

The Politics of the Resource Curse: a review

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Abstract

This essay discusses the intellectual roots of the resource curse literature, explains how scholars define natural resources, and summarizes recent findings on how resource wealth affects democracy, the quality of government institutions, and the incidence of violent conflict. It suggests there is robust evidence that one type of mineral wealth, petroleum, has at least three harmful effects: it makes authoritarian regimes more durable, increases some types of corruption, and is associated with the onset of violent conflict in low and middle income countries under certain conditions. The essay also points to some of the literature's weaknesses, unresolved puzzles, and empirical challenges.

1 Introduction

Hundreds of studies report that too much natural resource wealth is harmful for developing countries.¹ The apparent symptoms include a reduction in democratic accountability, bureaucratic effectiveness and female labor force participation, and a rise in economic volatility, corruption, and the likelihood of civil war.

Is the discovery of natural resource wealth really so harmful? Which resources matter and why? How strong is the evidence?

The resource curse can be defined as the perverse effects of a country's natural resource wealth on its economic, social, or political well-being. While most published studies report evidence that is consistent with the idea of a resource curse, there is considerable disagreement about the mechanisms that cause the reported problems and the conditions under which they are more likely to occur. Little is known about the policy interventions that might help. A handful of studies argues that the resource curse is illusory.

The study of the resource curse is linked to many other debates in political science for example, on the causes of democratic transitions (Gassebner, Lamla

¹Forthcoming in the *Handbook on the Politics of Development* (Carole Lancaster and Nicholas van de Walle, ed.), Oxford University Press. I am grateful to Jørgen Juel Andersen, Carol Lancaster, Paasha Mahdavi, Ragnar Torvik, and Nic van de Walle for their helpful comments on earlier drafts.

and Vreeland, 2012), the role of taxation in state-building (Brautigam, Fjeldstad and Moore, 2008; Smith, 2008), the consequences of foreign aid (Ahmed, 2012; Morrison, 2012; Bermeo, 2011) and the determinants of civil war (Fearon and Laitin, 2003). A series of global policy initiatives including the Kimberley Accord, the Extractive Industries Transparency Initiative, and the Publish What You Pay movement has been launched to help resource-rich developing countries avoid these ailments.

This chapter offers a short review of research on politics of the resource curse.² It develops three broad themes. First, there is robust evidence that one type of mineral wealth—petroleum—has at least three harmful effects: it seems to make authoritarian regimes more durable; it appears to increase certain types of corruption; and it is associated with the onset of violent conflict in low and middle income countries, particularly when it is found in the territory of marginalized ethnic groups. The effects of oil on both authoritarian rule and conflict appear to be recent phenomena, emerging after the 1970s. Many other claims are plausible and await further testing.

Second, the literature has many weaknesses and unresolved puzzles: there is no consensus on the mechanisms that link petroleum wealth to these outcomes, the conditions that make them more or less likely, the reasons they emerged when they did, and why other minerals—with the partial exception of alluvial diamonds—do not seem to be linked to the same outcomes.

Finally, it points out that research on this issue has been sharply limited by available data. Some of the data that scholars most fervently covet—for example, on the true size and disposition of natural resource revenues, or the operation of state-owned petroleum companies—are deliberately concealed or misreported by governments. Until recently, most studies have been based on the statistical analysis of large datasets with a single observation for each country and year—datasets that have been mined up to (and perhaps beyond) the point of diminishing returns. There is a promising trend toward subnational research, where the data are often better and identification strategies more convincing. Future progress will depend on our capacity to find new data, including both cross-national and sub-national data, that can cast light on the many unresolved puzzles.

The next section of this essay discusses the intellectual roots of the resource curse literature, in both political science and economics. Section two describes the many ways that scholars define natural resources, and explains why some of them are problematic. The subsequent three sections summarize research on how resource wealth affects democracy, the quality of government institutions, and the incidence of violent conflict. The final section looks at some key puzzles and challenges.

²For reviews of research on the economics of the resource curse, see Wick and Bulte (2009); van der Ploeg (2011); Frankel (2012).

2 Some Roots

The earliest published reference to the term resource curse appears in Auty (1993). The notion that natural resource wealth can have perverse consequences, however, has a long and distinguished intellectual history. Early modern philosophers like Machiavelli, Bodin, and Montesquieu argued when countries had favorable resource endowments, their citizens became myopic and slothful. Adam Smith's *The Wealth of Nations* stressed the dangers of pursuing mineral wealth, warning

Of all those expensive and uncertain projects, however, which bring bankruptcy upon the greater part of the people who engage in them, there is none perhaps more ruinous than the search after new silver and gold mines. They are the projects, therefore, to which of all others a prudent law-giver, who desired to increase the capital of his nation, would least choose to give any extraordinary encouragement (Smith, 1776 (1991, volume IV, chapter 7, section 18).

Even David Ricardo, who helped develop the modern concept of economic rents, saw few social or economic benefits from mining silver or gold. In *On the Principles of Political Economy and Taxation*, he notes that Spain and Portugal were Europe's greatest producers of gold and silver, yet

This increase of the quantity of those metals, however, has not, it seems, increased that annual produce; has neither improved the manufactures and agriculture of the country, nor mended the circumstances of its inhabitants. Spain and Portugal, the countries which possess the mines, are, after Poland, perhaps, the two most beggarly countries in Europe (Ricardo, 1817 (1911, chapter 28, par. 10).³

Political scientists who study the resource curse draw more proximately on the work of Middle East scholars who, beginning in the 1970s, revived the concept of the rentier state to explain the peculiar qualities of the regions oil-producing governments.⁴ Mahdavy (1970, 428) is widely credited with giving the rentier state term its contemporary meaning: a state that receives substantial rents from foreign individuals, concerns, or governments. Beblawi (1987, 50) developed a more precise definition, suggesting that a rentier state was one where the rents are paid by foreign actors, where they accrue directly to the state, and where only a few are engaged in the generation of this rent (wealth), the majority being only involved in the distribution or utilization of it.

