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Mineral Wealth and Budget Transparency

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Abstract: How does a country's mineral wealth affect the transparency of the government's budget? Among democracies, a country's mineral wealth is not convincingly related to the transparency of its government. But among autocracies, greater oil wealth is correlated with less fiscal transparency, while greater non-fuel mineral wealth is paradoxically associated with *greater* transparency. Explaining this pattern is a challenge: there is no *prima facie* evidence that it is driven by either membership in the Extractive Industries Transparency Initiative, or by the need to attract foreign investment. There is some evidence that among autocracies, oil reduces transparency because it helps dictators stay in power.

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1 Introduction

In recent years there has been growing interest in government transparency, in both the academic and policy worlds. Yet our knowledge about the causes and effects of transparency has been sharply constrained by three problems.

The first has been the availability of data. Recently this has begun to change: thanks to studies by Islam (2003), Hameed (2005), Rosendorff and Vreeland (2006), Bellver and Kaufman (2005), and International Budget Partnership (2008, 2010), we now have several ways to measure government transparency. Still, the most careful measures only cover recent years – allowing us to make broad comparisons across countries, but not comparisons within countries over time.

The second problem is endogeneity: even though we can show cross-national correlations between measures of transparency and other political and economic variables, it is hard to separate cause and effect. Greater transparency could cause less corruption, more investment, and greater fiscal discipline, but it could also be the result of these factors. These correlations could also be spurious, if both transparency and its observed correlates are jointly driven by other, unmeasured factors.

The final problem is identifying causal mechanisms. Even if we are confident that factors like democracy and foreign aid are causing greater transparency, we face major challenges explaining why – thanks to both the limited number of years for which transparency data are available (which limits our ability to make within-country inferences), and the observational nature of these data.

This paper explores how a country's mineral wealth – both from petroleum and other sources – affects the transparency of the government's budget. Petroleum is the world's most widely-traded commodity: in 2009, it accounted for 14.2 percent of the world's trade.[2] Yet the industry is strikingly opaque. One study pointed out that "secrecy in the extractive industries is so commonplace that until recently, neither states nor companies have felt compelled to develop sophisticated arguments to defend it."[3] Many country-level studies have documented a profound absence of transparency in mineral-producing countries.[4]

This paper shows that among democracies, a country's mineral wealth is probably unrelated to the transparency of its government. But among autocracies, greater oil wealth is correlated with less fiscal transparency, while more non-fuel mineral wealth is paradoxically associated with *greater* transparency.

[2] "BP Statistical Review of World Energy," (London: British Petroleum, 2010); UN comtrade online database, http://comtrade.un.org/db/.

[3] Rosenblum, Peter and Susan Maples, "Contracts Confidential: Ending Secret Deals in the Extractive Industries," (New York: Revenue Watch Institute, 2009), p. 12.

[4] See reports by Global Witness, a London-based NGO, on the secrecy and misuse of petroleum revenues in Angola, Cambodia, Congo-Brazzaville, Equatorial Guinea, Kazakhstan, and Turkmenistan, available at www.globalwitness.org; and reports by another NGO, Publish What You Pay, on similar problems in Chad and Nigeria, available at www.publishwhatyoupay.org.

Like most other studies of transparency, this analysis is limited to cross-national comparisons. But when looking at petroleum, it is less constricted by the endogeneity problem: there are good reasons to suspect that producing more oil will cause a government to become less transparent, but little chance – as I will argue below – that having less transparency will cause a country to produce more oil.[5] Unfortunately, this still runs afoul of the third problem: explaining *why* mineral wealth seems to affect a country's transparency is still very difficult – although it is possible to unearth some clues. The paper documents an intriguing pattern that it cannot fully explain.

Some obvious explanations cannot account for the link between mineral wealth and budget transparency. Prior studies have already found a strong link between oil and government accountability: when countries produce more oil, they are less likely to become democracies.[6] This paper demonstrates, however, that petroleum has an effect on transparency that goes above and beyond its more general effect on democratic accountability.

Nor is it simply because oil revenues are easier to hide than other types of revenues. Many oil-producing governments use their national oil companies (NOCs), or special "stabilization" and "future generations" funds to keep some of their petroleum revenues off-budget and concealed from the public. During the rule of Saddam Hussein, more than half of Iraq's national budget was funneled through the Iraqi National Oil Company, whose budget was secret.[7] The Iranian government transfers oil profits to politically-powerful figures through *bonyads* – semi-pubic enterprises that are nominally outside the government's purview and shielded from public disclosures.[8] In Azerbaijan, about half of the government's expenditures run through the national oil company, known as SOCAR. The actual sum, once again, is secret.

Yet even these patterns do not explain the link between oil and reduced transparency in autocracies: more oil seems to diminish the transparency of the central government's regular budget, which does not reflect money hidden away in NOCs or unreported off-budget funds.

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[5] When looking at non-fuel mineral wealth, however, the endogeneity problem returns since higher levels of transparency could increase mineral production by attracting more investment.

[6] Ross, Michael, "Does Oil Hinder Democracy?" *World Politics*, vol. 53, no. 3 (April 2001), pp. 325-361; Jensen, Nathan and Leonard Wantchekon, "Resource Wealth and Political Regimes in Africa," *Comparative Political Studies*, vol. 37, no. 9 (November 2004), pp. 816-841; Ulfelder, Jay, "Natural Resource Wealth and the Survival of Autocracies," *Comparative Political Studies*, vol. 40, no. 8 (August 2007), pp. 995-1018; Dunning, Thad, *Crude Democracy: Natural Resource Wealth and Political Regimes* (New York: Cambridge University Press, 2008); Ramsay, Kristopher W., "Revisiting the Resource Curse: Natural Disasters, the Price of Oil, and Democracy," *International Organization*, vol. 65, no. 3 (July 2009), pp. 507-529; Aslaksen, Silje, "Oil and Democracy: More Than a Cross-country Correlation?" *Journal of Peace Research*, vol. 47, no. 4 (July 2010), pp. 421-431; Tsui, Kevin K., "More Oil, Less Democracy? Evidence from Worldwide Crude Oil Discoveries," *The Economic Journal*, vol. 121, no. 551 (March 2011), pp. 89-115.

