Resources, Politics, Economics, and Curses: Evidence from the United States 1929-2002

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The relationships between natural resources and political outcomes and between natural resources and economics outcomes are important and difficult to examine because of the need for panel data over a long time period. This paper uses state-level data from 1929-1998 on American state natural resources, state political outcomes and state economic outcomes to address these questions. We build on related work a number of authors by using state-level panel data over a long time period with multiple measures of resources, political outcomes and economic outcomes. Preliminary results suggest that natural resources have had remarkably little effect on political outcomes, although they have had some adverse effects on economic outcomes. The main driver seems to be oil and not coal or other mineral resources.

1. Introduction

The relationships between natural resources and political outcomes and between natural resources and economic outcomes are of enormous policy interest. From the early papers by Sachs and Warner (1995, 1997), the political science and economic literatures on the resource curse have become very large.[1] Most studies have focused their analysis at the country level. Many early studies used cross-sectional identification to examine these relationships, although some recent studies now exploit time series variation to identify the relationships between resources and outcomes. [2]

This paper uses panel data techniques to examine these relationships in the U.S. context using data on natural resources and political and economic outcomes over the period 1929-1998. The analysis begins in 1929, because this is the first year for which state income per capita is available in an annual series. It ends in 1998, because there is a break in the state oil production series in that year. Our measures of natural resources include coal, oil, and total mineral resources, which includes natural gas, metals, and non-metal mineral production. Measures of politics include levels of competition in state legislatures and state gubernatorial races, and measures of economic outcomes include state income and the growth of state income.

Focusing on the United States has both benefits and drawbacks. The United States has many different states each with different resource endowments and had high quality data covering a long historical time span. The U.S. is a federal system with a single language, no barriers to internal mobility, and unified trade laws. Compared to analysis that draws on country

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[1] See literature surveys such as Van der Ploeg (2011), Frankel (2012), Deacon (2011). Clay (2011) discusses the literature as it relates to historical evidence on the resource curse.
[2] For example, see Haber and Menaldo (2011), Michaels (2011) and (2011 (2013).

level data, omitted variable bias is likely to be less of an issue, but the relevance for developing countries may be more limited.

We find that American state legislatures and governorships were remarkably unaffected by natural resources. Depending on the specification, resources sometimes increased and sometimes decreased political competition in legislatures and in gubernatorial races. Although the effects were sometimes statistically significantly positive or negative, the magnitudes were universally small. Goldberg et al (2008) in their two regressions on gubernatorial competition find small, positive and statistically significant results. We show that using lagged measures of resource dependence causes the effect to become insignificant. Although Berkowitz and Clay (2011) did not examine the effects of natural resources, our results support their findings that levels of political competition in state legislatures were remarkably persistent over the period 1866-2000. It appears that states were already on a particular path by 1929 and so were relatively immune to the effects of resources. This finding is similar to Haber and Menaldo's (2011) finding for the international context. Using panel data covering 18 countries over 1800-2006 they find that resources appear to have very little effect on political outcomes.

We find that state natural resource production as a share of state income was negatively related to per capita growth in income, but not to levels of resource income or to population growth. The primary negative effect on growth was from oil production as a share of state income and not from coal. This is in line with the recent literature focused on oil booms. Political institutions also appear to play a role in growth, although it is not clear that they are directly mediating the resource curse.

2. Resources Curses

This section reviews possible channels through which resources can affect political and economic outcomes and reviews the literature on resource curses in the U.S.

Resources and Politics

How might resources be related to institutions, particularly political institutions? In principle, influence may flow through three channels: legal influence such as lobbying and taxes paid by corporations; illegal influence such as bribery and corruption paid for by corporations; and voters. The voters may be workers or family members of workers in the natural resource sector or in sectors closely tied to natural resources. Alternatively, they may be non-employees who are influence by political campaigns supported by the natural resource sector. The channels are not mutually exclusive. In many cases, influence likely occurs through all three channels.

In the international context, Haber and Menaldo (2011, p. 4) note: "The resource curse literature claims that the causal mechanism that links natural resources to regime types is the rents captured by governments from oil, gas, and mineral production, which allow them to become "rentier states" that are financed without taxing citizens. We therefore follow Mahdavy (1970) and Herb (2005) by constructing a measure of fiscal reliance on resource revenues, the percentage of government revenues from oil, gas, or minerals."

In the United States context, Goldberg et al (2008, p. 481) argue: "The experience of the American states in the 20th century does not include full-blown dictatorships, the transformation of democracies into monarchies, the seizure of power by officials through a coup, or refusals to recognize electoral defeat. Nevertheless, we understand the logic of the resource curse argument to suggest that the flow of resources to political incumbents allows them far greater scope to prolong their hold over power. The importance of distributive politics to retaining office in democratic settings is well established, and corruption is not unknown. In fact, it would seem peculiar if political incumbents refrained from using a flow of relatively free resources to maintain their political power."

A number of papers, both theoretical and empirical, have emphasized the importance of institutions in mediating the effects of resources (Robinson et al 2006, Mehlum et al 2006). While the United States likely has more limited variation in institutions across states than is typical in the cross-country context, states have and continue to exhibit differences in institutions. In large part, this is a reflection of the political structure is Southern states that was shaped by their strong comparative advantage in producing tobacco, cotton, and rice for the export market. Berkowitz and Clay (2011) argue that initial state geographic conditions shaped political competition through the occupational homogeneity or heterogeneity of the elite. In states with more homogeneous elites, voting units (counties or townships) sent legislators with the same party affiliation to the legislature and the less competitive legislature produced rules that favored the dominant elite. In states with more heterogeneous elites, different voting units sent legislators with different party affiliations to the legislature. The more competitive legislature had to pass legislation that was acceptable to multiple parties.

The variation in baseline institutions in the United States in the early twentieth century informs our analysis. States with relatively more competition had scope for increases or decreases in political competition as a result of resource shocks. States with relatively limited competition had less scope for decreases in political competition before the 1960s, when competition began to rise in the South, although decreases are still possible.[3] Given that Southern

[3] South refers to the eleven Confederate states. Non-South refers to all other states.

states vary in their resource endowments, resource may well influence either positively or negatively the rapidity with which competition began to rise.

It is worth noting that a number of features that are important in the international context are relatively less important in the United States. States are part of a federal system and so do not experience currency fluctuations. For historical reasons, states also tend to own limited amounts of natural resources. Resources are generally either privately owned or are controlled by the federal government. In contrast, in their paper that draws on international data, Robinson et al (2006, p.449) state: "The resources we have in mind are especially those that are publicly owned such as oil, gas and other minerals. For such resources the resource rents accrue to the public sector, and the government decides how much of the resources to extract. For instance, for practically all main oil exporters this is the case." A distinct, but related issue, is how political institutions spend resource income. Inefficient expenditure is still a potential issue in the U.S. context.

Resources and Economics

How might resources be related to economic outcomes? In his 2011 survey of the literature, van der Ploeg discusses eight hypotheses. Four of these are plausibly relevant for the United States. The first is the Dutch disease hypothesis that natural resource windfalls cause deindustrialization. The second is a temporary loss in learning by doing with compositional changes in the economy. The third is that resources lead to corruption, but the extent of the effects depends on the quality of governmental institutions. The fourth is the volatility of world prices, which can harm productivity growth.

Previous work on the U.S. suggests mechanisms related to these hypotheses through which the resource curse could be operating. Papyrakis and Gerlagh (2007) and Goldberg et al (2008) both conduct analysis similar to Sachs and Warner (1997) for the United States. Papyrakis and Gerlagh (2007) present evidence that over the period 1986-2001, state resource abundance was negatively related to state growth in GDP per capita. They provide evidence on the channels through which resource abundance may be negatively affecting growth, including schooling, research and development, quality of state government institutions, investment, and openness. They find that "The schooling variable has the most significant relation to natural resource abundance at the 1% level, and resource abundance alone accounts for 17% of the variation in educational quality across different states. Interestingly, we also find a strongly significant coefficient for R&D and natural resources by themselves explain more than 11% of variation in R&D expenditures. On the other hand, the corruption channel seems to be relatively weak, since it is only significant at the 10% level." Goldberg, Wibbels, and Mvukiyehe (2008) conduct similar analysis for the American states for 1929-2002. They find negative relationships between natural resources and per capita income, a measure of very long run growth, and between natural resources and growth. James and Aadland (2011) examine U.S. counties over the period 1980-1995 and also find negative relationships between resources and growth.

Earlier historical work suggests that resource abundance was a blessing, at least at the national level. American manufacturing exports burst onto the international scene in 1890s. To evaluate the sources of American success in the export market, Wright (1990) used data for 165 manufacturing industries in six years over the interval from 1879 to 1940. He compared the inputs for industries for which the United States was a net importer with the inputs for industries for which it was a net exporter. Although the United States was exporting relatively more capital intensive and skill intensive goods than it was importing, Wright found that the differences were generally modest. For natural resources, the story was quite different. U.S. exports were much more natural resource intensive than its imports and relative resource intensity was generally rising from 1879 to 1914. In 1899, manufacturing exports were 3.5 times more natural resource intensive than imports in direct use and 1.7 times more intensive in direct and indirect use.[4] In 1914, the peak year for resource intensity, the ratios had risen to 7.4 for direct use and 2.4 for direct and indirect use. Further analysis showed that up to 1928, capital and natural resources were complements in net export performance. This finding was consistent with work by Cain and Patterson (1986), James (1983) and James and Skinner (1985) showing complementarities between capital and materials in production more broadly during the nineteenth and early twentieth centuries.

Interestingly, some of the historical patterns are evident in recent county-level analysis. For example, Michaels (2011, p. 31) finds: "In 1890 oil abundant counties were mostly agricultural and similar to other nearby counties, but after oil was discovered they began to specialize in its production. From 1940-1990 oil abundant counties developed a manufacturing sector that was smaller in terms of its share of employment, but not in terms of its absolute size. At the same time, these counties enjoyed a better-educated workforce and higher per capita income, and attracted population at a faster rate. By 1990 these advantages had diminished, but oil abundant counties still had slightly higher per capita income without suffering from worse inequality." Although it does not bear directly on how states – as opposed to counties – did, it suggests that oil was generally associated with mildly positive outcomes, even in the South.