³Beblawi notes that classical economists had few kinds words to say about rents or rentiers, who were regarded as "unproductive, almost anti-social, sharing effortlessly in the produce without, so to speak, contributing to it (Beblawi, 1987, 50)."

⁴The concept of a rentier state dates back to at least the beginning of the 20th century, when Lenin used the term to vilify European governments that earned interest on their loans to non-European governments (Lenin, 1914 (1975).

Both Mahdavy and Beblawi argued that governments funded by external rents were freed from the need to raise taxes; this made them less accountable to their citizens, and hence less likely to deploy these rents in ways that promoted economic development. Their argument encapsulates two of the most prominent claims in the resource curse literature: that rents damage government accountability and reduce economic growth.

In the 1980s and 1990s, the rentier state literature was gradually refined by scholars studying Libya (First, 1980; Vandewalle, 1998), Iran (Skocpol, 1982; Shambayati, 1994), Tunisia (Bellin, 1994), Saudi Arabia and the Arab Gulf states (Crystal, 1990; Gause III, 1994; Chaudhry, 1997), the Congo Republic (Clark, 1997), Gabon (Yates, 1996), Indonesia (Tornquist, 1990), and other resource-rich countries. Karl's influential *Paradox of Plenty* drew heavily on this literature to explore the disappointing political and economic outcomes in Venezuela and more briefly, Algeria, Iran, Indonesia, and Nigeria following the oil shocks of the 1970s (Karl, 1997, 44).

For economists, much of the resource curse debate was triggered by a seminal 1995 working paper by Sachs and Warner, which reported a negative correlation between a country's dependence on natural resource exports in 1970 and its economic growth between 1971 and 1989 (Sachs and Warner, 1995). The Sachs and Warner study, in turn, drew on a World Bank-sponsored study organized by Gelb that analyzed how six oil-rich states—Algeria, Ecuador, Indonesia, Nigeria, Trinidad, and Venezuela—responded to the oil shocks of the 1970s (Gelb and Associates, 1988). Later studies by Auty extended this analysis, looking at an overlapping set of oil and mineral exporting countries (Auty, 1990, 1993).⁵

The ensuing research by economists has traveled deep into territory nominally occupied by political scientists. It also echoes arguments first raised by development economists in the 1950s and 1960 about the hazards of primary commodity exports: that the volatility of international commodity prices is economically damaging for low-income countries (Nurske, 1958; Levin, 1960); that commodity booms fail to stimulate other sectors of the economy, at least in the absence of strong government intervention (Hirschman, 1958); and that the declining terms of trade for primary commodities relegates the commodity-exporting countries to the periphery of the global economy (Prebisch, 1950; Singer, 1950).⁶

3 What does *natural resources* mean?

The term *natural resources* can cover many types of commodities, each of which can be measured in many ways. Scholars have gradually converged on certain measures, but problems remain.

⁵Many studies also drew on Corden and Neary's (1982) work on the concept of the Dutch Disease, although both researchers and journalists came to confuse the Dutch Disease with the resource curse.

⁶This earlier literature is discussed at greater length in Ross (1999). Other fields have also explored the often-baneful consequences of natural resource wealth; in sociology, early influences include Delacroix (1977), Bunker (1984), and Peluso (1992).

There are three components to most definitions of natural resources. The first is the choice of resource. Early studies by Sachs and Warner (1995) and Collier and Hoeffler (1998) looked at broad measures of resources that included petroleum, other minerals, and agricultural commodities—everything that fell under the World Bank's prepackaged measure of primary commodities. Today agricultural products are rarely seen as part of the resource curse—both because they are produced, not extracted, and hence fail to meet standard definitions of natural resources; and because they are seldom correlated with unfavorable outcomes.⁷ A relatively small number of studies have looked closely at the effects of non-fuel minerals (Sorens, 2011), forest products (Price, 2003; Harwell, Farah and Blundell, 2011), or commodities more generally (Besley and Persson, 2011; Bazzi and Blattman, 2013).

Just two types of resources have been consistently correlated with lamentable outcomes: petroleum, which is the key variable in the vast majority of the studies that identify some type of curse; and alluvial diamonds, which in several careful studies have been associated with civil conflict. Still, it is too early to conclude that other resources do not matter: not everything has been well-measured or received the same kind of attention as oil.⁸

The second component identifies the salient quality of the resource. Common choices include the quantity of production, the value of production, the rents generated by production, and the value of exports. A smaller number of studies have looked at the value of petroleum or mineral reserves, petroleum discoveries, the number of workers employed in the resource sector, the international price of a given resource, the depletion of the resource, and the government revenues generated by the resource sector.

The final component is the method used to normalize these values to make them comparable across countries or regions—that is, whether to express the measured quantity as a fraction of GDP, a fraction of total exports, a fraction of total government revenues, by land area, or on a per capita basis.

These three components can be combined in dozens of ways to generate alternative measures of a country's natural resource endowment. The proliferation of measures has been both good and bad: it means that scholars have usefully explored many potentially-interesting dimensions of resource wealth that might have important economic or political effects; but it has also made it lamentably easy for researchers to stumble across resource measures that are statistically, but spuriously, associated with a given outcome.

For example, one common measure—exports of fuel or non-fuel minerals, as a fraction of GDP—is probably biased upwards in poorer and more conflict-prone countries; this could cause it to be spuriously correlated with bad outcomes. Consider two countries with the same population that produce the same quantity of oil: the numerator—a country's oil exports—will be larger in the poorer country, since it will be too poor to consume its own output. On a per-capita basis, the

⁷A notable exception are studies that employ the concept of point source resources developed by Woolcock, Pritchett and Isham (2001), which includes oil, other minerals, and coffee and cocoa production.

