

# Resource Endowments, Elite Competition, and Inclusive Political Institutions

(Paper Prepared for the APSA Annual Meeting 2018\*)

Victoria Paniagua, Duke University ([victoria.paniagua@duke.edu](mailto:victoria.paniagua@duke.edu))

Jan Vogler, Duke University ([jan.vogler@duke.edu](mailto:jan.vogler@duke.edu))

August 24, 2018

## **Abstract**

According to modernization theory, economic development leads to democratization. Yet, some of the wealthiest countries remain authoritarian and there is wide variation in levels of democracy among middle-income countries. How can these observations be explained? We argue that different degrees of competition between economic elites can explain the absence of democratic power-sharing institutions in some of the most prosperous countries and variation among developing economies. To avoid a potential causal feedback loop, we first consider the impact of natural resource endowments on economic elite configurations. We create a new measurement of resource diversity and identify a strong relationship to both market concentration and, ultimately, inclusive democratic institutions through instrumental variable regression analysis. In addition to our cross-sectional analysis, we illustrate the inter-temporal dynamics of our theory through three historical case studies.

\* This is a preliminary draft. Please do not cite or circulate without permission by the authors. Comments are welcome.

## **Acknowledgments**

Helpful comments have been provided by Luis Ballesteros, Elaine Denny, Bill Keech, Mathew McCubbins, Jeremy Spater, Katherine Spruill, Juan Tellez, and Erik Wibbels. We would also like to thank participants of a workshop at Duke University.

# 1 Introduction

The question of why some countries adopt more democratic institutions than others represents a central puzzle in political economy. *Modernization theory* sustains that economic development is associated with rising education levels, greater social complexity, and the emergence of the middle class, which are key forces behind democratization (Boix & Stokes, 2003; L. Diamond, Hartlyn, Linz, & Lipset, 1999; Epstein, Bates, Goldstone, Kristensen, & O’Halloran, 2006; Lipset, 1959).<sup>1</sup> However, among the wealthiest countries in the world there are many non-democratic states (World Bank, 2018) and variation in political regimes among middle-income countries is significant (Huntington, 1984; Muller, 1995). These observations have opened a prolific debate about the relationship between economic prosperity and democracy.

Some scholars have challenged the direction of causality between these two factors, arguing that political regimes affect economic development and not vice versa (Przeworski & Limongi, 1993). Recent contributions claim that *inclusive political institutions*—which create checks and balances and allow for the involvement of many different actors in decision-making processes—lead to better economic outcomes (e.g. Acemoglu & Robinson, 2013).<sup>2</sup>

Considering that the relationship between development and democracy is argued to be positive in both directions, how can we explain that some of the wealthiest countries in the world remain authoritarian? Also, how can we account for the wide variation in democratization among middle-income countries? Finally, how can we address this puzzle while avoiding the feedback loop between economic development and democratization?

---

<sup>1</sup>Przeworski and Limongi (1997) challenge this notion by claiming that higher levels of development merely make it more likely that democracy can be sustained (but do not necessarily cause it).

<sup>2</sup>Furthermore, according to Baum and Lake (2003), democracies invest more into public services, which contributes to economic growth.

The argument advanced here is that competition within the economic elite influences the existence of inclusive or *power-sharing institutions*—a pillar of democracy as famously argued by Hamilton, Madison, and Jay in the *Federalist Papers*. On the one hand, we argue that when competition is high within the economic elite—that is, under the presence of multiple yet similarly powerful groups—it is more likely that institutions embodying checks and balances emerge. In such a setting, in equilibrium, competition between elite factions—each of which can credibly transform their economic power into political power (Ansell and Samuels, 2014, 40; Acemoglu and Robinson, 2005, 80)—leads to a compromise about the establishment of power-sharing institutions that makes it more difficult for any one faction to step over the interests of the others.

On the other hand, when intra-elite competition is low—that is, a single economic elite or a few factions within the elite enjoy disproportionately high levels of economic power—the existence of authoritarian institutions is more likely. In such cases, the powerful faction that dominates the economy captures the state and locks in a set of rules that block the emergence of competitors.

Thus, the theory we propose is not about how the presence of multiple versus a single elite group enhances democratic institutions but about how the *balance of power* between elite factions leads to such an outcome.

In an attempt to address issues of causality, the empirical novelty of this paper is the creation of an original measurement of *resource diversity* that instruments for elite competition. The presence of natural resources is not dependent on social organization and thus it is causally prior to political institutions.<sup>3</sup> However, we claim that countries with several resources available in similar quantities—i.e., high resource diversity—are more

---

<sup>3</sup>Nevertheless, there could be some endogeneity of the discovery of natural resources with social organization (Berkowitz & Clay, 2011, 75). We discuss this issue in the appendix (subsection 8.5).

likely to give rise to multiple economic groups. Where many natural resources are present, several downstream industries can emerge, indicating higher economic complexity. Moreover, where economic complexity is high and many firms exist, market concentration is typically low. Due to a plurality of downstream industries and lower market concentration, an economy with high resource diversity is more likely to produce multiple economic factions with competing interests. Likewise, countries with low resource diversity tend to give rise to a monolithic elite and, therefore, to low intra-elite competition, indicated by high market concentration.

To measure resource diversity we rely on data of resources with great strategic and/or economic value. Our measurement assesses the extent to which *many different resources in similar quantities* are present in a country. This is different from traditional measurements that mainly focus on resource rents or the size of a country's resource stock, but not the *internal distribution* of resources. In constructing our measurement, we use data on a number of individual resources without first merging them into broader categories, such as 'minerals.'

This paper proceeds as follows. First, we discuss the political economy literature related to our topic. Then, we present our theory of resource diversity, elite competition, and political institutions. For the empirical test, we construct a novel measurement of resource configurations and conduct a cross-national analysis. Finally, since comprehensive empirical endowment data for many considered resources is limited to recent years, we also conduct three case studies which illustrate the *inter-temporal* dynamics of resource configurations, elite competition, and the existence of power-sharing institutions.

## 2 Natural Resources, Economic Elites, and Political Institutions

Our study speaks to several bodies of the political economy literature. First, our argument draws upon existing works that investigate how environmental conditions (Acemoglu, Johnson, & Robinson, 2001; Boix, 2015; Nunn & Puga, 2012) and natural resources affect economic, social, and political organization (Engerman & Sokoloff, 1997; Goldberg, Wibbels, & Mvukiyehe, 2008; Sachs & Warner, 1997). According to the resource curse thesis, the abundance of resources can produce rent-seeking and create predatory or authoritarian states (Auty, 2001; Karl, 1997; Ross, 2001). Similarly, some studies have found a negative correlation between resource wealth and the duration of democratic regimes (Ulfelder, 2007). Several works also point out that the presence of oil in particular has a negative effect on democracy (Karl, 1997; Tsui, 2011). Additionally, high concentrations in resources may fuel domestic armed conflict (Le Billon, 2001b). However, the effect of resources on political organization could be conditional on market structures (Dunning, 2005, 2008), institutions (Mehlum, Moene, & Torvik, 2006; Robinson, Torvik, & Verdier, 2006), and resource ownership (Luong & Weinthal, 2010).

The potentially beneficial effects of resources have received more attention in the recent literature. A criticism of earlier work is that most measurements of resource prevalence are endogenous to social organization as they measure resource dependence (resource rents/GDP) and not stocks. When accounting for potential endogeneity, the relationship between resources and development could be positive (Brunnschweiler & Bulte, 2008, 2009). Similarly, other studies suggest that resource wealth has positive impact on regime durability regardless of the type of regime (Smith, 2004); that it does

not block democratization (Liou & Musgrave, 2014); and that it has a positive effect on economic growth (Alexeev & Conrad, 2009). Moreover, Haber and Menaldo (2011) find that resources can have a positive effect on democratization<sup>4</sup> and Mitchener and McLean (2003) show that mineral endowments improve productivity.<sup>5</sup>

We share the understanding that resources can have an impact on socio-economic development. However, we argue that *resource configurations*—specifically also *diversity*; in addition to endowment levels—affect social structures and political institutions.

Second, we also draw upon a recent but rapidly growing literature that associates geography, elite configurations, and political institutions. For instance, Berkowitz and Clay (2011) posit that the emergence of different *types* of elites (agricultural and/or commercial), conditioned by geography, explains variation in political development across American states. Specifically, natural environments that are favorable to the emergence of both groups likely lead to greater political competition and judicial independence. Similarly, following Engerman and Sokoloff (1997), Easterly (2007) explains inequality as a function of (historical) economic structures emerging from different agricultural endowments. Boix (2015) links ecological conditions to the emergence of a non-agricultural population which enables technological innovation, the subsequent reconfiguration of elites' economic interests, and their motivation to produce political order. Finally, Beramendi and Rogers (2015) explain that a more geographically concentrated and, therefore, homogeneous elite is associated with malapportionment which, in turn, translates into larger regional disparities and lower fiscal capacity.

Like these authors, we posit a strong relationship between exogenous environmental

---

<sup>4</sup>Also see Menaldo (2016).

<sup>5</sup>However, Andersen and Ross (2014) have challenged the analysis by Haber and Menaldo, arguing that the transfer of oil revenues from transnational corporations to regimes has enabled rent-seeking by the latter.

factors—climate and distance to navigable waterways in the case of [Berkowitz and Clay \(2011\)](#); “rich soils and a salubrious climate” in the case of [Boix \(2015, 209\)](#); geographic concentration of economic activity in the case of [Beramendi and Rogers \(2015\)](#); and the diversity in resource endowments in ours—, the configuration of economic elites, and their impact on institutions. However, our argument differs in that it underscores the *balance of power* between elite groups, and not their economic homogeneity, the reconfiguration of their interests or the presence of multiple elites versus a single elite. In doing so, it considers a wide variety of specific natural resources (which are often merged into broader categories in other contributions), potentially associated with many different downstream industries. Furthermore, differently from these works, ours specifically examines power-sharing institutions.

Finally, our paper also speaks to other contributions that study the consequences of intra-elite competition. With respect to the debate on democratization and redistribution, we follow [Ansell and Samuels \(2014\)](#) who claim that inter-sectoral elite disputes drive democratization.<sup>6</sup> Regarding fiscal capacity, several studies offer insights for our own work. [Mares and Queralt \(2015\)](#) highlight the importance of inter-sectoral competition between landed and manufacturing elites to explain the introduction of income taxation’s timing. Moreover, [Beramendi, Dincecco, and Rogers \(2018\)](#) argue that it is the extent of competition between agricultural and capitalist elites in the course of industrialization which determines long-run fiscal development. Regarding the development of state capacity, [Garfias \(2015\)](#), too, explains that state development results from changes in the relative power of economic and ruling elites.

---

<sup>6</sup>More generally, we also build upon works on democratization which show the central role of economic elites in the design of political institutions ([Albertus & Menaldo, 2018](#)).

### 3 Resource Diversity, Intra-Elite Competition, and Power-Sharing Institutions

Our theory links natural resources to the configuration of economic elites. Like others, we claim that resources can have a significant impact on social organization. For instance, the existence of fertile land and moderate climatic conditions enabled humans to engage in agricultural activities (J. M. Diamond, 1998). Similarly, coal has historically been an important resource for the advancement of an industrial economy, as it is fundamental to powering steam engines and locomotives (Clark & Jacks, 2007; Shulman, 2015). Further examples of economically valuable resources include iron ore (used for the production of steel and central to the global economy), oil (storing energy in an extremely dense way), natural gas (used for the production of electricity), and timber/forests (the foundation of forestry). Finally, diamonds—a resource with relatively little productive value but an enormous market worth—have often been seen as a potential driver of conflict (Le Billon, 2001a).

Moreover, resources have a significant impact on the emergence of economic elite factions. The economic elite is defined here as the ‘set of people who own and/or manage the factors of production and extraction in an economy.’ Within it, there are often multiple subgroups that manage the extraction, processing, utilization, and/or trading of a specific natural resource. Therefore, each group has an interest in promoting the advancement of the economic sector for which it is responsible.

Accordingly, we argue that *resource diversity*, that is, the presence of various natural resources in similar quantities, is likely associated with the existence of multiple elite factions that compete with each other to advance their interests. Sectoral variation in

extraction procedures and in the processing, utilization, or trading of resources typically leads to diverging economic interests among these groups.<sup>7</sup> As [Ippolito and Walker \(1980, 282\)](#) point out, “the business community is not a monolithic, single-minded entity. [...] A policy responsive to the needs of the natural gas industry might jeopardize the future of the coal companies. For this reason, business groups often conflict with each other as much as they do with their rivals in the labor, consumer, and environmentalist movements.” Similarly, [Mizruchi \(1989\)](#) finds evidence that when two businesses are dependent on different primary industries, they display divergent political behavior.<sup>8</sup>

There is comprehensive evidence that different sectors of the economy have diverging interests with respect to a large number of policy issues, indicating intra-elite conflicts. The most evident one is the cleavage between sectors that are import-competing and those that are export-oriented. For example, when President Donald Trump announced in March 2018 that he would introduce a 25% tariff on steel and a 10% tariff on aluminum, representatives from different sectors had widely different opinions on the proposed measure.<sup>9</sup> This is not surprising given that some American businesses dealing with the extraction and processing of raw materials are import-competing, like the steel industry, others are more export-oriented, like the oil and natural gas industries ([International Energy Agency, 2017, 68-72](#)). Furthermore, the dependence of industries on different raw materials, also created intra-elite disparities: “Members of the oil industry have warned that Trump’s steel tariffs could derail the country’s energy boom by raising prices on for-

---

<sup>7</sup>On how the configuration of economic elite members’ ownership portfolio affects their policy preferences and its implications for the emergence of intra-elite conflict, see [Paniagua \(2017\)](#).

<sup>8</sup>The political preferences of businesses have also been found to vary based on the regulatory environment and region ([Burris, 1987](#)).

<sup>9</sup>American steel producers were strongly in favor of the reform: in a statement published by the *American Iron and Steel Institute*—a business association of the steel industry—they thanked the President for his actions ([American Iron and Steel Institute, 2018](#)). Yet, other business leaders had less favorable views of the tariffs. For example, a prominent American business leader wrote a column against the tariffs ([Washington Post, 2018](#)).

eign steel, which oil companies use in drilling and production...” (CNN, 2018). In short, world market prices, the intensity of foreign competition, dependence on resources, and regulations can differ substantially between sectors, creating enormous conflict potential.