[7] Alnasrawi, Abbas, *The Economy of Iraq* (Westport, CT: Greenwood Press, 1994).

[8] Brumberg, Daniel and Ariel Ahram, "The National Iranian Oil Company in Iranian Politics," Baker Institute for Public Policy, Rice University, 2007; Mahdavi, Paasha, "Oil, Monarchy, Revolution and Theocracy: A Study on the National Iranian Oil Company," in David G Victor, David Hults, and Mark Thurber (eds), *Oil and Governance: State-Owned Enterprises and the World Energy Supply* (New York: Cambridge University Press, 2011), Chapter 6.

This analysis is part of a growing literature on the causes of transparency, including studies that find greater transparency in countries that are democratic, have divided or minority governments, and are dependent on foreign aid.[9]

It also casts light on broader debates about the resource curse, meaning the perverse effects that petroleum wealth has on political and economic development, especially in non-OECD states. A large number of studies argue that resource wealth leads to a wide range of undesirable outcomes, including slower and more volatile economic growth, less democracy, more frequent civil wars, fewer opportunities for women, heightened corruption, and an overall decline in the quality and effectiveness of government institutions.[10]

The most careful studies find support for some of these claims but not others: van der Ploeg and Poelhekke (2009) show that countries with more petroleum wealth have greater economic volatility, but not typically slower growth; both Alexeev and Conrad (2009) and Ross (2012) find that oil – the most consequential mineral resource – does not lead to a decline in the performance of government institutions; studies by Dunning (2008), Morrison (2009) and Ross (2009) show that oil tends to make governments less democratic under most, but not all, conditions; and Mehlum, Moene, and Torvik (2006), Jones Luong and Weinthal (2010) and others stress the contingent features of the resource curse – emphasizing that the effects of resource wealth vary widely, and depend on a country's institutional features.

Like these latter studies, this paper finds the political effects of oil are conditional: oil reduces transparency in authoritarian states, but not democracies. This pattern provides important clues about the inner workings of petroleum-based autocracies. Ross (2009) points out that while many studies find that "oil hinders democracy," there is little agreement about why this is so. The transparency link gives us a new perspective on the mechanisms that connect oil wealth to authoritarian rule. It also

[9] See Rosendorff, B. Peter and James R. Vreeland, "Democracy and Data Dissemination: The Effect of Political Regime on Transparency," Unpublished paper (New Haven: Yale University 2006); Bellver, Ana and Daniel Kaufmann, "Transparenting Transparency: Initial Empirics and Policy Applications," World Bank (August 2005); Wehner, Joachim and Paolo de Renzio, "Citizens, Legislators, and Executive Disclosure: the Political Determinants of Fiscal Transparency," Paper presented at the 1st Global Conference on Transparency Research, Rutgers University (May 2011); Hameed, Farhan, "Fiscal Transparency and Economic Outcomes," International Monetary Fund, IMF Working Paper 05/225 (December 2005); Hameed, Farhan, "Budget Transparency and Financial Markets," International Budget Partnership Working Paper, no. 1 (December 2011); and Alt, James E., David D. Lassen, and Shanna Rose, "The Causes of Fiscal Transparency: Evidence from the U.S. States," *IMF Staff Papers*, vol. 53, Special issue (2006), pp. 30-57; On transparency more generally, see Fung, Archon, Mary Graham, and David Weil, *Full Disclosure: The Perils and Promise of Transparency (*New York: Cambridge University Press, 2007); Piotrowski, Suzanne (ed), *Transpare*ncy and Secrecy: A Reader Linking Literature and Contemporary Debate (Lanham, MD: Lexington Books, 2010); Kolstad, Ivar and Arne Wiig, "Is Transparency the Key to Reducing Corruption in Resource-Rich Countries?" *World Development*, vol. 37, no. 3 (March 2009), pp. 521-532.

[10] For literature surveys, see Ross, Michael, "The Political Economy of the Resource Curse," *World Politics*, vol. 51, no. 2 (January 1999), pp. 297-322; Stevens, Paul and Evelyn Dietsche, "Resource Curse: An Analysis of Causes, Experiences, and Possible Ways Forward," *Energy Policy* vol. 36, no. 1 (January 2008), pp. 56-65; Wick, Katharina and Erwin Bulte, "The Curse of Natural Resources," *Annual Review of Resource Economics*, vol. 1 (2009), pp. 139-156; and Frankel, Jeffrey A., "The Natural Resource Curse: A Survey," NBER Working Paper, no. 15836 (March 2010).

confirms something that earlier studies have noticed: while oil wealth often has perverse effects, other types of mineral wealth (with the narrow exception of diamonds, which are linked to conflict) do not.[11]

This paper is closely related to a study by Egorov, Guriev, and Sonin (2009), which finds that authoritarian countries with more oil tend to have less press freedom, both across countries and within them over time. My paper looks at the effects of oil on the transparency of the government's budget, rather than the government's decision to allow a freer press; is based on a cross-section of countries, rather than a panel, due to data restrictions; considers alternative explanations for petroleum's transparency-reducing effects; and points out that non-fuel mineral wealth seems to have a positive effect on transparency.

Understanding the impact of mineral wealth on transparency has practical implications. Since 2000 there have been several global initiatives to promote transparency in mineral-rich countries. They include Publish What You Pay, a campaign sponsored by a network of NGOs urging extractive companies to reveal what they pay, and governments to disclose what they receive, for the sale of oil, gas, and minerals; a project launched in 2002 by then-British Prime Minister Tony Blair called the Extractive Industries Transparency Initiative (EITI), which in 2007 became an independent multi-stakeholder organization; and a program developed by the World Bank, dubbed "EITI plus plus," to help foster transparency in targeted resource-rich countries.[12] Understanding why oil producers are more opaque, and mineral producers less opaque, can help policymakers develop more effective interventions.

