and determines revenue and rents to be the most valid. The study has implications for the extraction industry, as well as how states use excess revenue.

*“But as the power of Hellas grew, and the acquisition of wealth became more an objective, the revenues of the states increasing, tyrannies were established almost everywhere—the old form of government being hereditary monarchy with definite prerogatives—and Hellas began to fit out fleets and apply herself more closely to the sea.”*

*-Thucydides,* A History of the Peloponnesian War

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**Introduction**

Why is it that countries with large resource reserves have such negative political, social, and economic tendencies? Counter-intuitively, with the exception of a few states, resource rich countries are often poorer, less democratic, and less egalitarian than their resource poor counterparts.[[1]](#footnote-1) This phenomenon is called the “resource curse,” and has been observed by scholars for decades. Most inquiries into this topic fail to distinguish between essential mineral-specific mechanisms or draw relevant cross-commodity comparisons for the development of a more general theory. They also fail to effectively outline the differences between how specific resources are used. In fact, most of the scholarship is done on oil. It is the most valuable and widely traded commodity, but might there be pertinent political consequences of less valuable minerals? The resources compared in this study are coal, natural gas, and oil. These are all carbon energy sources and valuable commodities. The study first attempts to observe the political effects of different resources. Guided by the theory within the literature, it then distinguishes between the different causal mechanisms to determine why different resources display either similar or unique political characteristics.

At a broad level, the term “resource curse” signifies the negative political, economic, and social effects of natural resource wealth on a particular state. The theory of the *political* resource curse holds that resource abundance unfavorably affects forms of governance and government operation. The political, economic, and social aspects of the resource curse can be grouped into certain observable effects:

|  |  |  |
| --- | --- | --- |
| **Political** | **Economic** | **Social** |
| Durable authoritarianismWeak political institutionsWeak institutional developmentGender inequalityFrequent civil conflictLow levels of political accountabilityDecreased international cooperationCorruption[[2]](#footnote-2) | CorruptionHigh income inequalityDutch Disease (currency appreciation/volatility)High unemploymentLow rates of female labor force participationDebt development model[[3]](#footnote-3) | Public health failures and the subsequent spread of HIV/AIDSDecreased status of womenDemographic and labor trends[[4]](#footnote-4) |

Numerous studies have sought to explain the negative social outcomes of the resource curse including its relationship with HIV/AIDS and demographic trends**.[[5]](#footnote-5)** These socio-political topics would benefit from increased study, as it is relatively unknown how the resource curse may be affecting other aspects of social life besides the commonly cited variables of democracy and economic growth.[[6]](#footnote-6) Despite the relevance of economic and social investigations, this paper will primarily focus on the politics of the resource curse.

Each group mentioned above is not exclusive. Often, the effects are inextricably linked. There are also contentions to the notion of the resource curse.[[7]](#footnote-7) For the purposes of this particular study, the politics of the resource curse are especially important. The politics of natural resources have influenced the history of nation-state development for centuries. From the Spanish conquest of the new world in search for gold and silver, to the dirty black rock that fueled the British Empire’s path to industrial supremacy, natural resources, and the politics that surround them, have been, and will no doubt continue to be, some of the most important units of study in the social sciences. Immediately following WWII, the U.S. and Great Britain gained control of valuable oil fields, often through neo-colonial legal workings of the “Seven Sisters,” a collection of seven oil conglomerates, who controlled nearly all oil supplies before the formation of OPEC in the early 1970s. After the formation of OPEC, arguably the world’s most powerful cartel, the geopolitics of energy changed forever. I build largely off the scholarship of Timothy Mitchell, whose magisterial work *Carbon Democracy: Political Power in the Age of Oil* outlined the role of carbon energy sources and political development (in a Keynesian liberal sense). Coal and steam in the 19th century dominated energy. Today, oil occupies such a role, but does that negate potential political effects of other carbon energy sources? What makes oil special?

As the political discourse of major oil importing states such as the U.S. shifts (or at least begins to discuss a potential shift) towards cleaner, more efficient fuel sources, the study of the political effects of resources becomes ever more pertinent and puzzling. Who is to say the resource curse will vanish with a shift to a new form of energy? If theorized mechanisms of influence suggest that revenue, specifically excess revenue, is a determining factor for political and institutional development, what systems can be put in place to promote democracy, in all of forms? What will become of states that rely so heavily on revenue form natural resources, notably oil, when reserves dry up? How can the resource curse be remedied, rectified, or otherwise prevented? Which of the theorized mechanisms of influence are the most valid?

In this paper I analyze the unique relationship between natural resources, democracy, and government effectiveness, but in a way that few scholars have done before. I examine why petroleum has unique political effects, whereas other minerals might not. Oil wealth is correlated with lower levels of democracy, increased longevity of dictators, and increased levels of international violence.[[8]](#footnote-8) Yet, in order to truly understand the relationship between democracy and oil, it is necessary to explore the comparative effects of oil on measures of democracy when tested against other commodities. This is where existing scholarship falls short. Are the isolated effects of oil true when we observe other resources? Using coal and natural gas as independent variables and controlling for numerous political, historical and economic factors theorized to influence democracy, I attempt to answer that primary question. Many states, notably in Africa, the Middle East and Eastern Europe have the potential to turn to oil or natural gas extraction as a source of state revenue in the future, and it is essential to understand how extraction and resource wealth will influence democracy and institutional development. Whether it be Nigeria, whose fragile democracy sits atop large oil reserves, or post-soviet satellite states whose geographic position blesses them with natural resource reserves, it is essential to understand the implications of how resource revenue is used or will be used by government officials. The path to economic development for industrialized states, i.e. environmental destruction with the use of harmful carbon energy sources, need not be the same for other countries.