This suggests that a consensus on economic policy is increasingly unlikely as the diversity in natural resources and the complexity of the domestic economy is greater. Thus, a wide diversity of natural resources means greater intra-elite conflicts and greater economic complexity, often reflected by low levels of market concentration (i.e. more market competition). Under these conditions, when many resources are present in similar quantities, the economic power between elite groups is closer to being balanced: no single group has the economic power to dominate the others by the means of coercion.

Due to the diversity in economic interests and the balance of power between elite groups, in equilibrium, attempts to capture the state are unlikely to succeed permanently. While such attempts may take place, we expect that an elite compromise with the creation of democratic power-sharing institutions—allowing for a number of different interests to be represented in political decision-making—is the most stable equilibrium outcome. In short, natural resources diversity means high levels of intra-elite competition (indicated by high economic complexity and low market concentration), resulting in the establishment of power-sharing institutions as the most likely political outcome.

On the other hand, where a single natural resource dominates, that is, where resource diversity is low, there is a high degree of economic monolithicity. In this scenario, a single subgroup of the economic elite concentrates the ownership of valuable economic assets centered on the extraction and/or trading of this resource, leading to high levels of market concentration. Under such conditions, we argue, there are fewer conflicts of interest within the elite, and the relative economic power base of one subgroup is

greater. Since there are no other significant resources available in this economy, the chances of a rival or competitor elite emerging are smaller.<sup>10</sup> Thus, where a single elite has overwhelming economic power, it has both the incentives and the means to capture the state and promote more exclusive political institutions. To summarize, without intra-elite competition, we expect the predominance of exclusive political institutions. We derive the following empirical expectations from this theory:

**Hypothesis 1:** In countries with greater resource diversity, we expect higher levels of intra-elite competition, indicated by lower levels of market concentration.

**Hypothesis 2:** In countries with higher levels of intra-elite competition, indicated by lower levels of market concentration, we expect the presence of stronger power-sharing institutions.

In the appendix, we discuss the temporal limitation of our theory to the period of industrialization ([subsection 8.4](#)) the role of ‘pre-existing elites’ ([subsection 8.1](#)).

---

<sup>10</sup>For instance, [Goldberg et al. \(2008\)](#) find evidence that American states in which the oil industry provided rents to political elites suffered from lower levels of political competition.

## 4 Empirical Test

We empirically test our argument with a cross-national instrumental-variable (IV) regression analysis. First, we investigate the link between natural resource configurations and market concentration. Second, we use resource configurations as an instrument to estimate the relationship of market concentration and power-sharing institutions.

Since comprehensive data for endowments in a large number of specific resources is only available for recent years, our empirical analysis is focused on cross-country comparisons and does not include an inter-temporal dimension. Considering the potential shortcomings of such an approach (Haber & Menaldo, 2011), we also explore the *inter-temporal dynamics* of elite competition and power-sharing institutions through three case studies (section 6).

### 4.1 The Dependent Variable: Power-Sharing Institutions

As elaborated earlier, we are primarily interested in explaining cross-country variation in *power-sharing institutions*, for which we use a variety of indicators. All of these indicators have in common that they refer to mechanisms to decentralize, distribute, or put checks on political power. We use the following variables from the *Varieties of Democracy* dataset (Coppedge et al., 2017).<sup>11</sup>

**(1) Division of power index:** Refers to the division of power between federal, regional, and local government institutions.

**(2) Election Management Body (EMB) autonomy:** Refers to the degree to which the body managing national elections can operate without political interference.<sup>12</sup>

---

<sup>11</sup>We use data from the year 2010 as this marks the year with the widest data availability.

<sup>12</sup>The fair conduct of elections is a central feature of democratic political systems, i.e. its absence indicates authoritarianism (Levitsky & Ziblatt, 2018, Ch. 4).

**(3) Political civil liberties index:** Refers to the comprehensiveness and strength of political civil liberties, i.e. rights to organize politically.

**(4) Horizontal accountability index:** Refers to the degree of accountability between branches of government.

**(5) Vertical accountability index:** Refers to the degree of accountability of the government towards citizens.

In the appendix, we provide more detailed information on these variables ([subsection 8.2](#)) and show that the presence of these institutions is highly correlated with economic development ([subsection 8.3](#)).

## 4.2 The Instrument: Resource Configurations

To measure natural resource endowments and diversity, we create a novel measurement which we use as an instrument in our regression analysis. The first two versions of this measurement are based on seven resources that are of great strategic and/or economic value. Whereas the first measurement relies on the earliest data available, the second one relies on the most recent data available.<sup>13</sup> The resources considered are the following:

1. Coal (reserves) ([BP, 2017](#))
2. Iron Ore (production) ([USGS, 2014](#))
3. Oil (reserves) ([BP, 2017](#))
4. Natural Gas (reserves) ([BP, 2017](#))
5. Diamonds (production) ([Kimberly Process, 2016](#))
6. Agricultural Land (reserves) ([World Bank, 2017](#))
7. Timber/Forest Area (reserves) ([World Bank, 2017](#))

---

<sup>13</sup>For more details on the different measurements, see the appendix ([subsection 8.6](#)).

A third measurement incorporates three additional resources of great relevance for modern economies that, if present in sufficient quantities, can constitute their own industries centered on their extraction and/or utilization:<sup>14</sup>

1. Aluminum (production) (Matos, 2015)
2. Copper (production) (Matos, 2015)
3. Pig Iron (production) (Matos, 2015)

Since many of these resources only achieve their full value through industrialization, we discuss the temporal limitations of our approach in the appendix (subsection 8.4).

In order to reduce potential measurement errors in the creation of this indicator we followed certain rules. First, we chose sources that offer data for as many countries as possible (as we need to assume a value of zero for other countries). This is due to the fact that resource data is often not available for countries that have only small amounts of a specific resource relative to overall global reserves. However, according to our argument, even though some countries may only have small share of the world-wide amount of a specific resource, it may still constitute an important *domestic* economic factor.

Second, when multiple measurements that cover a similar number of countries were available, we chose data on endowments over data on production (extraction) levels, since the latter could be endogenous to political regimes (Brunnschweiler & Bulte, 2008, 2009). For instance, democracies may be less likely to extract oil in certain areas because of potential environmental hazards. Therefore, we use extraction data only where endowment data is not available or limited in coverage.

Third, we use data from the earliest moment of data availability. On the one hand, this is to ensure that our independent variable is measured temporally prior to our dependent

---

<sup>14</sup>Additionally, in the third measurement, we standardize agricultural land and forests by both area and population instead of just area.

variable whenever possible. Additionally, economic elites and downstream industries may have emerged historically and the natural resources may have declined over time. In order to ensure that the eventual exhaustion of those resources does not obfuscate historical differences, we use the earliest data available for each resource.<sup>15</sup>

To construct our measurements of resource endowments, we conduct the following steps: First, for coal, iron ore, oil, natural gas, and diamonds, we compute the amount per capita in each country.

With respect to both agricultural land and forest area, we use two different forms of obtaining a relative value for each country. In the first and second measurements, we use agricultural land and forest area relative to the overall area of the country. In third measurement, we calculate the square kilometers of land relative to the population size. These alternative forms of accounting for the prevalence of resources measured in land area are meant to ensure that the results hold across different proxies.<sup>16</sup>

We proceed by standardizing the endowment of every resource  $i$  to have a mean of 0 and a standard deviation of 1 across countries. We do this through the following formula ( $i$  = index for resources,  $j$  = index for countries):

$$ResSt_{ij} = \frac{Res_{ij} - Mean(Res_i)}{SD(Res_i)} \quad (1)$$

This means that a country that has the average endowment of a specific resource has a value of 0. A country with a value of 1 has one standard deviation more in this resource than the average country. A country with a value of -1 has one standard deviation less in this resource than the average country. Note that this measurement also partially

---

<sup>15</sup>Detailed information on the date of measurement is provided in the appendix (subsection 8.6). We use recent data in our second measurement of diversity.

<sup>16</sup>Detailed information on the differences between the three measurements can be found in the appendix (subsection 8.6).

reflects the value of the resource as the value of resources is directly related to their scarcity. We do not include a direct measurement of price because resource prices are highly endogenous to social/economic organization. Accounting for the endowment across countries, our standardized measure is a good representation of the *relative availability* of resources and thus to some extent of their relative value.

Subsequently, we identify the mean resource endowment of a specific country  $j$  (across all resources). This number reflects how much a country deviates—on average—from other countries in terms of its overall resource endowment.<sup>17</sup>

$$Mean\ Endowment_j = \frac{\sum_{i=1}^n ResSt_{ij}}{n = 7} \quad (2)$$

Effectively, this is the average of a country’s endowment in natural resources. Countries can score highly on this measurement if they have an enormous amount of a single resource (e.g., 1 resource at 7 SD above the mean). Alternatively, they can have moderately high amounts of each resource and also score highly (e.g., 7 resources at 1 SD above the mean each, which would lead to the same overall endowment as the country above). This measurement indicates the presence of resources in general but does not yet allow us to make statements about diversity.

To create a measurement of *resource diversity*, we proceed in multiple steps: For mathematical reasons, we first create a measure of resource monolithicity. This measurement is high when there is a single predominant resource:

$$Monolithicity_j = \sqrt{\sum_{i=1}^n (ResSt_{ij} - Mean\ Endowment_j)^2} \quad (3)$$

---

<sup>17</sup>In the third measurement, the denominator is  $n = 10$  as we include three additional natural resources.

Mathematically, this is comparable to the standard deviation in resources for any given country. This measure is very high when there is an uneven distribution of resources, i.e. when a country has highly concentrated endowments in only one or only a few resources (relative to the rest of the world). The standard deviation is bound between 0 and  $\infty$ .

We then transform this measurement to one of resource diversity. To do this, we begin by taking the inverse of monolithicity:

$$\textit{Inverse Monolithicity}_j = -\textit{Monolithicity}_j \quad (4)$$

This variable is bound between  $-\infty$  and 0. Then, we subtract the minimum observed value from this measurement to create a measurement of diversity that has 0 as its lower bound.<sup>18</sup>

$$\textit{Diversity}_j = \textit{Inverse Monolithicity}_j - \textit{Min}(\textit{Inverse Monolithicity}) \quad (5)$$

We use these measurements in our empirical tests to identify the relationship between resource configurations, market concentration, and inclusive political institutions. As resources existed prior to social organization and most of the resources measured were of little/no strategic value during the era of imperialism, we suggest that the requirement of exogeneity and as-if randomness is met (Angrist, Imbens, & Rubin, 1996). We address some potential issues of endogeneity with social organization in the appendix (subsection 8.5).

Figure 1 and Figure 2 show the distribution of resource endowments and resource diversity (according to our first measurement) across countries. Graphs showing the

---

<sup>18</sup>Since the inverse of monolithicity is negative, subtracting the minimum value effectively adds the absolute value of the minimum to it.



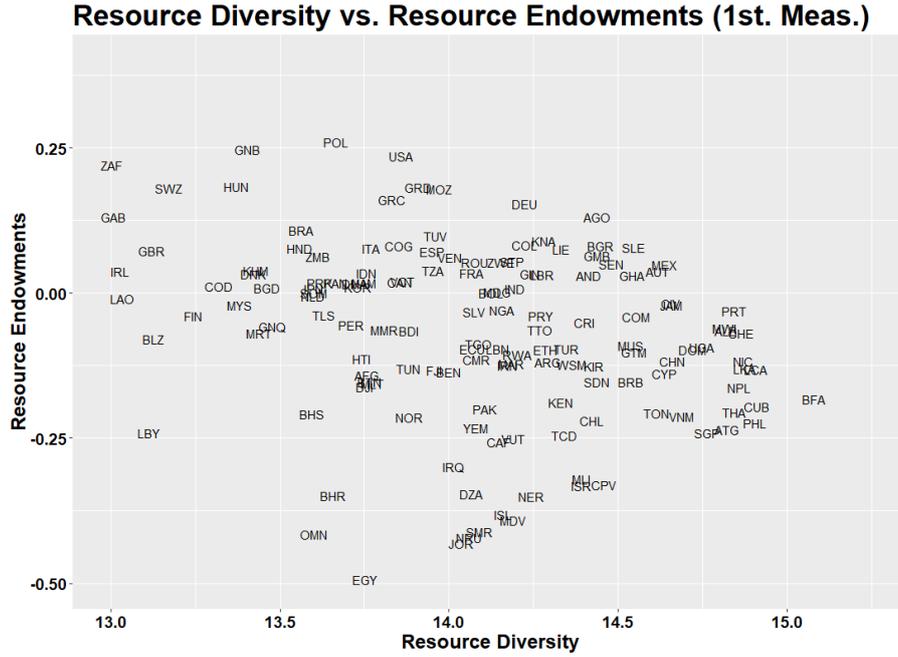


Figure 2: Scatterplot — Resource Diversity and Resource Endowments (Zoom) (1st Meas.)

### 4.3 The Key Explanatory Variable: Average Market Concentration

According to our theory, resource diversity promotes economic complexity and thus intra-elite competition. As a proxy to measure economic complexity and/or competition within the economic elite we use the average level of market concentration by country. Market concentration is high when a few firms have a very large market share and low when many firms of similar size are present. The measurement we use is based on an indicator created by [Ballesteros \(2016\)](#) who utilizes the Herfindahl-Hirschman Index to estimate the degree of market concentration by industry and country. We rely on this data (for the year 2006) to calculate the average market concentration across industries. Since this variable is based on all industries within a country, we expect that there are only marginal changes from year to year. Even though it would be ideal to measure market concentration closer to the year in which we measure our outcome variable, considering

the expected marginal yearly changes, we do not think that a measurement from a few years earlier is systematically biased.

The rationale behind using market concentration as a proxy for elite competition is the following. Highly concentrated markets mean the domination of the economy by a small number of firms. Under such conditions, the owners and managers of those firms concentrate a high level of economic power, which can be used to influence politics and push through particular economic interests (Du Boff & Herman, 2001, 26-28). We follow a well-known literature which argues that economic power is the foundation of political power (Ansell and Samuels, 2014; Acemoglu and Robinson, 2005). Economic power can be used to finance political parties, bribe office holders, and fund campaigns. Especially small, homogeneous groups can exert disproportionately high levels of influence on politics (Olson, 2009).

