

Lessons from Strange Cases:
Democracy, Development, and the Resource Curse in the U.S. States

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Abstract

Both the theory and empirical work linking natural resource wealth to authoritarianism and underdevelopment (commonly referred to as the rentier state hypothesis) suffer from a number of shortcomings. In this paper, we outline a number of those shortcomings and address them in a new empirical setting. Utilizing a new cross-sectional, time-series dataset for the U.S. states spanning 73 years and case studies of Texas and Louisiana, we are able to more carefully examine both the inherently diachronic nature and comparative legs of the rentier state hypothesis than previous research. We argue that natural resource wealth, rather than directly contributing to authoritarianism, serves to preserve underlying political dynamics at the time natural resources begin to contribute to state finances. With regards to their effect on development, we hypothesize that the impact of natural resources is conditioned by economic geography. We draw implications from our findings for resource abundant countries across the world.

Few ideas in comparative politics evoke the consensus accorded the rentier state hypothesis even though both the theory and empirical work linking oil wealth to authoritarianism and underdevelopment suffer shortcomings. Our most important contribution to the discussion is to provide a new empirical setting to test the hypothesis which has, until now, only been tested on the data set from which it was developed. We employ cross-sectional, time-series data for the U.S. states spanning 81 years. We also discuss a selection of case studies of resource dependent states in the US which allows us to examine more carefully the effects of natural resource income over time. We argue that natural resource wealth, rather than directly contributing to authoritarianism and economic underdevelopment, serves to preserve underlying political and economic dynamics present at the time natural resources begin to contribute to state finances.

Originally developed in the study of Middle East politics, the rentier state hypothesis is one of the few to have passed into the disciplinary mainstream. The rentier state concept first appeared in a study of Iranian politics under Muhammed Reza Shah, but it was quickly adapted to explain the political structures and economic trajectories of oil-exporting countries from Latin America to the Persian Gulf. The rentier state hypothesis correlates the absence of democracy and economic development with the production of oil. Although the range of cases to which the rentier state concept applies has been limited, researchers have adduced causal mechanisms to explain outcomes. Because these mechanisms are fiscal (at least in part) it is easily adapted to statistical testing. There are a large number of empirical studies on the causal mechanisms, and it now appears to have been accepted by most pundits, political scientists, and even policy makers (Sachs and Warner 1995; Ross 2001; Smith 2004).

Abundant data and a small number of countries, aside, there are unresolved issues in regard to the hypothesis. First, despite the conventional wisdom, there is disagreement about the strength (and even the existence) of the rentier effect in the statistical research. Because all the existing studies employ what is essentially the same data set, this does not appear to be a problem that can be resolved without finding a different body of evidence with which to test the hypothesis. Second, the rentier effect does not seem to exist for other commodities that share many characteristics (ease of extraction, propensity for state ownership, capital intensity) of oil. In cross-national empirical work, reliance on other kinds of natural resources often seems to have no impact on either democracy or development. At the level of correlations, this is not troubling. The problem is that the underlying mechanisms adduced to explain the rentier effect appear to exist for other forms of raw material extraction and therefore ought to apply in those cases. Third, the effect itself appears to be absent beyond a certain income threshold. Thus, some who espouse the theory do not believe that it applies to any settings outside the Third World. Norway, for instance, is often held up as an exception. If the underlying correlation is simply to income, then its absence above a certain threshold is plausible. The problem we see is that the mechanisms adduced to explain the correlation ought to still be at work and an effect, even if small, ought therefore to be observed. Fourth and particularly germane to this study, the data used for large-n, cross-national tests of the rentier concept allow for only a crude test. Studies of the hypothesis rely on a fairly short time-series (30 years or so) of data during an anomalous period in the history of natural resource markets. There is some doubt that such a time-series is appropriate to undergird generalizable statements on the relationship between resource wealth, regime type, and development. There is also an important conflict in the literature about one important prediction of the rentier state hypothesis—the threat of inflation or the so-called Dutch disease. While instances of such inflation are frequently observed, it remains a matter of some contention whether the causal process lies in government decisions about exchange rates or in the structure of relative prices of tradeable and non-tradeable goods (see, for instance, Sarraf and Jimanji 2001).

Aside from its importance to a handful of petro-states, assessing the empirical accuracy of the rentier state hypothesis is of great significance for our understanding of international trade. When the rentier state hypothesis is paired, as it sometimes is implicitly, with the hypothesis of

the so-called “developmental state”, important but unrecognized challenges to theories of trade emerge. The dominant theory of trade among economists is based on comparative advantage: products are envelopes for international trade in factors of production (Irwin, Leamer). Countries produce goods employing locally abundant factors of production. The theory of the developmental state, by contrast, suggests that governments can, by fiat or manipulation, “get prices wrong” and so increase per capita national product and the well-being of impoverished populations (Amsden; Wade; Wade [1992]; Collins, Bosworth and Rodrik; Hawes and Liu). One perverse implication of the theory of the rentier state is therefore that governments that encourage production of at least one good for which their societies have a comparative advantage decrease both the economic and political well-being of their populations. Where it was once asserted that comparative advantage and resource abundance were royal roads to development through the Smithian channel of “vent for surplus” (Haberler and more recently Kibritcioglu) it is now implicitly and frequently argued that comparative advantage and resource abundance are in fact a road to underdevelopment and authoritarian government. Thus it matters very much that we understand whether resource abundance can yield a significant rentier state effect as we assess policies aimed at increasing human well-being through global trade.

We propose to consider the rentier hypothesis in relationship to a new set of evidence. The most powerful test of any hypothesis is on a data set other than the one that was used in its original construction. We therefore explore the rentier hypothesis in relationship to the experience of states in the United States over the 73 years between 1929 and 2002. The empirical setting has a number of advantages: exchange rates are not an issue; a relatively uniform set of rules governing data collection apply across the states; cultural differences between governments are not very great (or at least less than in cross-national settings); and the longer time-series (containing several international business cycles) allow for a more rigorous test of the hypothesis. So doing, we join a growing list of scholars who have used the diversity of a large, federal state such as India or the United States to test hypotheses developed in studies of states in the international system. We believe strongly that such approaches are methodologically viable and, perhaps of even greater significance, can begin to bridge the gap between studies of American politics as a *sui generis* undertaking and those of comparative politics (that is, the rest of the world).

At bottom we believe that the rentier state hypothesis, properly understood, is a powerful conceptual tool to understand what can happen to the politics of raw material exporters. We believe there is a “rentier effect” and that it is significant. Unlike most authors on the concept, however, we expect the primary effect is politically conservative. The “rentier state” works to keep incumbents in place and prolong the life of the political system they inhabit. Economically, we believe the “rentier state” effect is in large part a function of economic geography, whereby the nature of resource extraction often militates against the creation of ancillary, localized markets. Because production is often geographically confined to areas with limited access to trade routes, it often will not easily or quickly contribute to the creation of larger markets for labor and capital that are associated with development. We note that while this is a relatively under-explored aspect of the rentier state and we have only limited data to test the hypothesis, our findings work against the more common emphasis on Dutch Disease-type mechanisms. Consistent with expectations, we find considerable support for a significant rentier effect with regard to politics, annual economic growth, and long-term development.

Rentier States, Democracy and Development

The rentier state literature makes two distinct claims: one about politics and one about economics. First, politics in oil-exporting countries are not democratic. The absence of democracy occurs because revenues from the sale of crude oil accrue directly to the state. Politics is therefore typically distributive and administrative rather than participatory and legislative. State elites have no need either to bargain with social elites or even to discover any

significant information about society. Consequently, state and social institutions atrophy (especially those related to open democratic debate). In some variants of the argument, oil exports retard the emergence of democratic norms and institutions and in some oil exports appear as a structural element that may tend to undermine or even dismantle existing elements of democratic norms and institutions.

We believe that it is important to disaggregate two dimensions of the autocratic features of the oil-producing states. One dimension is the use of state institutions, including the organs of physical violence, against political opponents and even whole sections of the population. The other dimension is the use of fiscal mechanisms to ensure that incumbents remain in power for long periods. Because the term “long period” is necessarily undefined we offer an analytic rather than a quantitative measure. It is generally accepted in the business-cycle literature on democracies that incumbents lose elections during periods when the economy either ceases to grow or experiences an actual decline. The presence of state income generated as an external rent allows both democratic and non-democratic political elites to remain in power without regard to the business cycle. The presence of a rentier-effect should, therefore, appear even in a democratic government by the ability of a party or governing elite to retain control of elective office across the business cycle and, more generally, for longer than average periods relative to other, similar countries (or states).

The experience of the American states in the 20th 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. We do not understand the rentier-state effect, however, necessarily to require authoritarian government. The logic of the argument is rather that the flow of resources to political incumbents allows them far greater scope to prolong their hold over power and to increase the role of the central state than would otherwise be the case. We see no reason why this effect should be absent in democratic polities. The importance of distributive politics to retaining office in democratic settings is well established. In fact, it would seem peculiar to us if political incumbents did not use a flow of relatively free resources to maintain their political power.

A second claim in the literature is that economic development in oil-exporting state is stunted and oriented toward consumption rather than value-added production. Two possible mechanisms are adduced for this negative outcome: fiscal and monetary. In the monetary scenario, the overvaluation of the domestic currency makes imports cheaper and exports (other than oil which is denominated in dollars) more expensive, thus creating structural barriers to investment in tradable goods and development more generally. The monetary scenario predicts the likely emergence of high levels of inflation, the so-called Dutch disease. More important for studies of political economy is the fiscal scenario. Here government spending decisions to distribute oil wealth—whether to buy political support or for other reasons of social policy—result in significant increases in the prices of locally produced inputs such as labor and land. Consequently, again, tradable goods are not competitive internationally and structural barriers to export-led growth develop. In this scenario, as well, it is cheaper to import many goods than to produce them locally. To the degree that the government distributes goods, it also becomes more efficient to engage in behavior designed to win rents from the government than to invest in risky undertakings.