The era of Keynesian models, with an emphasis on economic growth and stimulation in the short run appears to be environmentally catastrophic when applied to oil. The fantasy of infinite oil literally fueled such modes of thought. Oil was the resource that largely allowed the industrial expansion of what we understand as the “first world” for the greater part of the 20th century. Not only do we now understand that oil has negative outcomes for a variety of sociopolitical/economic contexts, it would be erroneous to omit the most obvious detriment that carbon energy sources such as the one’s examined in this study carry: environmental destruction. Oil will either run out or the damage it causes will be even more irreparable than what we can already observe. Rising seas, and smog smeared skies are only some of the byproducts of the *environmental* consequences of burning carbon, but as long as there are individuals in positions of power who profit immensely from the “devil’s excrement,”[[9]](#footnote-9) the *political* consequences of energy are equally imperative. This is why it is so important to understand the mechanisms that have led oil to such a dominance over society, so as to understand if such political effects will exist for other sources of energy that are likely replace it in the near future.

 In what follows, I provide a brief review of the relatively saturated literature of the resource curse, where I outline the distinct groups of scholarship and identify the holes in the debate. Next, I discuss my methodology and results. Following the methodological discussion, I address the limitations of my results and its tradeoffs. In my conclusion, I analyze the results, discuss the theoretical implications, and provide avenues for future research.

**Literature Review**

*Democracy, Institutions, and Conflict*

Numerous publications have supported the notion that generally, oil wealth leads to a lower likelihood of democratic transition as a result of increased authoritarian regime duration.[[10]](#footnote-10) This connection is largely observed in the Middle East and North Africa, but is also observed in Russia, Angola, Gabon, Brunei, and Malaysia.[[11]](#footnote-11) This essential finding has been replicated using increasingly robust models and predictive measures that account for theoretical developments and scholarly criticisms.[[12]](#footnote-12)

Two main theories of the relationship between oil, democracy and authoritarianism are present in the debate. The first is that oil strengthens pre-existing autocracies and prevents democratic transition, and the second is that oil weakens pre-existing democracies and promotes authoritarian transition.[[13]](#footnote-13) Most scholars agree on the first relationship, whereas the second is slightly more contested.

There are many ways that oil distorts democracy by promoting authoritarianism. First, oil empowers authoritarian strongmen by increasing their terms in office.[[14]](#footnote-14) Second, oil rents help dictators ward off revolutionary threats.[[15]](#footnote-15) These threats are often domestic revolutions, so the precaution taken is often to either increase public goods spending, or to allow for selective coordination of assembly, transparency, and free press.[[16]](#footnote-16) Such measures were taken in the wake of the “Arab Spring” by more stable autocracies such as Iran and Saudi Arabia. It is common for stable autocratic regimes to allow for the selective extension of coordinated freedoms in times of political upheaval. Minor concessions can often satisfy short term demands of protestors engaged in regional political strife.[[17]](#footnote-17) There are more observable negative effects of oil not directly related to the behavior of autocratic regimes.

Oil wealth is even associated with a lack of media freedom.[[18]](#footnote-18) This is puzzling because no dictator enjoys free media, but yet many non-democratic countries allow for partial or even fully free media.[[19]](#footnote-19) This is because in oil rich autocracies, rulers have less of an incentive for bureaucratic efficiency because of the money a valuable commodity provides, whereas in oil-poor autocracies, media freedom encourages bureaucratic efficiency and therefore improves quality of government.[[20]](#footnote-20) Free media operates as an incentive to bureaucrats in this sense, which allows for increases in government efficiency.[[21]](#footnote-21) Furthermore, scholars suggest that oil wealth is used as a means of warding off *other* autocratic competition, and can buy weaponry to placate a potentially precarious populace.[[22]](#footnote-22) Furthermore, weaponry bought from oil wealth can be used to prevent coups that are threats to regime survival.[[23]](#footnote-23)

Again, the findings on the effects of resource wealth on pre-existing democracies are more mixed.[[24]](#footnote-24) These mixed findings have led some scholars to claim that oil is both an autocratic *and* democratic regime stabilizer, rather than inherently *anti*-democratic.[[25]](#footnote-25) Oil is understood to increase the durability of regimes, controlling for repression.[[26]](#footnote-26) Essentially, oil allows whoever happens to hold power to sustain it. However, there is another group which suggests that oil’s effects on democratic stability are conditional.[[27]](#footnote-27) Oil may enhance democratic stability when the democracy is wealthy and has strong institutions, and lead to autocratic tendencies when it does not have the aforementioned variables.[[28]](#footnote-28)