⁸I use the term oil to refer to both oil and gas.

US produces more oil than Nigeria, but Nigeria exports more than the US, because the US is wealthier and consumes all of its oil domestically. Another concern is omitted variable bias: there may be other factors besides resource abundance like having high corruption levels or endemic conflict that cause a country to be highly-dependent on its resource sector. If so, it might be these other, omitted factors that are causing resource-dependent countries to have such bad outcomes.

To circumvent these problems, some scholars are turning to alternative measures like the value of oil production per capita (Ross, 2008, 2012; Haber and Menaldo, 2010) or global price shocks (Ramsay, 2011; Besley and Persson, 2011); or are using instrumental variables to identify the exogenous component of the resource variable (Brunnschweiler and Bulte, 2009; Busse and Gröning, 2013; Tsui, 2011; Cotet and Tsui, 2013).

Unfortunately, one of the most potentially-important measures is also among the most difficult to obtain: government revenues from the extractive sector. States collect these revenues in a variety of ways: through royalties, corporate taxes, concession fees, transit fees, signing bonuses, in-kind payments, and revenues from state-owned companies. Different types of revenues may accrue to different arms of the state like oil and finance ministries, state-owned oil companies, and local governments and may or may not be transferred to a central account. Governments can also hide their revenues by understating the value of the fuel they sell domestically to their citizens.⁹

4 Resource Wealth and Democracy

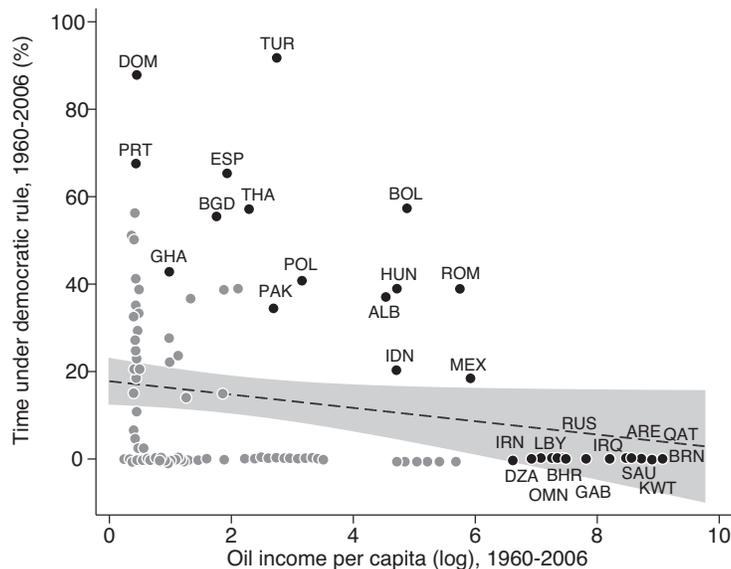
Since the early 2000s, dozens of books and articles have analyzed the effects of resource wealth, especially petroleum wealth, on government accountability. A large majority are broadly consistent with the claim that oil wealth makes autocratic governments more stable, and hence less likely to transit to democracy.

Figure 1 summarizes the global relationship between oil wealth and democratic transitions. It includes all countries that, since 1960, could have made transitions from authoritarianism to democracy - including all 64 countries that were under authoritarian rule in 1960, plus the 50 countries that became independent after 1960 and were under authoritarian rule in their first year of independence. The values on the horizontal axis represent each country's mean oil income per capita between 1960 and 2006; the values on the vertical axis denote the percentage of the time (since either 1960 or their first year of independence) that these initially-authoritarian countries dwelt under a democratic government. Those that were continuously authoritarian have a score of 0, while those that transited to democracy early and stayed democratic have scores approaching 1.

The downward-sloping line suggests the overall relationship between oil and the persistence of authoritarianism: the greater a country's oil income, the less

⁹This is why the non tax revenue measure in the World Development Indicators does a poor job of capturing natural resource revenues.

Figure 1: Oil and transitions to democracy 1960-2006.



likely the transition to democracy. Countries that transitioned to democracy early, and remained democratic like the Dominican Republic, Turkey, Portugal and Spain had little or no oil. A handful of countries with modest oil and gas wealth, like Bolivia, Romania, and Mexico, had more recent (and sometimes more erratic) transitions to democracy; but no country with high levels of oil and gas income has successfully become democratic since 1960. Most countries on the far right edge of the horizontal axis states with lots of oil and no democratic transitions are in the Middle East and North Africa; but the group also includes Russia, Angola, Gabon, Brunei and Malaysia.

The connection between petroleum wealth and autocratic rule has long been explored by scholars of resource-rich countries, particularly in the Middle East.¹⁰ Many of their insights were drawn together by Ross (2001*a*), which reported a negative statistical association between a country's level of dependence on oil (and mineral) exports, and its democracy level, measured by the Polity index. The core finding that more oil wealth is associated with less democracy has been replicated many times, using better data and more sophisticated methods; recent studies suggest it is robust to the use of country fixed effects (Werger, 2009; Aslaksen, 2010; Tsui, 2011; Andersen and Ross, 2014) and instrumental variables (Tsui, 2011; Ramsay, 2011). An extreme bounds analysis identified oil dependence as one of the few robust correlates of regime types (Gassebner, Lamla and Vreeland, 2012). A statistical meta-analysis of the oil-democracy question, which integrated the results of 29 studies and 246 empirical estimates,

¹⁰See section 2 for some important examples.

concluded that oil had a negative, nontrivial, and robust effect on democracy (Ahmadov, 2013). Much of this research has tried to clarify the conditions under which petroleum wealth has anti-democratic effects. There are two broad possibilities: oil could strengthen authoritarian governments and prevent them from transiting to democracy; and it could weaken democratic governments and push them toward authoritarianism. Most studies have come to similar conclusions: oils most robust effect is to help prevent autocratic regimes from democratizing.¹¹

These findings also consistent with research on the survival in office of authoritarian leaders, rather than authoritarian regimes. Both Cuaresma, Oberhofer, and Raschky (2010) and Andersen and Aslaksen (forthcoming) show that oil wealth lengthens the survival in office of authoritarian rulers; Andersen and Aslaksen also find that kimberlite diamonds have a similar effect, while alluvial diamonds and other types of minerals can reduce the longevity of authoritarian leaders and parties. Looking exclusively at African states, Omgba (2009) finds that oil, but not other mineral resources, helps incumbents remain in office.