Under conditions of high market concentration, i.e. low levels of intra-elite competition, we expect the absence of power-sharing mechanisms. As shown in the appendix (subsection 8.10), we find this theoretical expectation confirmed. However, similar to economic development, it is not entirely clear if this is a *one-directional relationship*. Democracies often promote competition between market actors and so we need to identify an instrument for market concentration that is independent of democratic political institutions. Therefore, in our main empirical analysis, we rely on two-stage regression with natural resource configurations as our instrument.

#### 4.4 Covariates and the Possibility of Endogeneity

In addition to market concentration as our explanatory variable, we include two covariates. Due to our confidence in the relative exogeneity of resource configurations and the

potential of measuring the same concept twice (resource endowments vs. resource rents, see [subsection 8.9](#)), we only include these covariates to demonstrate that many of our results hold even when accounting for factors that have been identified as highly important by the political-economic literature.

**GDP PC (Log.):** We use the natural logarithm of GDP per capita to account for levels of economic development, the key explanatory factor for democracy according to modernization theory.

**Resource Rents (% of GDP):** We use the level of resource rents as percent of GDP to address the possible argument that our analysis merely replicates the resource curse thesis.

However, these models are likely to suffer from endogeneity. As inclusive political institutions likely affect economic development ([Acemoglu & Robinson, 2013](#); [Baum & Lake, 2003](#)) and political configurations can impact the level of resource rents ([Brunnschweiler & Bulte, 2008, 2009](#)), the results with additional covariates are likely to be biased. Thus, we favor the models without controls and only include additional variables to be fully transparent about the robustness of our results under different conditions.

In the appendix, we discuss and empirically examine the validity of the exclusion restriction ([subsection 8.9](#)). We also show how the inclusion of settler mortality as measured by [Acemoglu et al. \(2001\)](#) as an additional/alternative instrument affects our results ([subsection 8.11](#)).

## 4.5 Descriptive Statistics

In [Table 1](#), we show descriptive statistics for all variables used in the empirical analysis.

<b>Variable</b>	<b>n</b>	<b>Min</b>	<b>q<sub>1</sub></b>	<b><math>\bar{x}</math></b>	<b><math>\tilde{x}</math></b>	<b>q<sub>3</sub></b>	<b>Max</b>	<b>IQR</b>
Market Concentration	169	0.21	0.82	0.89	0.93	1.00	1.00	0.18
Resource Diversity 1	162	0.00	13.60	13.64	14.06	14.39	15.08	0.79
Resource Endowment 1	162	-0.49	-0.14	0.01	-0.03	0.05	3.81	0.19
Resource Diversity 2	189	0.00	13.60	13.73	14.13	14.48	15.16	0.88
Resource Endowment 2	189	-0.52	-0.13	0.00	-0.03	0.04	3.77	0.17
Resource Diversity 3	152	0.00	14.34	13.95	14.92	14.98	15.13	0.64
Resource Endowment 3	152	-0.20	-0.18	0.01	-0.14	-0.05	3.41	0.13
Division of Power Index	158	0.00	0.14	0.49	0.45	0.85	1.00	0.71
EMB Autonomy	166	-2.58	-0.11	0.93	1.10	2.06	3.89	2.17
Civil Political Liberties Index	165	0.01	0.54	0.70	0.80	0.91	0.98	0.37
Horizontal Accountability Index	166	-1.75	-0.23	0.48	0.58	1.21	2.37	1.44
Vertical Accountability Index	166	-1.58	0.32	0.72	0.80	1.32	1.94	1.00
GDP PC (Log.)	183	5.07	6.87	8.13	8.14	9.25	11.31	2.39
Resource Rents (%GDP 2015)	179	0.00	0.35	5.78	2.04	8.23	46.44	7.89

Table 1: Descriptive Statistics: Empirical Analysis

## 5 Results

### 5.1 IV Regression: Stage 1

Table 2 shows the results of our first-stage regression. We find that resource diversity is negatively associated with average market concentration. These results are in line with our first hypothesis: when multiple different resources in comparable quantities are present in a country, there is a greater fragmentation within the economic elite.

Resource endowments are also negatively associated with market concentration. This result is also in line with our argument as countries with some resource endowments can develop at least one economic elite (in addition to a political-administrative elite). The positive impact of resource endowments also corresponds with findings by Haber and Menaldo (2011), Menaldo (2016), Mitchener and McLean (2003), and Brunnschweiler and Bulte (2008).

Table 2: Stage 1: Resource Configurations and Market Concentration

	<i>Dependent variable:</i>		
	Market Concentration		
	(1)	(2)	(3)
Resource Diversity 1	-0.026** (0.012)		
Resource Endowment 1	-0.169*** (0.054)		
Resource Diversity 2		-0.022** (0.010)	
Resource Endowment 2		-0.146*** (0.046)	
Resource Diversity 3			-0.023* (0.012)
Resource Endowment 3			-0.169** (0.069)
Constant	1.245*** (0.158)	1.190*** (0.136)	1.219*** (0.168)
Observations	147	168	139
R <sup>2</sup>	0.074	0.064	0.053
Adjusted R <sup>2</sup>	0.062	0.053	0.039

Note: OLS

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

## 5.2 IV Regression: Stage 2, First Measurement

In the second stage of our regression, we estimate the effect that average market concentration has on our different measurements of political *power-sharing institutions*. [Figure 3](#) and [Figure 4](#) graphically show the effect of market concentration when we use values that are predicted by natural resource configurations.<sup>19</sup> As expected, we observe a strongly negative relationship between market concentration and the presence of democratic power-sharing institutions. Thus, these results confirm hypothesis 2.

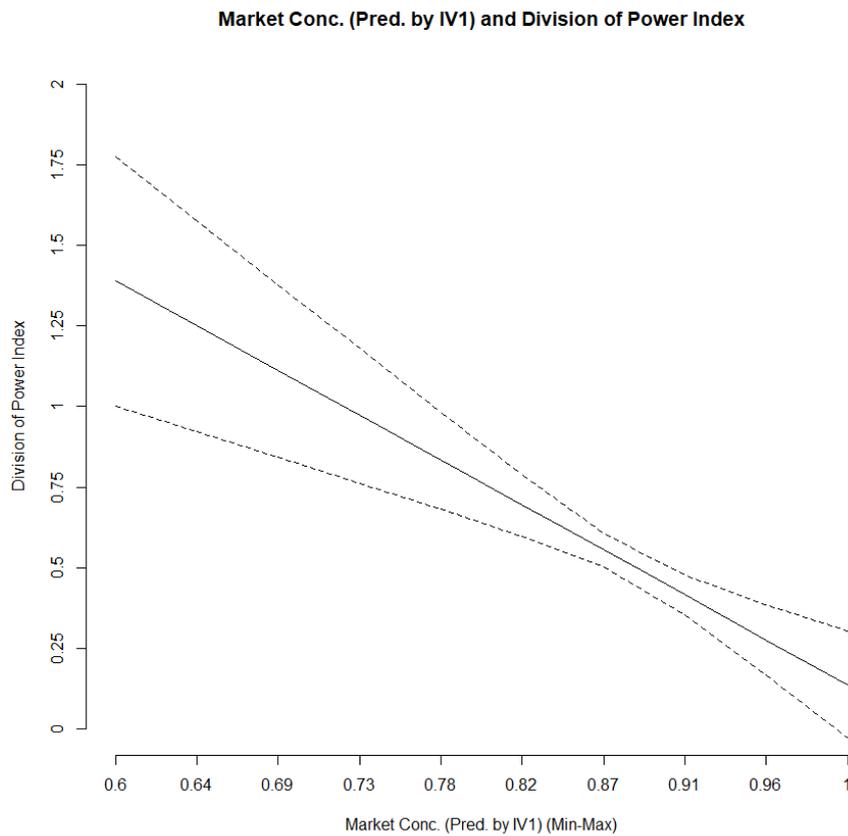


Figure 3: Market Concentration (IV1) and Division of Power Index

---

<sup>19</sup>The figures include 90%-confidence intervals.

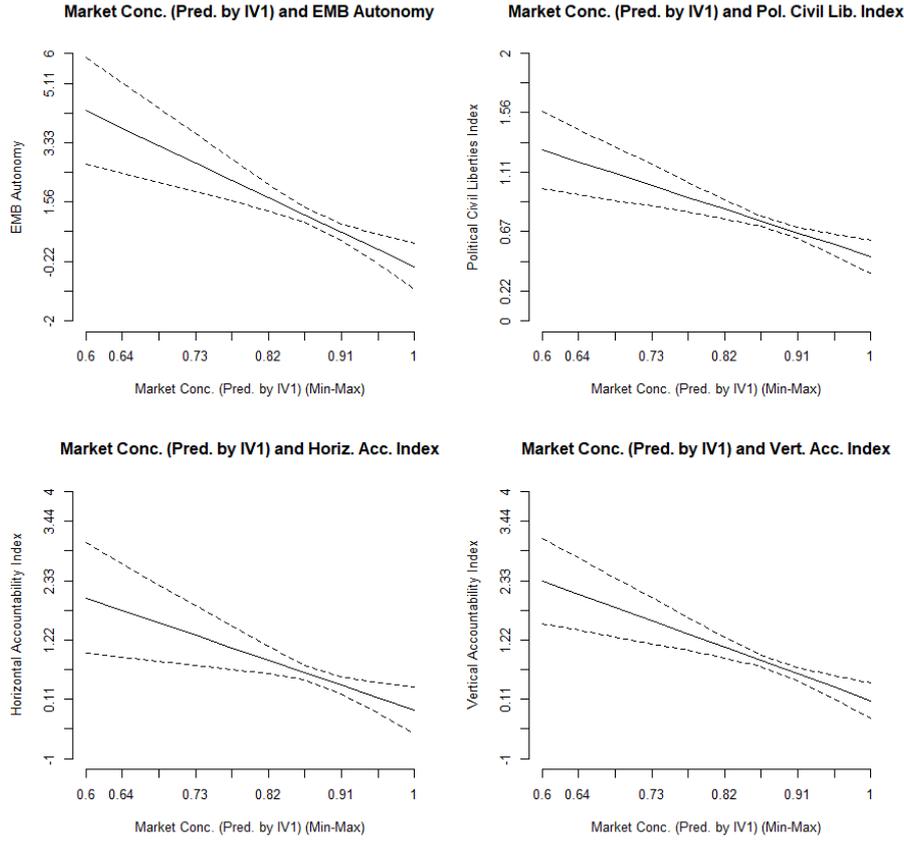


Figure 4: Market Concentration (IV1) and Division of Power Index (With Controls)

Table 3 and Table 4 show detailed numerical results of our IV regression. In the appendix (subsection 8.12), we discuss a large number of diagnostic tests for all three measurements, including weak instruments, Wu-Hausman, and Sargan tests.

Table 3: Market Concentration (IV1) and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV1)	-3.190*** (0.900)	-11.879*** (3.075)	-2.048*** (0.732)	-5.222*** (1.546)	-5.647*** (1.565)
Constant	3.317*** (0.795)	11.497*** (2.708)	2.520*** (0.642)	5.138*** (1.357)	5.724*** (1.378)
Observations	127	130	129	130	130

Note: IV, Robust SE

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 4: Market Concentration (IV1) and Democratic/Inclusive Institutions (With Controls)

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV1)	-3.077** (1.204)	-13.088*** (4.677)	-2.392** (0.990)	-4.727* (2.438)	-6.266** (2.677)
GDP PC (Log.)	-0.076 (0.057)	-0.245 (0.234)	-0.069 (0.049)	0.039 (0.138)	-0.100 (0.142)
Resource Rents (Pct.)	-0.004 (0.005)	-0.004 (0.020)	-0.0001 (0.004)	-0.009 (0.012)	-0.003 (0.012)
Constant	3.861** (1.477)	14.635** (5.840)	3.398*** (1.231)	4.495 (3.194)	7.129** (3.416)
Observations	120	123	122	123	123

Note: IV, Robust SE

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

### 5.3 IV Regression: Stage 2, Second Measurement

Table 5 and Table 6 present the results of our second-stage regression when using the second measurement of resource configurations. In general, we find similar results as in our first analysis. However, when including control variables, some of the relationships do not reach conventional levels of statistical significance. This may be due to issues of endogeneity (which occur when covariates are included) as discussed in the previous section and in the appendix (subsection 8.9).

Table 5: Market Concentration (IV2) and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV2)	-2.990*** (0.852)	-9.292*** (3.357)	-1.709** (0.744)	-3.229 (2.029)	-4.098** (1.616)
Constant	3.152*** (0.757)	9.275*** (2.965)	2.231*** (0.657)	3.392* (1.798)	4.396*** (1.435)
Observations	146	150	149	150	150

Note: IV, Robust SE

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 6: Market Concentration (IV2) and Democratic/Inclusive Institutions (With Controls)

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV2)	-2.876** (1.141)	-10.752** (4.983)	-2.012** (0.998)	-2.352 (2.371)	-4.540* (2.423)
GDP PC (Log.)	-0.064 (0.054)	-0.123 (0.256)	-0.049 (0.050)	0.154 (0.130)	-0.013 (0.124)
Resource Rents (Pct.)	-0.007 (0.005)	-0.020 (0.019)	-0.004 (0.004)	-0.020* (0.011)	-0.011 (0.012)
Constant	3.616** (1.413)	11.745* (6.370)	2.932** (1.269)	1.518 (3.106)	4.992 (3.076)
Observations	139	143	142	143	143

Note: IV, Robust SE

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

## 5.4 IV Regression: Stage 2, Third Measurement

Table 7 and Table 8 show the results of our second-stage regression when using the third measurement of resource configurations. In general, we find results comparable to the ones obtained in our first and second analyses. However, similar to the above results, when using control variables, many variables are not statistically significant at conventional levels.