Few studies have actually compared oil to other resources. Omgba finds that oil, not other minerals, leads to increases in political tenure.[[29]](#footnote-29) This is against conventional wisdom. African petro-states are thought to be politically unstable, however Omgba finds that oil increases stability within the executive branch.[[30]](#footnote-30) This finding is consistent with schools suggesting that the government stability associated with oil wealth is not regime specific. It is also one of the few studies to address the *comparison dilemma*,[[31]](#footnote-31) which merits its individual mention. It also notes the need for future research on the role of clientelism, and rentier state politics. The rentier state is understood to be a state which derives a significant portion of its national revenue from the rent (return) on a particular resource. This group within the literature is the most interconnected with those previously mentioned. While it relates most closely to the role of democracy, understanding how the theory works is essential for understanding the resource curse. The rentier state and the political resource curse are indivisible. The rentier state argument is one of the most common in the literature. Natural resources provide rents (returns on scarce non-reproducible assets) that decrease the incentive of a ruling party to provide for its citizens.[[32]](#footnote-32) Rarely any citizen of any state enjoys paying taxes, but usually this essential function of a state elicits certain expectations from a populace. When a government gains most of its revenue from returns on a resource, taxes are not essential, and a divide emerges between citizens and officials. Citizens expect something in return for their money, and when a government takes no money from citizens, to whom are they financially accountable? This relationship distorts the development of open political institutions, another major school of thought in the literature.

 A second school looks at the relationship between resources and the effective bureaucratic operation of governments. Common units of analysis within this group are quality of government and control of corruption, as opposed to type of government discussed previously. Resource wealth, specifically oil wealth, is associated with more detrimental institutional effects. This school of thought addresses the comparison dilemma more so than other schools. Within this school, several theories exist. For one, scholars suggest that resource wealth leads to rent seeking behavior, which decreases tax incentives, therefore lowering institutional quality.[[33]](#footnote-33) A third abundant discourse within the political resource curse literature examines the relationship of resource abundance to international and civil conflict.[[34]](#footnote-34) Oil is observed to increase the likelihood of both international and civil conflict within or between states. Colgan claims that this is because oil generates financial resources for both revolutionary movements and incumbent governments. Incumbent governments have easier access to these financial tools than revolutionary leaders.[[35]](#footnote-35) He further claims that “the international trade of oil injects vast amounts of money into political systems that are ill suited to receive it.”[[36]](#footnote-36) In short, the combination of revolutionary leaders, incumbent political regimes, and oil is “explosive.”[[37]](#footnote-37)

*Theoretical Contentions and Reaffirmations*

Another group of political scholars, who I denote as the ‘contention scholars’ claim that conditional factors account for the expressed negative political effects of the resource curse, and posit that the abundance of studies which examine the relationship fall victim to spuriousness, omitted variable biases, and reverse causation**.**[[38]](#footnote-38)They argue that simply controlling for some social aspect such as Muslim share of the population cannot address internal and external validity concerns.[[39]](#footnote-39) A 2011 time series analysis from 1800 to 2006 that examined resource reliance and type of government found that increases in resource reliance did not lead to increases in authoritarian regime type.[[40]](#footnote-40) Other scholars support this key finding and note that price changes in oil have little to no effects on the systematic democratization of states in the long run.[[41]](#footnote-41) Contentions that stress time series approaches to an analysis of the political resource curse use statistical findings as evidence that there is no resource curse.[[42]](#footnote-42) Still other contention scholars argue that the basic premise of the resource curse is too general which results in its prolific discussion in academia.[[43]](#footnote-43) It is a relatively simple concept to consider: resource wealth hinders democratic political development. But does a simple framework necessarily undermine the theory’s foundation? For some, yes, as it takes for granted a causal structure that explains the relationship between *communities* and natural resources. These contention scholars argue in favor of a contextual approach.[[44]](#footnote-44)

Others posit that the relationship between communities and resources does not affect all countries in a similar fashion, and that there is no law to dictate if resource wealth leads to corruption and protest apathy in one state, that such a result will hold true in other cases.[[45]](#footnote-45) Instead, this particular group of contention scholars pose that the resource curse harms nations with bad institutions worse than nations with good institutions. [[46]](#footnote-46) In this case, bad institutions are meant to be those that have high rates of corruption and underdeveloped financial systems.[[47]](#footnote-47)Essentially, some nations lose and others benefit from large resource reserves.

The same group of scholars who ran the original regressions which would be criticized by the contention scholars have since reaffirmed and amended their original positions.[[48]](#footnote-48) They concede that the methods employed by contention scholars were true, but only before the commodity booms of the 1970s. It appears that higher price levels tend to hinder democracy *after* 1980, whereas short term increases in price levels have no significant effect *prior* to 1970.[[49]](#footnote-49) The “existence” debate has been resolved and it now becomes the responsibility of scholars to examine why different natural resources appear to have different political outcomes. Few studies have examined the effects of non-fuel resources or commodities more generally. I strive to explain the political relationship of various carbon energy sources in order to develop a more general theory of the resource curse as it relates to rentier states.[[50]](#footnote-50)

**Methodology**

I chose to pursue a large-n neo-positivist research design primarily because I test a numerical relationship between empirical indicators of my variables of interest. I neither investigate discourses, nor constructs of the resource curse, nor any related anthropological/sociological relationship—rather I deal with independent variables that derive from economic data and test a relationship between those values and the assigned values of freedom indexes and governance indicators. First, I want to test for an observed relationship. In order to address my research question, I have assembled a sample of all countries with available data over the time period 1970-2012 in order to determine if the resource curse exists for other carbon energy sources besides oil.