Researchers have attempted to empirically verify the rentier state hypothesis in two ways. In political science these two variants are typically referred to as the “case study” approach and, less elegantly, as the “large n” approach. The former approach constructs a historical narrative and examines whether the causal chain of the hypothesis can be verified. The second approach employs the largest possible set of quantitative indicators and attempts to verify the existence of significant levels of correlation between them.

The structure of the case studies has been consistent since the first enunciation of the rentier state hypothesis (Mahdavy). After laying out the underlying causal logic, the author

constructs a narrative sequence through which it can be argued that the political system became markedly less democratic or representative after oil revenues attain a certain level (usually more than 40%) of commodity exports and often of government revenues. Occasionally the narrative is accompanied by a time series of a relatively small number of elements that show (for example) that the growth of the service sector tracks the growth of oil revenues. This is true of the seminal article (Mahdavy) and many subsequent studies (Crystal 1990, Chaudhry 1997, Karl 1997). When oil revenues reach this significant (albeit arbitrary) level, they mark an inflection point in the political system, the economy, or both.

The structure of the statistical studies has been somewhat different. The data sets available for scrutiny typically begin around 1970 (see, for instance, Sachs and Warner 1995 and Sal-I-Martin and Subramanian 2003). These studies undertake cross-sectional analysis of oil-producing and non-oil producing countries in an attempt to assess natural resource's impact on outcomes between about 1970 and 2000. Some authors have discovered a pronounced oil effect (Sala-i-Martin and Subramanian 2003; Ross 2001; Smith 2004) while other scholars have found none (Herb). All students agree that there is at least one oil-exporter where the rentier state effect does not seem to be at play: Norway. When the analysis expands beyond oil to other, apparently similar natural resources (such as diamonds) or cases (such as Botswana), no clear effect exists (Sarraf and Jimanji 2001).

We believe that the time series used to assess the rentier state effect is limited in its ability to test a theory of democratization. The cross-national time series for discussing oil rents is composed of about 30 annual observations, but the time frame usually employed by social scientists in discussing the creation of viable democratic institutions is significantly longer. The East Asian experience with economic development can suggest that very short times are sufficient for economic development and the institution of political democracy, perhaps on the order of 30 years (from 1948 to 1990). To so argue, however, is to ignore the relatively higher levels human and physical capital that characterized Korea or Taiwan in the middle of the 20th century relative to the countries of the Middle East (Kimura). Poor as these countries may have been, their starting point for economic and political development was not identical with the oil producing countries of the Middle East. Many of the rentier states entered the period of significant oil exports with illiterate populations, highly impoverished economies, and poorly institutionalized governing structures. There is therefore reason to question whether the few years of the economic boom which was followed by a prolonged period of economic retrenchment in the 1980s and 1990s is useful for the investigation of the claims of the rentier state literature. That impoverished societies with autocratic political structures did not create industrial economies or political democracies in the space of a single generation, even with the acquisition of massive financial wealth, does not appear to us as an unlikely outcome.

Above and beyond the problems associated with analyzing short time spans, there is a noteworthy lack of theoretical and empirical agreement as to whether there is (or should be) a resource curse. Current opinion tends to support the notion that abundant oil and minerals contribute to everything from authoritarian politics (Jensen and Wantchekon 2004; Ross 2001) to distorted economic development (Sachs and Warner 1995) to corruption (Leite and Weidman 1999) to civil war (Collier and Hoeffler 2001). Empirical referents in these articles are to Latin American commodity producers, Middle East oil exporters, and African mineral producers. There are, however, reasonable theoretical arguments to the contrary. One argument holds that resource abundance, be it a superior endowment of oil, coal, farmland, or whatever, can only be favorable to growth (Bardini 1997). As McLean (2005: 1) explains "To be resource 'rich' is contrasted with being resource 'poor', the less favorable implication of the latter being self-evident." Certainly simple factorial and sectoral approaches to growth provide no basis for suspecting a consistent resource curse—the impact of oil or mineral booms should be positive or negative depending on

the factoral makeup of a country (or state within a federation for that matter).¹ Indeed, an entire class of open economy models suggests that a booming sector can generate a level of domestic demand sufficient to generate spillovers to other sectors and ultimately increasing returns to a wide range of economic activity (Murphy, Shleifer, and Vishny 1989; Krugman 1991; Corden 1984). Despite the claims of many (but not all) analysts in the tradition of the rentier state, there is evidence suggesting that resource dependence in general either has no impact on growth (Delacroix 1977; Davis 1995) or even fosters long-term development prospects (McLean 2005; Pomeranz 2000; Wright 1990). Protagonists on this side of the debate point to the developmental foundations of easily extracted coal in early 19th century Great Britain (Pomeranz 2000, though see Bardini 1997 for the related argument that a country without such easily extracted resources grew slowly), the comparative per capita resource wealth of the U.S. and Australia in the latter decades of the 19th century (Wright 1990), and the early high wage equilibrium established by the California gold rush (McLean 2005).

The absence of agreement about the effect of resource abundance generally is not necessarily troubling, but it does suggest that considerably more work must be done before we can feel secure in accepting or rejecting the rentier state hypothesis. The absence of any rentier state effect in Norway, for example, should not be ignored. The obvious question is whether the effect is absent in Norway or if, when Norway is considered with Third World countries, the effect is so small that it can no longer be noticed. If there is no clear effect, then we might reject the hypothesis. On the other hand, the idea that political actors would use resources that come directly to hand in order to prolong their hold over power at the expense of rivals and that government spending has some impact on economic development are sufficiently attractive intuitively to be worth retaining. Below we focus first on assessing whether or not a resource curse exists in the U.S. states (it does). We then move on to a preliminary attempt to identify the key mechanisms through which the curse exists.

Evidence from Strange Cases: The U.S. States

In the following analysis, we focus on the relationship between natural resource dependence, economic development, and partisan hegemony in the U.S from 1929 through 2002. A focus on the U.S. states has a number of advantages over the traditional approaches taken in the literature. First and most important, it allows us to analyze a much longer time-series of data than any previous study. As noted above, existing cross-national research provides little leverage on many national cases that were authoritarian before and after the oil-induced swelling of state coffers. Given the long-term nature of any argument that bears on the broad process of ‘development’, our data on 73 years represents an important improvement over the 30 year window most rentier state research has focused on. It also moves the research away from what many have noted to be an anomalous period in the history of natural resource markets—namely the post-1973 oil boom.

Second, the U.S. states have at least as much variation in their resource abundance as does the world at large. Indeed, the American states show “extreme diversity” in natural resource dependence, levels of development, and experiences with electoral democracy (Coatsworth 1998;

¹ The gory details are as follows: A resource boom has two key effects—the reallocation of resources and increased incomes. Import-competing sectors benefit from the income effect as demand increases but are hurt by the higher wages associated with the reallocation of resources. For these sectors, the net impact is ambiguous. Non-booming traditional exports will be hurt by the rise in wages brought about by the boom sector and benefit little from the income effect. Nontradables, on the other hand, can adjust to higher wages with increased prices and will benefit from increased demand via the income effect of the boom. In this sectoral approach, the overall impact of a resource boom is positive when the economy is weighted to non-tradables and negative to the degree that it relies on non-boom exports.

Engerman and Sokoloff 2001).² Some states such as Alaska, West Virginia, and Wyoming would qualify as rentier states in the comparative literature, but a host of others (Connecticut, Massachusetts, Iowa) produce few or no natural resources.³ Indeed, mean resource dependence across the U.S. states is very similar to that across countries around the world and shows a higher standard deviation.⁴ Third, although the states show less variation on wealth than the world as a whole, US developmental experiences vary considerably. In 2000, the wealthiest state in the country (Connecticut) had an income twice that of the poorest (Mississippi).⁵ The disparities are even larger earlier history—in 1929, the wealthiest state (New York) had 400 percent the per capita income of the poorest (South Carolina).

Political conditions in the US have also varied widely over time and space. Despite an overarching competitive democracy at the national level, electoral politics have ranged from the competitive to the hegemonic across the states. If we take the average margin of victory in gubernatorial elections as a proxy for the competitiveness of electoral politics, six states are highly competitive, with average victories of less than 10 percent over the last 80 years.⁶ At the same time, a full seven states have had *average* margins of victory in excess of 40 percent over the same time period.⁷ Given the infrequency of partisan turnover in such cases, they exhibit a longevity that authoritarian states in the Third World might envy. To reiterate, we are not claiming that resource dependence, and especially oil, transform all polities into one-party dictatorships. We are simply looking for whether political incumbents in resource-abundant polities with fair and free elections manage to retain power longer than those in other polities. If they can then it there must indeed be a rentier effect.

Fourth, the U.S. states provide considerable variation with regards to a number of alternative explanations for political and developmental outcomes. For example, the colonizing nation, factor endowments, and transportation networks vary considerably across the states. Indeed, in one important way the U.S. states provide *more* variation than that in most cross-national studies. While most currently resource-rich countries began the early 70s with considerable natural resource wealth (thus limiting theoretically important time variation in resource dependence), our sample of U.S. states includes cases that begin the period with limited resource wealth and develop extensive dependence, others that begin with extensive dependence and see their resource wealth wane, and yet others that show reasonably steady reliance over decades. Figure 1 provides evidence of this in three cases: Louisiana, Oklahoma, and West Virginia. While West Virginia maintains a relatively high level of dependence through time, Oklahoma shows a fairly steady decline, and Louisiana shows a steady rise (until the 1990s). We exploit this time-series variation in developing case studies later in the paper.