The impact of oil wealth on democracies is more ambiguous. One set of studies reports that oil has pro-democratic effects in democracies, either by making the governments more stable (and hence less likely to become autocracies), or by improving their democracy scores (Smith, 2004; Morrison, 2009; Dunning, 2008; Tsui, 2011).¹² If this is true, as Smith (2004) argues, oil might be better characterized as pro-regime stability than anti-democratic.

But a second group of studies finds no evidence that oil helps stabilize democratic regimes (Caselli and Tesei, 2011; Wiens, Poast and Clark, 2011; Al-Ubaydli, 2012) or rulers (Andersen and Aslaksen, forthcoming); and a third group suggests that even if oil has no aggregate effect on democratic stability, under certain conditions it can promote the breakdown of democratic regimes for example, among the states of sub-Saharan Africa (Jensen and Wantchekon, 2004), or more generally, among low and middle-income states (Ross, 2012). It should not be surprising that this issue is unsettled: there are relatively few oil-rich democracies, especially outside the OECD, making it hard to draw strong inferences about their stability.

New insights on this question have emerged from sub-national studies in democracies including in the US (Goldberg, Wibbels and Mvukiyehe, 2008; Wolfers, 2009), Brazil (Brollo et al., 2013; Monteiro and Ferraz, 2010), and Argentina (Gervasoni, 2010) all of which find that oil windfalls (or in the Brollo et al. and Gervasoni studies, windfall-like federal transfers) tend to lengthen the terms in office of elected local officials. The Brazilian studies are particularly interesting: Brollo et al. found that windfall-like federal transfers reduced the education levels of mayoral candidates, and increased the incidence of cor-

¹¹See Smith (2004), Ulfelder (2007), Tsui (2011), Bueno de Mesquita and Smith (2010), Cabrales and Hauk (2011), Caselli and Tesei (2011), Al-Ubaydli (2012), and Wiens, Poast, and Clark (2011). Resource wealth may have other effects on autocratic regimes: according to Erogov, Gurviev, and Sonin (2009), it reduces media freedom; Gandhi and Przeworski (2007) show that it makes authoritarian legislatures less likely to emerge.

¹²Morrison (2009) does not focus on petroleum, but a broader class of non-tax revenues.

ruption detected by the federal governments random audit program; Monteiro and Ferraz report that oil windfalls gave incumbents a strong re-election advantage, but only in the short-run. All four studies suggest that windfalls had pro-incumbent effects; whether this should be seen as anti-democratic is subject to interpretation.

The anti-democratic (or pro-incumbent) powers of oil might also be conditional on the rulers ability to capture the rents it generates (Snyder and Bhavnani, 2005; Greene, 2010). According to Andersen and Ross (2014), oil only gained strong anti-democratic powers in the late 1970s, after most oil-rich developing countries nationalized their petroleum industries and were able to capture the bulk of the rents. Dunning (2008) argues for a different type of conditional influence: that oil impedes democratization in countries with low levels of inequality, but hastens democratization in countries with high inequality levels by alleviating the concern of wealthy elites that democracy will lead to the expropriation of their private wealth. This is why, according to Dunning, oil had pro-democratic effects in Latin America but anti-democratic effects in the rest of the world.

Many studies dwell on the mechanisms that link more oil to less democracy. Perhaps the most common argument is for the rentier effect: an abundant flow of oil revenues enables incumbents to both reduce taxes and increase patronage and public goods, allowing them to buy off potential challengers and reduce dissent (Mahdavy, 1970; Crystal, 1990; Ross, 2001*a*). An important assumption is that taxation and democracy are closely related: when governments try to raise tax revenues, they are often met with demands for greater accountability (Bates and Lien, 1985; Ross, 2004*a*; Brautigam, Fjeldstad and Moore, 2008).

Several studies have tested versions of the rentier mechanism with cross-national data. Morrison (2009) reports that non-tax revenue is associated with enhanced regime stability in both autocracies and democracies, but through somewhat different avenues: it leads to greater social spending in autocracies but the reduced taxation of elites in democracies. According to Ross (2012), there is statistical support for the rentier mechanism in the available cross-national data, but the correlations are somewhat fragile, perhaps due to inaccurate and missing data.

A handful of studies has scrutinized the rentier effect with subnational data.¹³ McGuirk (2013) uses micro-level survey data from 15 sub-Saharan countries and finds strong within-country correlations between increased sums of natural resource rents, decreases in the (perceived) enforcement of taxation, and declines in the demand for democratic governance. One of the few field experiments on this topic carried out by Paler (forthcoming) in Indonesias Blora district found that a taxation treatment led to increased monitoring of public officials, while a windfall treatment did not.

The rentier model assumes that resource wealth does not affect the preferences of rulers, only their fiscal capacity to act on these preferences. An alter-

¹³Subnational studies in authoritarian states are difficult to carry out; still, many qualitative case studies report evidence that is consistent with the rentier effect (e.g., Crystal, 1990; Yates, 1996; Fish, 2005; Kendall-Taylor, 2012).

native set of approaches explored formally by Robinson et al. (2006), Morrison (2007), and Caselli and Cunningham (2009), and informally by Fish (2005) suggests that resources affect the value that leaders place on remaining in office, rather than their capabilities. According to these models, the availability of resource rents heightens the value that incumbents place on remaining in power, thereby inducing him or her to invest more on regime-preserving activities.