Strangely, the resource curse is a slight misnomer, as it seems to be applied to only one resource: oil. While these insights are no doubt extremely valuable, in order to develop a more general theory-- such as the one that some scholars blindly elicit with their diction-- it is necessary to determine if the effects observed with oil are the same for other resources. Then, the title “resource curse” would actually be more accurate. As it stands for most of the literature, the “resource curse” is a euphemism for “oil curse.” I will also determine which of the existing proposed mechanisms of influence discussed in the literature are most valid based on my empirical results.

The literature suggests that rents are essential to the way in which oil influences politics. As such, I include them as indicators of my dependent variables to test if their presence with coal and natural gas displays a similar correlation observed with oil.[[51]](#footnote-51) The study can tell if the key dependent variables-- institutionalized democracy, government effectiveness, and political stability-- are statistically correlated. In order to infer causation, I have developed a model that accounts for potential influencing variables and have included them as controls to account for potential omitted variable bias or spuriousness.

 To investigate my hypotheses, I conduct a cross national, time-series multivariate regression of resource rents as a % of GDP (independent variables) operationalized by World Bank datasets, against dependent variables of institutionalized democracy, government effectiveness, and political stability. I test variations of my dependent variable and include a set of controls. I operationalize my dependent variables and controls using the quality of government dataset.[[52]](#footnote-52) My dependent variables are continuous interval-ratio data (index based), which allows for this type of regression analysis. My independent variables are also continuous (% GDP). Due to the empirical nature of the data from which I draw, a statistical model will offer valuable insights.

The independent variables I test are the following: oil rents, coal rents, and natural gas rents. Rents as a percentage of GDP is understood to be the difference between the value of production for a stock of resources at world prices and their total cost of production, taken as a percentage of GDP for a particular state.[[53]](#footnote-53) Using the most valid unit of analysis is imperative in order to obtain robust results. Past studies have operationalized resource wealth as exports divided by GDP (almost exclusively using oil as the resource). This is an imprecise measurement for the reason that it does not relate to the theoretical context of this study. Many theories of the resource curse relate to the rentier state, which suggests that it is not necessarily the proven reserves, or the value of exports that makes a political difference but the rents captured, and how they are used. Ross claims, “The value of oil exports is not good measure of either rents or revenues since it does not include oil that is produced but consumed domestically, and it does not account for extraction costs, which vary widely from country to country.”[[54]](#footnote-54) Rents are essential to the theory, and as such they will be specific units of analysis. That is not to say that there has not been relevant scholarship performed on the ratio of reserves to debt and its relationship with poor governance—a theory which essentially holds that a state will engage in riskier financial management that harms its quality of government due to the presence of large resource reserves. Essentially, sitting on a valuable mine, or buying and hording a valuable commodity for intended future sale leads to poor state macroeconomic management.[[55]](#footnote-55) However, this is not my primary concern.

 In order to obtain the most valid results as possible, I need to ensure that the results I obtain are not due to endogeneity or omitted variables. To account for this, I have included a set of control variables in order to test *other* factors that might also partially explain the variance in my dependent variable. The quality of my control variables is essential for addressing concerns of internal and external validity. My control variables are a set of continuous variables that could spuriously influence the outcome in my dependent variables had they been omitted. Figure 1 displays the set of codes that define the control variables. Each of these values will be assigned to the individual case under examination.

*Figure 1*

|  |  |
| --- | --- |
| Code | Value  |
| Colonial Origin | Continuous (numbers depend on colonizing power)  |
| The Region of the Country | Continuous  |
| Military expenditure (%GDP) | Continuous |
| Total Debt Service (% of GNI) | Continuous |

Colonial origin is included as a control due to the fact that many former colonies experience difficult transitions to democracy and effective governance. It is a variable, that, if not included in the model, could spuriously influence the results. The other controls are measures common to the literature which is why they are included in my primary model.

Both democracy and quality of government are normative in nature, and can be subject to critique when presented in a numerical context. Scores are subjective to the scorer. Despite that, the measurements are nevertheless recognized as valid within the realm of neo-positivism. There are certain observable characteristics within each variable that can be numerical. Another tradeoff of this approach is that it does not allow for case specific inquiry at the large-n level. Due to the nature of my research question, I seek to investigate general trends, and explain potential influencing mechanisms for the development of a more general theory of the resource curse. In the future, a small-n approach to further investigate the causal mechanisms behind the resource curse would be valuable. First though, I strive to determine if the general relationship associated with oil holds true for other commodities.