Table 7: Market Concentration (IV3) and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV3)	-3.226** (1.356)	-8.363*** (2.945)	-1.355** (0.624)	-5.812*** (2.077)	-4.630*** (1.744)
Constant	3.372*** (1.203)	8.486*** (2.565)	1.927*** (0.548)	5.690*** (1.830)	4.862*** (1.524)
Observations	119	122	121	122	122

Note: IV, Robust SE

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 8: Market Concentration (IV3) and Democratic/Inclusive Institutions (With Controls)

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV3)	-1.684 (1.246)	-5.098 (6.503)	-0.949 (1.209)	-3.493 (4.060)	-4.258 (4.283)
GDP PC (Log.)	-0.006 (0.063)	0.141 (0.336)	0.008 (0.063)	0.088 (0.210)	-0.003 (0.226)
Resource Rents (Pct.)	-0.005 (0.005)	-0.023 (0.022)	-0.001 (0.005)	-0.018 (0.014)	-0.011 (0.014)
Constant	2.093 (1.588)	4.659 (8.361)	1.525 (1.553)	3.081 (5.222)	4.654 (5.553)
Observations	113	116	115	116	116

Note: IV, Robust SE

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

## 6 Case Studies

The previous statistical analyses provide support for the argument that resource diversity contributes to a more diversified economy and elite competition, which ultimately leads to the establishment of power-sharing institutions. Yet, these correlations do not necessarily allow us to make a perfect claim for causality (Levine & Zervos, 1993). Furthermore, due to the cross-sectional character of our data, it should be complemented by an analysis of individual cases over time. This would be important to ensure that our theory also applies when considering *inter-temporal dynamics* in economic elite competition and the creation of institutions (Andersen & Ross, 2014; Haber & Menaldo, 2011).

We have selected three cases that share a comparable level of overall resource endowments but that differ in the three key indicators of economic heterogeneity: (1) our measurement of resource diversity, (2) the measurement of market concentration based on Ballesteros (2016), and (3) the economic complexity rankings by CID (2018). Our cases are Saudi Arabia (low resource diversity, high average market concentration, intermediary economic complexity), Argentina (intermediary resource diversity, high market concentration, intermediary economic complexity), and Germany (intermediary resource diversity, low market concentration, high economic complexity).<sup>20</sup> Moreover, to test the explanatory power of our theory, our cases also represent different world regions—the Middle East, South America, and Europe.

For each of the case studies, we systematically discuss (1) the natural resource configuration, (2) economic structures and elites, and (3) which role these elites played in the creation, maintenance, or abolishment of power-sharing institutions.

We find that in Saudi Arabia, where there is one predominant resource (oil), a rela-

---

<sup>20</sup>In the appendix (subsection 8.14), we provide detailed numerical information on all of these measurements for the three cases selected.

tively monolithic economic elite emerged, captured the state, and, from within the state apparatus, reproduced authoritarian institutions. Moreover, in Argentina, a more diverse resource endowment (fertile land and smaller amounts of other resources) gave rise to competition between a strong landed elite and a smaller but at times powerful industrial elite. Finally, in Germany, many different resources led to the emergence of a variety of downstream industries, which resulted in high levels of economic complexity. This high economic complexity led to significant intra-elite competition, resulting in extensive power-sharing mechanisms as the political-economic equilibrium.

## 6.1 Saudi Arabia

### Natural Resources in Saudi Arabia

Saudi Arabia has been historically characterized as an economy with a very low level of diversification. Since the discovery of petroleum, the country has become heavily dependent on it. The oil sector accounts for about 45% of the total GDP, 90% of the total export earnings, and 85% of government revenues. It has also one of the largest reserves of natural gas in the world (BP, 2017).

Compared to the oil industry, other pursuits in this largely desert and resource-poor country have no economic significance (Lipsky, 1959). In 2015, 80% of Saudi Arabia's exports were concentrated in petroleum and derivatives, 10% on plastics, and 6.5% in mineral products (CID, 2018). Although agricultural land was estimated at 40% in 1961 (the earliest moment of data availability) (World Bank, 2017), most of it has been used for subsistence pastoral and agricultural activities.

## Oil and the State

Oil started being exploited in 1938 by the predecessor of the Arabian American Oil Company (Aramco) (Owen, 1975). Since then, Aramco has had the monopoly of oil extraction in Saudi Arabia and, therefore, become the most important entity of the Saudi economy.

It was not until 1973 that the Saudi state acquired participation in the oil sector. First, it acquired 25% of Aramco, then 60% and, finally, in 1980, it became the sole owner of the company (Marcel, 2007). The management control of Aramco remained in foreign hands until in 1988 when the state assumed control as well. This increased the government's power, which not only enjoyed all the revenues from oil but now also had discretion to appoint managers.

Aramco is today “one of the giants in the world of oil production” (New York Times, 2018). It produces more oil than any other company and manages the massive reserves of Saudi Arabia, which exports more crude oil than any other country (Business Insider, 2018). Aramco's market worth has been estimated at 2 trillion dollars, making it the world's most valuable company (Fortune Global 500, 2018).

Beyond the direct exploitation of oil, some related industries have developed, specifically the petrochemical industry. However, given the almost complete absence of other raw materials, no additional industries have prospered. Since the 1970s, the Saudi government has attempted to diversify its economy, but these efforts have mostly failed and Saudi Arabia remains one of the least diversified economies in the world (Albassam, 2015; Samargandi, Fidrmuc, & Ghosh, 2014).

In sum, due to the concentration of oil revenues in the hands of the state via Aramco ownership, the ruling elite and its inner circle represent a powerful monolithic economic

and political elite.

## **Elites and the Creation of Exclusive Institutions**

The Kingdom of Saudi Arabia was established by King Abdulaziz Al Saud in 1932 through the military conquest of territories and tribes. Upon unification, the king created a political order in which authority was concentrated in the hands of an executive figure who filled the three traditional roles: tribal leader, religious leader, and king (Lipsky, 1959). Following the commercial exploitation of oil, and the associated increase in revenues, Saud was able to buy the loyalties of powerful tribe leaders whose potential to resist the concentration of power was nullified (Abir, 1987, 7).

As the oil industry flourished, government advisers increasingly included representatives of the big merchant families. The administrative system also included provincial governors directly responsible to the King. These were princes of the royal house or members of the aristocratic families. Until then, there was nothing like an integrated bureaucracy. The state was undeveloped and ruled through patrimonial and clientelistic links (Chaudhry, 1997; Hertog, 2010).

The development of the modern state began in 1953. It was a process guided by a few Saudi royals' decisions (Abir, 1987) that were made in a top-down fashion but often resulted in the oil-funded recruitment of clients into the growing state apparatus (Hertog, 2010). In this hierarchical system, the only common denominator was and is “the central role of the Al Saud ruling family as patrons and controllers and the only macro-level political force in the kingdom” (Hertog, 2010, 98).

In 1953 King Saud established a *Council of Ministers*, one of the fundamental institutions in Saudi Arabia's political system, responsible for drafting and overseeing state

policies ([The Embassy of the Kingdom of Saudi Arabia, 2018b](#)). The Council is formed by the Prime Minister (the king), the Deputy Prime Minister (the crown prince), and government ministers, who are either descendants of the Saud family or members of the families linked to the oil sector. The king appoints all members of the council and government, including the Minister of Justice, who administers the Shari'a courts, the second fundamental institution ([Dhanani, 1980](#)).

The kingdom never had a written constitution. In 1992, King Fahd issued a document known as the *Basic Law of Government* which provided guidelines for the organization of government. This paved the way in 1993 for the establishment of a quasi-legislative body, the Consultative Council, the third fundamental institution in the Saudi system, which has the power to draft legislation and promote it for the king's approval ([The Embassy of the Kingdom of Saudi Arabia, 2018a](#)).

Today, Saudi Arabia is considered one of the most tightly controlled political systems in the world despite having implemented some modest reforms, including the introduction of the Basic Law, the holding of municipal elections, and the enfranchisement of women. However, the king still combines legislative, executive, and judicial functions and Saudis still lack protections for the exercise of basic civil rights, including speech and association, and have limited opportunity to participate in the political process at the national level ([National Democratic Institute, 2018](#)).

In sum, the historical control of oil revenues in the hands of the royal family and its inner circle has allowed the political-economic elite to suppress domestic and foreign pressures for changes that are considered to be inimical to their interests. Thus, it is not surprising that this rich country has been consistently rated as one of the least free countries in the world by organizations such as [Freedom House \(2018\)](#) and [Polity Project](#)

(2013).

## 6.2 Argentina

### Natural Resource Endowments in Argentina

Argentina is endowed with a relatively wide variety of natural resources of which arable land is the most important. Except for oil and natural gas, exploitable mineral reserves are generally small and geographically scattered (BP, 2017). Furthermore, a wide range of nonmetallic minerals is found throughout the country (The CIA Factbook, 2018).

The area of agricultural land in the country is about 54% (World Bank, 2017) and is the source of the country's main exports, namely foodstuffs, animal, and vegetable products, which account for 63% of Argentinian exports. The rest of the exports are distributed across different industries: transportation sector (9.4%), chemical products (8.2%), and mineral products (4.4%) (MIT, 2018).

### The Emergence and Persistence of Elite Competition

During the nineteenth century Argentina experienced a large economic expansion led by the agrarian sector. Therefore, the landed elite became the key economic actor (Losada, 2007). By 1900, the country was one of the top world exporters of agricultural goods, meat, and leather (Haber, 1995), and the leading economic power in South America (Hora, 2001).

Argentina's wealth attracted immigrants from all over Europe who fueled rapid urban growth. Increasing demand for consumer goods due to the expansion of the domestic market was met through imports and growth in the domestic manufacturing sector. By 1913, manufacturing activities had become a vital component of the domestic economy,

accounting for 16.6% of GDP (Pineda, 2009).

The role of the state in creating and sustaining a profitable industrial sector was key. Since 1876 tariff protections were applied on selected products (Rocchi, 2005). By the 1930s, substantial government support of domestic industry had helped it maintain its position as the second most important sector behind the agrarian. However, it was not until the years following the Depression that a radical modification occurred with the inauguration of the industrialization by import substitution (ISI) process (Barbero & Rocchi, 2003).

The ISI period, which reached its peak in the 1940s, helped consolidate the domestic power of the industrial elite. Despite changes in the international economic context, this sector continued to expand until the mid-1970s (Barbero & Rocchi, 2003). Thereafter, liberalization of trade produced led to relative industrial decline. However, the weakened industrial elite did not disappear. Instead, it experienced transformations during the following decades and, finally, it was revitalized during the 2000s.

## **Elites and the Creation of Political Institutions in Argentina**

After decades of confrontations, national reunification was achieved in 1861 with ratification of the 1853 Constitution by Buenos Aires, enacted by the Confederation. The Constitution facilitated presidential supremacy through mechanisms such as federal intervention, but it also put in place checks and balances: the limit to presidential re-election, the control over the executive by the Congress and the Judiciary, and the latter's independence. Furthermore, the liberal principles of the Constitution made the development of an independent press possible, which closely monitored national authorities (Gallo, 1993, 98).

Between 1880 and 1916, political power was in hands of the National Autonomy Party (PAN), a party with conservative characteristics and strong linkages to the export-oriented interests of big ranchers. Its power was based on electoral fraud and the maintenance of large political clientele, especially in rural areas, which could be easily mobilized (Alonso, 1996; Botana, 1977).

As the power of the working class and industrial elite increased, the hegemonic power of the PAN began to be contested. This was reflected, first, by the creation of Radical Party (UCR), formed in 1891 by a coalition of heterogeneous social groups with competing interests, including the working class, certain groups of the industrial elite, and some sectors of the rural elite (Berensztein & Spector, 2003). Second, the passage of the 1912 law introduced universal and secret voting (Devoto, 1996).

The UCR won the 1916 election and remained in power until 1930. During this period, it accepted the emphasis on export-led economic growth but called for an overall increase in the government's role, both in providing basic services to citizens and as an economic actor (Rock, 1975). In 1930, the UCR was overthrown by members of the armed forces representing the old conservative elites. This began the cycle of military interventions in the political process that plagued Argentina until the 1980s.

In 1945, the election of Perón inaugurated a new period characterized by the expansion of labor rights and the deepening of the ISI process that further contributed to empower the industrial elite vis-à-vis the landed elite. The agricultural elite experienced a decay, especially after the centralization of agricultural commerce in the state (Gerchunoff and Llach 2007, 189).

Perón's government was overthrown in 1955 by a coalition of military factions and the export-oriented elite. They proposed a revision of the policies which they believed had

led to the creation of an over-protected industrial base that discouraged rural producers (Torre & De Riz, 1993). This lasted until the 1958 constitutional attempt to build a more highly integrated industrial structure (Torre & De Riz, 1993, 273). However, in 1962 yet another coup led by the military and the agrarian elite took power. Thereafter, a new period of attempts to restore a constitutional government began, frequently interrupted by military coups. This unrest reflected the tensions between landed and industrial interests.

After the military dictatorship (1976-1983), which benefited the rural sector to the detriment of the industrial one, democracy was restored. Since then, free elections have brought political parties into power that, at different times, have been closer either to the agrarian elite or to the industrial one. The reestablishment of democratic institutions has organized the dispute between these two actors so that they now compete by supporting different parties and candidates.

To summarize, a resource endowment with significant arable land but also including other resources gave rise to both a powerful landed elite and a number of industries. Despite its smaller size and lower economic relevance, the industrial elite was able to gain strength throughout the twentieth century, partially due to import-restricting policies. Throughout most of the twentieth century, the struggle between these two groups led to the alternation between democratic and military regimes.

### **6.3 Germany**

#### **Natural Resources in Germany's Past and Present**

Germany has significant natural resource reserves. At the earliest point of data availability, 55% of its area was agricultural land (1961) (World Bank, 2017) and 32% were

forest area (1990) (World Bank, 2017). Germany also has comprehensive coal and natural gas reserves (BP, 2017). Historically, it enjoyed access to significant iron ore supplies (Roesler, 1921, 75-86). However, peace treaties in 1918/19 meant the loss of 74.5% of the iron ore reserves (Berglund, 1919; Stolper, Häuser, and Borchardt, 1967, 74).<sup>21</sup> Germany still has extensive pig iron production (Matos, 2015).