Figure 1 About Here

² The term “extreme diversity” is taken from Sokoloff and Engerman (2000). Note that works cited here represent a small sample of a trend in research that aims to answer broad questions in comparative politics using subnational comparisons in the U.S. and elsewhere.

³ What qualifies as a rentier state is something of a moving target in the comparative politics literature. One common cut-off is when natural resource revenues making up at least 40 percent of the budget. Using that as a lower bound and making reasonable assumptions about the translation of resources/GDP into resources/budget, Alaska, Louisiana, New Mexico, North Dakota, Oklahoma, Texas, West Virginia, and Wyoming all qualify as rentier states during some portion of our time series.

⁴ Smith’s (2004) data shows a cross-national mean dependence of 6.3 percent of GDP with a standard deviation of 12.9 in 1989. For the U.S. states in 1989, the average dependence was 4.3 percent with a standard deviation of 13.5.

⁵ In 2003 dollars, Connecticut’s per capita income was \$44,347 in 2000 and Mississippi’s was \$22,384.

⁶ The states are Connecticut, Hawaii, Illinois, Indiana, Massachusetts, and New Mexico.

⁷ These cases are Georgia, Louisiana, Mississippi, South Carolina, Alabama, Arkansas, and Texas. Note that in the former four cases, the average margin actually exceeded 50 percent.

Finally, inherent to varying degrees in statistical comparative politics work is a considerable amount of unmeasured cross-national variation that is consumed by either the error term or country dummies—this is what researchers either do not know, do not understand, or cannot measure but that has a bearing on explaining outcomes across nations. By analyzing states within a federation, we control for legal practices, institutions of government, party systems, and cultural differences that might impact variation on developmental outcomes or the competitiveness of politics but that are often un- or poorly-measured in cross-national work. On the economic side, this also has the important advantage of controlling for the complex and difficult to measure exchange rate effects of resource booms as per the Dutch Disease phenomenon.⁸

The following analysis utilizes a new dataset collected from a variety of sources (see Appendix) on natural resource dependence, per capita income, the competitiveness of electoral politics, and several controls for each state in the U.S. from 1929-2002. We estimate three separate models, each with a distinct dependent variable associated with the rentier state hypothesis. In moving across the models, we start with the least convincing evidence (for which we have the least well specified models)—that on annual state growth—move on to long-term development which we measure in terms of state income per capita, and conclude with several attempts to assess the impact of natural resources on the competitiveness of electoral politics. The rentier state hypothesis, of course, suggests a link between resource abundance and authoritarianism. Since all of the U.S. states are at least formally democracies, we draw an analogy between one-party dominance and authoritarianism. We measure one-party dominance as the margin of victory in gubernatorial elections and the likelihood of a partisan turnover. In all of the models, our measure of resource dependence is oil and coal production as a share of state GDP. Focusing on either oil or coal separately has little impact on the results (itself pretty odd if you think about it), which are not very sensitive to the operationalization of the dependent variable.

Table 2 reports the results of two simple models of state level economic growth measured as the annual percent change in per capita state income. It is worth noting that despite the rentier state literature's focus on "development"—itself typically measured as per capita income—it has had little to say about annual growth rates (see Sachs and Warner 1995 for an exception). This is somewhat odd since long term development must itself be a function of persistent annual growth through time. If we expect rentier states to have poor developmental outcomes, then they should grow systematically more slowly. We suspect the lack of analyses of growth in the comparative literature is a function of two factors: first, the short data time-series discussed above; and second, the conflict in the findings on growth and wealth. Indeed, while Sachs and Warner (1995) find a negative association between natural resources and annual growth, Gallup, Sachs and Millinger (1999) find a positive association between per capita income across countries and deposits of natural resources. The disjuncture between strong developmental outcomes (i.e. wealthier societies) and weak growth underscores the shortcomings of such work.

In contrast, our findings with regard to growth and development (wealth) are consistent—natural resource dependence has a negative impact on both. Table 2 shows that growth rates and resource dependence are negatively and significantly associated. Note that the models control for lagged wealth following Barro's (1989) evidence and theorization of a return to the mean in growth rates. The dependent variable in Model 1 is the year-on-year growth rate. The coefficient suggests that a 10 percent increase in resource dependence cuts the annual growth rate by about

⁸ Dutch disease, for instance, implies that an appreciating exchange rate places pressure on various sectors of the economy, which in turn can produce political crises even during good times. Given a uniform exchange rate across the U.S. states, we are able to control for much of this effect. State level price increases could vary quite significantly, of course, thereby impacting state-level real exchange rates. Using state-level CPIs, we found no evidence for a dutch disease impact.

.15 percent. In terms of substantive impact, this is quite similar to that found by Sal-I-Martin and Subramanian (2003) cross-nationally.⁹ Lest the reader think these cuts in growth rates trivial, Figure 2 suggests that relying on natural resources to the tune of 30 percent of the state economy (think Louisiana or West Virginia) would reduce the average states per capita income by \$4,000 over the next 20 years when compared to a state with no resources at all. Models 2 and 3 in Table 2 increase our confidence in these findings by focusing on 10 year averages in growth. Model 3 adds the only good time-series control we have at this point—each state’s level of inequality as measured by the gini coefficient (see Barro 2000 on the relationship between inequality and growth cross-nationally). In both models, resource dependence has a significant, negative coefficient.

Table 2 and Figure 2 About Here

Turning to “development”, Table 3 reports the results of two models in which the dependent variable is state wealth, measured as per capita state income in 2002. In Model 1, the only other variable is the state’s initial per capita income in 1929. Resource dependence in this case is the average for the entire time period under consideration. The results suggest that a one percent increase in average reliance on oil and coal reduces state wealth by nearly \$1200 per person. To give the reader a sense of the overall relationship between state wealth and resource endowments, Figure 3 plots the predicted state income generated by model 1 against logged resource dependence. Considerable variance in wealth across states with no resources aside, the figure shows a noteworthy downward slope as resource dependence climbs. Note, however, that Alaska appears as a significant outlier (more on Alaska below).

Table 3 and Figure 3 About Here

In Model 2 we introduce a series of controls for alternative explanations for development, including factor endowments, access to external markets, and colonial heritage. Research dating back to Stopler and Samuelson has noted that factor endowments have important implications for development. In the context of the U.S. states (and the Western hemisphere more generally), Engerman and Sokoloff (2000) argue that the key factoral determinant of long term growth trajectories was the degree to which geographic and climatic conditions created the foundations for either plantation or smallholder agriculture. Plantation agriculture producing sugar, cotton, tobacco, etc. led to slavery, extractive property rights institutions, exclusionary political institutions, inequality, and weak human capital development—all of which contributed to poor long-term development. Smallholder agriculture, in contrast led to more egalitarian property rights protections, earlier extension of the franchise, and more widespread systems of public education. All of these, they argue, contributed to development in the northeast U.S. To control for factor endowments, we introduce a measure of the percentage of the state population that was enslaved in 1860. Note that this measure significantly improves on the atheoretical standard practice of including a dummy for ‘southern states’ in statistical work on the U.S. A second foundation oft-associated with development is access to external markets (Hausmann 2001). Landlocked, isolated regions far from world markets may suffer from what former Treasury Secretary Lawrence Summers has decried as “the tyranny of geography.”¹⁰ To control for market access, we include a dummy variable for states that have access to rivers, lakes, or an ocean upon which to transport goods to and from foreign markets. Finally, a prominent line of work suggests that colonial origins have significant implications for long-run growth trajectories (see, for instance, North 1979). The 50 U.S. states had one of eight different colonial experiences.¹¹ Detailed discussion aside, probably the most common theme running through the literature is the

⁹ Though it is worth noting that their effect is an indirect one, via political institutions.

¹⁰ In a similar vein, see Sache (2001).

¹¹ The eight different experiences were: colonized by the English alone, the French alone, the Spanish alone, the English and Dutch, the French and Spanish, the English and Spanish, the English, French and Spanish, and those that were not colonized (or rather that were colonized by the U.S.).

particularly negative implications of Spanish colonialism. As such, we create a dummy variable taking on a value of 1 for any state in which the Spanish were *not* involved. The results for Model 2 show that the resource dependence finding holds up in the presence of these controls. Indeed, along with initial wealth, it is the only variable to achieve significance. Again, each percent increase in average resource dependence reduces 2002 per capita state wealth by well over \$1000. We should note that in unreported results the volatility of annual growth rates, another hypothesized mechanism for the translation of resource dependence into poor development outcomes, has no impact on the findings.

Finally, Table 3 turns to politics. Given the poor economic performance of resource dependent states noted above, the U.S. voting behavior and comparative literature on elections would suggest that such states should see significant political turnover. From research on elections in the U.S. states to those across established OECD democracies to newer democracies in poorer regions of the world, weak economic growth is associated with declining electoral fortunes of incumbent governments. If resource dependent states grow at systematically lower rates, they should evince more partisan turnover. Something like this line of argument is present in one branch of the rentier state literature. For example, Chaudhry (1997) and Karl (1997) suggest that while resource wealth contributes to political stability during good times, governments dependent on such wealth are particularly vulnerable to instability in bad times. Others such as Smith (2004) argue that cheap government revenues resulting from easily taxed resource extraction should contribute to governmental stability even in bad times as leaders in such states have the resources to invest in strong patronage networks strong enough to survive downturns in commodity markets. This argument can explain the persistence of authoritarian regimes in oil-rich states long after the bust of the 1980s—after the size of rents available for patronage had dropped dramatically.