There are many additional theories that connect oil to either autocracy or incumbency: oil-rich autocrats may invest more heavily in repression (Ross, 2001*a*; Cotet and Tsui, 2013)¹⁴; oil might give undemocratic leaders the foreign support they need to fend off challengers (Rajan, 2011); the fixed quality of mineral resources could make it harder for elites in authoritarian states to transfer their wealth abroad, which could lead them to more vigorously oppose democratic reforms (Boix, 2003); or oil rents could spur immigration, which may enhance the governments capacity to block democratic movements (Bearce and Hutnick, 2011).

There have been two types of challenges to the claim that oil prolongs autocracies. The first is about the net impact of petroleum wealth: even if oil has a harmful direct effect on democratic transitions, this might be counterbalanced by a positive indirect effect, brought about through the higher incomes that oil wealth tends to bring. Herb (2005) first articulated this problem, and suggests that these two effects may effectively cancel each other out, leaving oil with no net effect on democracy. Alexeev and Conrad (2009; 2011) address the same question but use a different empirical strategy; unlike Herb, they conclude that oils harmful direct effect on voice and accountability is greater than its beneficial, indirect effects.

Resolving this issue is difficult because the impact of oil wealth on incomes is not straightforward; many argue it is conditional on other factors, like the ex ante quality of the governments institutions (Melhum, Moene and Torvik, 2006), the type of democratic institutions (Andersen and Aslaksen, 2008), openness to trade (Arezki and van der Ploeg, 2011), the level of human capital (Kurtz and Brooks, 2011), the survival function of political leaders (Caselli and Cunningham, 2009), or other factors (Torvik, 2009). Oil could also have other indirect effects positive or negative that further complicate our ability to determine its net impact.

The second challenge is causal identification: conceivably, the correlation between oil wealth and autocratic governance might be endogenous or driven by omitted variables. Haber and Menaldo (2010) emphasize this problem, and develop a series of models that use historical data stretching back to 1800, and control for country and year fixed effects; they show that together these strategies cause the oil-democracy correlation to lose statistical significance or even reverse signs. Gurses (2009) uses more recent data, again with country fixed effects, and reports a similar finding.¹⁵

¹⁴This claim is made harder to evaluate by the underreporting of military expenditures in some oil-rich countries (e.g., Colgan, 2011).

¹⁵More limited critiques by Wacziarg (2012) and Brückner, Ciccone, and Tesei (2012) suggest that price shocks themselves do not have anti-democratic effects.

Yet these critics also have critics. Andersen and Ross (2014) argue that Haber and Menaldo decline to test the most credible version of the resource curse hypothesis (e.g., that more oil revenues helps autocracies stay in power); that they draw invalid inferences from their longitudinal data; and that they fail to account for changes over time in the global distribution of petroleum rents. According to Andersen and Ross, oil wealth only became a hindrance to democratic transitions after the expropriations of the 1970s, which enabled developing country governments to capture the oil rents that were previously siphoned off by foreign-owned firms. They show that the statistical results of both Haber and Menaldo and Gurses can be overturned even when using their data and specifications by simply adding to their models a term that interacts their oil measures with a dummy variable for the post-1980 period.

5 Resources and Institutions

The second branch of the resource curse literature looks at the relationship between resource wealth and the quality of institutions, meaning the effectiveness of the government bureaucracy, the incidence of corruption, the rule of law, and more broadly, the states capacity to promote economic development. Once again, petroleum is typically associated with harmful outcomes, while other mineral resources are not. Most of this research falls in one of two categories.

The first looks at the ways that institutional quality may condition the effects of resource wealth on economic growth. Tornell and Lane (1999) develop a model showing how a state with weak institutions, upon receiving a positive fiscal shock (like a resource boom), may suffer from a voracity effect in which powerful groups struggle for and squander the windfall. Mehlum, Moene, and Torvik (2006) argue that the effects of natural resources on economic performance are conditional on the ex ante quality of state institutions: where institutions are grabber friendly (and more prone to corruption), resource wealth tends to lower aggregate income; where they are producer friendly (and less prone to corruption), it will raise aggregate income. Robinson et al. (2006) develop a parallel argument, suggesting that when institutions are weak ex ante, resource booms will be dissipated through excessive public employment and patronage.

The second body of research asks whether natural resource wealth can damage, or stunt the beneficial evolution of, institutions themselves. There are many theories about how this could occur: revenue volatility could shorten a governments planning horizon and subvert major investments (Karl, 1997); windfalls could cause a governments revenues to expand more quickly than its capacity to efficiently manage them (Hertog, 2007; Ross, 2012); high levels of resource revenues could forestall a states capacity to extract taxes from its citizens, leaving the government weak, vulnerable to rent-seeking, and unable to develop sound economic policies (Beblawi, 1987; Chaudhry, 1989; Karl, 1997); discourage politicians from investing in the states bureaucratic capacity (Besley and Persson, 2010); encourage lower-quality candidates to compete for public office; and induce politicians to dismantle the institutions that govern the allocation

and use of natural resources (Ross, 2001*b*).

Several empirical studies report that resource wealth is inversely correlated with measures of institutional quality (Bulte, Damania and Deacon, 2005; Isham et al., 2005; Anthonsen et al., 2012; Sala-i Martin and Subramanian, 2013). According to Beck and Laeven (Beck and Laeven, 2006), variations in institution-building in the transition countries after 1992 can be partly explained by variations in initial levels of mineral exports. Knack (Knack, 2009) finds that revenues from fuel exports are strongly associated with, and revenues from nonfuel minerals exports are weakly associated with, inefficient tax systems.