The paper proceeds as follows. The next section discusses four alternative explanations for why mineral wealth might be correlated with less transparency. Section three describes my measures of oil wealth and non-fuel mineral wealth, and explains how they address the endogeneity problem that typically limits cross-national studies of government transparency. Section four introduces the measure of budget transparency, and the key control variables in the model. Section five demonstrates the empirical relationships between oil wealth and non-fuel mineral wealth on one hand, and budget transparency on the other, and shows that there is some evidence that among autocracies, oil reduces transparency because it helps dictators stay in power – and not because of either EITI or the need to attract foreign investment. The final section summarizes the findings, discusses their implications, and suggests directions for future research.

2 Why Would Oil Affect Transparency?

Some correlates of transparency are not surprising. Democracies are more transparent than autocracies, probably because democratically-elected officials can benefit from the disclosure of

[11] See Ross, Michael, "A Closer Look at Oil, Diamonds, and Civil War," *Annual Review of Political Science*, vol. 9 (2006a), pp. 265-300; and Brunnschweiler, Christa N. and Erwin H. Butte, "The Resource Curse Revisited and Revised: A Tale of Paradoxes and Red Herrings," *Journal of Environmental Economics and Management*, vol. 55, no. 3 (May 2008), pp. 248-264.

[12] For more on these initiatives, see Gillies, Alexandra, "Reputational Concerns and the Emergence of Oil Sector Transparency as an International Norm," *International Studies Quarterly*, vol. 54, no. 1 (March 2010), pp. 103-126.

information (Rosendorff and Vreeland 2005). Richer countries have more transparent governments, perhaps because greater budget transparency makes countries wealthier by increasing investor confidence and boosting economic growth; or conversely, because richer citizens demand more information about their governments.[13]

But why would a country's mineral wealth affect a government's transparency? One possible explanation is that mineral wealth affects a country's access to foreign investment. Past studies have linked a country's financial and government transparency to the risk premiums it must pay when borrowing money (PricewaterhouseCoopers 2002). Glennerster and Shin (2003) suggest that countries that adopted transparency reforms after the 1997-98 Asian Financial Crisis enjoyed substantially lower borrowing costs.[14] For most countries, more transparency should make it easier to attract foreign investors.

Conceivably oil-rich countries care less about borrowing money, and hence have less incentive to become transparent. This could be because they do not need the money: they might have enough capital from their own oil revenues to make foreign borrowing unimportant. Or it could be because they can easily borrow without becoming transparent – perhaps because their petroleum is an unusually reliable form of collateral, or because foreign governments will loan them the money (or guarantee private sector loans) in exchange for strategic access to their oil. As a result, they would face less market pressure to adopt measures that would render their finances more transparent.

It is also possible that non-fuel mineral producers have different borrowing incentives: if they find it unusually difficult to attract foreign investment, they might be compelled to adopt unusually far-reaching transparency reforms.

These explanations are difficult to test, since they suggest that variations in transparency are caused by variations in something that is hard to measure directly – a country's need to reassure foreign investors. One modest test would be to see whether transparency is correlated with foreign direct investment (FDI) in non-oil states, but uncorrelated with FDI in oil states. If so, it would be consistent with the claim that transparency helps non-oil producers, but not oil producers, attract FDI. Moreover, if transparency were correlated with FDI in mineral states but not oil states, it might imply that mineral producers were penalized (with less FDI) for low transparency but oil producers were not. These broad correlations would not prove this explanation – it is much too easy to find other reasons for these patterns – but the absence of these correlations would make this argument implausible.

A second possible argument looks at the influence of international financial institutions. Ross (2006) and others have pointed out that international financial institutions like the IMF often make

[13] Of course, these correlations could also be spurious: democracy and higher incomes might be the result of other unmeasured factors, like high levels of education or greater civil liberties, which are also making governments more transparent. Since democracy and income are only control variables in my analysis, however, establishing causality is not important.

[14] Also see the discussion of this issue in Bellver and Kaufman (2005).

authoritarian states more transparent. Democratic states, whether rich or poor, are relatively transparent because their citizens demand it, while authoritarian states remain relatively opaque because there are insulated from popular pressures. But when authoritarian states seek IMF assistance, they are typically forced to make their operations more transparent. Oil wealth may help countries avoid IMF funding, and hence the mandate to publicly disclose more information. Conceivably, non-fuel mineral wealth could make countries more likely to seek IMF assistance, which could make them more transparent.

If these arguments are correct, the negative correlation among autocracies between oil wealth and transparency, and the positive correlation between mineral wealth and transparency, should disappear once we control for whether a country has been under IMF supervision.

A third argument might look at the effects of EITI, which includes both oil producers and non-fuel mineral producers in their membership. Imagine that oil producers were less susceptible than mineral producers to the transparency pressures created by EITI membership – conceivably because oil producers were shielded by the strategic influence of oil-importing states like the US and China, but mineral producers were not.[15] Testing the effects of EITI membership is especially difficult: EITI members are a self-selected group, and the factors that lead countries to join EITI could easily bias any inferences about the impact of membership. Still, if this argument was correct, then a substantial fraction of the most transparent mineral producers should be EITI members.

A fourth explanation – which only addresses the role of oil, not non-fuel minerals – looks domestic, not international pressures. Different scholars have offered alternative arguments why petroleum might cause dictators to reduce transparency. Egorov, Guriev, and Sonin (2009, hereafter EGS) suggest that oil increases the value for dictators of remaining in power; as a result, oil-funded autocrats reduce transparency in order to reduce the danger they will be overthrown. Ross (2012) argues that petroleum only hinders democracy when autocrats are able to limit transparency – since concealing the true size of the government's oil revenues enables rulers to hide their government's corruption and inefficiency, and make citizens falsely believe that their nation's oil money is being well spent.