Table 3 and Figure 4 About Here

Taken together, the results in Table 3 support Smith's characterization of politics in rentier states. The dependent variable in model 1 is the margin of victory in each gubernatorial election going back to 1929 (a total of 1,101 elections). In model 2, the dependent variable is a dichotomous indicator taking on a value of '1' when a partisan turnover takes place. Controls include the same slave state, colonial heritage, and wealth indicators noted above. Given the importance of growth in retrospective election models, we also introduce a control for state-level economic growth the year prior to the election. Both models exclude Alaska, which appears as a strong outlier in diagnostics. Having investigated this case a bit, it seems clear that its outlier status is a result of the Alaskan Independence Party (AIP), the U.S.' largest third party. Founded in the 1970s as a libertarian offshoot of the Republican Party, it has attracted between 10 and 43 percent of the gubernatorial vote in recent decades (including a victory in the 1990 contest). Given the state's three party system, it looks much more competitive (particularly with our 'margin of victory' measure) than most states, irrespective of resource dependence. If it is correct, as our reading of Alaskan politics suggests, to code the AIP as a wing of the Republicans, Alaska ceases to be an outlier and the results are broadly similar to those presented here.

In any case, the results support the notion that natural resources contribute to uncompetitive politics. Turning first to electoral margins, each percent increase in natural resource dependence increases the margin of gubernatorial victory by about .41 percent. Likewise, Model 2 shows a significant negative impact of resource abundance on the likelihood of a partisan turnover. Figure 4 plots out the predicted margin of victory (right side y-axis) and the predicted probability of a partisan turnover (left side y-axis) at varying levels of resource dependence on the basis of the results in Table 3.¹² In the absence of natural resources, there is a 35 percent chance of a partisan turnover and the predicted margin of victory is slightly less than 20 percent. When natural resources account for 40 of state GDP, the likelihood of partisan

¹² All other variables are held at their mean.

turnover falls to 10 percent and the predicted margin of victory climbs to over 35 percent. We should note that we also explored the possibility that the oil shock fundamentally altered the relationship between resource wealth and electoral politics. We found little supporting evidence.¹³

In summary, we find evidence that a rentier effect holds across the U.S. states. As resource dependence mounts, annual growth slows, per capita income declines, and the competitiveness of state politics falls.

The Quest for Mechanisms

Though the aggregate results presented above are suggestive, they are somewhat far removed from the mechanisms commonly touted in the rentier state literature. Below we make a preliminary attempt to parse out the causal mechanisms underpinning the findings above. Though the theoretical development and empirical assessment of the mechanisms are brief, we note that the extensive state-level data going back to the 1920s leads us to expect that a more careful test of the various arguments in the literature will be possible in this context than the cross-national literature has provided.

Politics

We begin with the impact of natural resources on political competition. Putting aside the aspect of the comparative literature that has emphasized the affinity between natural resources and coercion (an argument that applies less clearly to our setting), there is considerable theoretical convergence as to the mechanisms governing the relationship between resource wealth and political competition. In most accounts, cheap revenues accrue to the state from natural resource production. These resources allow officials to buy public support and build patronage networks, thereby stunting the development of a viable opposition and related democratic institutions. There are two steps in the causal chain: first, from natural resources to “easy” fiscal expansion and patronage networks; and second, from patronage the capacity to survive under otherwise adverse circumstance—to insulate incumbents from the political business cycle.

Table 4 presents preliminary evidence on the first step. Though we do not have a direct measure of patronage networks, we do have a measure of the extent to which states have to work to collect revenues. Using data from the Advisory Commission on Intergovernmental Relations, Berry and Fording (1997) develop time-series measures of actual tax effort and taxing capacity. We subtract the latter from the former and refer to this as “tax effort”. A negative number implies that a state government does not have to try very hard to meet its revenue requirements. We estimate a simple of model of tax effort, using resource dependence, lagged growth, and lagged deficits as independent variables. As expected, natural resource dependence has a strong, negative impact on tax effort. A 30 percent increase in reliance on natural resources (the West Virginia effect) reduces tax effort by 20 percent. For comparisons sake, the average score on the measure for the sample is -3.6. Note that this finding is not a function of a demand on the part of citizens in natural resource dependent states for smaller government. Indeed, the results from a simple model (not shown) for the size of government suggests that each one percent increase in resource dependence *increases* per capita spending by \$3.43. Thus, rentier politicians in the states are spending a lot of easily raised revenues

Tables 4 and 5 About Here

The results in Table 5 begin to explore the second step in the causal chain—from easy revenues to the strength of incumbent politicians. The table reports results from a 2SLS test using natural resource dependence as an instrument for tax effort. The dependent variable is the gap between the winner’s and loser’s vote shares. Panel A reports results from regressions that enter per capita income and economic growth as exogenous regressors in the first and second stages,

¹³ We interacted a post oil shock dummy with the natural resource measure. It seems that the impact of natural resources is ever so slightly muted in the post-oil shock era.

while Panel B reports the corresponding first stages, which also includes per capita deficits as an exogenous regressor. Concerns about the exclusions restriction implied by this strategy (any recommendations?) aside, the results are again suggestive. The negative coefficient on tax effort suggests that as tax effort declines (i.e. the gap between actual and potential effort becomes more negative), electoral margins climb. Put differently, natural resource dependence seems to generate easy revenues, which in turn return the competitiveness of electoral politics.

One can cull a number of more specific hypotheses regarding the impact of point source resources on fiscal policy, particularly with regards to expenditures. For the moment, we leave these issues for the case studies in the coming section while turning right now to the mechanisms linking natural resources and growth.

Growth and Development

Previous research has discussed a number of plausible mechanisms linking natural resource dependence to poor economic growth and developmental outcomes. Several of those hypotheses are addressed in the context of the analysis above. Consistent with some recent cross-national research (McMahon 1997), the exchange rate mechanism seems less important than some have suggested. Likewise, the economic volatility that is often associated with dependence on natural resources has no implications for development, at least in the context of the U.S. states. Lastly, while some have suggested that private ownership might be a means to avoid the resource curse (Weinthal and Jones-Luong 2002), we find evidence of a rentier effect in contexts where the bulk of resources are privately held.

In contrast, our readings of economic history suggest the importance of geography as having fundamental importance for the prospects of commodity producers. Rethinking the traditional emphasis in the literature on the propensity for natural resources to be produced in enclaves (Sachs and Warner 1995; Hirschman 1958) from the point of view of research on economic geography (Krugman 1991), we argue that topography has two potential implications: first, geography (broadly understood to include local endowments) conditions the costs of researching and developing natural resources with consequences for the initial level of local demand at the time of the resource boom; and second, geographically-determined access to external markets conditions the likelihood that natural resource wealth will generate externalities and increasing returns to other kinds of economy activity (and thereby ‘development’). Where local demand is low and transportation is costly, natural resource production is likely to remain isolated in an enclave. As local demand increases and transportation costs fall, the prospects for resource wealth to spillover into other forms of production and foster development improve. Such mechanisms, we suspect, offer the potential to account for apparent outliers—the Norways and Californias of the world.

Traditional discussions of enclave economies have emphasized that natural resource extraction is capital intensive, involves a small workforce, and often relies on imported inputs. The result is weak linkages with the rest of the economy. Such accounts bear strongly on the West Virginian and Bolivian economies. They fail, however, to explain the role of natural resource wealth in fostering broad-based development in places like California and Australia. Why does the coal boom of West Virginia look so different from the gold boom of California from the vantage point of 2005? Consistent with the insights of Krugman (1991), we expect that natural resource extraction (or any form of production) can, under certain conditions, generate positive externalities for other forms of production, thereby generating increasing returns to a rich array of economic activity, urbanization, and development. In explaining when this is likely to happen, Krugman emphasizes two key factors: the size of the local market and transportation costs. As local market size increases, incentives mount for other producers to locate nearby. Transportation costs work in a parallel manner. As economies of scale mount, the incentives to produce in any given location increase as its transportation networks improve—only thus will large initial investments be recouped by serving a broader market through trade.

How does this discussion bear on the relationship between resource wealth and

development? Natural resource deposits are randomly located around the world. This means both that the sites and the sizes are randomly (normally) distributed—a lot of the resource will be in a large number of very small sites and a lot will be in a small number of very large sites. Search and development, however, is determined by cost, so the cheapest (easiest) deposits will be located first. These will usually be deposits near existing use, i.e. where local demand is quite high. Only over time (as more geological and technological information is gained and transportation technology also improves) will more distant sites be located and developed. These are in "harsher environments" on average because they are not where people preferred to live at the earlier stages of search and development. Because populations will be smaller and less dense, local demand will be lower. The returns to natural resources will ensure extractive investments, but the paucity of local demand will militate against increasing returns to other economic activity. Such an economy will be linked via trade to external markets and become an enclave.¹⁴

The geography of transportation costs functions similarly. Broad-based investments and economic concentration (another way of talking about development) will only occur if the costs of serving a wider market are relatively low. Thus, while a large resource boom may generate some initial level of demand, whether that demand is served by investments in local production and external economies resulting from other firms' decisions will depend in large part on the costs of transporting other products to wider markets. Again, where the costs of transporting ancillary products to broader markets are high, investments will likely be concentrated only in the high return resource sector—the value to weight ratio of other products will simply be too low to warrant producing them for outside markets. In contrast, if transportation costs are low, the local demand and capital generated by a resource boom are more likely to generate spillovers for other sectors of the economy. This is precisely the story told by McLean (2005) of California, where the gold rush generated population inflow, high wages and considerable local demand, but also where propitious geography combined with mineral capital to finance capital intensive, mechanized, large-scale investments in wheat and other agricultural production for outside markets shipped via an emerging San Francisco. The growth of San Francisco strengthened local demand and stimulated early industries, generating increasing returns to a broad swath of economic activity. Thus, the gold boom rippled through the agricultural, service, nascent manufacturing, construction, and transport sectors. Los Angeles emerges as a manufacturing center as part of this process.