## **The German Economy and Economic Elites: Historical Developments and Contemporary Structures**

The presence of many different natural resources contributed to a highly diversified economy. In the 19th century, agriculture gave rise to wool, linen, and cotton industries amongst others (1902 Encyclopedia, 2018; Pierenkemper and Tilly, 2004, 17-19).<sup>22</sup> The value of agricultural products and increases in agricultural productivity (Stolper et al., 1967, 21; Pierenkemper and Tilly, 2004, 29, 75-86) constituted the power base of the landed elites (Anderson, 1993; Baranowski, 1996; Carsten, 1990; Schissler, 1980).

Iron ore reserves were the foundation of a large iron and steel industry (Stolper et al., 1967, 13, 19; Pierenkemper and Tilly, 2004, 17-18, 54-57). Furthermore, coal was used to power steam engines and trains in a rapidly growing railroad network, fueling a new elite centered on transportation. However, the nationalization of the train network in the late 19th and early 20th centuries ultimately disintegrated this elite subgroup (Stolper et al., 1967, 40-42; Pierenkemper and Tilly, 2004, 56-68).

During industrialization (1850-1920), Germany had multiple economic centers that gave rise to geographically dispersed elites (Stolper et al., 1967, 14). Even within a single geographic region, like Bavaria, the business elites were often heterogeneous in terms of

---

<sup>21</sup>Its shortage became a factor during World War Two (Karl bom, 1965).

<sup>22</sup>This was also true for Alsace-Lorraine (Stolper et al., 1967, 19).

industry association (Krauss, 2016). Interests diverged significantly between sectors. For instance, in the 19th century, German trade and agricultural elites supported free trade, while the textile and steel industries lobbied for protectionism (Böhme, 1967, 219-220; Eley, 1992, 8-10).

Despite the cartelization of German industries in the late 19th and 20th centuries, conflicts of interest did not only exist between but also *within* sectors: “The history of German cartels is one of continual internal struggles. At every renewal of an expiring cartel agreement fights flared up...” (Stolper et al., 1967, 49)

The complexity of industry in Germany has steadily increased over time. Its present-day economy is highly diversified: the automotive industry, the machine industry, the chemical and medical industries, and the electronics industry are leading export sectors (CID, 2018; Braun, 1990, Ch. 13). In particular its famous *Mittelstand* businesses have been categorized as “extremely heterogeneous” (Owen-Smith, 2012, 419). A high degree of internal competition is reflected by the measure of average market concentration at 0.58 (mean = 0.89) (Ballesteros, 2016).

## **The Role of Economic Elites in the Creation and Maintenance of Power-Sharing Institutions**

Comprehensive political power-sharing institutions were created in 1871. The landed elites unified Germany, but the revolution of 1848 had shown that the rising entrepreneurial and professional middle classes enjoyed significant political mobilization potential (Budde, 2009, Ch. 4; Shorter, Edward, 1969).

Thus, the construction of the political system reflected a compromise: Even though the nobility controlled the executive, business elites were represented in parliament,

especially by the National Liberal Party which also governed with Bismarck (Craig, 1980, 62-64; O'Boyle, 1956; Wehler, 1994, 80-90). Moreover, wealthy industrialists maintained informal channels of political influence (Augustine, 1991). Thus, the Empire's political system was considered a settlement between the agricultural and entrepreneurial/professional economic elites (Eley, 1984; Rogowski, 1987; Mooers, 1991, 144). Reflecting the geographic dispersion of elites, there was also vertical political decentralization in the form of federalism.

In 1918, it appeared that Germany could become a socialist state. However, the political power of the agricultural and industrial economic elites prevented this. Shortages in food supply even meant a temporary increase in agricultural elite power (Stolper et al., 1967, 73, 111). Due to the inability of the socialist parties to challenge the power of both the agricultural and economic elites, a representative democracy with a complex system of checks and balances was maintained. It included two parliamentary chambers and a dual executive consisting of a politically powerful Chancellor and a politically powerful President.

Does the abolishment of power-sharing institutions associated with the emergence of Nazi Germany in 1933 contradict our theory? We argue that it does not. First, two exogenous shocks (hyperinflation in 1923 and the Great Depression in 1929) contributed to the end of democracy (Braun, 1990, 37-41, 64-77). Second, a subset of the economic elite was able to exert disproportionate political power. The landed elites still controlled many positions in army, bureaucracy, and politics and allowed for the National Socialists' rise (Baranowski, 1996; Stolper et al., 1967, 110-111). Additionally, certain segments of the heavy industrial elite contributed financially to anti-democratic newspapers, parties, and organizations (Requate, 2000; Wiesen, 2003, 12; Ziegler, 2000, 25; Requate, 2000,

180-181). This is compatible with our theory: elites want to gain political power by capturing state institutions and only if other elites keep them in check, will we see the maintenance of power-sharing mechanisms.<sup>23</sup>

While Germany retained a relatively complex economy throughout most of the Nazi era—with the exception of the total war economy 1943-45 (Tooze, 2008)—, the Nazis eliminated the Jewish business elite (Mosse, 1989; Ziegler, 2000, 16-18). In light of our theory, the attempts by the Nazis to homogenize the economic elite can be seen as endeavors to consolidate their authoritarian rule.

After 1945, a policy goal of the Allies was preventing the concentration of economic power in a monolithic elite—a potential threat to democracy (Kramer, 1991, Ch. 2; Stolper et al., 1967, 194-196). Furthermore, the post-war business elite mainly promoted parties that were in favor of democracy: the Christian Democratic Union (CDU) and the Free Democratic Party (FDP). Also, businessmen were generally overrepresented in the German parliament (Grünbacher, 2017, Ch. 6). Besides Germany's Social Democrats, the two parties that found the strongest support of the business elite (CDU and FDP) were crucial for the creation of a new set of power-sharing institutions (Lange, 1978; Markovitz, 2007; Morsey, 1970).

Until the present day, economic and political actors have continued their collaboration in maintaining the current political-economic system. This wide-ranging cooperation is also reflected by the classification of Germany as an ideal type of a coordinated market economy (Soskice & Hall, 2001).

To summarize, Germany has a highly diversified natural resource environment which historically gave rise to a large number of downstream industries and a diversified economic elite. Heterogeneous interests between different elites contributed to the mainte-

---

<sup>23</sup>Also note that our theory is probabilistic, not deterministic.

nance and establishment of power-sharing institutions. The regression from 1933 to 1945 can be explained by exogeneous shocks and temporary increases in the power of subsets of the elite.

## 7 Summary and Conclusion

Why do some of the wealthiest countries in the world remain authoritarian? Why is there so much institutional variation among middle-income countries? We argue that the configuration of economic elites is a crucial component to the existence of power-sharing institutions. Building on an extensive literature in political economy (Beramendi & Rogers, 2015; Berkowitz & Clay, 2011; Boix, 2015; Easterly, 2007; Engerman & Sokoloff, 1997), we posit that natural resource configurations, specifically *resource diversity*, impact intra-elite competition, which in turn shapes political institutions.

Empirically, we find a strong relationship between natural resource diversity and average market concentration. Furthermore, the predicted levels of market concentration are highly correlated with the presence and strength of various power-sharing institutions. Because our statistical analysis is based on cross-sectional data, we also explore intertemporal dynamics of elite competition and power-sharing institutions in three case studies. What are the implications of our findings? First, when explaining elite configurations, we cannot ignore environmental, geographic, and climatic factors. Natural resources and other environmental conditions can have enormous effects on social structures. Second, with respect to the emergence of democratic institutions, economic elites play a crucial role. Third, proponents of modernization theory should take the relationships between economic elites as an additional explanatory factor for political development into account.

Even though this paper has shed light on important questions of political economy, it can only be considered a small part of answering the question of how natural resources shape intra-elite competition and how elite competition affects power-sharing institutions. More refined empirical tests, ideally in subnational settings, and additional case studies need to be conducted to consolidate these insights.

## References

- 1902 Encyclopedia. (2018). *The Encyclopaedia Britannica, Ninth Edition and Tenth Edition*. <http://www.1902encyclopedia.com>, Accessed April 16th, 2018.
- Abir, M. (1987). *Saudi Arabia in the oil era: regime and elites; conflict and collaboration*. Croom Helm Ltd.
- Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *The American Economic Review*, 91(5), 1369-1401.
- Acemoglu, D., & Robinson, J. A. (2005). *Economic origins of dictatorship and democracy*. Cambridge University Press.
- Acemoglu, D., & Robinson, J. A. (2013). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Business.
- Albassam, B. A. (2015). Economic diversification in Saudi Arabia: Myth or reality? *Resources Policy*, 44, 112–117.
- Albertus, M., & Menaldo, V. (2018). *Authoritarianism and the elite origins of democracy*. Cambridge University Press.
- Alexeev, M., & Conrad, R. (2009). The elusive curse of oil. *The Review of Economics and Statistics*, 91(3), 586–598.
- Alonso, P. (1996). Voting in Buenos Aires (Argentina) before 1912. In E. Posada-Carbó (Ed.), *Elections before democracy: The history of elections in Europe and Latin America* (pp. 181–199). Springer.
- American Iron and Steel Institute. (2018). *AISI Comments on Section 232 Signing, March 8th, 2018*. [http://www.steel.org/Steel\\_org/document-types/news/2018/section-232-signing.aspx](http://www.steel.org/Steel_org/document-types/news/2018/section-232-signing.aspx), Accessed April 11th, 2018.

- Andersen, J. J., & Ross, M. L. (2014). The big oil change: A closer look at the haber–menaldo analysis. *Comparative Political Studies*, *47*(7), 993–1021.
- Anderson, M. L. (1993). Voter, junker, landrat, priest: The old authorities and the new franchise in imperial Germany. *The American Historical Review*, *98*(5), 1448–1474.
- Angrist, J. D., Imbens, G. W., & Rubin, D. B. (1996). Identification of causal effects using instrumental variables. *Journal of the American statistical Association*, *91*(434), 444–455.
- Ansell, B. W., & Samuels, D. J. (2014). *Inequality and democratization: an elite-competition approach*. Cambridge University Press.
- Augustine, D. L. (1991). Arriving in the upper class: the wealthy business elite of Wilhelmine Germany. In D. Blackbourn & R. J. Evans (Eds.), *The German bourgeoisie* (pp. 46–86). Routledge.
- Auty, R. M. (2001). The political economy of resource-driven growth. *European economic review*, *45*(4-6), 839–846.
- Ballesteros, L. (2016). Firm’s economic reliance to national markets and the corporate provision of public goods. *The Wharton School Research Paper No. 80*, <https://ssrn.com/abstract=2586580>.
- Baranowski, S. (1996). East Elbian landed elites and Germany’s turn to fascism: The Sonderweg controversy revisited. *European History Quarterly*, *26*(2), 209–240.
- Barbero, M. I., & Rocchi, F. (2003). Industry. In G. Della Paolera & A. M. Taylor (Eds.), *A new economic history of Argentina* (pp. 261–293). Cambridge University Press.
- Baum, M. A., & Lake, D. A. (2003). The political economy of growth: Democracy and human capital. *American Journal of Political Science*, *47*(2), 333–347.

- Beramendi, P., Dincecco, M., & Rogers, M. (2018). Intra-elite competition and long-run fiscal development. *Journal of Politics*.
- Beramendi, P., & Rogers, M. (2015). Geography, capacity, and inequality. *Working Paper*.
- Berensztein, S., & Spector, H. (2003). Business, government, and law. In G. Della Paolera & A. M. Taylor (Eds.), *A new economic history of Argentina* (pp. 324–368). Cambridge University Press.
- Berglund, A. (1919). The iron-ore problem of Lorraine. *The Quarterly Journal of Economics*, 33(3), 531–554.
- Berkowitz, D., & Clay, K. B. (2011). *The evolution of a nation: how geography and law shaped the American states*. Princeton University Press.
- Böhme, H. (1967). Big-business pressure groups and Bismarck's turn to protectionism, 1873–79. *The Historical Journal*, 10(2), 218–236.
- Boix, C. (2015). *Political order and inequality*. Cambridge University Press.
- Boix, C., & Stokes, S. C. (2003). Endogenous democratization. *World politics*, 55(4), 517–549.
- Botana, N. R. (1977). *El orden conservador: la política Argentina entre 1880 y 1916*. Sudamericana.
- BP. (2017). *Statistical Review of World Energy*. <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>, Accessed October 19th, 2017.
- Braun, H.-J. (1990). *The german economy in the twentieth century*. Routledge.
- Brunnschweiler, C. N., & Bulte, E. H. (2008). The resource curse revisited and revised: A tale of paradoxes and red herrings. *Journal of environmental economics and*

- management*, 55(3), 248–264.
- Brunnschweiler, C. N., & Bulte, E. H. (2009). Natural resources and violent conflict: resource abundance, dependence, and the onset of civil wars. *Oxford economic papers*, 61(4), 651–674.
- Budde, G.-F. (2009). *Blütezeit des Bürgertums*. Wissenschaftliche Buchgesellschaft.
- Burris, V. (1987). The political partisanship of American business: A study of corporate political action committees. *American Sociological Review*, 732–744.
- Business Insider. (2018). *From an unexplored desert to a 2 trillion IPO*. <http://www.businessinsider.com/the-history-of-saudi-aramco>, Accessed March 20th, 2018.
- Carsten, F. L. (1990). Der preußische Adel und seine Stellung in Staat und Gesellschaft bis 1945. *Geschichte und Gesellschaft. Sonderheft*, 13, 112–125.
- Chaudhry, K. A. (1997). *The price of wealth: Economies and institutions in the Middle East*. Cornell University Press.
- CID. (2018). *Center for International Development: The Harvard Atlas for Economic Complexity*. <http://atlas.cid.harvard.edu>, Accessed April 16th, 2018.
- Clark, G., & Jacks, D. (2007). Coal and the industrial revolution, 1700–1869. *European Review of Economic History*, 11(1), 39–72.
- CNN. (2018). *These American companies could be hurt by Trump's tariffs*. <http://money.cnn.com/2018/03/08/news/companies/companies-steel-aluminum-tariffs-list/index.html>, Accessed April 1st, 2018.
- Coppedge, M., Gerring, J., Lindberg, S. I., Skaaning, S.-E., Teorell, J., Altman, D., ... Zimmerman, B. (2017). *Varieties of democracy — v-dem [country-year/country-date] dataset v7*. <https://v-dem.net/en/>. V-Dem Project.