If this final argument is correct, then a variable that interacts oil wealth with budget transparency should be negatively correlated with a country's democracy level; moreover, it should be more strongly correlated with a country's democracy level than an "oil" variable alone.

3 Measuring Mineral Wealth

If we wish to identify the effects of mineral wealth on budget transparency, it is important to use measures that are not affected by any of the other factors in the model. By far the hardest factor to exclude is a country's overall income: since we know that income affects transparency, we must be

[15] Since EITI encourages its members to improve revenue transparency but not broader budget transparency, we must assume here that improvements in revenue transparency tend to spill over into improvements in overall budget transparency.

confident that the mineral measure does not reflect a country's income in a way that would bias any estimates.

Many scholars suggest that the resource curse is caused by a country's *dependence* on minerals – that is, by the size of its minerals sector as a fraction of the entire economy. They also tend to measure a country's oil, gas and minerals exports, rather than its overall production, reflecting earlier scholarship that identified export income from resource rents as harmful (Mahdavy 1970; Beblawi 1987). Yet both a country's dependence on minerals, and its minerals exports, are problematic measures of a country's resource wealth since they are typically inflated in countries with lower incomes.

Imagine two countries with identical populations that produce the same quantity of oil each year, but one is poor and the other is rich. The poor country will be more dependent on oil than the rich one, since it constitutes a larger fraction of its overall economy. Oil dependence is an indirect measure of a country's non-oil income.

To fix this problem we could measure a country's oil exports per capita, rather than oil exports as a fraction of total exports or GDP. But the focus on exports may also be a source of bias: poor countries need less raw material to run their economies, and hence tend to export a larger fraction of their production than rich countries. For example, on a per-capita basis, the US produces more oil than Angola or Nigeria, but Angola and Nigeria export more than the US – because the US is wealthier than Angola or Nigeria and consumes more of its oil domestically. When we measure minerals exports, we are indirectly measuring a country's overall wealth.

To surmount these problems I measure the total value of minerals production instead of just exports, and divide it by a country's population, not its total exports or GDP. The resulting variables, *Oil Income per capita* and *Mineral Rents per capita,* enable us to ask whether the value of a country's oil or non-fuel minerals production – regardless of how well it is managed, and how it influences the rest of the economy – affects its politics.[16]

These variables allow us to measure a country's minerals wealth, rather than its dependence on minerals extraction or exports. If two countries with similar populations produce similar quantities of oil and gas – for example, Angola and the Netherlands – they will have similar oil incomes per capita (in this case, about $500 per capita in 2003). But if we measured their dependence on oil exports (that is, their oil-exports-to-GDP ratios), we'd find Angola's measure (.789) much higher than the Netherlands' (.056), because Angola is too poor to consume much of its own oil (making the numerator larger), and because its GDP is much smaller (making the denominator smaller).

[16] There is a slight different in the measures of oil wealth and non-fuel minerals wealth, due to differences in the data sources. The Mineral Rents per capita figure represents the per capita value of ten hard-rock minerals (bauxite, copper, iron, lead, nickel, phosphate, tin, zinc, gold, and silver), minus an estimate of their extraction costs. The underlying data are released by the World Bank in their World Development Indicators (as "Adjusted Savings: Mineral Depletion"), but without information on extraction costs, so no corrections can be made. The *Oil Income* variable includes no adjustment for extraction costs. It seems unlikely that including or excluding extraction costs would affect the analysis.

The *Oil Income* and *Mineral Rents* variables have two important weaknesses. First, the distribution of values among states is highly skewed – most countries produce little or no minerals, while a few produce enormous quantities – which can create problems when it is used in regressions; to correct for this, I use the natural log of these variables in all regressions. I also employ cross-tabulations in which countries are divided into "oil producers" and "non-oil producers," and "minerals producers" and "non-minerals producers" so that my inferences will not be driven by extreme values in a small number of cases. I identify countries as "producers" when they have at least $100 per capita (measured in constant 2000 dollars) in income from oil and gas, or from non-fuel minerals, in a given year.

The second problem is that a country's mineral income can be indirectly affected by its other economic and political characteristics. *Oil Income* and *Mineral Rents* are functions of three underlying factors: a country's geological endowment, which determines the physical quantity and quality of minerals that can be exploited; the investments made in extracting them, which determine how much will be discovered, and commercially exploited, at any given time; and their price. Both a country's geological endowment and global prices should be unaffected by a country's economic and political features.[17] The investments made in mineral exploitation, however, will be influenced by a country's economy and government: countries that are wealthier, more open to foreign investment, and provide better legal protections for investors, are likely to have more investment in their petroleum industries.

For this reason, the richer and more developed countries tend to have higher *Oil Income* and *Mineral Rents* values than the poorer and less developed ones. Even though the developing countries cover almost 60 percent of the world's land mass (outside of Antarctica), they hold less than 20 percent of the world's stock of foreign direct investment in mining. The rich democracies of Europe, North America, Australia and New Zealand cover just 25 percent of the world's land mass, yet have almost 75 percent of the foreign direct investment stock in mining.[18] This indicates that the rich democracies have about ten times more foreign direct investment in all types of mining, per square kilometer, than either the developing states or the states of the former Soviet Union and south-eastern Europe. In fact, this understates the investment advantage of the rich democracies: while the developing countries are heavily dependent on foreign investment – including expensive Western technology – to develop their oil sectors, the rich democracies have more domestic investment available.

This suggests that both the *Oil Income* and *Mineral Rents* measures are biased upwards in richer countries; since richer states tends to be more democratic, they are also biased towards a positive correlation with transparency. When examining the affects of mineral wealth on budget transparency it is important to control for income.