The simplest hypothesis to emerge out of this discussion is that natural resources will not foster development when they are far removed from broader markets. As such we estimate a growth model below in which resource dependence is conditioned on access to broader markets. As Hausmann (2001) notes, even the transportation of goods over land is seven times more expensive than over water. As such, "access to markets" is measured with a dummy variable coded as 1 where states have access to navigable rivers, lakes, or oceans. The results are presented in Table 6 and the interactive relationship is graphed in Figure 5. The interaction is jointly significant, and Figure 5 shows the impact to be considerable and in the hypothesized direction. When combined with access to broader markets, natural resources do not have a negative impact on growth. In contrast, they have a negative impact in the absence of external markets. A case such as West Virginia (where natural resources comprise about 30 percent of state product and the state lacks navigable waterways) is predicted to grow about three percent

¹⁴ If we think of development in terms of GDP/population, harsher environments are thus likely to reduce both the numerator and the denominator. This might help explain the apparently strange finding in the comparative literature, whereby resource endowments are associated with weak growth but high per capita incomes. In the presence of a large resource boom, the depressing effect of "bad" geography on the denominator of GDP/population will generate high per capita incomes. At the same time, the absence of strong local demand and transportation networks (themselves also a function of geography) is likely to facilitate weak growth.

more slowly than a similar state that does have access to markets. Indeed, looking back to Figure 3, it is suggestive that most of the states that appear toward the bottom-right are also either land-locked (West Virginia, New Mexico, Oklahoma, Wyoming, etc) or have large distances between the resources and external markets (Texas).

Table 5 and Figure 6 Here

Our focus on geography aside, certainly the most important pending alternative hypothesis is that linking resource dependence to growth via its impact on the quality of institutions. Such accounts emphasize the role of natural resources in fostering rent-seeking, corruption, and weak state investments in bureaucratic capacity. Though we lack the data to explore this hypothesis at the moment, we are optimistic about future prospects.

Developing the Details: Texas and Louisiana

These aggregate statistics are suggestive, but of course fail to pin down the underlying mechanisms between natural resources, electoral politics, and developmental trajectories. In the following section we explore those mechanisms in greater detail using brief case studies of Texas and Louisiana. Both states have experienced decade-long ups and downs in their reliance on oil. It has long been well understood by students of the politics of both states that fiscal policies and electoral politics are significantly driven by the availability of oil wealth. Both states receive income from oil on state-owned lands (royalties and severance taxes) and from taxing oil produced on privately-owned land (property and income taxes). Texas has experienced several periods of increased and decreased reliance on oil: in 1931 petroleum taxes accounted for 31.3% of total tax revenues but sank to a low of 15.1% in 1970 and then rose to 28.3% in 1981. The experience of Louisiana is quite similar insofar as “all income groups are afforded the luxury of undertaxation because of the revenues received from gas, oil, and other mineral resources” (Landry and Parker 9).

We would expect the decades of resource wealth to be associated with political consolidation and one party dominance, while lean years should be associated with the decline of patronage networks and a slow increase in the competitiveness of politics. Figure 5 shows the relationship between resource dependence and the competitiveness of politics in Texas over the last 70 years. The trend, represented by the dotted line, is toward a more diversified economy less dependent on oil and more competitive electoral politics.

Figure 6 About Here

Because so much has been written about the US as a petroleum importer in the last 20 years, it is necessary to recall that the US was, for most of the 20th century, this was not the case. Between 1900 and 1930, the consumption of petroleum exploded in the United States, and it was all produced in the United States. The U.S. was the major producer, consumer, and exporter of petroleum globally and the new fuel re-shaped the American and global economies. Petroleum production is not evenly spread across the US. To make explicit what is implicit in our earlier discussion of variation in resource dependence in the US: domestic petroleum production resembles global trade insofar as a handful of states emerged as the primary producers of oil. In a variety of ways, the flow of revenues related to oil transformed the politics, regulatory practices, and budgets in each of them. The politics of each of these states was dominated for decades by decisions about how governments could maximize oil rents and how to spend the resulting incomes. State governments made crucial decisions about property rights, federal relations, and the provision of social services based in order to preserve, enhance and (ultimately) spend oil rents.

For most of the 20th century, Texas was responsible for close to half of oil production in the US (Katzman and Osborn) and was thus, by any account, the dominant force in global oil production. Not long after the beginning of oil production, legal conflicts emerged over state regulation of hours and work conditions in oil fields as well as the definition of property rights to the fields themselves. Property rights were originally understood in American jurisprudence

through the law of capture, whereby subsoil resources were presumed to be the property of those who owned the plots above them. This concept of property was extremely inefficient because it encouraged competition to deplete the pressure within fields. In the short term owners pumped too much oil and the glut could drive prices below the cost of production. Over the medium and long term significant quantities of oil remained unavailable in the ground because the depleted pressure made it uneconomical to bring it to the surface. Both the state and the large companies suffered the loss of revenue due at first to low prices and later to oil that could not be raised.

Oil production, transmission, and distribution were (and are) taxed directly and local politics at the state and even the school district level are affected by oil prices.

Given the attractiveness of taxing oil, it should not be surprising that the state government became embroiled in attempts to redress overproduction by regulating property rights in the earliest period of oil production. By the 1930s independent producers and state government officials in Texas had a common interest in ensuring that the price of crude oil did not become ‘artificially’ low. It was therefore the state government that intervened to transform property rights during this period and it did so explicitly in order to increase state revenues. In other words, the power of the state, exercised largely at the initiative of the executive branch, over private rights to property was increased in the search to secure income from rents. When Governor Dan Moody signed the Common Purchaser Act in 1930 to implement rationing and limit well spacing and slant drilling, he understood that he was putting into place a law designed to reduce production and prop up prices.

The political rationale for intervening to change property rights was based, in large measure, on a promise by the state to re-distribute revenues from oil. Moody claimed that “artificially low oil prices injured the public interest by decreasing tax revenues and royalties in the public school fund.”¹⁵ Despite Moody’s attempts, the conflict over oil field property rights and the taxation of oil continued throughout the 1930s. As one oil company attorney noted, without regulation thousands of wells would shut down with the consequent “bankruptcy of producers, the loss of millions of dollars in revenues of the state, and the consequent increase of taxes on other sources in order that the public schools, higher institutions of learning, elementary institutions and the departments of state may continue to function.”¹⁶ That the central government in an electoral democracy should engage in redistributive politics is not surprising, but the explicitness with which this occurred clarifies the degree to which politicians were attuned to rent-seeking. In the American context, unlike that outside the US, this rent-seeking was closely aligned with the defense of the interests of larger domestic firms against the encroachment of smaller ones.

The following 70 years of Texas history are replete with public sector booms and busts associated with the price and production of oil. The state budget increased well over 65 percent in *real terms* during the decade of the 1970s, for instance, as the oil shock worked its way through the state economy and into the public sector coffers and enabled “politicians to expand more funds on government programs without raising taxes” (Champagne and Harpham 7). Throughout recent decades, the state has been about 50 percent more reliant on taxing natural resources than the overall state economy is in their production of those natural resources. Put differently, the state has found oil a comparatively cheap source of tax dollars. As in several accounts in the comparative rentier state literature, politicians showed a deep appreciation for the cheap rents available through natural resource taxation. In 1978 direct taxes on oil and gas production amounted to about 16% of total government revenues in Texas or 27% of taxes and the addition of the ambiguous category “land income or royalties” added another 5% to the total. In short, until very recently income on the production of oil and gas may have accounted for nearly 20% of all revenues generated for the state of Texas and the figure could be as high as 25% with the

¹⁵ Cited in Malvais (1996), p. 47.

¹⁶ Cited in Malvais (1996), page 86.

addition of taxes paid by consumers at the pump for motor fuels (which were, after all, produced in state).¹⁷

It comes as little surprise therefore to know that “if one word could capture the essence of Texas, it would be *petroleum* and rightly so” and that the primary impact is through the provision of services without requiring additional taxes on the population at large (Katzman and Osborn 129). Income from 50 million acres of public land has provided an endowment for the public schools and colleges since 1900 and these produced significant revenues after the oil discoveries of the 1920s and 1930s (Katzman and Osborn 132). The boom of the 1920s which allowed “free-spending government to meet the needs, or so he [Ferguson] claimed, of folks plain and poor” was an oil boom, although V.O. Key did not specifically mention it (Key 265). During the 1970s oil boom, these revenues accounted for one third of all state aid to the K-12 system and financed all the *growth* in state aid to public education.