An interval-ratio dataset for normative values such as democracy indexes and institutional quality scores allows for a statistical investigation of their respective relationships with potentially consequential values. Most scholars who approach this topic do so using a similar methodology.[[56]](#footnote-56) The statistical approach to the resource curse has been subject to much debate due to its reliance on observational data.[[57]](#footnote-57) Nevertheless, as discussed previously in the literature review, the evidence strongly suggests that a “curse” exists, at least for oil, using similar approaches.[[58]](#footnote-58) Will the negative correlation noted with oil and democracy hold true for other resources? My hypotheses are the following:

*H0: In a sample of countries, oil, coal, and natural gas will display no significant relationship with institutionalized democracy, government effectiveness, or political stability, controlling for factors listed in figure 1.*

*H1: In a sample of countries, oil rents (%GDP) will display a negative relationship with institutionalized democracy, government effectiveness, and political stability.*

*H2: In a sample of countries coal rents (%GDP) will display a negative relationship with institutionalized democracy, government effectiveness, or political stability, controlling for factors listed in figure 1.*

*H3: In a sample of countries natural gas rents (%GDP) will display a negative relationship with institutionalized democracy, government effectiveness, political stability, civil rights, or political liberties, controlling for factors listed in figure 1.*

**Description and Analysis of Results**

Figure 2 displays basic descriptive statistics of the variables used. This model tests dependent variables that directly relate to the theory addressed in the literature review. Government effectiveness is a dependent variable addressed in the institutions school, whereas political stability and institutionalized democracy fall within the discussion of resources and democracy.

**Figure 2: Summary Statistics of Variables[[59]](#footnote-59)**

Variable | Obs Mean Std. Dev. Min Max

-------------+-------------------------------------------------------------------------

Government

Effectiveness | 2,437 -.059279 .9977787 -2.454161 2.407654

----------------------------------------------------------------------------------------

Institutionalized

Democracy | 8,594 .4448452 17.44665 0 10

----------------------------------------------------------------------------------------

Political

Stability| 2,452 .3130963 .0808248 .2318984 .6854197

----------------------------------------------------------------------------------------

Coal Rents

 (% GDP) | 5,899 .0803174 .5132 0 19.14837

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Oil Rents

 (%GDP) | 5,782 4.12437 11.2794 0 86.98248

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Nat. Gas Rents

(%GDP) | 5,839 .8065005 3.624318 0 69.1758

 Figures 3 shows basic descriptive statistics of three independent variables tested: oil, coal, and natural gas rents (%GDP). A limit of these tables is that they display no variance between states, effectively reducing the sample size to one (world aggregate for a particular year). However, they merely serve to illustrate the comparatively higher amount of rents as a % of GDP of oil to coal and natural gas.

**Figure 3: Summary Statistics of World Aggregate Oil, Natural Gas, and Coal Rents**

**(1960-2015)[[60]](#footnote-60)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Variable* | *Mean* | *Std. Dev.* | *Min* | *Max* |
| Oil | 2.158405 | 1.205042 | .4691264 | 5.446406 |
| Natural Gas | .551067 | .2765885 | .2159945 | 1.426554 |
| Coal | .1219224 | .1552266 | .0011006 | .6186081 |

Even comparing the basic statistics of oil rents in the world over the time period compared to coal and natural gas convey relevant insights into the nature of the resource curse. For instance, by merely comparing the means of each resource, it is clear that oil rents are significantly higher on a world average when compared to natural gas and coal. Natural gas and coal rents over the period under examination average to less than 1% of GDP for all countries. Oil is around 2% of the world aggregate. Of course, these observations cannot tell us anything about influencing mechanisms, or whether a certain percentage can be associated with any level of each dependent variable under examination. These descriptive statistics merely serve to show that oil rents are larger than coal and natural gas rents at the aggregated world level. Furthermore, a potential problem with these economic measurements is that they can be seriously biased by price fluctuations. They simply measure average percentages of GDP. Nevertheless, they provide valuable general comparisons into how resource revenue is allocated across commodities and numerically support the notion that oil is a comparatively more valuable resource, which accounts for its higher percentage of world rents. Next I test if this increased value is relatively more powerful in its impact on democracy and measures of institutional quality.

*Results*

 Column 1 of figure 6 illustrates the time series multiple regression on institutionalized democracy, government effectiveness, and political stability. According to the results, and in a manner consistent with the scholarly literature, there is a significant negative correlation between oil rents and institutionalized democracy, government effectiveness, and political stability, controlling for the factors listed. This means that we can reject the null hypothesis for oil. The inclusion of the oil variable was mainly as a model robustness check. The fact that oil’s relationship with the variables matches the theory of the literature supports the notion that oil has negative effects on democracy and institutional quality. It is included as a means of comparison to the other variables of interest: coal and natural gas.

 Row 2 shows that natural gas has no significant relationship with any of the dependent variables of interest. Row three displays that coal only has a statistically significant, negative relationship with political stability. This also matches the theory considering that coal and steam powered energy sources have been theorized to have aided in the *promotion* of democracy during the 19th century.[[61]](#footnote-61) There are other statistically significant relationships between controls and dependent variables, but the controls are not the independent variables of interest.

At large, the results indicate that other resources are not only less valuable than oil (as displayed in figures 3-5), but also that the percentage of the rents captured is so much smaller than oil that the effects on democracy are insignificant. Coal appears to harm political stability, which makes sense given the theoretical distinctions between oil and coal. Coal is a heavier resource-- it’s properties call for a relatively larger use of intensive human labor compared to oil. Coal also serves one main purpose: energy. This is an important distinction to make and one of the reasons why oil’s effects are so abundant. Oil is involved not only in the energy sector but also in the plastics industry. This increases its use, which increases the various industries that profit from its extraction.