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[4] See Wright (1990), Table 3.

Using county level data on oil and gas and coal production for rural counties over the period 1969-2011, Allcott and Keniston (2013) to investigate Dutch Disease – whether resource booms adversely affect manufacturing – in the United States. They find: "First, oil and gas booms increase growth rates in producer counties by 60 to 80 percent relative to non-producer counties, and a necessary condition for Dutch Disease is satisfied: wages increase by 0.3 to 0.5 percentage points per year during a boom. Second, however, manufacturing growth is positively associated with natural resource booms: manufacturing employment and output both rise. Third, there is little evidence that oil and gas booms significantly increase productivity."

3. **Measuring Resources, Political Institutions, and Economic Outcomes**

Resources

What is a natural resource? The original Sachs and Warner paper and many later papers, including some papers on the United States, use a broad very definition of natural resources. These definitions include both renewable and nonrenewable resources. For example, in their original papers, Sachs and Warner (1995, 1997) include exports of fuels and non-fuel primary products. The latter include beverages and tobacco; crude materials (inedible); animal and vegetable oils, fats, and waxes; and non-ferrous metals. In their study of the United States, Papyrakis and Gerlagh (2007) use "The share of the primary sector's production (agriculture, forestry, fishing, and mining) in GSP for 1986." In their study of U.S. counties, James and Aadland (2011) also use the share of primary sector's production in GSP.

On the other end of the spectrum, many papers in the international context focus solely on oil. For example, in the international context, Ross (2001, 2012) focuses on oil in his paper and book. Haber and Menaldo (2011) examine the effects of oil, total fuel production (oil, natural gas, and coal) and total resource production (oil, natural gas, coal, precious metals, and industrial metals). In United States context, Michaels (2011) uses oil and gas and Goldberg et al (2008) and Allcott and Keniston (2013) use oil and gas and coal.

In line with this latter group, we show results for oil, coal, oil and coal, and total mineral production. In 1930, total mineral production in the United States was $49.6 billion in 2010 dollars. Production includes metallic minerals (iron, gold, copper), non-metallic minerals (phosphate, clay, cement), and fuel-minerals (petroleum, coal, natural gas). By value, fuel-minerals were 62 percent. Coal and coke was the largest in value, followed closely by petroleum. By 2000, the resource production was $238 billion in 2010 dollars, and mineral fuel was 78 percent. [5]

Figure 1a shows the trends for oil, coal, the sum of oil and coal, and total mineral production as a share of gross state personal income. Oil had a very large spike in the late 1970s but returned to roughly its previous level by the second half of the 1980s. Coal has been less variable than oil and has on average been trending downward. Total minerals has been quite variable, but like coal has been trending down over time.

Figures 1b and 1c show trends for the sum of oil and coal and for total mineral production as a share of state income for the North and the South. South had greater oil and coal revenues then the North through the late 1970s, when their relative positions reversed. Strikingly the pattern is quite different for total minerals, which includes oil and coal. The South was substantially lower then the North through the mid-1940s and then was very similar to the North through the mid-1970s.

[5] Until the 1970s, natural gas was smaller than coal or petroleum. It was only in the late 1990s that natural gas surpassed petroleum products to become the most valuable of the fuel-minerals.

Tables 1A and 2A show oil and gas as a share of state GDP and total mineral production as a share of state GDP across states at 10 year intervals from 1930 to 2000. Total mineral resource production and oil and gas production varied strikingly both across states and within states over time.

Institutions

Scholars focused on the resource curse have used a variety of measures of institutions. These include aggregate measures of institutional quality such as the rule of law index (Sachs and Warner 1997) and Worldwide Governance Indicators from the World Bank, which measures six dimensions of governance (Brunnschweiler and Bulte 2008).[6] Many of the political science papers (Haber and Menaldo 2011, Andersen and Ross 2001) use the Polity political data, which characterizes the extent to which a regime is democratic or authoritarian based on "six component measures that record key qualities of executive recruitment, constraints on executive authority, and political competition."[7] In the United States context, Goldberg et al (2008) use measures of competition for state governor. Papyrakis and Gerlagh (2007) focus on prosecutions of public officials for corruption.

This paper examines the effects of resources on measures of competition for state governor and for the state legislature. While aggregate measures of institutional quality such as prosecutions of public officials for corruption or the Frasier Institute's measures of economic freedom are of interest, they tend to change slowly and the data are only available over short

[6] Sachs and Warner (1997, p. 30) describe the Rule of Law variable as "This is an index constructed by the Center for Institutional Reform and the Informal Sector (IRIS) from data printed in the International Country Risk Guide, published by Political Risk Services. This variable "reflects the degree to which the citizens of a country are willing to accept the established institutions to make and implement laws and adjudicate disputes" Scored 0 (low) -6 (high)." Brunnschweiler and Bulte (2008, p. 262) describe their variable as "Measures the quality of the bureaucracy and of public services in 1996."

[7] http://www.systemicpeace.org/polity/polity4.htm

time periods. Goldberg et al (2008) offer two measures of competition for state governor, the margin of victory in gubernatorial elections and the vote share of the incumbent party for the governorship. Margin of victory and vote share are available over long time frames, 1929-2002 for Goldberg et al, and the levels of competition change within states over time. In addition to these two measures, this paper examines the absolute value of the difference between the share of seats in the legislature held by Democrats and Republics. Berkowitz and Clay (2011) used closely related measures in their book on the relationship between initial conditions and political competition. Further, this or similar measures of political competition in legislatures have been widely used in the political science literature.

Figures 2a-2c show the trajectory of gubernatorial election gaps, incumbent party vote shares, and legislative election gaps overall and for the South and the North. All three figures show the changes in the South after the Voting Rights Act of 1965. In the South, the gubernatorial election gap fell, the gubernatorial voteshare for the incumbent party fell, and the legislative gap fell. In the North, the gubernatorial election gap increased slightly, the vote share for the incumbent party was more or less constant, and the average legislative gap fell. These figures highlight features of the data that will need to be accounted for in the estimation. Specifically, the issue is that baseline trends differ across regions – and states – in nonlinear ways.   We discuss this in the Data and Identification section.

Economic Outcomes

In addition to examining the relationship between resources and institutions, we examine the relationship between resources and economic outcomes.[8] The papers commonly examine per capita income and growth in per capita income. In the U.S. context, Papyrakis and Gerlagh (2007), Goldberg, Wibbels, and Mvukiyehe (2008), James and Aadland (2011), Michaels (2011), and Allcott and Keniston (2013) use one or both of these measures. Michaels (2011) and Allcott and Keniston (2013) use other measures, notably population. We use this measure as well.

Figures 3a and 3b show trends in per capita income and the growth rate of per capita income overall and for the South and non-South. The South was catching up to the North in per capital income over much of the period. This is reflected in the narrowing of the gap in Figure 3a and in the generally higher growth rate in the South through the 1970s in Figure 3b.

4. Data and Identification

Table 1 presents summary statistics for the sample on resources, politics, and income.

Our goal is to examine the relationship between resources and political outcomes. Our baseline model is as follows:

$$(1)\quad POLITICAL_{sy} = \beta_1\, RESOURCES_{sy} + \eta_y + \theta_s + \lambda_{1s}\, TIME + \lambda_{2s}\, TIME^2 + \varepsilon_{smy}$$

where POLITICAL is the political outcome of interest – either gubernatorial gap or legislative gap – in state *s* in year *y*; RESOURCES is the measure of resource production/GSP or resource taxes/state budget. Year fixed effects (η) mitigate biases from national changes in political competition. State fixed effects (θ) account for fixed differences in political competition that are

[8] Some papers also examine other outcomes such as education (Cabrales and Hauk 2011) or the human development index (Pineda and Rodriguez 2010). Goldberg et al (2008) discuss the importance of oil revenue for education in Texas and Louisiana. The human development index is, however, not available at the state level. While this is an interesting area for future research, it is beyond the scope of the current paper.

related to resources. State-specific quadratic time trends address underlying political trends in states and mitigate bias correlated with resources. As robustness check, we replace state quadratic time trends with state linear time trends and allow year fixed effects to differ by South and non-South. The error term (ε) is clustered at the state-level to account for time series correlation within states.[9]

A potential concern is that state political structure might influence our primary measures of resource production/GSP. In the international context, this is a potentially serious concern, because the state often owns many of the resources. In the U.S. context, the issue is mitigated by two factors. First, politicians control very few of the natural resources. Multinational corporations make most of the production decisions in response to forecasted prices in world markets. Second, levels of taxation and tax revenues have historically been fairly modest (see Table 3A).

Relationships between resources and politics may differ over time, across states with higher and lower levels of political competition, or across states with high or low resource shares. To address this, a number of specifications explore differences in the effects of resource over time, where EARLY is defined by whether the year is before 1965 (1) or from 1965 on (0), and across states with different levels of competition. Although some states within the North have lower competition than some states within the South, the simplest approach is to divide states based on whether they are located outside the SOUTH (0) or in the SOUTH (1), where South is defined as the 11 Confederate States. As discussed earlier, any potentially negative effects of resources on politics are constrained in the early period in the South by the fact that the

[9] The unweighted estimates are qualitatively similar (results available upon request).

baseline level of political competition is low. HISHARE is defined by whether the state's maximum share over the series was lower than 5 percent (0) or 5 percent or higher (1).