- Craig, G. A. (1980). *Germany, 1866-1945*. Oxford University Press.
- Devoto, F. (1996). *De nuevo el acontecimiento: Roque Sáenz Peña, la reforma electoral y el momento político de 1912*. Impresario Belgrano.
- Dhanani, G. (1980). Political institutions in Saudi Arabia. *International Studies*, 19(1), 59–69.
- Diamond, J. M. (1998). *Guns, germs and steel: a short history of everybody for the last 13,000 years*. Random House.
- Diamond, L., Hartlyn, J., Linz, J. J., & Lipset, S. M. (1999). *Democracy in developing countries: Latin America*. Lynne Rienner Pub.
- Doyle, W. (1992). *The old European order, 1660-1800*. Oxford University Press.
- Du Boff, R. B., & Herman, E. S. (2001). Mergers, concentration, and the erosion of democracy. *Monthly Review*, 53(1), 14.
- Dunning, T. (2005). Resource dependence, economic performance, and political stability. *Journal of conflict resolution*, 49(4), 451–482.
- Dunning, T. (2008). *Crude democracy: Natural resource wealth and political regimes* (Cambridge studies in comparative politics).
- Easterly, W. (2007). Inequality does cause underdevelopment: Insights from a new instrument. *Journal of Development Economics*, 84(2), 755–776.
- Eley, G. (1984). The British model and the German road: Rethinking the course of German history before 1914. In D. Blackbourn & G. Eley (Eds.), *The peculiarities of German history. bourgeois society and politics in nineteenth-century Germany* (pp. 39–158). Oxford University Press.
- Eley, G. (1992). Bismarckian Germany. In G. Martel (Ed.), *Modern Germany reconsidered, 1870-1945* (pp. 1–32). Routledge.

- Engerman, S. L., & Sokoloff, K. L. (1997). Factor endowments, institutions, and differential paths of growth among new world economies. In S. Haber (Ed.), *How Latin America fell behind* (pp. 260–304). Stanford University Press.
- Epstein, D. L., Bates, R., Goldstone, J., Kristensen, I., & O'Halloran, S. (2006). Democratic transitions. *American Journal of Political Science*, 50(3), 551-569.
- Fortune Global 500. (2018). *The Global 500*. <http://fortune.com/global500/>, Accessed March 20th, 2018.
- Freedom House. (2018). *Freedom House Index*. <https://freedomhouse.org>, Accessed March 16th, 2018.
- Gallo, E. (1993). Society and politics, 1880-1916. In L. Bethell (Ed.), *Argentina since independence* (pp. 82–111). Cambridge University Press.
- Garfias, F. (2015). Elite competition and state capacity development: Theory and evidence from post-revolutionary Mexico. *American Political Science Review* (forthcoming).
- Gerchunoff, P., & Llach, L. (2007). *El ciclo de la ilusión y el desencanto: un siglo de políticas económicas argentinas*. Emecé.
- Goldberg, E., Wibbels, E., & Mvukiyehe, E. (2008). Lessons from strange cases: Democracy, development, and the resource curse in the US states. *Comparative Political Studies*, 41(4-5), 477–514.
- Grünbacher, A. (2017). *West German industrialists and the making of the economic miracle: a history of mentality and recovery*. Bloomsbury Publishing.
- Haber, S. (1995). *Industry and underdevelopment: The industrialization of Mexico, 1890-1940*. Stanford University Press.
- Haber, S., & Menaldo, V. (2011). Do natural resources fuel authoritarianism? A reap-

- praisal of the resource curse. *American political science Review*, 105(1), 1–26.
- Hertog, S. (2010). *Princes, brokers, and bureaucrats: oil and the state in Saudi Arabia*. Cornell University Press.
- Hora, R. (2001). *The landowners of the Argentine pampas: A social and political history 1860-1945*. Clarendon Press.
- Huntington, S. P. (1984). Will more countries become democratic? *Political Science Quarterly*, 99(2), 193–218.
- International Energy Agency. (2017). *World Energy Outlook 2017*. <https://www.iea.org/weo2017/>, Accessed April 16th, 2018.
- Ippolito, D. S., & Walker, T. G. (1980). *Political parties, interest groups, and public policy: Group influence in american politics*. Prentice Hall.
- Karl, T. L. (1997). *The paradox of plenty: Oil booms and petro-states* (Vol. 26). Univ of California Press.
- Karlbom, R. (1965). Sweden's iron ore exports to Germany, 1933–1944. *Scandinavian Economic History Review*, 13(1), 65–93.
- Kimberly Process. (2016). *Diamond Production Data*. [https://kimberleyprocessstatistics.org/static/pdfs/public\\_statistics/2015/2015SemiAnnualProduction.pdf](https://kimberleyprocessstatistics.org/static/pdfs/public_statistics/2015/2015SemiAnnualProduction.pdf), Accessed February 2nd, 2018.
- Kramer, A. (1991). *The West German economy, 1945-1955*. Bloomsbury Academic.
- Krauss, M. (2016). *Die bayerischen Kommerzienräte. eine deutsche Wirtschaftselite von 1880 bis 1928*. Volk Verlag.
- Lange, E. H. (1978). Die Diskussion um die Stellung des Staatsoberhauptes 1945-1949 mit besonderer Berücksichtigung der Erörterungen im Parlamentarischen Rat. *Vierteljahrshefte für Zeitgeschichte*, 26(4. H), 601–651.

- Le Billon, P. (2001a). Angola's political economy of war: The role of oil and diamonds, 1975–2000. *African Affairs*, 100(398), 55–80.
- Le Billon, P. (2001b). The political ecology of war: natural resources and armed conflicts. *Political geography*, 20(5), 561–584.
- Levine, R., & Zervos, S. J. (1993). What we have learned about policy and growth from cross-country regressions? *The American Economic Review*, 83(2), 426–430.
- Levitsky, S., & Ziblatt, D. (2018). *How democracies die*. Crown.
- Liou, Y.-M., & Musgrave, P. (2014). Refining the oil curse: country-level evidence from exogenous variations in resource income. *Comparative Political Studies*, 47(11), 1584–1610.
- Lipset, S. M. (1959). Some social requisites of democracy: Economic development and political legitimacy. *American political science review*, 53(1), 69–105.
- Lipsky, G. A. (1959). *Saudi Arabia: its people, its society, its culture*. Hraf Press.
- Losada, L. (2007). ¿oligarquía o elites? estructura y composición de las clases altas de la ciudad de Buenos Aires entre 1880 y 1930. *Hispanic American Historical Review*, 87(1), 43–75.
- Luong, P. J., & Weinthal, E. (2010). *Oil is not a curse: Ownership structure and institutions in soviet successor states*. Cambridge University Press.
- Marcel, V. (2007). *Oil titans: National oil companies in the Middle East*. Brookings Institution Press.
- Mares, I., & Queralt, D. (2015). The non-democratic origins of income taxation. *Comparative Political Studies*, 48(14), 1974–2009.
- Markovitz, I. (2007). Constitution making after national catastrophes: Germany in 1949 and 1990. *Wm. & Mary L. Rev.*, 49, 1307.

- Matos, G. (2015). *Historical global statistics for mineral and material commodities (2015 version): U.S. Geological Survey Data Series 896*. <http://dx.doi.org/10.3133>.
- McKenzie, R. T. (1993). Civil war and socioeconomic change in the upper South: The survival of local agricultural elites in Tennessee, 1850-1870. *Tennessee Historical Quarterly*, 52(3), 170.
- Mehlum, H., Moene, K., & Torvik, R. (2006). Institutions and the resource curse. *The economic journal*, 116(508), 1–20.
- Menaldo, V. (2016). *The institutions curse: Natural resources, politics, and development*. Cambridge University Press.
- MIT. (2018). *Observatory of the Economic Council*. <https://atlas.media.mit.edu/en/>, Accessed April 16th, 2018.
- Mitchener, K. J., & McLean, I. W. (2003). The productivity of us states since 1880. *Journal of Economic Growth*, 8(1), 73–114.
- Mizruchi, M. S. (1989). Similarity of political behavior among large American corporations. *American Journal of Sociology*, 95(2), 401–424.
- Mooers, C. (1991). *The making of bourgeois Europe: absolutism, revolution, and the rise of capitalism in England, France, and Germany*. Verso.
- Morsey, R. (1970). Die Rolle Konrad Adenauers im Parlamentarischen Rat. *Vierteljahrshefte für Zeitgeschichte*, 18(1. H), 62–94.
- Mosse, W. E. (1989). *The German-Jewish economic elite, 1820-1935: A socio-cultural profile*. Oxford University Press.
- Muller, E. N. (1995). Economic determinants of democracy. *American Sociological Review*, 60(6), 966–982.
- National Democratic Institute. (2018). *Saudi Arabia*. <https://www.ndi.org/middle>

- [-east-and-north-africa/saudi-arabia](#), Accessed March 16, 2018.
- New York Times. (2018). *Saudi Aramco Public Listing May Be Delayed Until 2019*. <https://www.nytimes.com/2018/03/11/business/dealbook/saudi-aramco-public-listing-may-be-delayed-until-2019.html>, Accessed March 11, 2018.
- Nunn, N., & Puga, D. (2012). Ruggedness: The blessing of bad geography in Africa. *Review of Economics and Statistics*, *94*(1), 20–36.
- O’Boyle, L. (1956). Liberal political leadership in Germany, 1867-1884. *The Journal of Modern History*, *28*(4), 338–352.
- Olson, M. (2009). *The logic of collective action*. Harvard University Press.
- Owen, E. W. (1975). *Trek of the oil finders: A history of exploration for petroleum*. American Association of Petroleum Geologists.
- Owen-Smith, E. (2012). *The German economy*. Routledge.
- Paniagua, V. (2017). Elites, portfolio diversification, and business influence. *Paper presented at the American Political Science Association Annual Meeting 2017*.
- Pierenkemper, T., & Tilly, R. H. (2004). *The German economy during the nineteenth century*. Berghahn Books.
- Pineda, Y. (2009). *Industrial development in a frontier economy: the industrialization of Argentina, 1890-1930*. Stanford University Press.
- Polity Project. (2013). *Polity Index*. <http://www.systemicpeace.org/polity>, Accessed March 16th, 2018.
- Przeworski, A., & Limongi, F. (1993). Political regimes and economic growth. *The Journal of Economic Perspectives*, *7*(3), 51–69.
- Przeworski, A., & Limongi, F. (1997). Modernization: Theories and facts. *World politics*,

49(2), 155–183.

- Requate, J. (2000). Zwischen Profit und Politik. Deutsche Zeitungsverleger im ersten Drittel des 20. Jahrhunderts. In D. Ziegler (Ed.), *Großbürger und Unternehmer: Die deutsche Wirtschaftselite im 20. Jahrhundert* (pp. 167–186). Vandenhoeck & Ruprecht.
- Robinson, J. A., Torvik, R., & Verdier, T. (2006). Political foundations of the resource curse. *Journal of development Economics*, 79(2), 447–468.
- Rocchi, F. (2005). *Chimneys in the desert: industrialization in Argentina during the export boom years, 1870-1930*. Stanford University Press.
- Rock, D. (1975). *Politics in Argentina, 1890-1930: the rise and fall of radicalism*. Cambridge University Press.
- Roesler, M. (1921). *The iron-ore resources of Europe*. Government Printing Office.
- Rogowski, R. (1987). Trade and the variety of democratic institutions. *International organization*, 41(02), 203-223.
- Ross, M. L. (2001). Does oil hinder democracy? *World politics*, 53(3), 325–361.
- Sachs, J. D., & Warner, A. M. (1997). Fundamental sources of long-run growth. *The American economic review*, 87(2), 184–188.
- Samargandi, N., Fidrmuc, J., & Ghosh, S. (2014). Financial development and economic growth in an oil-rich economy: The case of Saudi Arabia. *Economic Modelling*, 43, 267–278.
- Schissler, H. (1980). Die Junker. Zur Sozialgeschichte und historischen Bedeutung der agrarischen Elite in Preussen. *Geschichte und Gesellschaft. Sonderheft*, 6, 89–122.
- Shorter, Edward. (1969). Middle-class anxiety in the german revolution of 1848. *Journal of Social History*, 189–215.

- Shulman, P. A. (2015). *Coal and empire: The birth of energy security in industrial america*. JHU Press.
- Smith, B. (2004). Oil wealth and regime survival in the developing world, 1960–1999. *American Journal of Political Science*, 48(2), 232–246.
- Soskice, D. W., & Hall, P. A. (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford University Press.
- Stolper, G., Häuser, K., & Borchardt, K. (1967). *The German economy, 1870 to the present*. Harcourt, Brace & World.
- The CIA Factbook. (2018). *The CIA Factbook*. <https://www.cia.gov/library/publications/the-world-factbook/fields/2111.html>, Accessed March 19, 2018.
- The Embassy of the Kingdom of Saudi Arabia. (2018a). *Basic law of government*. <https://www.saudiembassy.net/basic-law-governance>, Accessed March 14th, 2018.
- The Embassy of the Kingdom of Saudi Arabia. (2018b). *Council of ministers system*. <https://www.saudiembassy.net/council-ministers-system-0>, Accessed March 14th, 2018.
- Tooze, A. (2008). *The wages of destruction: The making and breaking of the Nazi economy*. Penguin.
- Torre, J. C., & De Riz, L. (1993). Argentina since 1946. In L. Bethell (Ed.), *Argentina since independence* (pp. 73–194). Cambridge University Press.
- Tsui, K. K. (2011). More oil, less democracy: evidence from worldwide crude oil discoveries. *The Economic Journal*, 121(551), 89–115.
- Ulfelder, J. (2007). Natural-resource wealth and the survival of autocracy. *Comparative*

- political studies*, 40(8), 995–1018.
- USGS. (2014). *US Geological Survey — 2014 Minerals Yearbook*. [https://minerals.usgs.gov/minerals/pubs/commodity/iron\\_ore/myb1-2014-feore.pdf](https://minerals.usgs.gov/minerals/pubs/commodity/iron_ore/myb1-2014-feore.pdf), Accessed April 18th, 2018.
- Washington Post. (2018). *Opinion by Charles Koch: Corporate leaders must reject Trumps tariffs*. [https://www.washingtonpost.com/opinions/corporate-leaders-must-reject-trumps-tariffs/2018/03/07/2f4bc7b2-2209-11e8-badd-7c9f29a55815\\_story.html](https://www.washingtonpost.com/opinions/corporate-leaders-must-reject-trumps-tariffs/2018/03/07/2f4bc7b2-2209-11e8-badd-7c9f29a55815_story.html), Accessed April 16th, 2018.
- Wehler, H.-U. (1994). *Das Deutsche Kaiserreich, 1871-1918*. Vandenhoeck & Ruprecht.
- Wiesen, S. J. (2003). *West German industry and the challenge of the Nazi past, 1945-1955*. University of North Carolina Press.
- World Bank. (2017). *World Development Indicators*. <https://data.worldbank.org/data-catalog/world-development-indicators>, Accessed October 19th, 2017.
- World Bank. (2018). *World Bank national accounts data, and OECD National Accounts data files - GDP per capita (current US\$)*. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>, Accessed April 16th, 2018.
- Ziegler, D. (2000). Die wirtschaftsbürgerliche Elite im 20. Jahrhundert: eine Bilanz. In D. Ziegler (Ed.), *Großbürger und Unternehmer: Die deutsche Wirtschaftselite im 20. Jahrhundert* (pp. 7–29). Vandenhoeck & Ruprecht.