The role of Texas in federal and national politics is also driven in large part by oil. Federal-state conflict over oil revenues was resolved by the passage of the Submerged Lands Act in 1953 which recognized state jurisdiction over tidelands (Katzman and Osborn 133). Some students of Texas politics assert that Texas lies at the core of US politics because it is an oil exporter and that it is ruled by crony capitalists (Bryce 6-7).¹⁸

Louisiana

If we wanted to make a case that petroleum rents can fuel an authoritarian regime even in the United States, Louisiana would be the perfect case. Governor Huey Long’s name was nearly synonymous in the early 20th century with the politics of redistribution, populism, and even extra-legal authoritarian governance. Certainly in Louisiana taxing oil rents was intimately involved with populist politics for much of the 20th century and is especially identified with the populist governments of Earl and Huey Long. In the words of one study Huey (and later Earl) Long “swelled the state’s coffers through increased severance taxes, mineral leases and royalties...the revenues generated enabled him to avoid directly taxing property, sales, and income, thereby placing himself in an impregnable position” (Kurtz and Peoples 6). Although the Long brothers are closely associated with these policies they were not alone in using them and in the years after World War II, Governor Jimmie Davis “with the state treasury overflowing with revenues from oil and gas severance taxes...substantially increased spending on health and education, as well as on drainage” (Kurtz and Peoples 121). During the boom years of the 1940s and 1950s severance taxes on the oil and gas industries became the major source of state revenues (Kurtz and Peoples 132). Indeed during the booming energy markets of the 1970s “the state actually reduced such traditional and essentially more stable revenue sources such as the sales and income taxes, and it abolished the property tax altogether...” (Kurtz and Peoples 269).

The Longs were quite straightforward about seeking state control over oil rents to enhance their own power through fiscal policies. Huey Long’s first attempt to use the power of the state to regulate the oil industry was, at least according to his autobiography, the result of his ownership of stock in small Louisiana oil companies. He had been paid legal fees in stock and suffered to lose financially if the Standard Oil Company was able to use its power over the pipelines to control prices and volumes of oil pumped from Louisiana (Long, 41). His political career began, as did the Organization of Petroleum Exporting States, in an attempt to prevent Standard Oil from driving down the price of oil (Long 46), but he was also engaged in legal work at the time to limit telephone company rates and streetcar fares (Long, 52-3, 56). A more finely-

¹⁷ Irrelevant as taxes on motor fuels may appear to the rentier-state argument, they are in fact central to the debate about tax levels and incidence between rentier and consuming states. The reason the producers give for collecting high royalties on production is that the consuming states, especially in Europe, tax oil products heavily in order to cross-subsidize transportation and other goods and services.

¹⁸ V.O. Key suggested that the Dixiecrat movement of 1948 that split the Democratic party might have been based on the tidelands issue rather than race (Key 331).

grained account of Long's rise to prominence suggests that, as in Texas, the redistribution of oil rents was an explicit and viable strategy in the search for elective office in the US.

Long won election to the Louisiana Railroad Commission whence he began a long struggle to tax Standard Oil (Key 158). By 1921 Long had brought the state legislature to the point of enacting a 3 percent severance tax on oil (Long 57). Long's bitter conflict, including a near-impeachment, with Standard Oil has become the stuff of Louisiana legend. Long avoided an early impeachment attempt and in 1922 succeeded in having the 3 percent severance tax enacted. Long, then chairman of the State Public Service Commission and a legislator from North Louisiana specifically defended the severance tax against its opponents as a way to shift the tax burden from property owners to Standard Oil and its "plunder-grabbing policy" (Long 64). This struggle continued until 1929 when, as Governor, Long was able to impose a five cents a barrel tax on oil produced in the state as an end run around Standard Oil's success in winning a Federal court order against the severance tax. Five cents a barrel was "a rather insignificant tax but sufficient to yield the schools nearly \$5,000.00 per day or more than \$1,500,000.00 per year which they badly needed" (Long 123). In the words of V.O. Key's classic study, Long was "as indigenous to Louisiana as pine trees and petroleum" (Key 157). Oil as both a populist issue and as a source of revenue were crucial to the creation of a system of control that "more nearly matched the power of a South American dictator than that of any other American state boss" (Key 156, 159). Beyond the flow of resources into the state treasury, the oil and gas industry "offered untold opportunities for graft" both through the threat of increased taxes levied openly and in the willingness of administrative officials to overlook legal violations for both the export of oil and for exemptions from penalties and requisite payments (Kurtz and Peoples 9).

It was clear to early observers that the Long "dictatorship" over Louisiana politics was due to their ability to distribute services to the population at large and their support for the "export" of oil and gas (Heberle and Bertrand 345, 349). The Long political machine was notorious for its corruption but its collapse was not due to internal factors. Rather it was due to aggressive federal intervention in the form of indictments against key members of Long's supporters for offenses that included kickbacks, the illegal export of oil (so-called "hot oil"), and the use of official positions to enhance the profits of oil companies in which officials held stock (Holloway 349). It is not surprising that with the election of Earl Long as governor in 1948 that Hodding Carter wrote "And now with Governor Earl Long, Louisiana returns to 'normalcy.' Louisiana is a Caribbean republic again" (cited in Kurtz and Peoples 129).

Conclusion

The value of the exercise we have undertaken here is that it was as close as social scientists can come to an experiment. At the outset, we were both ignorant about the results. Unlike most of the studies of the rentier state which are usually predicated on linking oil production to autocracy *grosso modo*, we simply had no idea what the outcome of the statistical analysis would be. Nor did we have any particular beliefs about the state of democracy in Texas, Louisiana or the other American states. We did believe that it was plausible that even in democracies incumbents would seek to find ways to use oil rents to prolong their stay in office but we really had no way of knowing whether they could actually accomplish this goal or had explicitly sought to do so.

On balance we find that oil rents appear to be politically conservative: they allow political elites to maintain control over the levers of power and they tend to allow economic and social structures that have been in place to remain so. In this regard we agree with Bayulgen that the "rentier-state literature pays no attention to the initial conditions that shape the way an oil-rich country develops its resources" (Bayulgen, 29), but we take issue with the idea that the production of oil has no impact on political or social structures. We do insist, however, that although oil production slows growth significantly it does not destroy growth nor preclude economic growth from occurring. Oil production does appear to be undemocratic if by that one means the opposition is less likely to come to power. However, it remains to be seen if the

pattern of social expenditures differs significantly between (for example) oil producers and non-oil producers. We leave it for further work to more precisely investigate the fiscal mechanisms that seem to underpin the longevity of rentier politicians.

One clear implication of our analysis is that the monetary channel is not necessary (although in some cases it might be sufficient) to explain the so-called Dutch disease phenomenon. Because all the American states share the same currency it is more plausible to assert that the shortfall in economic growth arises from some structural condition of the economy. However, rather than the distinction between tradeables and non-tradeables we would like to introduce a different way to think about economic development: as the outcome of both the intensity and scale of capital investment which themselves result from the intensity and scale of demand for consumption goods.

Oil production specifically (and raw material production more generally) is geographically constrained and (generally speaking) capital intensive. Unlike most industrial goods (and even many agricultural goods), minerals cannot be produced anywhere simply by changing the labor-capital mix. It is possible, for example, to produce automobiles outside of Tokyo or in Detroit. It is simply not possible to produce oil in Vermont or coal in Florida. The demand for labor for the production of these goods is, moreover, constrained and generally decreasing historically.

What we suggest is that the absence of growth associated with raw material production is a feature of geography, an admittedly poorly understood feature of the economy. We note, however, that even in relatively advanced economies such as that of the US mineral production does not lead to the creation of urban centers and more specifically does not create the kind of pooled markets for labor, capital goods, or information that since Marshall have been associated with intense economic growth (Krugman 36). In the absence of such localized markets (cities), we hypothesize that the only way to integrate mineral production into a larger economic system is through free trade which, in general, will tend to reproduce the so-called “enclave” or rentier economy. Texas, West Virginia and New Mexico have grown slowly because they have not had the local demand or transportation networks to provide the setting for investments in other capital goods. In addition, we note that as long as the returns to mineral production are higher than the returns to other forms of investment in a region, we would expect more investment to flow into the activity with the higher return than the one with the lower return.

Appendix:
Data and Sources

Coal and Oil Productions & Values

Minerals Yearbook (prepared by the staff of the Bureau of Mines: 1932-) Washington:
The Bureau: Supt. of Docs., U.S. G.P.O

Mineral Resources of the United States (1882-1931), Washington, U.S.G.P.O

United States Geological Survey (USGS) website
<http://minerals.usgs.gov/minerals/pubs/myb.html>

US Department of Energy (1977 – present): <http://www.eia.doe.gov/>

History of U.S. Oil Production, 1859 – 1998
<http://www.hubbertpeak.com/us/ok/oklahoma.xls>

American Petroleum Institute: <http://api-ec.api.org/frontpage.cfm>

State of Utah natural Resources, Utah Energy Office
<http://www.energy.utah.gov/data/oilpetrol.htm>

Income Data:

U.S. Department of Commerce, Bureau of Economic Analysis (per capita income)
<http://www.bea.doc.gov/>

Population:

Historical Statistics of the United States: Colonial Times to 1970 – Bicentennial Edition

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Table 1: Natural Resource Dependence and Annual Growth

	Model 1: Annual Growth	Model 2: Panel 10 year average	Model 3: Panel 10 year average with 'Inequality'
Resource Dependence	-.014* (.008)	-.030*** (.011)	-.038*** (.007)
Per Capita Income (ln)	-3.245* (1.848)	-.817*** (.004)	-4.618*** (.321)
Inequality			4.867*** (1.975)
Lagged DV	.047 (.056)		
N=	2838	248	151
R2	.05	.21	.64

Note: Dependent variable in Model 1 is annual growth in real per capita state income. In Models 2 and 3 the dependent variable is the 10 year average growth for the periods 1945-55, 1955-65, 1965-75, 1975-85, and 1985-95. In models 2 and 3, logged per capita income is measured at the beginning of the time period. Inequality is measured at the beginning of the period in Model 3. All models include state dummies—the basic gist of the results change little if they are excluded. Including a post-oil shock dummy has no impact on the findings.