Different iterations of the model were run in order to increase the robustness of the results. Figures 6-10 display different models run on the dependent variable of democracy. Figure 6 displays a random effects distribution with oil rents as a continuous variable and eliminating the controls for coal and natural gas rents. Figure 7 also displays a random effects regression but with a dichotomous variable of petrostates and non-petrostates.[[62]](#footnote-62) The results from the first model hold in both figures 7 and 8. Oil again is unique in its democracy distortion, to statistically significant levels, whereas coal and natural gas do not display results significant enough to reject their respective null hypotheses. Figures 9 and 10 display fixed effects regressions of the variables, and the results are much more different. Some controls were omitted, and despite the theoretically sensible negative coefficient on oil rents, there is not a large enough degree of statistical significance to reject the null hypotheses for any of the independent variables of interest. Due to data availability multiple models were only able to be run analyzing democracy instead of the two other listed dependent variables. This is another problem with the study that needs to be mentioned. The inconsistent results between the random and fixed effects models present a potential problem with the study. However, random effects models offer more theoretically sound information for the purposes of this study due to the nature of the indicators. The indicators of the dependent variables were percentages. Had the resource variables been operationalized using dollar amounts, a fixed effects regression would have been more reliable. Since the dependent variables were not subject to massive changes over time, a random effects regression is valid. Nevertheless, these various iterations must be included in order to paint a larger picture, as well as address the potential limitations of the study itself.

It appears that oil harms democracy and institutional quality more so than coal or natural gas. This is due to oil’s relatively larger revenue stream resulting from its higher values and multi-purposes, which generate more rents to be captured by government officials who can then use the excess revenue to fund conflicts, ward off autocratic competition, pay off political rivals, or limit media freedoms.[[63]](#footnote-63) The implications of these results demonstrate that oil is in fact unique in its democratic distortion, and illustrates that it has commodity-specific consequences for an array of policies regarding its extraction, sale, and rents-- assuming democracy, government effectiveness, and political stability are goals for states. Oil is a more valuable resource than coal or natural gas, and these results display that the influx of *money* behind oil adversely affects democratic politics, political stability, and government effectiveness, all to statistically significant levels, more so than coal or natural gas.

 Of course this is not the sole explanation, but within the context of this study it appears to hold. The theory offered in the literature that best explains this is the rentier state, but only to a certain extent. There are returns on coal and natural gas as well over the time period under study, however the political effects were not significant when compared to oil. Rents decrease incentives for effective state efficiency, and distort the citizen-politician relationship. However, the existence of rents alone is not enough, apparently there must be a certain value that can lead to these results. It seems to be that rents associated with a valuable commodity are more of an influencing factor than the commodity itself. If the revenue behind a commodity is more of an influence on democracy than the commodity itself, what does this imply? Could wind, or solar energy, if valued highly enough, be associated with the negative political characteristics observed with oil? Will oil depletions change much if another source replaces its value? What does this mean for the future of energy politics?

 The future of energy politics will depend on how resource revenue is used. Furthermore, the physical characteristics will play a significant role. This study is limited in that it only tested point-source non-renewable minerals that are burned or extracted from deep within the earth for energy purposes. Wind, solar, and nuclear power differ so greatly in their technical sources of energy collection that it would be fastidious to propose any causal claim about their relationship to rentier states. Furthermore, their rents are substantially lower than the carbon sources examined in this paper. Analyzing the political effects of renewable energy revenue would make for an excellent future research path, especially using a small-n approach, but the results of this study can not speak definitively about renewables at this point. It must also be noted that not every state fits the description of the generalized results presented in the large-n context of this study.

Norway is an example of a state with large oil reserves, yet does not display the same negative democratic effects of other major oil producers. This may be due to the fact that Norway has a sovereign wealth fund, part of which holds oil revenue. However, the presence or absence of a sovereign wealth fund is but one variable that can influence the nature of rents and politics within states. So long as mechanisms that control for corruption of resource specific revenue are in place, then the resource curse will fade, but this is easier said than done. The real problem is how to control the delegation of excess revenue. Studies that examine the efficacy of excess state revenue would directly benefit the scholarship of the resource curse.

The importance of this study is that it distinguishes between existing mechanisms theorized to affect democracy and finds the role of rents to be relatively more valid. The evidence to support this claim can be found in figures 7-9. Furthermore, it supports the theoretical notion presented by Mitchell that coal and steam actually promote democratic development, based on historical evidence from Western Europe and the United States.[[64]](#footnote-64) A century ago, coal provided workers a unique power. Miners understood the importance of their work, and how much the world depended upon the resource they mined.

 A great level of variance exists between resource industries in terms of market value and extraction mechanisms, and this result brings many new potential questions and avenues for future research other than those previously mentioned. For one, why does this seem to affect a certain type of state (low to middle income) more so than high income countries?[[65]](#footnote-65) This political phenomenon also opens the door to future research about the negative effects of money in elections and special interests for all forms of government. Does oil distort existing democracies? Are there more precise ways to measure the influence of oil lobbies and special interests within affluent states? To what degree do these companies play a role in the development of foreign policy?[[66]](#footnote-66) Such questions merely scratch the surface of future research paths. At large, this paper opens the door to future study of the efficient use of revenue returns on any valuable good. It calls for a redefinition and expansion of the “resource” curse to include various other revenue generators, such as foreign labor or land rented to foreign companies. The literature would benefit from a contextualized study of the effects of how coal is currently influencing individual states, in order to observe if miners in developing countries display labor structures similar to those that allowed miners in the U.S. and Europe to increase their collective power.