[17] Saudi Arabia might be a partial exception: due to its unique role as a "swing producer," it may have the capacity to unilaterally affect global prices, at least in the short run.

[18] UNCTAD, "World Investment Report 2009," New York: United Nations Conference on Trade and Development (2009).

4 Dependent and Control Variables

To gauge the secrecy of a country's finances I use the Open Budget Index (OBI), which measures the fiscal transparency of 85 national governments, based on an analysis of 91 observable features of their budgets – including the frequency with which they disclose important budget documents, the comprehensiveness of these documents, and the role played by the government's auditors. Governments are scored on a scale that runs from 1 to 100, with higher scores indicating greater budget transparency.

While these 85 countries are not a random sample, they do not appear to be systematically different from other countries in obvious ways. They are distributed across all world regions and include low-income, middle-income, and wealthy countries. Table 1 reports the average democracy scores (using the -10 to 10 Polity index), the average levels of media freedom (ranging from 1 to 100), and average incomes per capita in the 85 OBI countries, alongside the averages for 86 non-OBI countries. Countries included in the index are slightly more democratic, and somewhat poorer, than countries that were left out, and their levels of press freedom were virtually identical. None of these differences are statistically meaningful, using a simple difference-of-means test.

Table 1: Characteristics of Countries Included in Open Budget Index 2008

	Included in OBI	Not included in OBI
Democracy (-10 to 10)	4.4	2.7
Press Freedom (1 to 100)	50.6	51.2
Income per capita (PPP)	8,902	14,625

There are several ways to disaggregate the OBI into discrete subcomponents, to find out whether the mineral-transparency correlation is driven by any particular budget practice. Using the coding developed by International Budget Partnership (2008), I look separately at measures of "legislative strength" and "supreme audit institution (SAI) strength." By controlling for these two subcomponents, I can also evaluate a third measure – the quality of the executive's budget process, which is represented by the questions not placed in the first two measures.

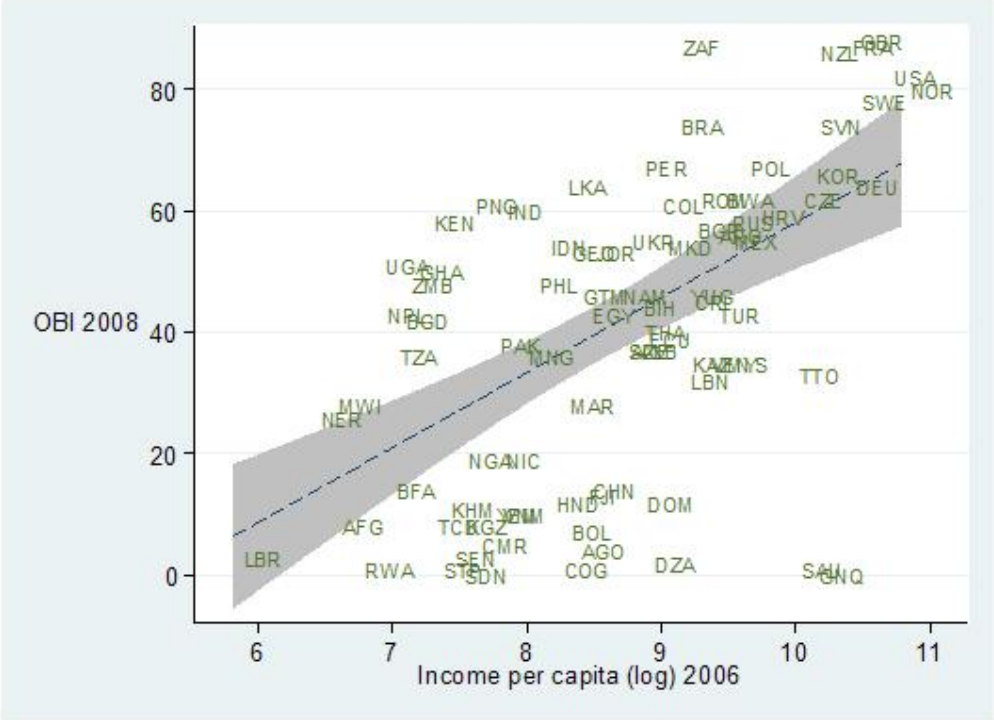
To correctly identify the relationship between mineral wealth and budget transparency, we must control for other factors that might affect a country's budget transparency. According to the *Open Budget Survey 2008,* three factors besides resource wealth are associated with a low OBI ranking: low incomes, weak democratic institutions, and a location in the Middle East or Sub-Saharan Africa.[19] A closer look at the data suggests the first two factors are important, although not the third.

Figure 1 is a scatterplot that displays the relationship between a country's income per capita (on the horizontal axis) and its OBI score (on the vertical axis). The fitted line slopes upward, showing a strong

[19] The report also mentions a fourth factor: dependence on foreign aid. As the report notes, however, this "may simply reflect the fact that aid-dependent countries are aid-dependent because of their low-income status, and low-income countries tend to be less transparent." For a careful look at the relationship between foreign aid and budget transparency, see Wehner and de Renzio (2010).

positive correlation between these two factors: on average, the richer the country, the higher its OBI score. Other studies, using alternative measures of government transparency, have found a similar pattern (Hameed 2005, Bellver and Kaufman 2005). Still, many countries lie far off the fitted line, which suggests that other factors, besides a country's income, have a strong influence on the transparency of its budget.

Figure 1 – Income and OBI Scores



There is also a strong correlation between a country's OBI score and the likelihood it is a democracy. To distinguish democracies from non-democracies, I use the coding developed by Przeworski et al. (2000) and recently updated by Cheibub, Gandhi, and Vreeland (2010). They identify countries as democracies if they meet all of the following conditions: the chief executive is chosen (directly or indirectly) through competitive elections; the legislature is chosen through competitive elections; there are at least two political parties; and at least one incumbent regime has been defeated and been replaced by an opposition party.