(2a) $POLITICAL_{sy} = \beta_1 \text{ EARLY x } RESOURCES_{sy} + \eta_y + \theta_s + \lambda_{1s} \text{ TIME} + \lambda_{2s} \text{ TIME}^2 + \varepsilon_{smy}$

(2b) $POLITICAL_{sy} = \beta_1 \text{ } SOUTH_s \text{ x } RESOURCES_{sy} + \eta_y + \theta_s + \lambda_{1s} \text{ TIME} + \lambda_{2s} \text{ TIME}^2 + \varepsilon_{smy}$

(2c) $POLITICAL_{sy} = \beta_1 \text{ } HISHARE_s \text{ x } RESOURCES_{sy} + \eta_y + \theta_s + \lambda_{1s} \text{ TIME} + \lambda_{2s} \text{ TIME}^2 + \varepsilon_{smy}$

5. Results

Resources and Political Outcomes

We start by replicating the two gubernatorial regressions from Goldberg et al (2008) and showing that the results are sensitive to the specification. This is not an issue specific to their paper. Results in many of the papers in the literature are sensitive to measures of natural resources and estimation technique. We then explore the relationship between resources and different political outcomes.

Column 1 of Table 2 replicates Goldberg et al's (2008) result that resource intensity is positively and statistically significantly associated with gubernatorial outcomes. The winnergap is the gap in vote share between the winner and the second place candidate (of either party). The incumbent party vote share is another measure of political competition for the governorship. Our results in columns 1a and 1b match theirs nearly exactly. Although the coefficient on resource intensity is positively and statistically significantly associated with gubernatorial outcomes, the effect is small. A one standard deviation increase in resources yields a 0.09 standard deviation increase in Winnergap.

Column 2 shows that the results are sensitive to the time over which resource intensity is measured. Note that resource intensity was measured in the same period as the political outcomes in the original regressions. Yet it seems unlikely that increases or decreases in resource intensity would have a significant role in the year of the race. One might instead think that rising (or falling) resource intensity would affect politics with some lag, as companies began to invest in political influence. Given that political cycles are four years, the natural lags are either four or eight years. In columns 2a and 2b, the contemporaneous measure is replaced with the average intensity of resources over four years. The coefficients are positive but no longer not statistically significant.

Columns 3-6 successively modify the original Goldberg specification from column 1 and show that many modifications cause the relationship between resources and gubernatorial outcomes to become insignificant. Columns 3a and 3b drop the variables from columns 1a and 1b that should be captured by the state fixed effects, because they are not time varying. Columns 4a and 4b include state quadratic time trends to capture changes in political competition over time that are unrelated to resources. The coefficient on resource dependence becomes negative and not statistically significant. Columns 5a and 5b drop the contemporaneous income and growth variables, since they imply that income and growth cause political competition. This has very little impact on the coefficients on resource dependence, probably because state fixed effects and time trends are capturing underlying trends. Columns 6a and 6b drop winner lagged voteshare, which was positive and significant in previous specifications. This reduces the fit, and the coefficients on resource dependence remain negative and not statistically significant.

Columns 7 and 8 return to the issue of the timing of resource dependence from column 2. As in column 6, the effects of resources are small and not statistically significant.

Table 3 shows that the results for gubernatorial elections are also sensitive to whether the resources are measured as shares of GDP or in constant dollars. Column 1 is the same as column 7 in Table 2. The following columns examine separately the effects of coal and oil as shares of state income and the effect of the real value of coal and oil in 2010 dollars. Similar to the sum of the two, the individual effects of coal and oil as shares of state income on gubernatorial outcomes in columns 2 and 3 are negative, small and statistically insignificant. Interestingly, in columns 4a and 4b the log of the value of coal and oil is positively and statistically significantly related to gubernatorial outcomes. More money in coal and oil is associated with less competitive gubernatorial elections, specifically larger winner gaps and larger incumbent party vote shares. The effects are somewhat sizeable. A one standard deviation increase in the log of coal and oil income is associated with a 0.4 standard deviation increase in the winner gap and in the incumbent vote share. In Columns 5 and 6, the values of coal and oil are not individually statistically significantly related to gubernatorial outcomes.

Table 3A in the appendix demonstrates that the results are not sensitive to the inclusion or exclusion of Alaska and Hawaii. Unlike the other states, these two states enter the data in 1960. Alaska has extremely high oil revenues, far higher than any other state.

Table 3B in the appendix shows the results are similar to alternative non-quadratic specifications. It presents results from a specification with state fixed effects, state linear time trends and year fixed effects, where the year fixed effects differ in the South and non-South. The log of average of oil and coal revenues over the previous four years is no longer statistically significant, but the log of average of just coal revenues over the previous four years is statistically significant. A one standard deviation increase in LnCoal4 yields a 0.14 standard deviation increase in winner gap and a 0.47 standard deviation increase in incumbent party vote share.

Table 4 is identical to Table 3, but the dependent variable is now the legislative gap. In the top panel, resource income is negatively and significantly related to the value of oil and coal production as a share of state income and to oil as a share of state income. Thus, resources appear to increase legislative competition (decrease the gap). The bottom panel shows that the results are sensitive to the inclusion or exclusion of Alaska and Hawaii.

Table 4B in the appendix shows alternative non-quadratic specifications. It presents results from a specification with state fixed effects, state linear time trends and year fixed effects, where the year fixed effects differ in the South and non-South. In this specification, coal seems to increase the legislative gap (decreases competition), while oil decreases the legislative gap (increases competition).

Table 5 explores whether there are heterogeneous treatment effects associated with being a Southern state, the time period being early (before 1965) or late (1965 onward), and whether a state is a high resource state, where high was defined by the state natural resource share of income reaching 5 percent or more in at least one period. Eighteen states meet this criterion. Given the sensitivity of the legislative results to the inclusion or exclusion of Alaska and Hawaii, they are excluded in this table. Being a southern state and being an early or later time period does not appear to change the effects. Being a high or low resource state does, however, have an effect. For low resource states, greater resources are associated with lower gubernatorial gaps, although the coefficient is not statistically significant. In contrast, for high resource states, there appears to be no effect. That is, the differential effect is approximately the same as the main effect, but of the opposite sign. The two effects sum to zero.

In sum, in contrast to Goldberg et al's findings that resources decreased gubernatorial competition, we find resources had very small and mixed effects on political institutions over the period 1929-1998. The effects depend on whether one is studying the legislature or the governorship and are quite sensitive to the specification, the measurement of the resource variable, and to the inclusion or exclusion of Alaska. Our interpretation, in line with Berkowitz and Clay (2011), is that American state political institutions are remarkably persistent. With the possible exception of Alaska, booms and busts in resources seem to have had very little effect on political outcomes.

Resources and Economic Outcomes

Table 5 shows that resources appear to be related to growth in income, but not income itself. In Columns 1-3 measures of resources are unrelated to log of per capita income. Column 4 indicates that resource dependence as a share of state income is negatively and statistically significantly related to growth in per capita income. The magnitude of the effect of resources on income growth is modest. A one standard deviation increase in resource dependence yields a 0.0 standard deviation decrease in income growth. Column 5 suggests that coal may have a greater effect than oil on income growth. In column 6, growth is not, however, statistically significantly related to the levels of resource income.

Table 7 evaluates the robustness of the findings in column 4 of Table 6 that oil and coal is a resource curse for growth. Column 1 replicates column 4 from Table 6. Column 2 drops states with zero resource dependence; column 3 drops Alaska and Hawaii; and column 4 drops Alaska, Hawaii, and states with zero resource dependence. Column 5 drops Alaska and Hawaii and uses linear state time trends and year effects that differ between the South and non-South, and column 6 drops states with no resources from the specification in column 5. The magnitudes of the effects of resources on income growth remain generally modest. A one standard deviation increase in resource dependence yields a 0.06-0.24 standard deviation decrease in income growth.

Table 8 explores the extent which resource curse varies for states with high resource dependence, Southern states, and early changes in resources to have different relationships between resources and income growth. Column 1 replicates column 4 from Table 7. In columns 2-4, high resource dependence, Southern states, and early changes in resources do not have statistically significant differential effects. It is worth noting that the point estimates are large and of opposite sign for states with low and high resource dependence. Column 5 allows coal and oil to have different effects income growth. The primary negative effect on growth appears to come from oil. Columns 6-8 follow columns 2-4 in allowing heterogeneous treatment effects. They offer a couple of insights. In column 5, for coal, the effect on income is positive for low resource states and zero for high resources states. In column 7, coal appears to have had a net positive effect in the South, while elsewhere it had a negative and insignificant effect. Otherwise the differential effects are not statistically significant.

Table 9 investigates one way on which the resource curse may be mediated by institutions. The legislative gap is included both individually and interacted with resources. The coefficient on legislative gap is negative and significant, indicating that less legislative competition is associated with slower growth in per capita income. The coefficients on the interaction between legislative gap and resources in columns 3 and 4 are not, however, statistically significant.

Table 10 examines population growth. Columns 1-4 show that resources may be positively related to population growth, under some conditions. The results are sensitive to the inclusion of Alaska, Hawaii. All remaining columns exclude Alaska and Hawaii. Columns 5-10 address the issue of heterogeneous treatment effects. Interestingly, population growth appears to have been higher in the non-South and lower in the South (column 6) and higher in places with more coal, although not early (before 1965) (column 10).

6. Discussion and Conclusion

This paper examined both the political and the economic resource curse in the context of the United States. In the political realm, we found very little evidence of a resource curse on gubernatorial or legislative elections. This is in line with other evidence in the U.S. context, notably Berkowitz and Clay (2011), suggesting that levels of legislative competition are remarkably persistent. In the economic realm, we find considerable evidence of a resource curse. Our results are in line with the previous literature. Although their estimation strategy differed from ours, Papyrakis and Gerlach (2007), Goldberg et al (2008), and James and Aadland (2011) all found resource curses too. In the spirit of Brunnschweiler and Bulte (2008), we find some evidence that institutions also play a role in growth, although the extent to which they are mediating growth is unclear.