Table 2: Natural Resource Dependence and Long Term Development

	Model 1	Model 2
Resource Dependence	-1190.21*** (447.15)	-1041.27** (476.65)
Initial Income (1929)	1.20*** (.15)	1.24*** (.19)
Slave Population in 1860		15.65 (33.79)
Access to Markets		15.65 (33.79)
Colonizer (non-Spanish= 1)		506.42 (986.75)
N=	50	50
R2	.60	.60

Note: The Dependent Variable is per capita income in 2002. The coefficient for resource dependence in Model 1 implies an approximately \$180 decline in per capita state wealth for each percent increase in resource dependence as a share of GDP.

Table 3: Natural Resource Dependence and Electoral Competition, 1929-2002

	Model 1: Electoral Margin	Model 2: Electoral Turnover (0/1)
Resource Dependence	.406*** (.172)	-.045** (.172)
Colonizer (non-Spanish= 1)	5.135 (6.526)	.799 (.939)
Economic Growth	.109 (.070)	-.007 (.009)
Per Capita Income	-8.629*** (.967)	.403*** (.128)
Slave Population in 1860	.561*** (.102)	.002 (.013)
N=	1101	1101
R2	.39	.05

Note: The DV in Model 1 is the difference between the winner's vote share and the runner up's vote share. Estimated using OLS with panel-corrected standard errors. DV in model two is a dummy variable assuming the value of '1' when there is a partisan change in government. Estimated using logit. In both models, Alaska is dropped from the analysis.

Table 4: Natural Resources and Tax Effort

	Tax Effort
Resource Dependence	-.800*** (.086)
Economic Growth	-.527* (.318)
Per Capita Income	-26.46*** (4.578)
Deficits (per capita)	-.003* (.001)
N	1100
R-squared	.23

Note: Dependent variable is the difference between actual tax effort and tax capacity.

Source: Berry and Fording, 1997.

Table 5: Two-Stage Model
Natural Resources, Tax Illusion, and Electoral Competition 1929-2002

Model 1:
Electoral Margin

Panel A: Stage 2 Results

Tax Illusion	-.641** (.277)
Economic Growth	-.005 (.347)
Per Capita Income	-8.108* (3.569)
Slave Population in 1860	.330** (.137)
Colonizer (non-Spanish=1)	-6.005 (7.853)

Panel B: Stage 1 Results

Natural Resources	-1.282*** (.262)
Deficits per Capita	-.005** (.002)
<hr/>	
N=	456
R ²	.10

Note: The DV in Model 1 is the difference between the winner's vote share and the runner up's vote share. "Tax Effort" is defined as the difference between actual tax effort and tax capacity. Estimated using two-stage least squares.

Table 6: Natural Resource Dependence, Access to Markets, and Annual Growth

	Model 1
Resource Dependence	-.101*** (.038)
Access to Markets	.183 (.394)
Resources * Markets	.102*** (.394)
Lagged Growth	.248*** (.030)
PC Income	-.00007*** (.00003)
Slave Population (1860)	.007 (.008)
Colonizer (Northern Europe = 1)	.652 (.964)
<hr/>	
N=	3558
R ²	.08

Note: The Dependent Variable is annual growth in real per capita state income.

Figure 1:
Natural Resource Dependence in Three States, 1929-2000

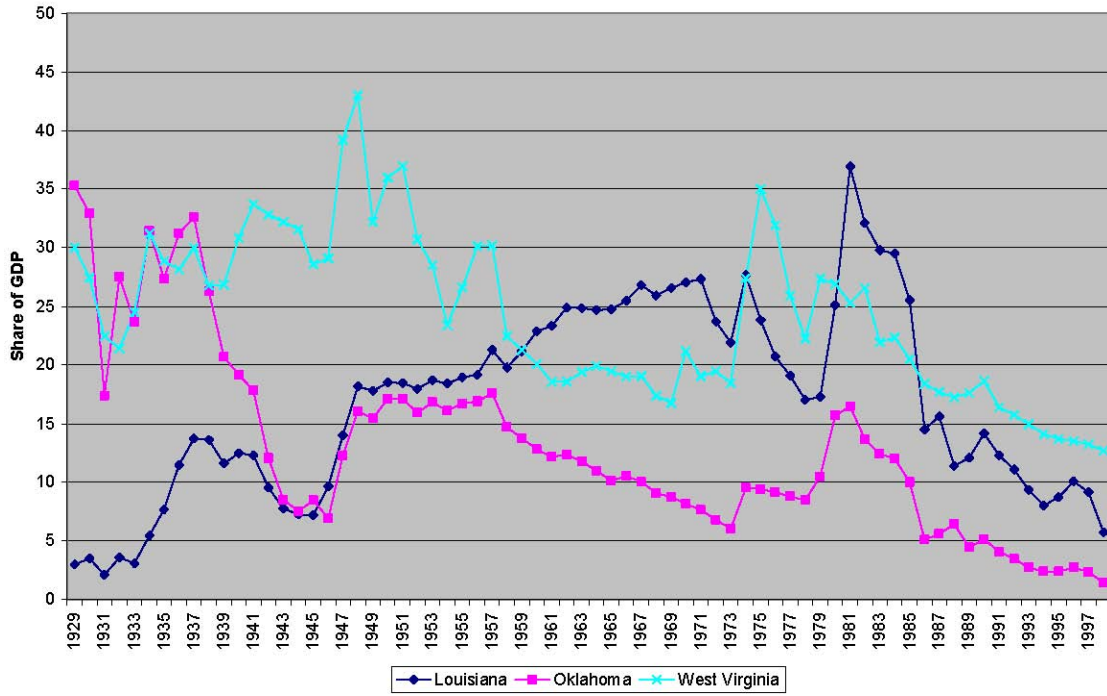
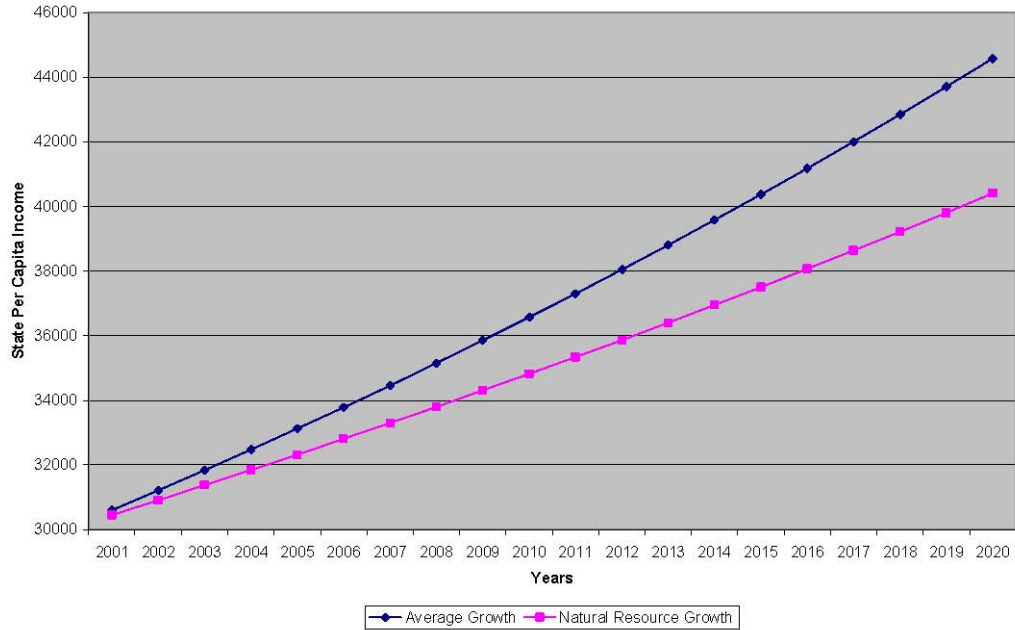