The Przeworski measure is useful because it is based on clear and observable country characteristics, and because it is dichotomous, which makes it easy to identify all countries that are unambiguously autocratic. To ensure that my results are robust to the use of other measures of regime type, I re-run the key tests with the widely used 21-point *Polity* measure, and the *Freedom House* measure of "civil liberties" and "political rights." I also use *Polity* to measure variations in accountability among authoritarian states.

Table 2 compares the OBI scores of democracies and autocracies; the asterisks note differences that are statistically significant, using a two-sample Wilcoxon-Mann-Whitney test. Democracies have significantly higher OBI scores, notably among middle and upper-income states.

Table 2: Average OBI 2008 Scores of Democracies and Autocracies

	Democracies	Autocracies
All countries (n=85)	48.2***	27***
By Income:[20]		
Low Income (below $2000) (n=22)	27.2	20.5
Middle Income ($2000 to 15000) (n=49)	46.5***	33***
High Income (above $15000) (n=14)	71.6**	0.5**
By subcomponent:		
Legislative Strength	46**	34.7**
SAI Strength	53***	33.3***

* significant at 10%; ** significant at 5%; *** significant at 1% in a two-sample Wilcoxon-Mann-Whitney test.

In part, the correlation between budget transparency and democracy simply reflects one component of the OBI score – its measure of the legislature's role in the budget process. Since democracies are characterized by the heightened power of the legislature, OBI scores tend to be – by construction – higher in democracies. Still, if we separate OBI scores into their subcomponents, we see that democracies have significantly higher scores for both the strength of their legislatures, and the strength of their supreme audit institutions.

A regression analysis shows the same pattern. Table 3 shows a series of ordinary least squares regressions, with the OBI and its subcomponents as the dependent variables. Column one shows that a country's income per capita is correlated with its OBI score, as noted above. In column two I add the dichotomous measure of democracy to the model; it is highly significant; democracy is also correlated with the OBI subcomponents, 'legislative strength' (column 3) and 'supreme audit institution strength' (column 4).

[20] Income is measured in GDP Purchasing Power Parity, in constant 2005 dollars.

Table 3: Correlates of Open Budget Index 2008

	(1) OBI	(2) OBI	(3) Legislative Strength	(4) SAI Strength	(5) OBI
Income (log)	12.341 (6.02)***	10.829 (5.20)***	7.646 (3.56)***	9.870 (5.20)***	4.588 (2.42)**
Democracy		15.648 (3.12)***	7.353 (1.74)*	14.651 (2.98)***	7.787 (1.91)*
SAI Strength					0.360 (3.59)***
Legislative Strength					0.351 (2.82)***
Observations	85	85	85	85	85
R-squared	0.31	0.40	0.25	0.36	0.62

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

If we control for both of these subcomponents, we can also examine the relationship between democracy and a third OBI component: the quality of the executive's budget process. Although it is not measured separately, it can be captured by the remaining portion of the OBI score after 'legislative strength' and 'supreme audit institution strength' have been controlled for (column 5). Democracy is indeed correlated with this third component of budget openness. Overall, these estimations are consistent with earlier research on transparency and democracy (e.g., Rosendorff and Vreeland 2006). They also suggest that democracy's impact on transparency is large: moving from an autocracy to a democracy at the same income level is associated with a 15.6 point jump in a country's OBI score.

Once we account for a country's income level and its status as a democracy, its location seems to be unimportant. It is true that low-scoring countries tend to be concentrated in the Middle East and Sub-Saharan Africa, but this is apparently because most Middle Eastern countries are undemocratic, and most African states are poor.

In the regression model in Table 4, column 1, dummy variables for countries located in Sub-Saharan Africa and the Middle East and North Africa are strongly correlated with OBI scores. But when income and democracy are added to the models in columns 2 and 3 respectively, the *Sub-saharan Africa* and *Middle East* dummy variables lose significance. This implies that countries in Africa and the Middle East have low OBI scores because they are poor and undemocratic; once these factors are accounted for, these countries have the same level of budget transparency as countries in the rest of the world.

Table 4: Correlates of Open Budget Index 2008 – regional effects

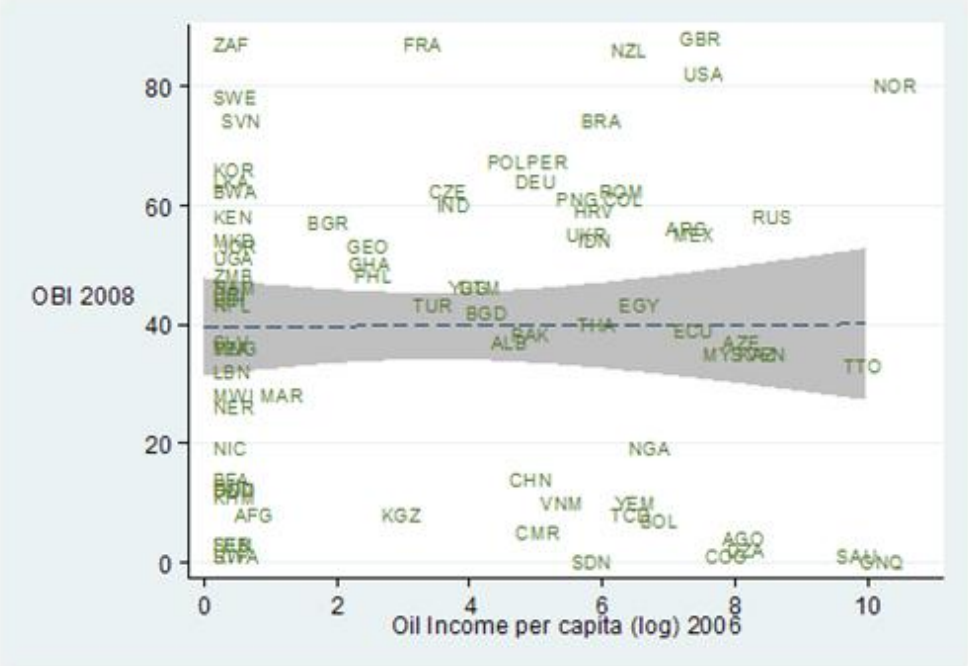
	(1)	(2)	(3)
Sub-saharan Africa	-22.401 (3.60)***	-7.744 (0.95)	-3.273 (0.43)
Middle East & North Africa	-23.304 (2.97)***	-21.275 (2.34)**	-11.759 (1.23)
Income (log)		11.063 (4.05)***	10.624 (3.96)***
Democracy			12.498 (2.57)**
Observations	85	85	85
R-squared	0.18	0.37	0.41