Interestingly, two recent studies at the county level find little evidence of resource curses. Using county level panel data for Southern states, Michaels (2011) finds: "In 1890 oil abundant counties were similar to other nearby counties …. From 1940–90 oil abundance increased local employment per square kilometre especially in mining but also in manufacturing. Oil abundant counties had higher population growth, higher per capita income and better infrastructure." Allcott and Keniston (2013), use national data on rural counties over the period 1969-2011. They find "oil and gas booms increase growth rates in producer counties by 60 to 80 percent relative to non-producer counties, and a necessary condition for the resource curse is satisfied: local wages increase by 0.3 to 0.5 percentage points per year during a boom. Nevertheless, manufacturing growth is positively associated with natural resource booms. Manufacturing employment and output both rise, while productivity does not, suggesting that at least in the rural counties we study, manufacturing firms benefit from increases in local demand."

In contrast, at the state level over a longer time frame and using a national sample, we find negative effects on per capita growth in income and generally positive but insignificant effects of resources on population. While we find evidence of a resource curse at the state level, this is not inconsistent with Southern or rural counties with resources experiencing growth during resource booms, relative to comparison counties. Clearly more work remains to be done to understand the causes of the resource curse at different levels of geography and over different time periods.

Figure 1a: Trends in Resources

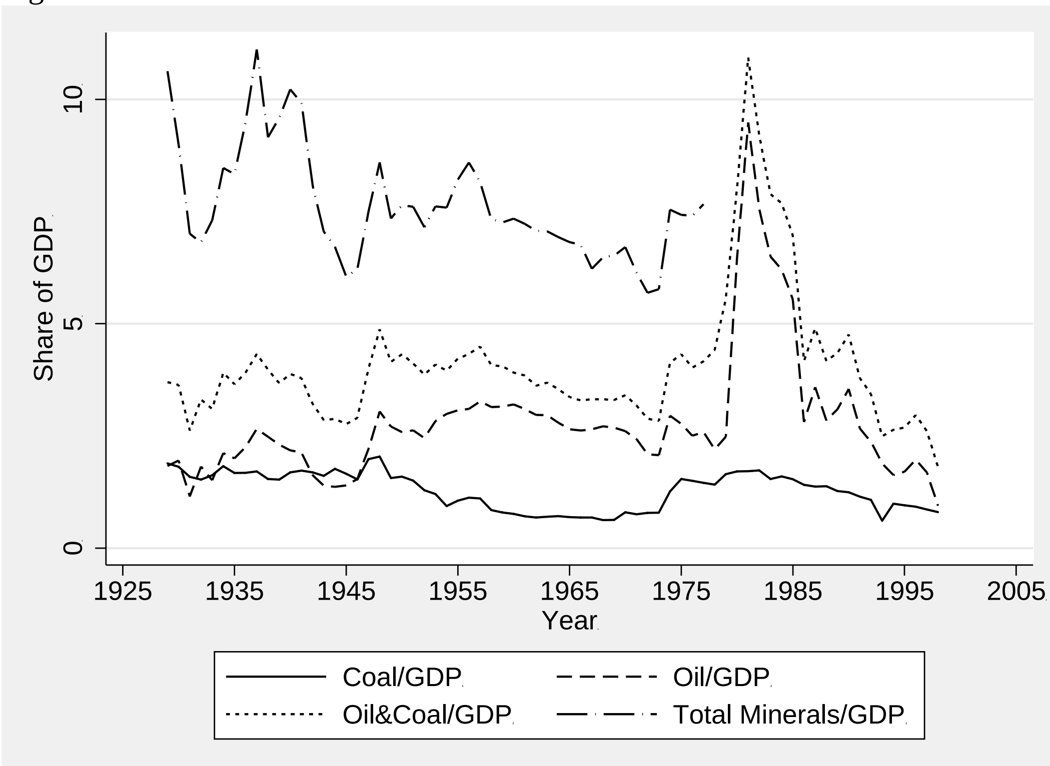

Figure 1b: Oil and Coal

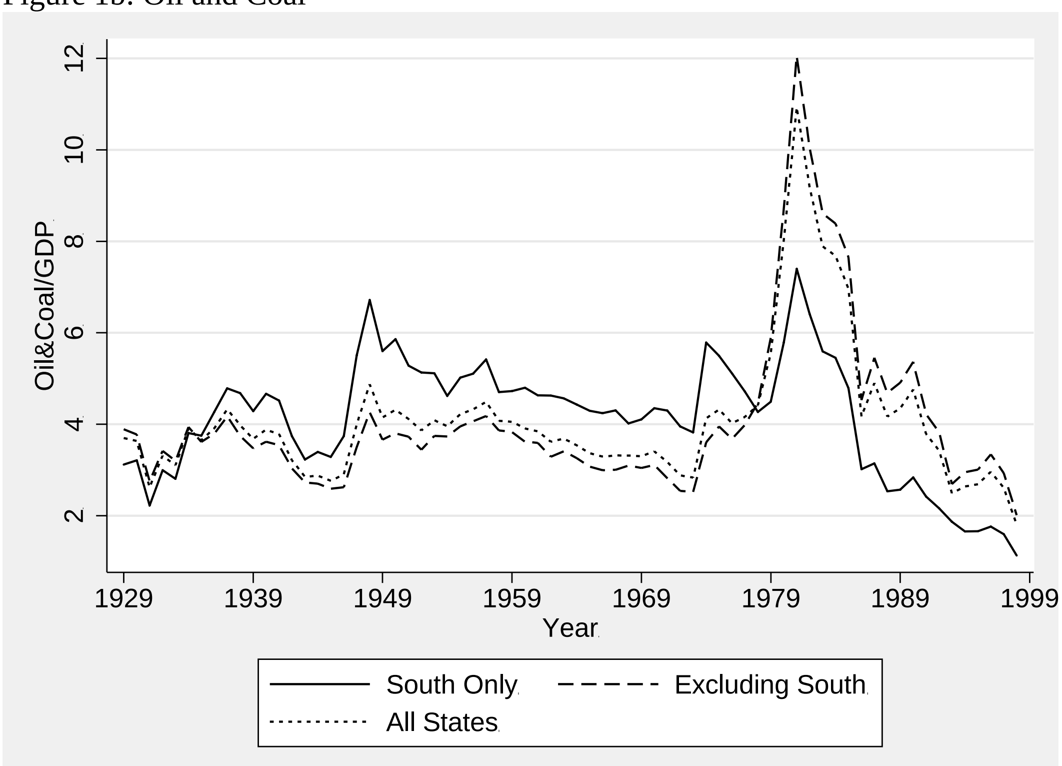

Figure 1c: Total Minerals

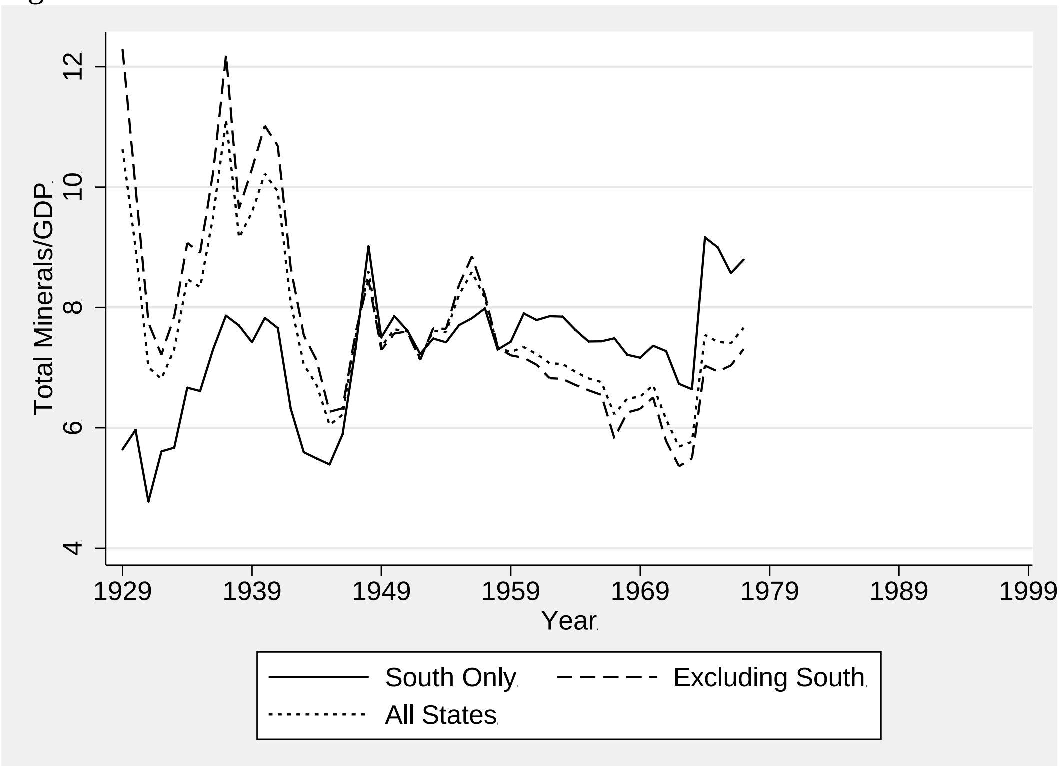

Figure 2a: Average Gap Between First and Second Place Candidates in Gubernatorial Election, 1929-1998