## 8 Appendix

In the appendix, we present additional empirical evidence and further discuss claims that were made in the paper. In [subsection 8.1](#), we explore the role of previous elites for our theory. In [subsection 8.2](#), we provide detailed information on the dependent variables. In [subsection 8.3](#), we show the relationship between economic development and inclusive political institutions. In [subsection 8.4](#), we explain the temporal limitations of our theory and empirical predictions. In [subsection 8.5](#), we discuss potential issues of endogeneity of resource measurements with social organization. In [subsection 8.6](#), we provide information on the differences between the three measurements of resource diversity we have created. In [subsection 8.7](#) and [subsection 8.8](#), we graphically show the distribution of cases in the second and third measurement respectively. In [subsection 8.9](#), we discuss the exclusion restriction. In [subsection 8.10](#), we investigate the relationship between average market concentration and inclusive political institutions when we use the raw format of the former variable (i.e., when it is not predicted by variations in resource diversity). In [subsection 8.11](#), we show the regression results when accounting for settler mortality in addition to resource diversity. In [subsection 8.12](#), we conduct tests for weak instruments, Wu-Hausman tests, and Sargan tests to check the validity of our IV regressions. In [subsection 8.13](#), we show the direct correlation between resource diversity and inclusive political institutions, but also highlight that two-stage models are the more appropriate choice given our theory. In [subsection 8.14](#), we provide detailed numerical information on our three case studies which show cross-country differences in natural resource diversity, average market concentration, and economic complexity.

## 8.1 The Role of Previous Elites in our Theory

In some cases, like Saudi Arabia, a single and relatively monolithic elite existed prior to the discovery of natural resources (oil, in this specific case). Does this mean that Saudi Arabia was destined to be an authoritarian regime in the first place? How does the existence of previous elites affect this theory?

The fact that an elite existed prior to the discovery of reserves in oil, gas, etc. is not a factor unique to Saudi Arabia. In the vast majority of cases, there were some elites prior to the discovery of other resources. For instance, in both the European and Latin American context, much of the economy was centered on agriculture and agricultural elites were the dominant elite throughout most of pre-modern history (Doyle, 1992, Ch. 4). Similarly, in the South of the United States, agricultural elites persisted even beyond the Civil War, which had led to the abolishment of the slave economy under their control (McKenzie, 1993). However, the discovery of natural resources and their use through emerging industries gave rise to a number of new economic elite subgroups. The pre-existence of an old elite does not preclude the emergence of new groups, as many cases in which those new elites were added to and existed side by side with the nobility demonstrate (Ansell & Samuels, 2014).

In short, despite the fact that the landed elites were already present in most countries when modern industries emerged, we observe significant diversification in economic structures and the creation of new economic elite subgroups. Even though we account for the potential impact of the landed elites in our statistical analysis by including agricultural land, in the industrial age, agricultural resources are only one among many resources that can give economic power to certain groups. Accordingly, the existence of elites prior to the discovery and utilization of natural resources (such as coal, oil, gas, etc.) does not

invalidate our theory.

However, this discussion also highlights a limitation to our theory. It is only applicable to the 19th, 20th, and 21st centuries, as many of the resources of interest only gain their high economic value as a result of industrialization. This issue will be discussed in detail in a following section of the appendix ([subsection 8.4](#)).

## 8.2 Description of the Dependent Variables

In this section, we provide detailed descriptions of the dependent variables used in the empirical analyses. The descriptions are all taken from [Coppedge et al. \(2017\)](#).

**(1) Division of power index:** “Are there elected local and regional governments, and—if so—to what extent can they operate without interference from unelected bodies at the local level?” ([Coppedge et al., 2017](#))

**(2) Election Management Body (EMB) autonomy:** “Does the Election Management Body (EMB) have autonomy from government to apply election laws and administrative rules impartially in national elections?” ([Coppedge et al., 2017](#))

**(3) Political civil liberties index:** “To what extent are political liberties respected?” ([Coppedge et al., 2017](#))

Clarification: “Political liberties are understood as freedom of association and freedom of expression. Among the set of civil liberties, these liberal rights are the most relevant for political competition and accountability. The index is based on indicators that reflect government repression and that are not directly referring to elections.” ([Coppedge et al., 2017](#))

**(4) Horizontal accountability index:** “To what extent is the ideal of horizontal government accountability achieved?” ([Coppedge et al., 2017](#))

Clarification: “Horizontal accountability concerns the power of state institutions to oversee the government by demanding information, questioning officials and punishing improper behavior. This form of accountability ensures checks between institutions and prevents the abuse of power. The key agents in horizontal government accountability are: the legislature; the judiciary; and specific oversight agencies such as ombudsmen, prosecutor and comptroller generals.” ([Coppedge et al., 2017](#))

**(5) Vertical accountability index:** “To what extent is the ideal of vertical government accountability achieved?” (Coppedge et al., 2017)

Clarification: “Vertical accountability captures the extent to which citizens have the power to hold the government accountable. The mechanisms of vertical accountability include formal political participation on part of the citizens—such as being able to freely organize in political parties—and participate in free and fair elections, including for the chief executive.” (Coppedge et al., 2017)

### 8.3 Economic Development and Democratic/Inclusive Institutions

In Table 9, we show that the existence of the inclusive political institutions discussed above (subsection 8.2) is highly correlated with the level of economic development as measured by GDP per capita.

Table 9: Economic Development and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
GDP PC (Log.)	0.092*** (0.017)	0.428*** (0.067)	0.052*** (0.013)	0.293*** (0.042)	0.216*** (0.032)
Constant	-0.242* (0.137)	-2.473*** (0.548)	0.294*** (0.103)	-1.856*** (0.342)	-0.992*** (0.261)
Observations	155	163	162	163	163
R <sup>2</sup>	0.166	0.203	0.096	0.233	0.222
Adjusted R <sup>2</sup>	0.161	0.198	0.091	0.229	0.218

Note: OLS

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

## 8.4 The Temporal Limitations of Our Theory and Empirical Predictions

Many of the resources included in our analysis become economically valuable or significantly more valuable during the time period of industrialization. For example, the economic value of coal dramatically increases through the invention of the steam engine (Clark & Jacks, 2007), and the invention of the petrol engine leads to a steep increase in the value of oil.

This means that our measurement of resource diversity is a useful measurement for diversity in economic elites only beginning in the time period of industrialization (19th century). Furthermore, it fully applies only to 20th and 21st centuries economies which depend on all of the resources named above.

Could this pose any problem to our analysis? Due to the absence of time-series data with respect to most resources, our statistical analysis is cross-sectional. We measure our dependent variables exclusively based on data covering the 21st century. Our key independent variable in terms of resource diversity does not go back further than 1961. Thus, the fact that the resources only gain full relevance in the 20th century is not problematic because our empirical test is limited to the second half of the 20th and early 21st centuries. Similarly, our case studies are restricted to this time period as well.

While this does not affect our empirical test, it is important to acknowledge it as a limitation on the applicability of our theory.

## 8.5 The Potential Endogeneity of Resource Discovery and Social Organization

Berkowitz and Clay (2011, 75) argue that resource discovery may depend on social organization, especially “increases in population and the development of demand for the natural resources.”

We believe that Berkowitz and Clay are correct in their assessment that increases in population and the development of demand for the natural resources are key factors in promoting their discovery. Does this pose a major problem to our analysis? We argue that it does not. As elaborated above (subsection 8.4), the entirety of our empirical analysis is focused on the second half of the 20th century onwards. This is the era of globalization, in which we see an increasingly globalized supply and demand structure. Throughout the 20th century, natural resources have been discovered in both democratic and authoritarian countries. Due to global demand structures, incentives for their discovery have been comparably high regardless of regime type or level of development. The value of resources primarily depends on world markets and not on domestic political regimes. Therefore, we argue that for the 20th and 21st centuries, the discovery of resources is primarily determined by global economic forces.

Interestingly, Berkowitz and Clay (2011, 75) also add that “oil and mineral discoveries would not happen until the second half of the nineteenth century and often later.”<sup>24</sup> This could be a problem for a paper that is centered on developments prior to the year 1900, but as explained above (subsection 8.4), our paper is strictly temporally limited both in theory and empirical predictions.

---

<sup>24</sup>Here, Berkowitz and Clay refer to the American states, but the observation that many resource discoveries took place only in the late 19th century and afterwards can be generalized to other countries as well. However, as pointed out above, other than in the American case, in many cases the drivers of discovery were not domestic but global economic factors.

## 8.6 Resource Diversity: Details on the Alternative Measurements

As discussed in the main body of the paper, we create a total of three different measurements for resource diversity to check if our results hold across different specifications of resource diversity. The key distinction between the first measurement (Table 10) and second measurement (Table 11) is that the latter uses the most recent data on natural resources available (to the best of our knowledge). This is to show that the results hold under both conditions.

Table 10: Details on the First Measurement

	Coal	Iron Ore	Oil	Gas	Diam.	Agr.Land	For.Area
Type	Res.	Prod.	Res.	Res.	Prod.	Res.	Res.
Year	2016	2014	1980	1980	2015	1961	1990
Source	BP	USGS	BP	BP	KP	WB	WB

Table 11: Details on the Second Measurement

	Coal	Iron Ore	Oil	Gas	Diam.	Agr.Land	For.Area
Type	Res.	Prod.	Res.	Res.	Prod.	Res.	Res.
Year	2016	2014	2016	2016	2015	2014	2015
Source	BP	USGS	BP	BP	KP	WB	WB

In the third measurement, we use three additional resources and compute values of agricultural land and forest area that are relative to both the area and population size (instead of just area).

Table 12: Details on the Third Measurement

	Coal	Iron Ore	Oil	Gas	Diam.	Agr.Land	For.Area	Alum.	Copper	Pig Iron
Type	Res.	Prod.	Res.	Res.	Prod.	Res.	Res.	Prod.	Prod.	Prod.
Year	2016	2014	1980	1980	2015	1961	1990	1990	1990	1993
Source	BP	USGS	BP	BP	KP	WB	WB	Mattos	Mattos	Mattos

## 8.7 Graphs of the Second Measurement

Figure 5 and Figure 6 show the distribution of resource endowments and resource diversity in our second measurement.

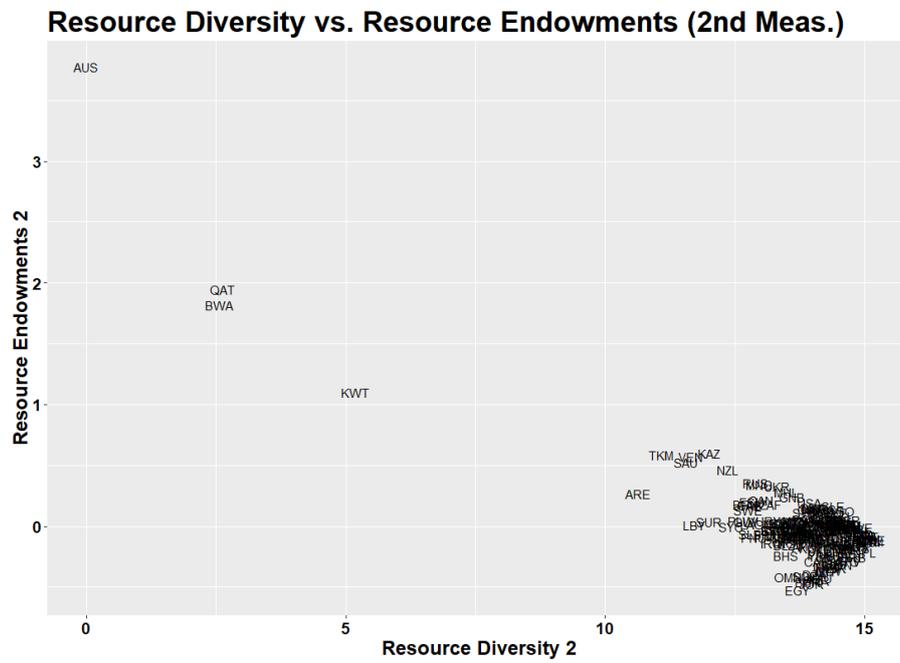


Figure 5: Scatterplot — Resource Diversity and Resource Endowments (2nd Meas.)



## 8.8 Graphs of the Third Measurement

Figure 7 and Figure 8 show the distribution of resource endowments and resource diversity in our second measurement.