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

5 Oil Income and Budget Transparency

When all countries are pooled together, there is no direct correlation between the amount of oil and gas they produce and their OBI scores. Figure 2 plots all countries by their oil income in 2006, and their 2008 OBI scores; the fitted line is flat, suggesting there is no correlation between these two measures.[21] One group of oil producers, in the upper-right quadrant, has notably high scores (including Norway, Great Britain, the US, and New Zealand); a second group, clustered in the lower-right quadrant, has exceptionally low scores (Equatorial Guinea, Saudi Arabia, Angola, Algeria, and Congo Republic).

Figure 2 – Oil Income and OBI Scores



[21] The 2008 OBI scores are based on the transparency of a country's budget practices in 2006 or 2007.

Another way to examine the data is by dividing all countries into two groups – "oil producers," defined as countries that earned at least $100 per capita in oil income in 2006 (in current dollars), and "non-oil producers." As Table 5 shows, the oil producers and non-oil producers had almost identical OBI scores. Within each income group, the non-oil states had higher scores than the oil states, although none of these differences are statistically significant.

Table 5: Average OBI 2008 Scores of Oil-producing and Non-oil producing states

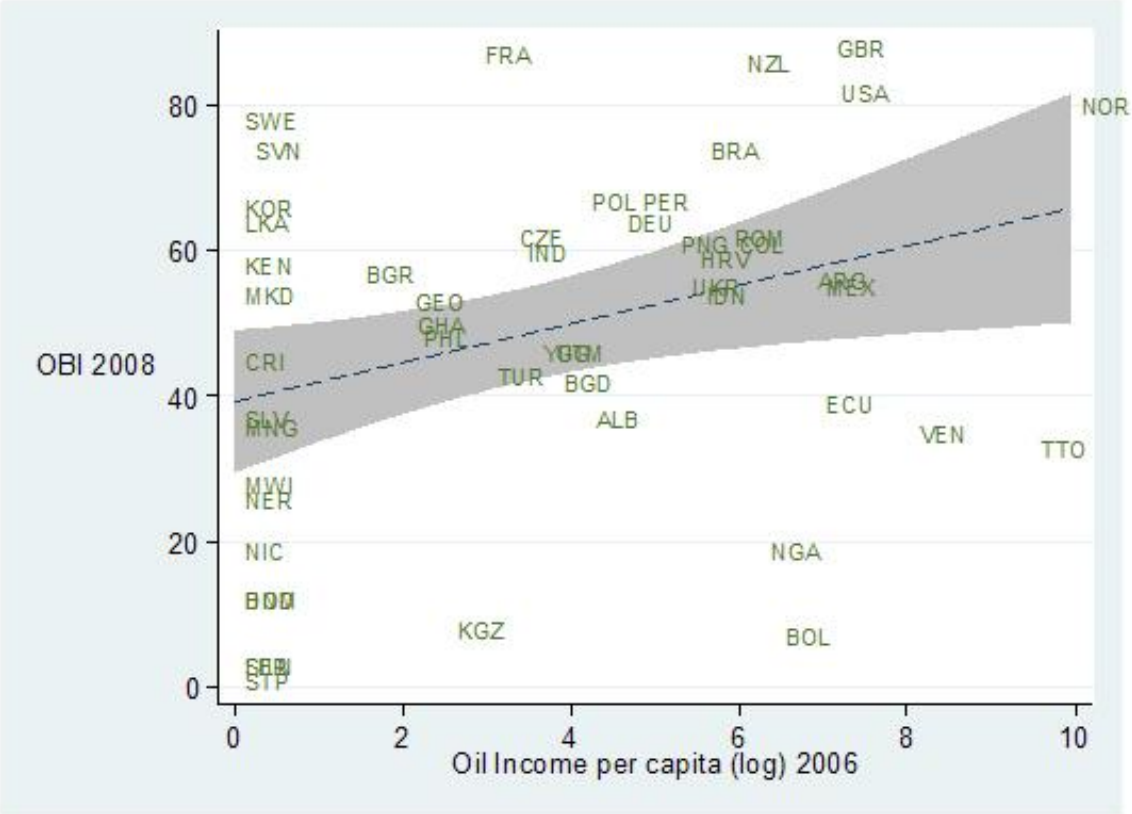
	Oil Producers[22]	Non-Oil Producers
All countries (n=85)	39.9	39.6
By Income:		
Low Income (below $2000) (n=22)	22	24.2
Middle Income ($2000 to 15000) (n=49)	38.2	42.7
High Income (above $15000) (n=14)	53.6	71.8
By Regime type:		
Autocracies (n=34)	18.9**	33.4**
Democracies (n=51)	56.5*	43.3*

When we divide democratic countries from non-democratic countries, however, a strong pattern emerges: among democracies, oil is associated with higher OBI scores; among authoritarian states, oil is correlated with lower OBI scores – differences that are statistically significant (Table 5, bottom rows).