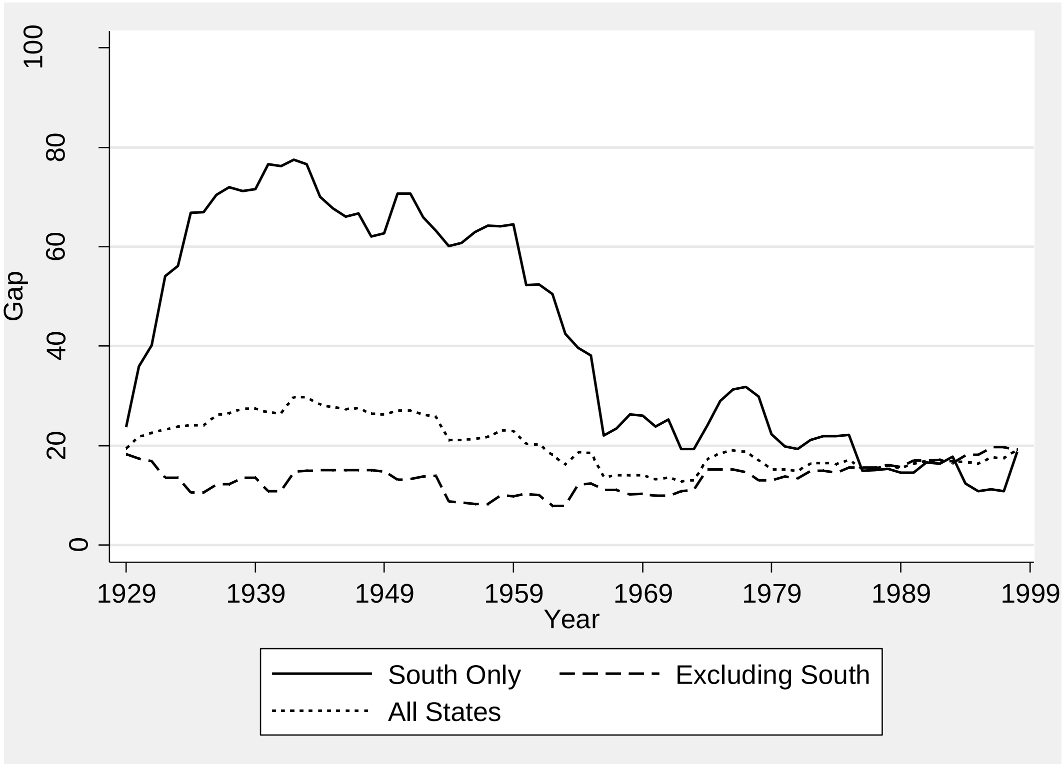

Figure 2b: Average Gubernatorial Election Voteshare For Incumbent Party, 1929-1998