The resource curse has made headlines in recent years, with a particular focus on developing countries within Africa. Case by case studies of the effects of the resource curse exist, but would no doubt benefit from further study into the micro mechanisms at work within an individual state. Further questions into other forms of the effect of rents on democracy, not necessarily resource related would bring valuable insights. Can we observe negative political effects on coffee? What about valuable black market commodities? Understanding that oil is unique, research that measures the efficacy of international oil policies and markets would no doubt be valuable. Scholars have presented certain ideas about policy intervention, such as sovereign savings funds, and alternative royalties and tax systems, but have not analyzed the efficacy of such propositions.[[67]](#footnote-67) This is where research on oil and state revenue should continue. Concurrently, research must continue on a separate path that analyzes the nuances of rentier states with different “resources.”

**Conclusion**

 For most of the history of the industrialized world, coal powered development. The entire structure of the economy was based on a faulty assumption: that carbon sources of energy were infinite. We now know this assumption to not only be false, but also to be actively harmful to both the environment, and, depending on the specific carbon energy source, democracy.

 The results of this study indicate that oil’s effects on democracy are more detrimental than coal or natural gas. Furthermore, oil’s effects are so pervasive due in part to it’s relatively larger value and subsequent rents, in part to the labor structure that surrounds its extraction, and in part to its multi-industrial purposes. However, that is not to say that these results are final or in any way fixed for the long run. Oil will eventually run out and there will likely be something equally valuable to replace it. Or will there? We live in the “age of oil” still, but the future might bring an energy age that is more egalitarian both in terms of revenue and associated civic outcomes. This creates more puzzles regarding the role of corporations and states, especially energy corporations in energy rich states. It is imperative to develop policies that prevent the formation of rentier states. More research must be done on the efficacy of existing policies regarding excess state revenue streams.

 The mechanisms behind the extraction of natural gas is more similar to oil than coal extraction. This leads one to believe that if natural gas is the energy source to replace oil, then we will likely see similar democratic consequences. Furthermore, many countries such as the United States and Russia are turning to this as a potential replacement for oil. The political implications of the inevitable shift away from carbon based energy sources will have significant effects, especially for countries whose economies rely on such energy sources. The political regimes of many autocratic Gulf states derive a significant portion of state revenue from returns on oil exports. OPEC states are notoriously undemocratic. Once oil becomes an anachronism, what will the political structures of petrostates look like? [[68]](#footnote-68) The lavish wealth of petrostates is as sustainable as the energy source that provides such wealth.

 Of course, the theory of the rentier state alone does not suffice in its descriptive ability. However, based upon these results, it appears that the rentier state theory is one of the most valid explanatory mechanisms. The more valuable a certain commodity (oil) is, the more rents to be captured. The resource curse can present itself in other forms of valuable goods, but for now it appears that oil specifically has detrimental effects on democracy, whereas coal and natural gas do not to the same extent.

**Appendix**

**Figure 6: Cross-National Pooled Regressions of Variables (random effects)**

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
|  | Institutionalized Democracy | Government Effectiveness  | Political Stability Standard Errors |
| Oil Rents (% of GDP) | -0.141\*\* | -0.0126\*\*\* | -0.000739\*\*\* |
|  | (0.0437) | (0.00261) | (0.000189) |
|  |  |  |  |
| Natural Gas Rents (% of GDP) | 0.0381 | -0.00904 | 0.000226 |
|  | (0.0987) | (0.00528) | (0.00101) |
|  |  |  |  |
| Coal Rents (% of GDP) | 0.00198 | 0.00453 | -0.00829\* |
|  | (0.514) | (0.0342) | (0.00357) |
|  |  |  |  |
| Colonial Origin | -0.842\*\*\* | -0.0305 | 0.000917 |
|  | (0.171) | (0.0220) | (0.00153) |
|  |  |  |  |
| The Region of the Country | 0.246 | 0.00157 | 0.00126 |
|  | (0.190) | (0.0215) | (0.00173) |
|  |  |  |  |
| Military Expenditure (% of GDP) | -0.961\*\*\* | -0.00569 | 0.00451\*\*\* |
|  | (0.171) | (0.0160) | (0.00105) |
|  |  |  |  |
| Total Debt Service (% of GNI) | 0.0758 | 0.00429 | 0.0000264 |
|  | (0.0436) | (0.00507) | (0.000206) |
|  |  |  |  |
| Constant | 5.738\*\*\* | -0.261\* | 0.288\*\*\* |
|  | (0.961) | (0.109) | (0.00741) |
| Observations | 1788 | 1054 | 1054 |