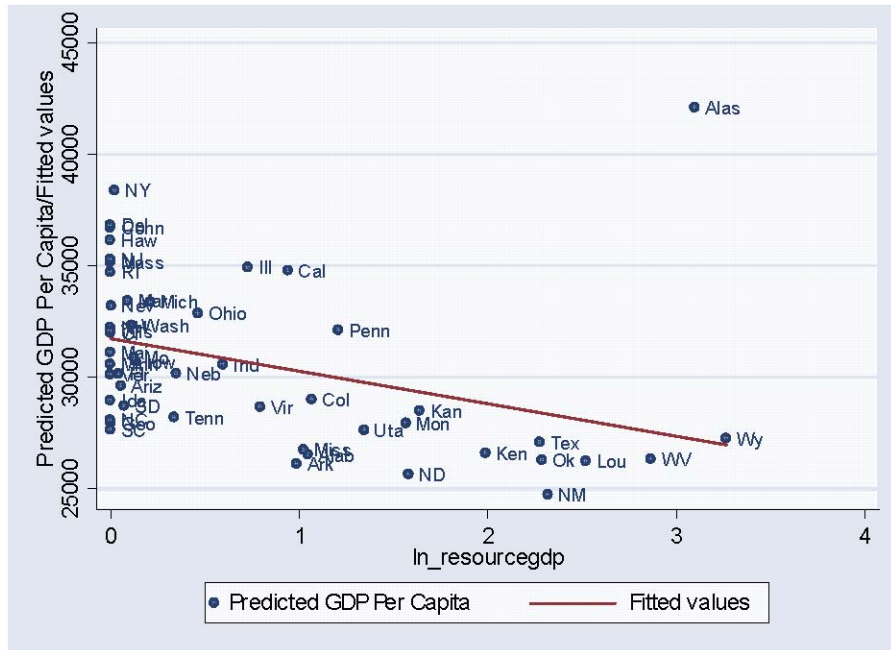
Figure 2

Predicted State Per Capita Income, 2001-2020



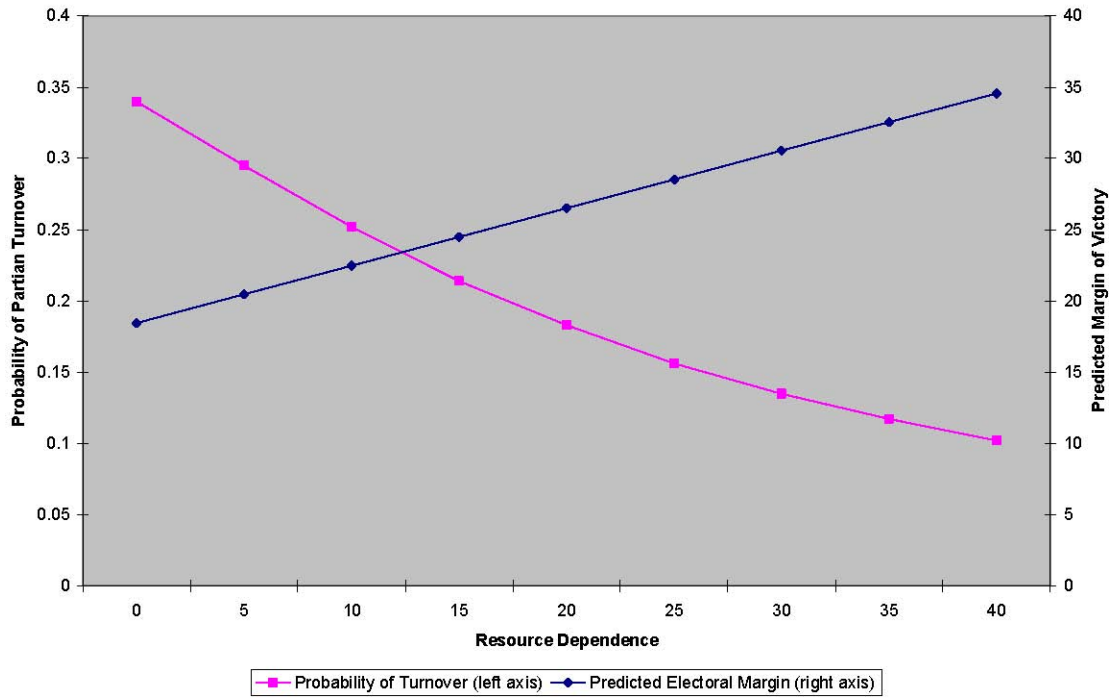
Note: The “Average Growth” line refers to what state income would be if a state with a per capita income of \$30,000 in 2000 experiences the same average growth as that experienced over the last 50 years. The “Natural Resource Growth” shows what state income would be if that same state experienced the natural resource effect resulting from relying on natural resource for 1/3 of GDP. Figure generated on the basis of results reported in Table 1.

Figure 3: Natural Resource Dependence and Development



Note: The graph shows the relationship between the predicted value of GDP per capita (from Model 1 in Table 2) and logged natural resource dependence.

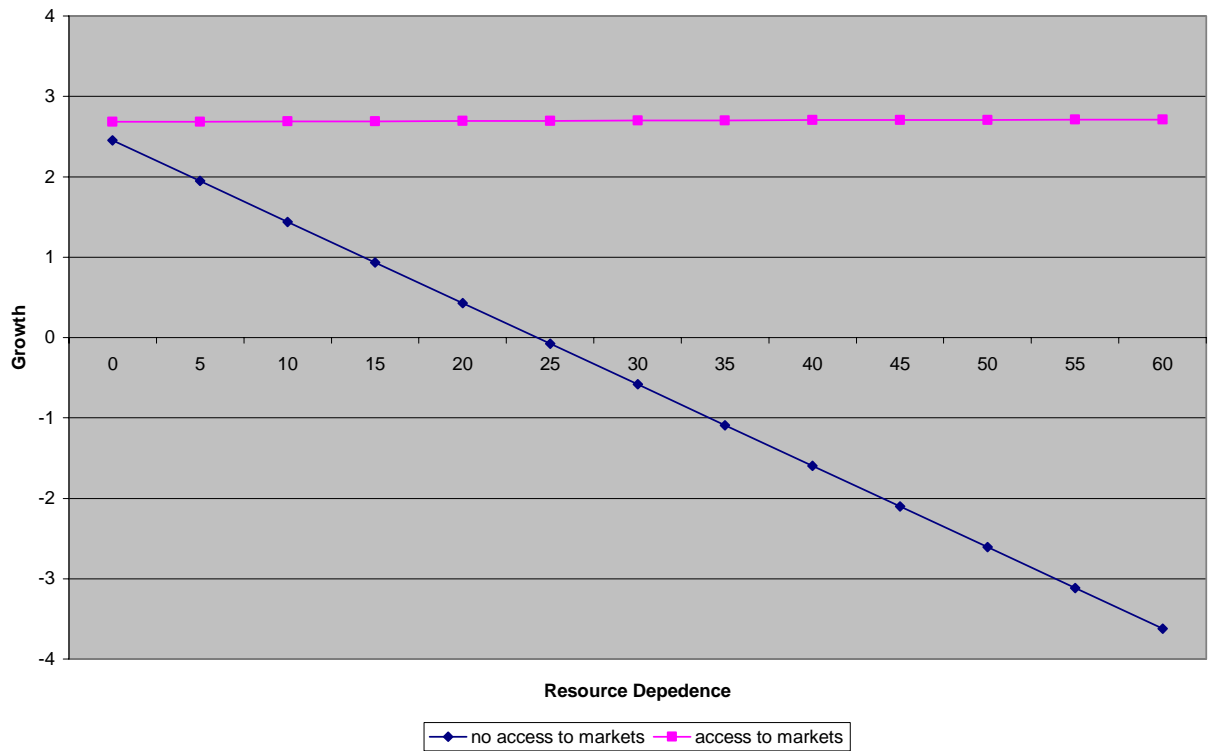
Figure 4: The Impact of Resource Dependence on Electoral Margins and Partisan Turnovers



Note: The lines represent simulated predicted values for the predicted margin of victory and the probability of a partisan turnover at varying levels of resource dependence on the basis of the results reported in Table 3.

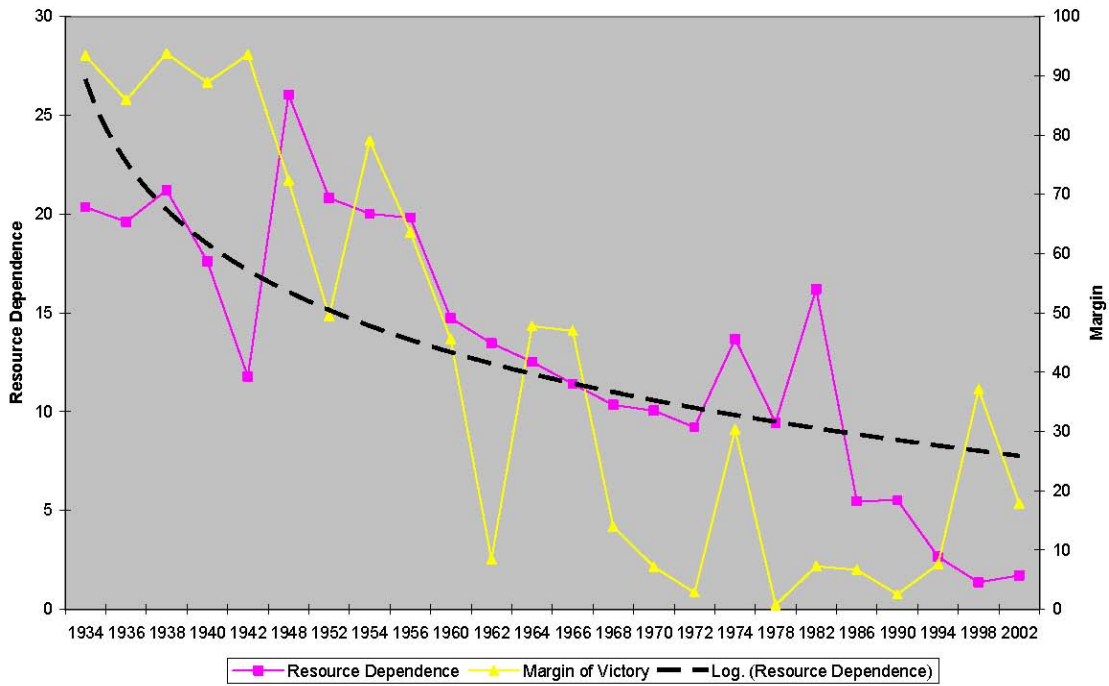
Figure 5:

Economic Growth and Natural Resources Conditional On Geography



Note: The graph is derived from the results presented above. 'Access to markets' is a dummy variable equal to '1' when a state has access to navigable rivers, lakes, or oceans.

Figure 6:
Resource Dependence and Margin of Electoral Victory, Texas 1930-2000



Note: The dashed line represents log detrended natural resource dependence. The margin of victory is the difference between the winner's and second place finisher's vote shares in gubernatorial elections. The bivariate regression of victory margin on resource dependence yields a coefficient of 3.4 that is significant at the .001 level. The R2 is .45.