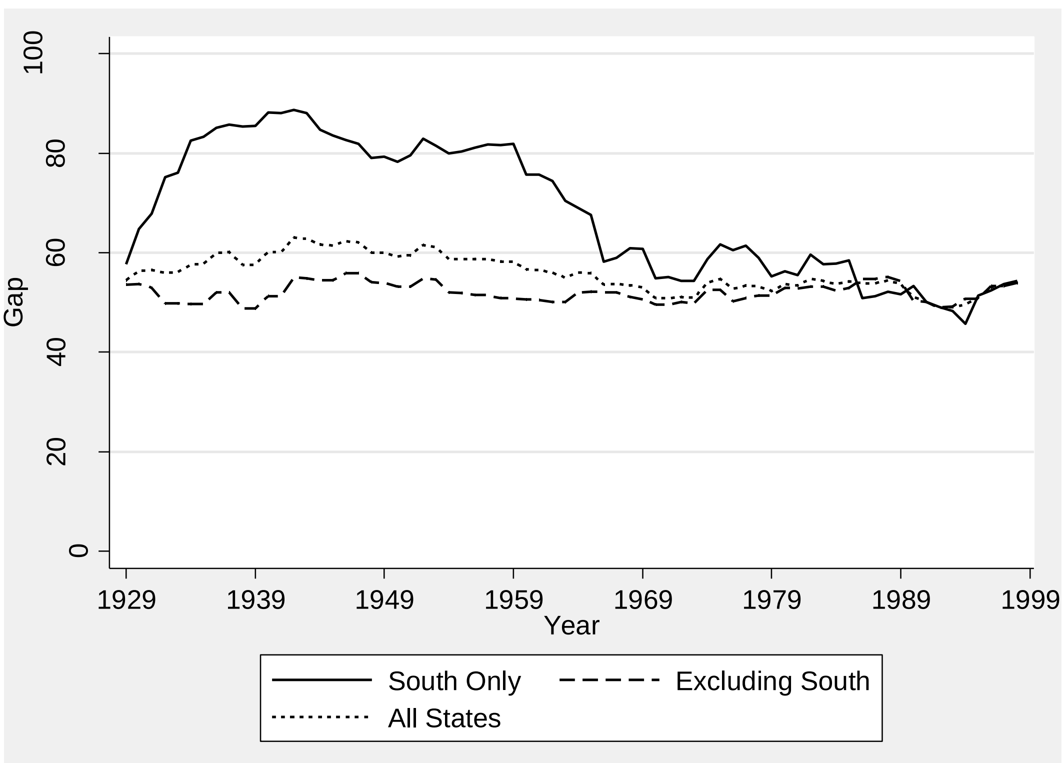

Figure 2c. Average Legislative Gap, 1929-2002

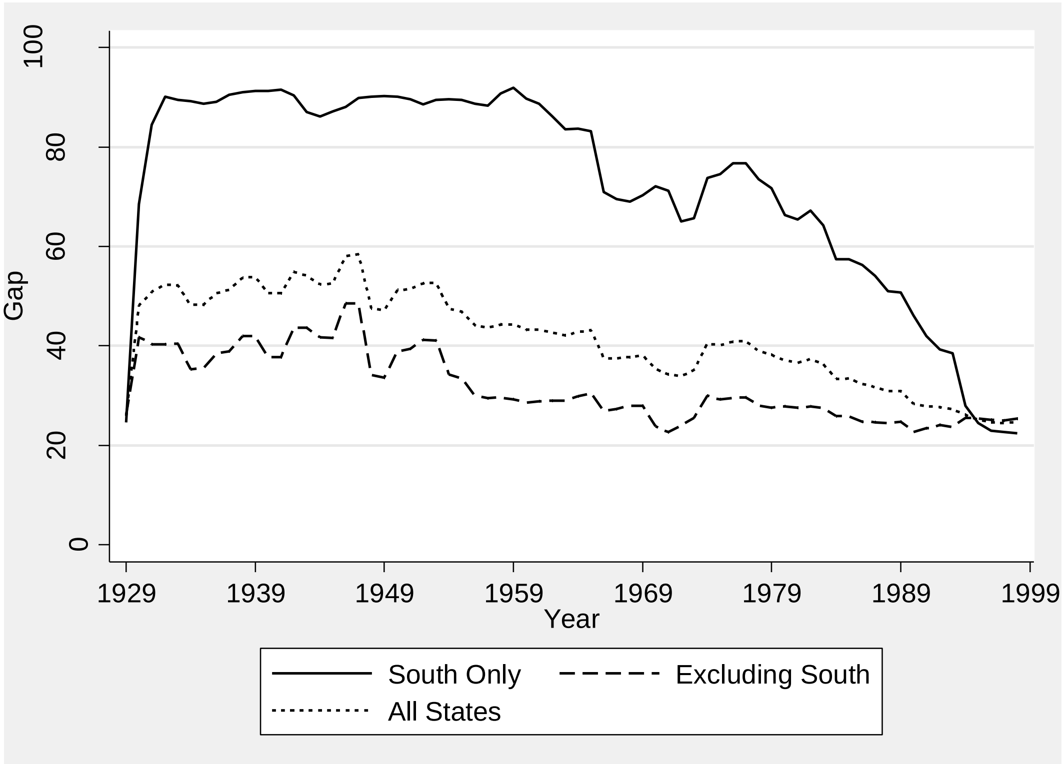

Figure 3a: Income Per Capita, 1929-1998

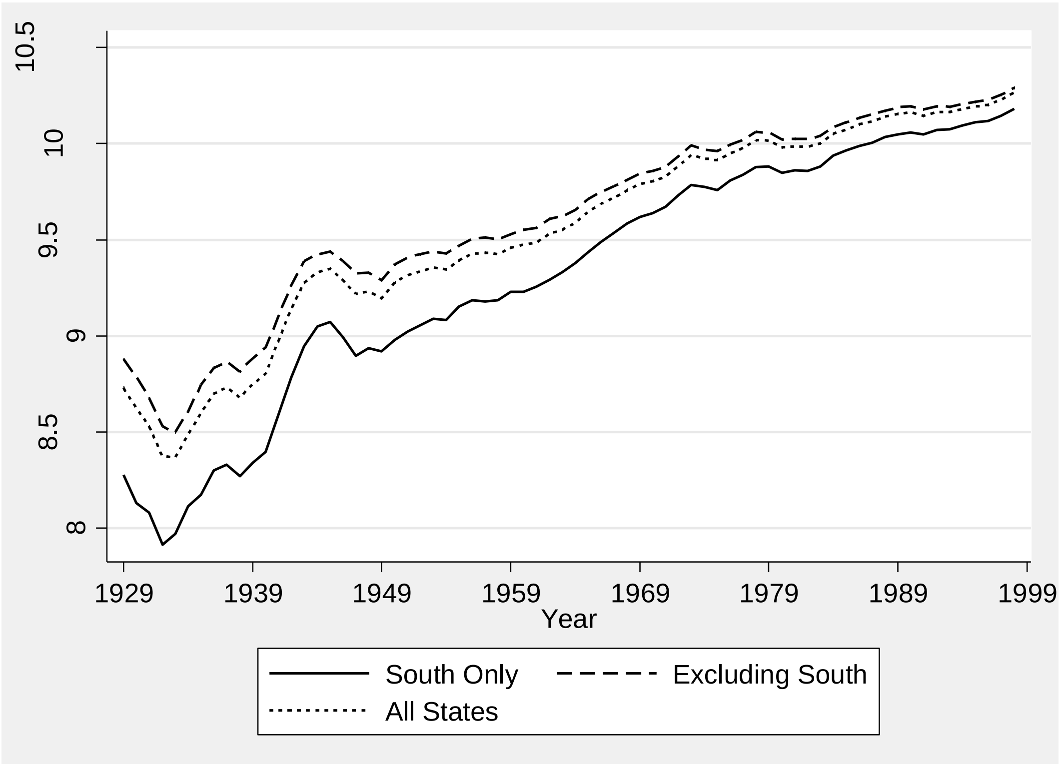

Figure 3b: Growth in Income Per Capita, 1930-1998

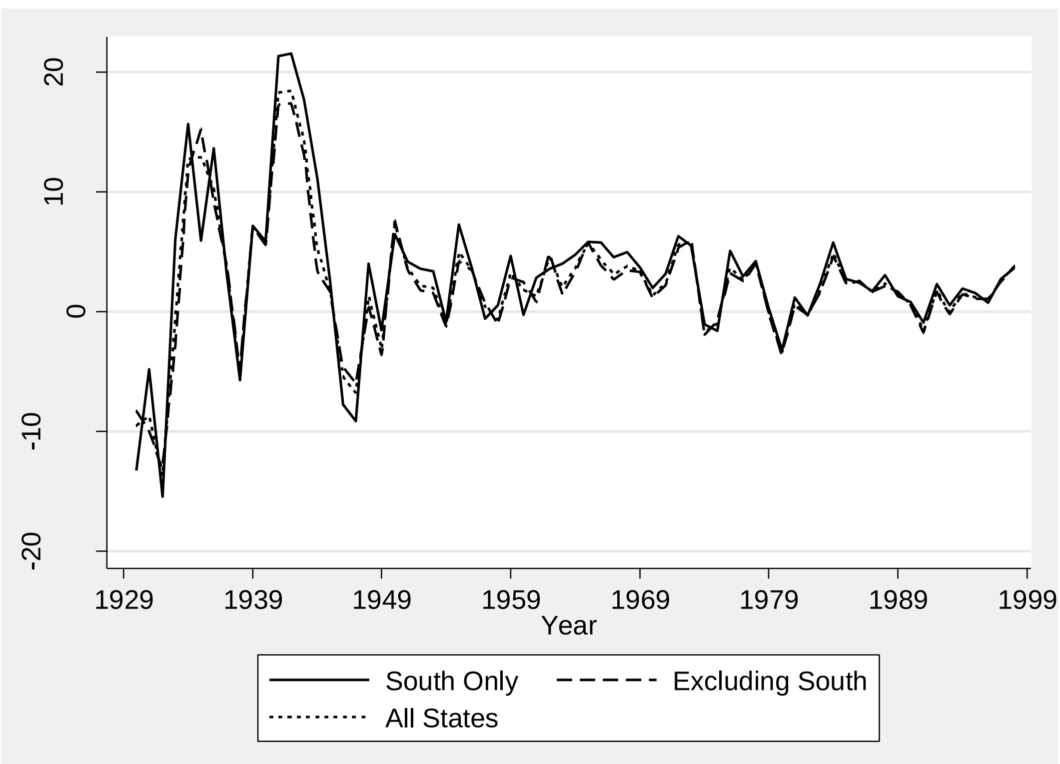

Table 1: Summary Statistics

	(1) N	(2) mean	(3) sd	(4) min	(5) max
WinGap	1,093	20.10	22.72	0.00730	100
VoteSh	1,090	55.95	14.28	0	100
Legislative Gap	1,623	40.18	30.00	0	100
Pcigrowth	3,408	2.411	6.958	-34.41	71.28
Lnpcincome	3,458	9.550	0.580	7.447	10.64
Popgrowth	2,950	0.140	0.146	-0.804	1.036
Slavesh1860	3,500	9.876	17.32	0	57.20
ColonizerNE	3,500	0.560	0.496	0	1
WinLagVote	1,087	55.23	15.05	0	100
OilCoal4/GSP	3,235	4.177	10.81	0	171.3
Coal4/GSP	3,250	1.284	4.099	0	38.61
Oil4/GSP	3,250	2.902	9.466	0	168.9
HighNR	3,500	1.367	0.482	1	2
South	3,500	0.240	0.427	0	1
Early	3,500	0.514	0.500	0	1

Table 1A: Oil and Gas as a Share of State GDP at 10 Year intervals, 1930-2000

Oil and coal production as a share of GDP (2010 Dollars)

	1930	1940	1950	1960	1970	1980	1990	2000
Alabama	4.478765	4.509615	3.221741	2.223726	1.789438	4.350365	2.590909	0.884071
Alaska	N/A	N/A	N/A	N/A	15.93201	134.7568	94.42593	49.08359
Arizona	0.012811	0	0.002603	0.006348	0.154702	0.376936	0.161036	0.090648
Arkansas	5.326516	5.239739	5.265042	3.451164	0.960701	2.581336	0.659364	0.34358
California	5.397112	3.717278	3.559211	1.692029	0.980306	2.992126	0.959695	0.616239
Colorado	3.828225	2.95995	4.025974	3.870588	1.241379	3.365854	1.723195	0.740132
Connecticut	0	0	0	0	0	0	0	0
Delaware	0	0	0	0	0	0	0	0
Florida	0	0	0.026961	0.0105	0.02672	0.670097	0.220123	0.027398
Georgia	0.002016	0.094982	0	0.000314	0	0.011031	0	0
Hawaii	N/A	N/A	N/A	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0
Illinois	1.669128	4.079794	2.5	1.52071	0.906198	1.847518	0.903293	0.266201
Indiana	1.670547	1.802105	1.816594	0.940718	0.638593	1.576724	0.948722	0.371589
Iowa	0.820144	0.634731	0.17363	0.067559	0.009709	0.044385	0.009622	0
Kansas	6.84825	9.879969	10.20144	7.085683	3.357496	8.789746	2.888929	1.333252
Kentucky	10.26738	10.59445	14.47982	6.909385	7.290123	14.00893	7.881841	3.264948
Louisiana	3.495737	12.47788	18.51528	22.89474	27.05224	25.12077	14.25956	3.066286
Maine	0	0	0	0	0	0	0	0
Maryland	0.317109	0.245818	0.081467	0.037521	0.045075	0.225472	0.082581	0.058031
Massachusetts	0	0	0	0	0	0	0	0
Michigan	0.23518	0.608666	0.392212	0.242017	0.097727	0.831776	0.255422	0.079553
Minnesota	0	0	0	0	0	0	0	0
Mississippi	0	1.897019	5.273438	5.416667	3.320144	4.19598	1.683438	0.917374
Missouri	0.440344	0.32392	0.219256	0.136042	0.109549	0.244541	0.027033	0.002651
Montana	4.259899	3.399569	2.687792	5.285756	4.456366	12.84007	6.306358	3.751918

Nebraska	0	0.174978	0.15957	2.284946	0.629214	1.31017	0.453258	0.173747
Nevada	0	0	0	0.009348	0.015354	0.020956	0.006875	0.000647
New Hampshire	0	0	0	0	0	0	0	0
New Jersey	0	0	0	0	0	0	0	0
New Mexico	10.75779	17.81394	14.5098	17.14662	13.32143	18.90749	9.078201	6.437672
New York	0.075745	0.099346	0.056872	0.01798	0.006062	0.010086	0.002315	0
North Carolina	0.010784	0	0	0	0	0	0	0
North Dakota	1.306781	1.133435	0.920351	5.68455	3.933928	22.42373	10.18182	7.360466
Ohio	0.993789	0.949092	1.207285	0.634618	0.674396	1.469136	0.580488	0.323392
Oklahoma	32.93787	19.14636	17.13333	12.84001	8.180332	15.67183	5.149218	2.644269
Oregon	0	0	0.000333	0	0	0	0	0
Pennsylvania	3.604774	7.497035	5.956451	2	1.472671	2.484015	0.929432	0.496636
Rhode Island	0	0	0	0	0	0	0	0
South Carolina	0	0	0	0	0	0	0	0
South Dakota	0.012222	0.037921	0	0.028889	0.017046	0.393187	0.326192	0.168941
Tennessee	0.992233	1.217585	0.807658	0.368676	0.328266	0.695015	0.224526	0.049975
Texas	12.06203	17.60592	20.4237	14.74138	10.05155	15.22215	5.52177	2.28624
Utah	4.172662	2.978014	3.714984	7.40708	2.788235	6.728261	4	1.758497
Vermont	0	0	0	0	0	0	0	0
Virginia	1.892157	2.396342	2.32389	1.596308	1.399536	2.611647	1.039134	0.386444
Washington	0.72415	0.45603	0.142269	0.024779	0.003281	0.10198	0.046323	0.020663
West Virginia	27.44845	30.8301	35.99651	20.09694	21.18709	26.90704	18.63675	10.27897
Wisconsin	0	0	0	0	0	0	0	0
Wyoming	28.48276	21.56566	31.51832	44.91558	38.02269	66.99187	45.82609	25.27027

Table 1B: Total Mineral Production as a Share of State GDP at 10 Year intervals, 1930-2000

Table 1C: State Revenue from Natural Resources Per Capita (2010 dollars)

State Revenue from Natural Resources Per Capita (2010 dollars)							
	1942	1950	1960	1970	1980	1990	2000
Alabama	2.140798	2.748377	3.59508	3.664462	22.05703	25.05959	27.07041
Alaska	.	.	136.2096	353.2954	3351.327	3386.137	1549.057
Arizona	0.025224	0.135978	1.413081	0.413906	1.952194	0.079273	0.022443
Arkansas	6.191599	15.93855	21.34999	12.71407	21.17509	11.66521	7.432336
California	2.284061	3.280327	1.827439	1.324047	5.563123	3.965821	2.87906
Colorado	1.145464	10.82198	25.98516	10.53806	48.0184	25.70899	21.86639
Connecticut	0	0	0	0	0	0	0
Delaware	0	0	0	0	0	0	0
Florida	0	0.09668	0.063346	0.2297	32.93987	8.755669	4.484808
Georgia	0	0	0	0	0	0	8.51E-06
Hawaii	.	.	0	0	0	0	0
Idaho	8.211241	2.208396	1.897543	3.726598	1.35E+01	4.063617	5.633807
Illinois	0.674126	0	0	0	0	0	0.035929
Indiana	0	0.700803	0.556003	0.34799	0.762761	0.227509	0.097265
Iowa	0	0	0	0	0	0	0
Kansas	1.212404	1.23792	1.827391	1.959443	2.229818	59.14567	29.81166
Kentucky	0.148271	0.388628	0.861836	0.33292	128.1522	96.78852	53.42223
Louisiana	74.93786	175.5716	309.9902	387.0745	330.8133	175.5989	114.0448
Maine	0	0	0	0	0	0	0
Maryland	0	0	0	0	0	0	0
Massachusetts	0	0	0	0	0	0	0
Michigan	1.434501	1.318481	0.744834	0.620224	12.44815	8.309629	5.820137
Minnesota	51.36074	49.02197	31.29191	27.99192	54.19925	0.791499	0.593212
Mississippi	2.082717	25.35512	36.37241	36.15746	55.17153	29.64304	13.07321