Scholars have made special efforts to scrutinize the association between natural resources and corruption. Several studies, using either cross-national or panel regressions, find strong correlations between natural resource dependence and perceptions of corruption (Leite and Weidmann, 1999; Arezki and Brückner, 2011; Sala-i Martin and Subramanian, 2013). To better measure corruption, Andersen et al. (2012) uses a unique dataset from the Bank of International Settlements of foreign deposits in the banks of countries that traditionally serve as tax havens, like Switzerland, Cayman Islands, and Bahamas; it shows that when autocracies (but not democracies) experience a rise in oil and gas rents, there is a corresponding rise in deposits held by their citizens in these tax havens. They estimate that at least eight percent of the petroleum rents in autocracies are transferred into these foreign, personal accounts.

Subnational studies also report evidence of an oil-corruption link. Vicente (2010) uses household surveys to compare changes in corruption in São Tomé and Príncipe, where oil had been discovered, to Cape Verde, where there were no discoveries; it finds a large increase in perceived corruption in São Tomé across many public services. Brollo et al. (2013) employs a regression discontinuity design to identify the effects of transfers from the federal government in Brazil to municipal governments; it concludes that a 10 percent rise in these windfall-like transfers are associated with a rise of 10 to 12 percentage points in the corruption found by the federal governments random audit program. A second study of Brazilian municipalities, by Caselli and Michaels (2013), found that plausibly exogenous increases in oil revenues were associated with increased spending on public goods and services; yet much of this money went missing, and was most likely absorbed by a combination of increased patronage and embezzlement by top officials.

The impact of resource wealth on institutions may also be conditional: Bhattacharya and Hodler (2010), for example, offer evidence from panel data that natural resources only lead to greater corruption in non-democracies. Government ownership might also be important: Luong and Weinthal (2010) study five petroleum-rich states of the former Soviet Union (Russia, Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan), and conclude that oil wealth only leads to weakened state institutions when the government has a dominant role in the petroleum industry; when the private sector (especially foreign investors) has a dominant role, governments are likely to have stronger fiscal institutions.

Claims about the causal effects of oil wealth on institutions have faced the same two questions discussed above: whether the direct, harmful effects are

offset by indirect, beneficial ones; and whether the observed correlations are produced by omitted variables or endogeneity. According to Alexeev and Conrad (2009; 2011), once the countervailing effects of oil on income have been fully accounted for, the net effects of resource wealth on institutions disappears; only the perverse effects of oil wealth on democracy remain. When Busse and Gröning (2013) use instrumental variables to mitigate endogeneity, and country fixed effects to account for omitted variables, they find measures of resource wealth are associated with heightened corruption but not other institutional weaknesses.

6 Resources and Civil War

The third major branch of research looks at the effects of natural resource wealth on civil war.¹⁶ In some ways it resembles the other branches: it brings together qualitative research—usually country-level, theoretically-informed case studies¹⁷—with cross-national quantitative work; most published studies identify a harmful effect, albeit a conditional one; and scholars disagree about the causal mechanisms.

There are four important differences, however, between the study of resources and conflict and the rest of the field. First, its claims have a different lineage. Other branches of the resource curse literature grew out of research on primary commodities and development in the 1950s and 1960s, and the rentier state in the 1970s and 1980s; the study of resources and civil war is based on economic theories of conflict from the early 1990s (e.g., Hirschleifer, 1991; Skaperdas, 1992; Grossman, 1994). It was also inspired by more recent events. The other branches can be seen as efforts to explain the perverse effects of the 1970s oil shocks; the study of resources and civil war was motivated by a wave of violent conflicts in the 1990s—in Angola, Cambodia, Colombia, the Democratic Republic of Congo, Liberia, Sierra Leone, Indonesia, and Sudan—that appeared to be linked to resource wealth. Qualitative studies by Keen (Keen, 1998), Reno (Reno, 1995, 1998), and Le Billon (Le Billon, 2001), and Collier and Hoefflers (Collier and Hoeffler, 1998) influential cross-national statistical study, touched off a flood of research on whether and how natural resources might be connected to the onset, duration, and intensity of civil war.¹⁸

The second difference is that other kinds of natural resources seem to matter: only petroleum is consistently correlated with less democracy and more corruption, but both petroleum and alluvial diamonds are statistically associated with the onset or duration of civil war (Ross, 2003, 2006; Lujala, Gleditsch

¹⁶For earlier reviews of this literature, see Ross (2004b; 2006). Koubi et al. (2013) provides a more recent review.

¹⁷See, for example, Omeje (2008), Collier and Sambanis (2005), and Kaldor, Karl, and Said (2007).

¹⁸There is also a separate body of research asking whether the scarcity of renewable resources can trigger violent conflict; see, for example, Gleditsch (2012) and Koubi et al. (2013). Bazzi and Blattman (2013) correctly emphasize the importance of looking separately at the effects of resource wealth on the onset, duration, and intensity of conflict.

and Gilmore, 2005). Other studies find that different types of minerals (Collier, Hoeffler and Rohner, 2009; Sorens, 2011; Besley and Persson, 2011), other contraband goods such as alluvial gemstones (Fearon, 2004), and coca leaves (Angrist and Kugler, 2008) have similar effects. The role of timber in several violent conflicts has been explored at the case study level (Price, 2003; Harwell, Farah and Blundell, 2011). Still, the salience of nonfuel resources is far from settled: Ross (Ross, 2006) notes that the correlation between alluvial diamonds and civil war is based on a handful of conflicts and statistically fragile.