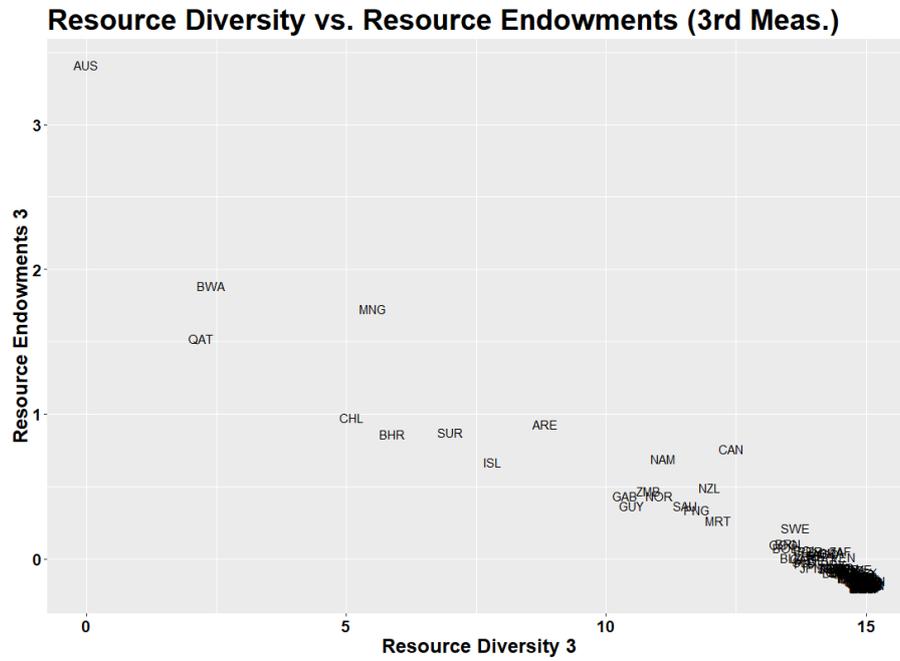


Figure 7: Scatterplot — Resource Diversity and Resource Endowments (3rd Meas.)



## 8.9 The Exclusion Restriction

The exclusion restriction is an important component of instrumental-variable regression analysis. Thus, in this section, we examine whether or not our instrument of choice meets it.

With respect to our first main covariate, GDP per capita, we make the argument that resource endowments are not a powerful predictor as there simply is no clear observable relationship between resource wealth and economic prosperity. Instead, both countries that are richly endowed in resources and poorly endowed in resources may be poor or rich or at intermediary levels of wealth. The argument that resource configurations are not directly related to levels of development is also supported by [Easterly \(2007, 769-772\)](#) who investigates the impact of agricultural endowments on economic development.

One might argue that much of the resource curse literature demonstrates that resources undermine economic development. However, our key claim is that resource *configurations*, particularly diversity, play the more important role.

To demonstrate that there is no direct observable relationship between resource configurations and GDP per capita, we also examined their correlation and found no evidence for such a relationship as shown in [Table 13](#).

Table 13: Resource Configurations and GDP PC

	<i>Dependent variable:</i>		
	GDP PC (Log.)		
	(1)	(2)	(3)
Resource Diversity 1	-0.206 (0.143)		
Resource Endowment 1	0.038 (0.665)		
Resource Diversity 2		-0.171 (0.124)	
Resource Endowment 2		-0.009 (0.576)	
Resource Diversity 3			-0.150 (0.161)
Resource Endowment 3			0.110 (0.920)
Constant	10.902*** (1.957)	10.486*** (1.701)	10.140*** (2.248)
Observations	155	182	146
R <sup>2</sup>	0.073	0.042	0.076
Adjusted R <sup>2</sup>	0.061	0.031	0.063

Note: OLS \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

With respect to our second covariate (Resource Rents), the exclusion restriction clearly is not perfectly met. Resource rents directly depend on the resources that are present within a state. The regressions including resource rents are likely to be biased for this reason.

Why did we include resource rents as a covariate nevertheless? Our goal is to demonstrate that under many conditions, resource configurations in terms of diversity and endowments are a more powerful predictor of political institutions (via market concentration) than resource rents—a measurement utilized in the resource curse literature.

Our claim is that resource rents themselves are not a good explanatory factor for political institutions as they do not take resource configurations, especially diversity, into account. Regardless, they are correlated with resource configurations (as they measure a closely related concept). Therefore, our primary concern is that resource rents partially measure our concept of resource configurations. The fact that our results still hold when

including resource rents as an additional covariate speaks to the explanatory power of market concentration and resource configurations.

## 8.10 Average Market Concentration and Democratic/Inclusive Institutions

In Table 14 and Table 15, we show that the existence of the inclusive political institutions discussed above (subsection 8.2) is highly correlated with the level of market concentration.

Table 14: Market Concentration and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Concentration	-1.257*** (0.209)	-4.890*** (0.875)	-0.651*** (0.164)	-3.211*** (0.561)	-2.142*** (0.437)
Constant	1.622*** (0.186)	5.389*** (0.780)	1.297*** (0.146)	3.375*** (0.500)	2.669*** (0.390)
Observations	146	150	149	150	150
R <sup>2</sup>	0.201	0.174	0.097	0.181	0.139
Adjusted R <sup>2</sup>	0.195	0.169	0.091	0.176	0.134

Note: OLS \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 15: Market Concentration and Democratic/Inclusive Institutions (With Controls)

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Concentration	-0.894*** (0.255)	-2.172** (1.036)	-0.263 (0.191)	-1.475** (0.636)	-0.454 (0.492)
GDP PC (Log.)	0.029 (0.021)	0.273*** (0.086)	0.031* (0.016)	0.194*** (0.053)	0.175*** (0.041)
Resource Rents (Pct.)	-0.009** (0.004)	-0.032** (0.016)	-0.006** (0.003)	-0.021** (0.010)	-0.017** (0.007)
Constant	1.133*** (0.356)	1.007 (1.441)	0.749*** (0.267)	0.421 (0.885)	-0.122 (0.685)
Observations	139	143	142	143	143
R <sup>2</sup>	0.269	0.278	0.167	0.328	0.301
Adjusted R <sup>2</sup>	0.253	0.262	0.149	0.314	0.286

Note: OLS \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

## 8.11 Settler Mortality as an Additional/Alternative Factor

[Acemoglu et al. \(2001\)](#) suggest that settler mortality is one of the most important explanatory factors when it comes to differences in the quality of political and economic institutions. Do we have to take settler mortality into account when estimating the impact of resource diversity? We believe we do. However, it is important to emphasize that the argument by [Acemoglu et al. \(2001\)](#) is fully compatible with ours. In fact, their focus on environmental factors does not contradict our perspective on the importance of resource configurations. Both settler mortality and resource diversity could have an impact on socio-economic structures and development outcomes. Below, we show that most results of our regressions do not change when we include settler mortality as an alternative explanatory factor for elite configurations. Thus, we estimate the same regressions as shown in [section 5](#), adding settler mortality as an additional instrument to directly compare its impact vis-a-vis resource configurations.

[Table 16](#) shows that the results for resource diversity measurements 1 and 3 do not change substantially when accounting for settler mortality. However, measurement 2 is no longer statistically significant. This is likely in part due to the substantially smaller number of observations (when controlling for settler mortality) and the fact that some of the most important cases (former colonial powers) are excluded from the analysis, indicating a selection bias.

Table 16: Stage 1: Resource Configurations, Settler Mortality, and Market Concentration

	<i>Dependent variable:</i>		
	Market Concentration		
	(1)	(2)	(3)
Resource Diversity 1	-0.048** (0.024)		
Resource Endowment 1	-0.209** (0.085)		
Resource Diversity 2		-0.026 (0.020)	
Resource Endowment 2		-0.143* (0.074)	
Resource Diversity 3			-0.032** (0.015)
Resource Endowment 3			-0.201** (0.079)
Settler Mortality (Log.)	0.044*** (0.011)	0.041*** (0.011)	0.032*** (0.010)
Constant	1.349*** (0.321)	1.053*** (0.275)	1.198*** (0.225)
Observations	81	81	76
R <sup>2</sup>	0.238	0.224	0.250
Adjusted R <sup>2</sup>	0.208	0.194	0.219

Note: OLS \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

The following tables (Table 17, Table 18, Table 19) show the second-stage regression results based on the predictions with settler mortality. The results are mostly in accordance with our theory and do not deviate substantially from previous regressions.

Table 17: Market Concentration (IV1 Alt.) and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV1 Alt.)	-2.017*** (0.564)	-8.673*** (2.082)	-0.735** (0.280)	-4.666*** (1.202)	-4.380*** (1.092)
Constant	2.302*** (0.495)	8.577*** (1.880)	1.361*** (0.245)	4.461*** (1.071)	4.563*** (0.976)
Observations	75	78	78	78	78

Note: IV, Robust SE

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 18: Market Concentration (IV2 Alt.) and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV2 Alt.)	-2.069*** (0.542)	-8.823*** (1.853)	-0.708*** (0.252)	-4.759*** (1.163)	-4.344*** (1.008)
Constant	2.348*** (0.477)	8.709*** (1.682)	1.338*** (0.222)	4.542*** (1.038)	4.532*** (0.903)
Observations	75	78	78	78	78

Note: IV, Robust SE

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Table 19: Market Concentration (IV3 Alt.) and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Market Conc. (IV3 Alt.)	-2.090*** (0.449)	-7.734*** (1.665)	-0.551* (0.298)	-4.572*** (1.170)	-3.849*** (0.859)
Constant	2.387*** (0.390)	7.823*** (1.487)	1.207*** (0.264)	4.407*** (1.037)	4.130*** (0.753)
Observations	70	73	73	73	73

Note: IV, Robust SE

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

## 8.12 IV Regression: Results of Diagnostic Tests

To test the appropriateness of an IV regression, we conduct a large number of tests, including tests for weak instruments, Wu-Hausman tests, and Sargan tests.

With respect to our weak instruments tests, we find that in all regressions we can reject the null hypothesis that we have a weak instrument ( $p < 0.05$ ). This indicates that we have strong instruments and is in accordance with the results of our first-stage regression analysis (Table 2).

With respect to our Wu-Hausman tests, the results vary slightly by measurement. For our first measurement, we can reject the null hypothesis (which is desirable) in 8 out of 10 regressions ( $p < 0.05$ ). For our second measurement, we can reject the null hypothesis that no endogeneity is present in 5 out of 10 regressions ( $p < 0.05$ ). For our third measurement, we can reject the null hypothesis in only 1 out of 10 regressions (and only at  $p < 0.1$ ). This indicates that our first and second instrument are consistent in most cases. However, it appears that our third measurement does not mean a major improvement over OLS in terms of consistency. This could also partially explain the weaker results we have obtained.

With respect to our Sargan tests, the results vary again by measurement. For our first measurement, we cannot reject the null hypothesis (which is desirable) in 10 out of 10 regressions ( $p < 0.05$ ). For our second measurement we cannot reject the null hypothesis in 8 out of 10 regressions ( $p < 0.05$ ). For our third measurement, we cannot reject the null hypothesis in 9 out of 10 regressions ( $p < 0.05$ ). These results indicate that our instruments are valid. The fact that we have to reject the null hypothesis in 3 out of 30 regressions could be caused by statistical noise as we would expect to reject the null hypothesis in 1.5 out of 30 cases on average when operating with the criterion  $p < 0.05$ .

## 8.13 The Direct Correlation Between Resource Diversity and Inclusive Political Institutions

In [section 5](#), we estimate the indirect impact of resource diversity on inclusive political institutions through market concentration via two-stage regression analysis. What the direct correlation looks like might be of interest. Therefore, [Table 20](#) and [Table 21](#) show the direct correlation between resource diversity and inclusive political institutions. While the results are interesting, we believe that the two-stage regression models are the more appropriate choice in light of our theory. The results presented here are merely additional information. As predicted, resource diversity is positively associated with the existence and strength of power-sharing institutions.

Table 20: Direct Correlation of Resource Diversity and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Resource Diversity	0.111*** (0.033)	0.461*** (0.136)	0.096*** (0.024)	0.172* (0.088)	0.250*** (0.067)
Resource Endowments	0.601*** (0.152)	2.354*** (0.628)	0.447*** (0.112)	0.971** (0.406)	1.202*** (0.310)
Constant	-1.024** (0.451)	-5.340*** (1.861)	-0.608* (0.332)	-1.837 (1.204)	-2.685*** (0.920)
Observations	136	142	141	142	142
R <sup>2</sup>	0.106	0.092	0.108	0.041	0.099
Adjusted R <sup>2</sup>	0.093	0.079	0.095	0.027	0.086

Note: OLS

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 21: Direct Correlation of Resource Diversity and Democratic/Inclusive Institutions

	<i>Dependent variable:</i>				
	Div. of Pow.	EMB Aut.	Pol. Civ. Lib.	Horiz. Acc.	Vert. Acc.
	(1)	(2)	(3)	(4)	(5)
Resource Diversity	0.101*** (0.032)	0.474*** (0.124)	0.091*** (0.022)	0.181** (0.077)	0.248*** (0.059)
Resource Endowments	0.497*** (0.142)	2.048*** (0.555)	0.375*** (0.101)	0.790** (0.346)	0.983*** (0.266)
GDP PC (Log.)	0.073*** (0.019)	0.391*** (0.074)	0.047*** (0.014)	0.254*** (0.046)	0.211*** (0.035)
Resource Rents (Pct.)	-0.007* (0.004)	-0.010 (0.014)	-0.001 (0.003)	-0.012 (0.009)	-0.003 (0.007)
Constant	-1.415*** (0.508)	-8.483*** (1.949)	-0.879** (0.355)	-3.860*** (1.216)	-4.274*** (0.933)
Observations	127	133	132	133	133
R <sup>2</sup>	0.279	0.310	0.215	0.312	0.336
Adjusted R <sup>2</sup>	0.256	0.288	0.190	0.290	0.315

Note: OLS

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

## 8.14 Case Selection: Numerical Details

For our case studies, we chose countries that each have substantial resource endowments, but differ significantly in terms of resource diversity, market concentration, and economic complexity. [Table 22](#) shows detailed information on resource diversity (as measured by us), average market concentration ([Ballesteros, 2016](#)), and the level of economic complexity ([CID, 2018](#)).

Table 22: Case Selection: Comparison of Relevant Variables

	Saudi Arabia	Argentina	Germany
Diversity 1	11.47	14.29	14.23
Diversity 2	11.56	14.20	14.48
Diversity 3	11.52	14.94	14.14
Avg. Market Concr.	0.81	0.79	0.58
Econ. Complex. Rank (2016)	47	59	3