Missouri	0	0	0.049352	0	0.024763	0.011412	0.22367
Montana	21.81039	24.79062	51.09966	62.03589	351.7788	242.3428	148.2905
Nebraska	0.000205	0.016862	7.069082	2.905387	5.279914	3.019408	1.23726
Nevada	8.007219	12.13082	5.297596	5.601651	23.8544	44.63552	19.95331
New Hampshire	0	0	0.942906	0.540131	0.89383	0.239203	0
New Jersey	0	0	0	0	0	0	0
New Mexico	36.25194	53.28639	187.1875	263.2809	647.4777	432.5844	465.7734
New York	0	0	0	0	0	0	0
North Carolina	0	0	0	0	0.581422	0.387415	0.304759
North Dakota	0.466827	0.180733	30.01222	30.87259	195.2062	220.9961	293.843
Ohio	0	0	0	0	1.126655	1.458312	1.05399
Oklahoma	57.26053	83.78533	104.0556	111.3156	382.9989	210.5969	144.7052
Oregon	1.463764	3.10234	2.963321	5.272496	51.16839	30.88682	14.41649
Pennsylvania	0	0	0	0	0	0	0.002015
Rhode Island	0	0	0	0	0	0	0
South Carolina	0	0	0	0	0	0	0
South Dakota	25.31008	8.889397	6.122399	1.614967	12.1086	22.22911	5.467555
Tennessee	0	0	0	0	1.270745	0.525801	0.214484
Texas	41.40754	119.5914	138.4024	136.9679	283.7156	108.4214	69.60564
Utah	20.5525	15.42302	53.97612	39.87916	50.02691	61.39098	35.90469
Vermont	0	0	0	0	0	0	0
Virginia	0.110088	0.376977	0.502369	0.379036	0.500985	0.424869	0.359929
Washington	0	0.004746	0.001289	0.000173	32.00515	23.79425	13.48903
West Virginia	0	0	0	0	0	151.3862	108.2313
Wisconsin	0.267295	0.221255	0.436661	0.282114	0.245801	0.29619	1.121131
Wyoming	53.4631	103.0638	278.7303	394.89	1243.315	1672.718	1449.195

Table 2: Gubernatorial Regressions including Replication of Goldberg, 1929-1998

	(1a) WinGap	(2a) WinGap	(3a) WinGap	(4a) WinGap	(5a) WinGap	(6a) WinGap	(7a) WinGap	(8a) WinGap
OilGas/GSP	0.169**		0.169**	0.0785	0.0908	0.0155		
	(0.0716)		(0.0716)	(0.0617)	(0.0647)	(0.0742)		
L.PCIgrowth	0.0994*	0.0691	0.0994*	0.00197				
	(0.0497)	(0.0507)	(0.0497)	(0.0569)				
Lnpcincome	-3.934**	-4.266**	-3.934**	14.36**				
	(1.812)	(2.080)	(1.812)	(6.731)				
Slavesh1860	0.455***	0.444***						
	(0.0397)	(0.0403)						
WinLagVote	0.760***	0.762***	0.760***	0.384***	0.404***			
	(0.0753)	(0.0736)	(0.0753)	(0.0507)	(0.0488)			
ColonizerNE	-2.25***	-2.48***						
	(0.339)	(0.356)						
OilGas4/GSP		0.0382					-0.0243	
		(0.0867)					(0.0731)	
OilGas8/GSP								0.0132
								(0.0932)
State FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	N	N	N	Y	Y	Y	Y	Y
State QTT	N	N	N	Y	Y	Y	Y	Y
Observations	1,027	986	1,027	1,027	1,060	1,064	990	917
R-squared	0.609	0.601	0.609	0.768	0.762	0.728	0.740	0.730
	(1b) VoteSh	(2b) VoteSh	(3b) VoteSh	(4b) VoteSh	(5b) VoteSh	(6b) VoteSh	(7b) VoteSh	(8b) VoteSh
OilGas/GSP	0.0511**		0.0511**	0.0119	0.0306	-0.0589		
	(0.0244)		(0.0244)	(0.0244)	(0.0270)	(0.0433)		
L.PCIgrowth	0.0900**	0.0615	0.0900**	-0.00055				
	(0.0345)	(0.0432)	(0.0345)	(0.0663)				
Lnpcincome	-0.908	-1.365	-0.908	11.72***				
	(0.799)	(0.901)	(0.799)	(4.235)				
Slavesh1860	0.124***	0.122***						
	(0.0129)	(0.0129)						
WinLagVote	0.663***	0.658***	0.663***	0.503***	0.519***			
	(0.0253)	(0.0258)	(0.0253)	(0.0380)	(0.0368)			
ColonizerNE	-1.40***	-1.47***						
	(0.105)	(0.104)						
OilGas4/GSP		0.00996					-0.0417	
		(0.0279)					(0.0469)	
OilGas8/GSP								-0.0905
								(0.0592)
State FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	N	N	N	Y	Y	Y	Y	Y
State QTT	N	N	N	Y	Y	Y	Y	Y
Observations	1,026	985	1,026	1,026	1,059	1,063	989	916
R-squared	0.669	0.664	0.669	0.763	0.759	0.643	0.652	0.640

Notes: A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 3: Gubernatorial Regressions with Other Measures of Resources, 1929-1998

	(1a) WinGap	(2a) WinGap	(3a) WinGap	(4a) WinGap	(5a) WinGap	(6a) WinGap
OilCoal4/ GSP	-0.024 (0.073)					
Coal4/GSP		-0.075 (0.300)				
Oil4/GSP			-0.015 (0.099)			
LnOilCoal4				0.933** (0.462)		
LnCoal4					0.152 (0.145)	
LnOil4						0.263 (0.227)
Obs	990	990	990	990	990	990
R-squared	0.740	0.740	0.740	0.744	0.741	0.741
	(1b) VoteSh	(2b) VoteSh	(3b) VoteSh	(4b) VoteSh	(5b) VoteSh	(6b) VoteSh
OilCoal4/ GSP	-0.042 (0.047)					
Coal4/GSP		-0.299 (0.217)				
Oil4/GSP			-0.023 (0.062)			
LnOilCoal4				0.628* (0.333)		
LnCoal4					0.149 (0.161)	
LnOil4						0.079 (0.127)
Obs	989	989	989	989	989	989
R-squared	0.652	0.652	0.652	0.656	0.652	0.652

Notes: All regressions have state fixed effects, year fixed effects, and quadratic state time trends. A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 3A: Gubernatorial Regressions with Other Measures of Resources, 1929-1998 without Alaska and Hawaii

	(1a) WinGap	(2a) WinGap	(3a) WinGap	(4a) WinGap	(5a) WinGap	(6a) WinGap
OilCoal4/GSP	0.184					
	(0.237)					
Coal4/GSP		-0.086				
		(0.300)				
Oil4/GSP			0.323			
			(0.303)			
LnOilCoal4				0.935**		
				(0.460)		
LnCoal4					0.111	
					(0.148)	
LnOil4						0.263
						(0.229)
Observations	974	974	974	974	974	974
R-squared	0.741	0.740	0.741	0.744	0.741	0.741
	(1b) VoteSh	(2b) VoteSh	(3b) VoteSh	(4b) VoteSh	(5b) VoteSh	(6b) VoteSh
OilCoal4/GSP	0.024					
	(0.183)					
Coal4/GSP		-0.316				
		(0.220)				
Oil4/GSP			0.115			
			(0.232)			
LnOilCoal4				0.624*		
				(0.331)		
LnCoal4					0.065	
					(0.148)	
LnOil4						0.078
						(0.129)
Observations	973	973	973	973	973	973
R-squared	0.653	0.653	0.653	0.657	0.653	0.653

Table 3B: Gubernatorial Regressions (excluding Alaska and Hawaii) with Other Measures of Resources, 1929-1998 with Linear Time Trends and Year Fixed Effects that Differ by South and non-South

	(1a) WinGap	(2a) WinGap	(3a) WinGap	(4a) WinGap	(5a) WinGap	(6a) WinGap
OilCoal4/GSP	-0.070 (0.054)					
Coal4/GSP		0.357 (0.224)				
Oil4/GSP			-0.109 (0.071)			
LnOilCoal4				0.482 (0.345)		
LnCoal4					0.330*** (0.118)	
LnOil4						-0.094 (0.200)
Observations	990	990	990	990	990	990
R-squared	0.732	0.733	0.733	0.733	0.734	0.732
	(1b) VoteSh	(2b) VoteSh	(3b) VoteSh	(4b) VoteSh	(5b) VoteSh	(6b) VoteSh
OilCoal4/GSP	-0.053 (0.048)					
Coal4/GSP		-0.063 (0.160)				
Oil4/GSP			-0.051 (0.051)			
LnOilCoal4				0.418 (0.278)		
LnCoal4					0.231** (0.099)	
LnOil4						-0.042 (0.106)
Observations	989	989	989	989	989	989
R-squared	0.621	0.621	0.621	0.623	0.623	0.621