The third difference is that the effects of resource wealth appears to be non-monotonic. The associations between oil wealth and authoritarian rule, and oil wealth and corruption, seem to be approximately linear: the greater the value of petroleum resources per capita, the worse the outcome. But the relationship between natural resource wealth and the onset of violent conflict instead resembles an inverted U: as the value of resource wealth increases, the risk of conflict first rises, then falls, (Collier and Hoeffler, 1998; Collier, Hoeffler and Rohner, 2009; Basedau and Lay, 2009; Bjorvatn and Naghavi, 2011; Ross, 2012). Large amounts of oil wealth per capita (comparable to Nigeria or Iran) are dangerous, but very large amounts (comparable to Saudi Arabia or Equatorial Guinea) are not.¹⁹

Interpretations of this pattern vary, but most bear a close resemblance to Collier and Hoefflers (1998) original argument: when resource wealth reaches very high levels it becomes a stabilizing force, by enabling the central government to buy off potential rebels and invest more heavily in security. In other words, the conflict-inducing properties of the resource are eventually offset by the rentier effect.

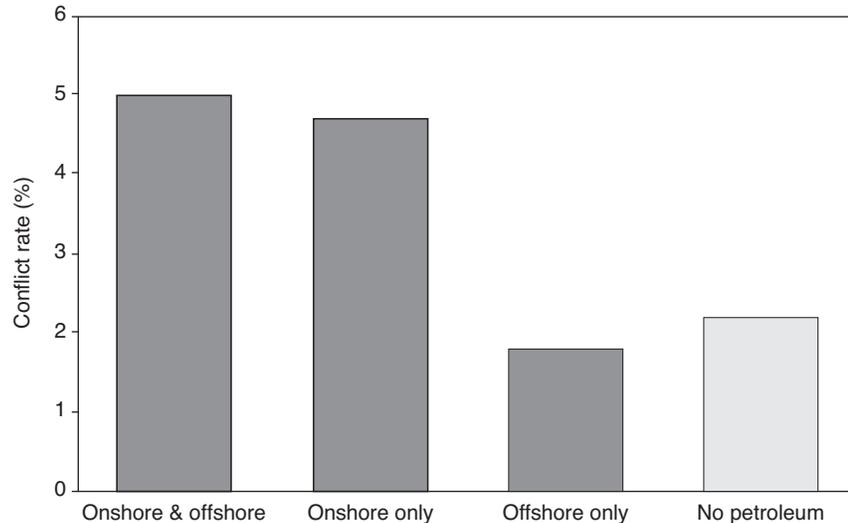
The fourth and most important difference is that location matters. The likelihood that resource wealth will trigger, prolong, or intensify a conflict seems to depend on where, within a countrys boundaries, it is found. Indeed, the unconditional correlation between oil and conflict has been strongly challenged (Cotet and Tsui, 2013; Bazzi and Blattman, 2013) and does not appear to be robust.

Studies that take location into account, however, show different results: when it is found offshore, oil wealth has no robust relationship with on a countrys conflict risk; if it is onshore, it has a large effect, as seen in Figure ?? (Lujala, 2010; Ross, 2012). Moreover, the precise onshore location matters: oil is more likely to spark conflict when it is found in regions that are poor relative to the national average (Østby, Nordås and Rød, 2009) and populated by marginalized ethnic groups (Basedau and Richter, 2011; Hunziker and Cederman, 2012); when the resource is located in a region with a highly-concentrated ethnic group (Morelli and Rohner, 2010); and where ethnic entrepreneurs use it to promote collective resistance to the central government (Aspinall, 2007).²⁰ When con-

¹⁹Not everyone agrees; see Humphreys (2005).

²⁰Some of these findings also apply to alluvial diamonds. All of these results appear to be consistent with Esteban, Mayoral, and Ray (2012), which reports that resource wealth is more likely to trigger conflict in countries characterized by heightened ethnic fractionalization and polarization.

Figure 2: Annual conflict rates by petroleum location.



licts take place near regions with petroleum or alluvial diamond wealth, they also appear to last longer (Lujala, Gleditsch and Gilmore, 2005; Buhaug, Gates and Lujala, 2009; Lujala, 2010), and become more severe (Weinstein, 2007; Lujala, 2009; De Luca et al., 2012).²¹

The salience of location has made it easier for scholars to explore the relationship between resources and conflict on a subnational level. A study of Sierra Leones civil war found that chiefdoms with diamond mines experienced more frequent attacks and battles (Bellows and Miguel, 2009). Dube and Vargas (2013) use municipal-level data from Colombia to estimate the effects of both coffee and petroleum price shocks on the severity of rebel and paramilitary violence; they find that coffee price shocks tend to reduce violence in the coffee-producing regions (perhaps by drawing labor out of the conflict and into the coffee sector), while oil price shocks tend to boost violence in oil-rich regions (possibly by creating more lucrative opportunities for predation). Their findings closely match the predictions of a model by Dal Bó and Dal Bó (2011) in which exogenous shocks can raise or lower conflict risks, depending on whether they occur in labor intensive or capital intensive sectors. report that during the countrys civil war.

It has also made it easier to distinguish among competing explanations for the resource-conflict correlation. One class of theories suggests that natural resource wealth leads to violence by affecting the government either making it administratively weaker, and hence less able to prevent rebellions; or by in-

²¹The effects of oil on conflict may be conditional on other factors, too. Ross (2012) argues that petroleum wealth only became a significant trigger for conflict after the nationalizations of the 1970s, and grew substantially more important after the end of the Cold War.

creasing the value of capturing the state, and hence inducing new rebellions (de Soysa, 2002; Fearon and Laitin, 2003; Le Billon, 2005).