**Figure 7: Cross-National Pooled Regressions of Variables (Petrostate dummy, random effects)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
|  | Institutionalized Democracy | Institutionalized Democracy | Institutionalized Democracy |
| Nat. Gas Rents %GDP | -0.0141 |  |  |
|  | (0.0196) |  |  |
|  |  |  |  |
| Colonial Origin | -0.441\*\*\* | -0.429\*\* | -0.420\*\*\* |
|  | (0.130) | (0.138) | (0.127) |
|  |  |  |  |
| The Region of the Country | 0.0883 | 0.0883 | 0.0734 |
|  | (0.154) | (0.163) | (0.150) |
|  |  |  |  |
| Military Expenditure (% of GDP) | -0.289\*\*\* | -0.283\*\*\* | -0.290\*\*\* |
|  | (0.0382) | (0.0384) | (0.0382) |
|  |  |  |  |
| Total Debt Service (% of GNI) | -0.0169\*\* | -0.0170\*\* | -0.0167\*\* |
|  | (0.00547) | (0.00545) | (0.00547) |
|  |  |  |  |
| Coal Rents %GDP |  | 0.125 |  |
|  |  | (0.0658) |  |
|  |  |  |  |
| Oil Rents %GDP |  |  | -0.986\*\* |
|  |  |  | (0.339) |
|  |  |  |  |
| Constant | 6.635\*\*\* | 6.543\*\*\* | 6.703\*\*\* |
|  | (0.621) | (0.651) | (0.601) |
| Observations | 1724 | 1724 | 1714 |

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Figure 8: Cross-National Pooled Regressions of Variables**

**(without controlling for other resource rents, random effects)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
|  | Institutionalized Democracy | Institutionalized Democracy | Institutionalized Democracy |
| Oil Rents %GDP | -0.0403\*\* |  |  |
|  | (0.0131) |  |  |
|  |  |  |  |
| Colonial Origin | -0.415\*\* | -0.441\*\*\* | -0.429\*\* |
|  | (0.127) | (0.130) | (0.138) |
|  |  |  |  |
| The Region of the Country | 0.0665 | 0.0883 | 0.0883 |
|  | (0.151) | (0.154) | (0.163) |
|  |  |  |  |
| Military Expenditure (% of GDP) | -0.289\*\*\* | -0.289\*\*\* | -0.283\*\*\* |
|  | (0.0382) | (0.0382) | (0.0384) |
|  |  |  |  |
| Total Debt Service (% of GNI) | -0.0177\*\* | -0.0169\*\* | -0.0170\*\* |
|  | (0.00548) | (0.00547) | (0.00545) |
|  |  |  |  |
| Nat. Gas Rents %GDP |  | -0.0141 |  |
|  |  | (0.0196) |  |
|  |  |  |  |
| Coal Rents %GDP |  |  | 0.125 |
|  |  |  | (0.0658) |
|  |  |  |  |
| Constant | 6.771\*\*\* | 6.635\*\*\* | 6.543\*\*\* |
|  | (0.606) | (0.621) | (0.651) |
| Observations | 1714 | 1724 | 1724 |

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Figure 9: Fixed Effects Regression (dichotomous petrostate variable)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
|  | Institutionalized Democracy | Institutionalized Democracy | Institutionalized Democracy |
| Oil Rents %GDP | -0.666 |  |  |
|  | (0.357) |  |  |
|  |  |  |  |
| Colonial Origin | 0 | 0 | 0 |
|  | (.) | (.) | (.) |
|  |  |  |  |
| The Region of the Country | 0 | 0 | 0 |
|  | (.) | (.) | (.) |
|  |  |  |  |
| Military Expenditure (% of GDP) | -0.303\*\*\* | -0.299\*\*\* | -0.293\*\*\* |
|  | (0.0408) | (0.0406) | (0.0407) |
|  |  |  |  |
| Total Debt Service (% of GNI) | -0.0174\*\* | -0.0174\*\* | -0.0175\*\* |
|  | (0.00550) | (0.00549) | (0.00548) |
|  |  |  |  |
| Nat. Gas Rents %GDP |  | 0.00989 |  |
|  |  | (0.0210) |  |
|  |  |  |  |
| Coal Rents %GDP |  |  | 0.127 |
|  |  |  | (0.0662) |
|  |  |  |  |
| Constant | 5.591\*\*\* | 5.489\*\*\* | 5.468\*\*\* |
|  | (0.107) | (0.104) | (0.103) |
| Observations | 1714 | 1724 | 1724 |

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Figure 10: Fixed Effects Regression (continuous oil variable)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
|  | Institutionalized Democracy | Institutionalized Democracy | Institutionalized Democracy |
| Nat. Gas Rents %GDP | 0.00989 |  |  |
|  | (0.0210) |  |  |
|  |  |  |  |
| Colonial Origin | 0 | 0 | 0 |
|  | (.) | (.) | (.) |
|  |  |  |  |
| The Region of the Country | 0 | 0 | 0 |
|  | (.) | (.) | (.) |
|  |  |  |  |
| Military Expenditure (% of GDP) | -0.299\*\*\* | -0.293\*\*\* | -0.302\*\*\* |
|  | (0.0406) | (0.0407) | (0.0408) |
|  |  |  |  |
| Total Debt Service (% of GNI) | -0.0174\*\* | -0.0175\*\* | -0.0182\*\*\* |
|  | (0.00549) | (0.00548) | (0.00551) |
|  |  |  |  |
| Coal Rents %GDP |  | 0.127 |  |
|  |  | (0.0662) |  |
|  |  |  |  |
| Oil Rents %GDP |  |  | -0.0270 |
|  |  |  | (0.0145) |
|  |  |  |  |
| Constant | 5.489\*\*\* | 5.468\*\*\* | 5.627\*\*\* |
|  | (0.104) | (0.103) | (0.114) |
| Observations | 1724 | 1724 | 1714 |

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

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