Table 4: Legislative Regressions with Other Measures of Resources, 1929-1998

	(1a) LegGap	(2a) LegGap	(3a) LegGap	(4a) LegGap	(5a) LegGap	(6a) LegGap
OilCoal4/GSP	-0.215***					
	(0.048)					
Coal4/GSP		-0.039				
		(0.317)				
Oil4/GSP			-0.229***			
			(0.045)			
LnOilCoal4				0.709		
				(0.449)		
LnCoal4					0.313	
					(0.321)	
LnOil4						-0.007
						(0.212)
Observations	1,501	1,501	1,501	1,501	1,501	1,501
R-squared	0.815	0.814	0.815	0.815	0.815	0.814
	(1b) LegGap NoAKHI	(2b) LegGap NoAKHI	(3b) LegGap NoAKHI	(4b) LegGap NoAKHI	(5b) LegGap NoAKHI	(6b) LegGap NoAKHI
OilCoal4/GSP	-0.113					
	(0.273)					
Coal4/GSP		-0.084				
		(0.311)				
Oil4/GSP			-0.288			
			(0.372)			
LnOilCoal4				0.727		
				(0.451)		
LnCoal4					0.135	
					(0.314)	
LnOil4						-0.017
						(0.214)
Observations	1,468	1,468	1,468	1,468	1,468	1,468
R-squared	0.815	0.815	0.815	0.816	0.815	0.815

Notes: All regressions have state fixed effects, year fixed effects, and quadratic state time trends. A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 4B: Legislative Regressions (excluding Alaska and Hawaii) with Other Measures of Resources, 1929-1998 with Linear Time Trends and Year Fixed Effects that Differ by South and non-South

	(1) LegGap	(2) LegGap	(3) LegGap	(4) LegGap	(5) LegGap	(6) LegGap
OilCoal4/GSP	-0.217 (0.199)					
Coal4/GSP		0.615** (0.260)				
Oil4/GSP			-0.331* (0.191)			
LnOilCoal4				0.433 (0.391)		
LnCoal4					0.146 (0.369)	
LnOil4						-0.327 (0.202)
Observations	1,468	1,468	1,468	1,468	1,468	1,468
R-squared	0.783	0.783	0.802	0.802	0.802	0.802

Notes: All regressions have state fixed effects, year fixed effects, and quadratic state time trends. A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent level.

Table 5: Testing for Heterogeneous Treatment Effects (excluding Alaska and Hawaii), 1929-1998

	(1) LegGap NoAKHI	(2) LegGap NoAKHI	(3) LegGap NoAKHI	(4) WinGap NoAKHI	(5) WinGap NoAKHI	(6) WinGap NoAKHI	(7) VoteSh NoAKHI	(8) VoteSh NoAKHI	(9) VoteSh NoAKHI
OilCoal4/GSP	-0.158	-0.085	0.720	0.129	0.217	-3.403	0.007	0.088	-2.204
	(0.293)	(0.268)	(3.030)	(0.240)	(0.192)	(2.143)	(0.202)	(0.173)	(1.317)
South x OilCoal4/GSP	0.428			0.412			0.127		
	(0.822)			(0.551)			(0.295)		
Early x OilCoal4/GSP		-0.083			-0.093			-0.178	
		(0.185)			(0.260)			(0.141)	
High x OilCoal4/GSP			-0.830			3.587*			2.228*
			(2.988)			(2.100)			(1.290)
South	-81,522.8			-99,078.6***			68,920.2***		
	(55,205.9)			(29,975.6)			(1,248.2)		
Early		-11.378			-163.9***			-89.7***	
		(13.907)			(29.3)			(20.6)	
High Resource			30,097.3			-56,335.6*			-45,256.7***
			(62,489.2)			(29,920.6)			(14,336.7)
Observations	1,468	1,468	1,468	974	974	974	973	973	973
R-squared	0.815	0.815	0.815	0.741	0.741	0.741	0.653	0.653	0.653

Notes: All regressions have state fixed effects, year fixed effects, and quadratic state time trends. A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 6: Resources and Income, 1929-1998

VARIABLES	(1) Lnpci	(2) Lnpci	(3) Lnpci	(4) PCIgrowth	(5) PCIgrowth	(6) PCIgrowth
Coal4/GSP		-0.002			-0.080**	
		(0.001)			(0.038)	
Oil4/GSP		0.000			-0.049***	
		(0.000)			(0.018)	
OilCoal4/GSP	0.000			-0.042**		
	(0.000)			(0.018)		
LnOilCoal4			-0.000			0.038
			(0.001)			(0.049)
Observations	3,235	3,246	3,240	3,235	3,246	3,240
R-squared	0.992	0.992	0.992	0.549	0.630	0.548

Notes: All regressions have state fixed effects, year fixed effects, and quadratic state time trends. A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 7: Resources and Income Growth, 1929-1998

	(1) PCIgrowth	(2) PCIgrowth Dropping states with no resources	(3) PCIgrowth NoAKHI	(4) PCIgrowth NoAKHI & Dropping states with no resources	(5) PCIgrowth NoAKHI & Linear	(6) PCIgrowth NoAKHI & Linear & Dropping states with no resources
OilCoal4/GSP	-0.042**	-0.035**	-0.141***	-0.122***	-0.062*	-0.062*
	(0.018)	(0.016)	(0.031)	(0.032)	(0.035)	(0.036)
Observations	3,235	2,408	3,168	2,376	3,168	2,376
R-squared	0.549	0.551	0.554	0.557	0.233	0.258

Notes: All regressions have state fixed effects, year fixed effects, and quadratic state time trends except columns 5 and 6, which have linear state time trends and year fixed effects that differ for South and non-South. A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 8: Resources and Income Growth (excluding Alaska and Hawaii and states with no resources), 1929-1998, Further Exploration

VARIABLES	(1) PCIgrowth	(2) PCIgrowth	(3) PCIgrowth	(4) PCIgrowth	(5) PCIgrowth	(6) PCIgrowth	(7) PCIgrowth	(8) PCIgrowth
OilCoal4/GSP	-0.122***	0.292	-0.124***	-0.125***				
	(0.032)	(0.279)	(0.034)	(0.032)				
Coal4/GSP					-0.025	0.942**	-0.047	-0.044
					(0.040)	(0.359)	(0.033)	(0.035)
Oil4/GSP					-0.158***	-0.322	-0.149***	-0.156***
					(0.044)	(0.266)	(0.049)	(0.046)
High x OilCoal4/GSP		-0.413						
		(0.272)						
South x OilCoal4/GSP			0.016					
			(0.075)					
Early x OilCoal4/GSP				0.010				
				(0.016)				
High x Coal4/GSP						-0.965***		
						(0.353)		
High x Oil4/GSP						0.169		
						(0.273)		
South x Coal4/GSP							0.110*	
							(0.063)	
South x Oil4/GSP							-0.032	
							(0.067)	
Early x Coal4/GSP								0.033
								(0.033)
Early x Oil4/GSP								0.002
								(0.012)
Observations	2,376	2,376	2,376	2,376	2,376	2,376	2,376	2,376
R-squared	0.557	0.557	0.557	0.557	0.557	0.557	0.557	0.557

Notes: All regressions have state fixed effects, year fixed effects, and quadratic state time trends and exclude Alaska, Hawaii and states with no resources over the entire period. A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 9: Resources and Income Growth (excluding Alaska and Hawaii and states with no resources), 1929-1998, Institutions

	(1) PCIgrowth	(2) PCIgrowth	(3) PCIgrowth	(4) PCIgrowth
OilCoal4/GSP	-0.126*** (0.031)		-0.140*** (0.0349)	
Coal4/GSP		-0.0270 (0.0409)		-0.00839 (0.0469)
Oil4/GSP		-0.164*** (0.0424)		-0.179*** (0.0483)
Leg gap	-0.011** (0.005)	-0.0118** (0.00491)	-0.0129** (0.00572)	-0.0119** (0.00567)
OilCoal4/GSP x leg gap			0.000331 (0.000442)	
Coal4/GSP x leg gap				-0.000427 (0.000387)
Oil4/GSP x leg gap				0.000354 (0.000575)
Observations	2,314	2,314	2,314	2,314
R-squared	0.556	0.556	0.556	0.556

Notes: All regressions have state fixed effects, year fixed effects, and quadratic state time trends and exclude Alaska, Hawaii and states with no resources over the entire period. A constant was estimated but not reported. Standard errors are clustered by state and are shown in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 10: Resources and Population Growth, 1940-1990, Further Exploration

	(1) Popgr w/AKHI	(2) Popgr w/AKHI	(3) Popgr	(4) Popgr	(5) Popgr	(6) Popgr	(7) Popgr	(8) Popgr	(9) Popgr	(10) Popgr
OilCoal4/GSP	0.005*		0.005		-0.032	0.007**	0.009			
	(0.003)		(0.003)		(0.026)	(0.003)	(0.006)			
Coal4/GSP		0.007		0.005**				-0.038	0.008*	0.015***
		(0.004)		(0.002)				(0.031)	(0.004)	(0.005)
Oil4/GSP		0.001		0.004				-0.026	0.004	0.008
		(0.001)		(0.003)				(0.044)	(0.003)	(0.005)
High x OilCoal4/GSP					0.037					
					(0.025)					
South x OilCoal4/GSP						-0.008				
						(0.006)				
Early x OilCoal4/GSP							-0.004			
							(0.004)			
High x Coal4/GSP								0.044		
								(0.031)		
High x Oil4/GSP								0.030		
								(0.044)		
South x Coal4/GSP									-0.006	
									(0.005)	
South x Oil4/GSP									-0.011	
									(0.013)	
Early x Coal4/GSP										-0.012***
										(0.003)
Early x Oil4/GSP										-0.003
										(0.003)
Observations	294	294	288	288	288	288	288	288	288	288
R-squared	0.858	0.859	0.855	0.854	0.856	0.856	0.858	0.856	0.856	0.862

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