An alternative class of theories holds that natural resources lead to conflict by affecting insurgents, not governments: rebels from an ethnically-marginalized region could be motivated by the prospect of establishing an independent state, so that locally-generated resource revenues would not have to be shared with the rest of the country; or rebels could finance the costs of staging a rebellion by either looting the resource itself (if it is a lootable resource like alluvial gemstones or oil), or extorting money from companies and workers who operate in their territory (Collier, Hoeffler and Rohner, 2009; Dal Bó and Dal Bó, 2011; Ross, 2012).²²

If the first approach is right, then both onshore and offshore petroleum wealth should have the same conflict-inducing effects—weakening the states ability to defend itself, or enlarging the size of its honeypot. If the second approach is correct, oil should only lead to conflict when it is found onshore, where it can be claimed by local separatists, or attacked by cash-hungry rebels. Since only onshore oil is associated with higher conflict risks, the first approach is probably wrong. Oil leads to civil war, at least in part, through its effects on insurgent groups.²³

Once again, several papers raise questions about both the net effects of resource wealth and the validity of the resources-conflict correlation. Brunnschweiler and Bulte (2009) addresses both issues. Empirically, it uses the World Banks measure of total natural capital stock to instrument for resource dependence, and finds that instrumented resource dependence is uncorrelated with one measure of conflict onsets. Yet their instrument is only available for two years and 100 countries, and may itself be endogenous to conflict. Van der Ploeg and Poelhekke (2010) argue that the Brunnschweiler and Bulte study is flawed by weak instruments, omitted variable bias, a violation of the exclusion restriction, and a misspecified model.²⁴

Cotet and Tsui (2013) also instruments for resource wealth, using a unique measure of oil discoveries, with much better coverage of countries and years; like Haber and Menaldo (2010), it also covers an unusually long historical period (covering 1930-2003). Cotet and Tsui find that instrumented oil wealth is statistically associated with conflict onsets in a simple pooled cross-sectional and time series setting, but loses significance once they include country fixed effects

²²Not all theories fall strictly in one of these categories; some focus on the interactions between governments and rebels. The model developed by Besley and Persson (2011) suggests that resource rents increase the likelihood of conflict, conditional on the inability of the state to facilitate peaceful transactions between groups. Fearons (2004) model of civil war duration suggests that resource-dependent governments cannot make credible commitments to redistribute resource wealth to local communities, since the volatility of resource prices causes the states strength to wax and wane; this makes it harder for them to reach peaceful agreements with insurgent groups, particularly when rebels can fund themselves by capturing contraband.

²³Glynn (2009) also finds that state weakness cannot explain the link between oil and civil war.

²⁴The van der Ploeg and Poelhekke critique focuses on the Brunnschweiler and Bulte claims about economic growth, rather than conflict, although the same points appear to apply.

to account for unobserved factors that are country-specific and time invariant.

By contrast, Lei and Michaels (2011) employs a different measure of oil discoveries as an instrument, along with country and year fixed effects; it finds the discovery of a giant oil field increases the incidence of armed conflict by about 5 to 8 percentage points, compared to a baseline probability of about 10 percentage points. In countries with recent histories of political violence, the effect is much stronger.

7 Looking Ahead

There is considerable evidence to support three broad claims about natural resource wealth: that more petroleum income leads to more durable authoritarian rulers and regimes; and that more petroleum income heightens certain types of government corruption; and that moderately high levels of petroleum wealth, and possibly alluvial diamond wealth, tend to trigger or sustain conflict in low and middle income countries, when they are found onshore, in regions dominated by politically-marginalized ethnic groups.

Each of these patterns appears to be statistically robust, and is supported by research using cross-national data, panel data, and subnational data. Still, these studies are almost exclusively based on observational data, which makes it difficult to put questions about causal identification to rest. The issue of net effects must also be taken seriously: oil wealth affects a countrys economy and governance through many channels simultaneously, making it important to look at net effects, not merely partial effects.

Research on the resource curse is still constrained by the availability of high-quality data, much of which is proprietary or obscured by governments; by insufficient attention to distinguishing between competing hypotheses about causal mechanisms; by an incomplete understanding of how and why the political effects of resources seem to vary over time; and by the need to better understand the determinants of resource extraction itself, so that biases in resource measures can be taken into account.

There are at least three sets of unsolved puzzles about the resource curse. The first is how and why petroleum wealth affects other dimensions of political and social life. Provocative studies have linked oil to the status of women (As-saad, 2004; Ross, 2008; Do, Levchenko and Raddatz, 2011), demographic trends (Cotet and Tsui, 2013), the spread of HIV/AIDS (de Soysa and Gizelis, 2013), international conflict and cooperation (Colgan 2010, Ross and Voeten 2012, Caselli, Roehner, and Morelli 2013), and levels of government transparency (Egorov, Guriev, and Sonin 2009, Williams 2011, Kolstad and Wiig 2009).

A second set is why different minerals appear to have different effects in other words, why is oil is different than bauxite, copper, or gold? The differences could be illusory, or could simply reflect the industrys scale: petroleum and its byproducts constitute more than 90 percent of the value of the international minerals trade, which leaves us with many more oil-dependent than mineral-dependent countries.

Or it could have something to do with the oil itself: petroleum extraction is more capital-intensive than other types of mining; it probably results in larger rents, and larger revenue flows to governments; it is more likely than other minerals to be controlled by state-owned companies; and its liquid state could make it easier to loot. Understanding this issue would help identify the qualities of oil wealth, or the oil industry, that carry such troublesome qualities.

The final set of puzzles is about what should be done. Many scholars have developed ideas about policy interventions, including greater transparency, stabilization and savings funds, community participation, cash payments to citizens, and alternative tax and royalty systems (Humphreys, Sachs, and Stiglitz 2007; Collier 2011; Moss 2012; Barma et al. 2011, Ross 2012). We have little systematic knowledge, however, about which policies work and under what conditions. A growing number of low and middle income countries particularly in Africa are likely to become oil or natural gas exporters in the next half-decade. The need for empirically-based policy advice is more urgent than ever before.

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