Once we separate democracies from non-democracies, we can see these correlations in scatterplots. The scatterplot in Figure 3 is identical to the scatterplot in Figure 2, but now includes only democracies; as the upward-sloping line suggests, more oil is associated with higher OBI scores. The oil-producing OECD states – Norway, Great Britain, the US and New Zealand – have exceptionally high scores, and Brazil follows close behind. The worst-performing oil democracies are Trinidad, Bolivia, Nigeria and Venezuela, with Ecuador only slightly better. Argentina, Mexico, Colombia and Romania fall close to the fitted line, performing about as well as the 'typical' democracy with their level of oil income.

[22] I categorize states as "Oil Producers" if they produced at least $100 in oil and gas per capita in 2006 (in 2000 dollars).

Figure 3 – Oil Income and OBI Scores, democracies only



Why might oil be linked to higher OBI scores among democracies? The simplest explanation is that among democracies the link between oil and transparency is just an illusion: countries with more oil happen to be richer (either because oil made them richer or their wealth allowed them to invest more heavily in oil extraction), and it is their higher incomes – not their oil wealth – that are correlated with their higher OBI scores. This is consistent with the regression results displayed in Table 6, columns one and two, which include only democracies in their samples: while oil income is positively correlated with OBI scores in column one, the correlation disappears once we account for income in column two.

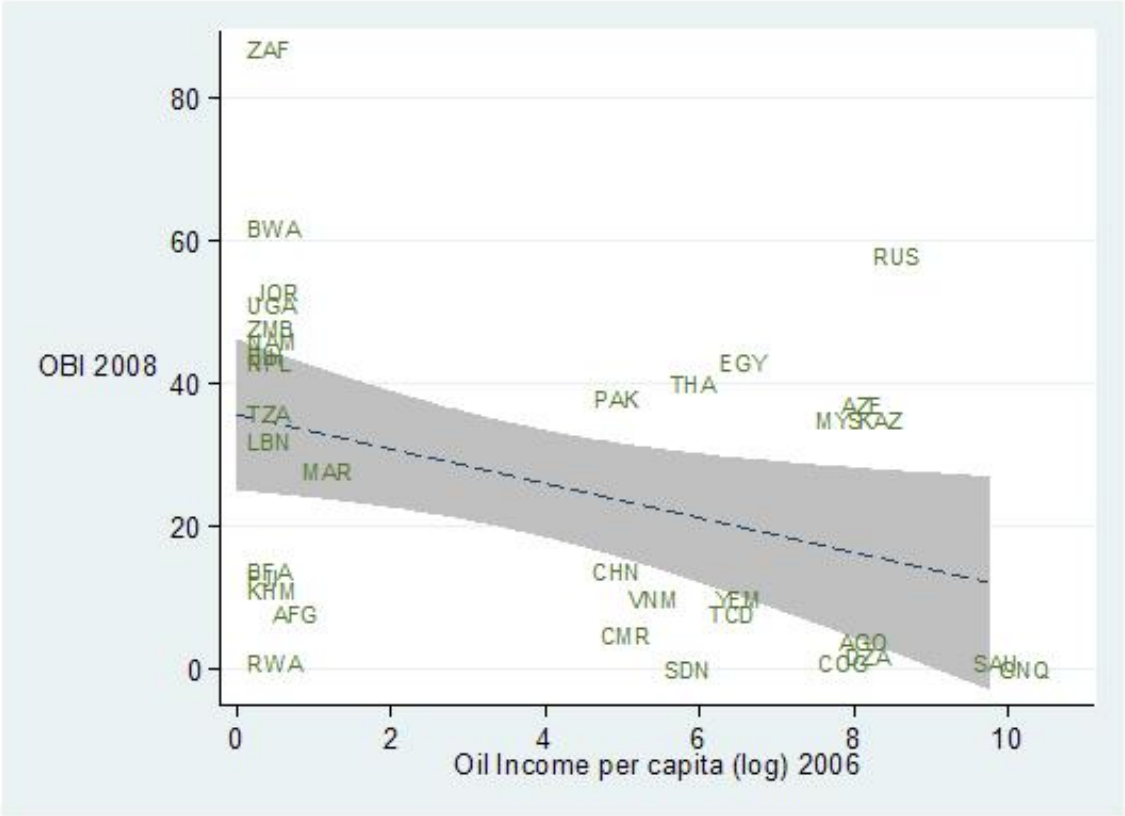
Table 6: Correlates of Open Budget Index 2008

	(1)	(2)	(3)	(4)	(5)	(6)
Oil Inc (log)	2.666 (2.23)**	0.267 (0.27)	-2.416 (2.30)**	-4.059 (3.87)***	-2.521 (2.06)**	-5.480 (5.01)***
Income (log)		13.245 (6.61)***		12.018 (3.11)***	8.311 (2.26)**	16.192 (3.96)***
Polity					1.709 (2.36)**	
Human Rights						-4.813 (2.32)**
Sample	Democracies	Democracies	Autocracies	Autocracies	Autocracies	Autocracies
Observations	51	51	34	34	32	34
R-squared	0.11	0.47	0.15	0.36	0.44	0.44

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

Yet among authoritarian states, the effects of oil do not appear to be spurious. Figure 4 displays the oil income and OBI scores of the autocratic states; the downward-sloping line indicates a negative correlation. The very worst performers remain the five countries in the lower-right quadrant: Equatorial Guinea, Saudi Arabia, Angola, Algeria, and Congo Republic. The best-performing oil autocracy is Russia: although it has about the same level of transparency as *democracies* with similar incomes (as seen in Figure 1, where it lies almost precisely on the regression line), it is uniquely transparent for an oil-producing autocracy. No other oil-rich autocracy has a 2008 OBI score above 37; Russia's score is 58. I return to the Russia case in the conclusion.

Figure 4 – Oil Income and OBI Scores, autocracies only



The bivariate regression in Table 6, column 3, shows that among autocracies there is a statistically significant negative correlation between oil and OBI scores – and that controlling for county incomes (column 4) increases the size and statistical significance of the "oil income" variable. While oil seems to increase transparency in democracies because it makes them richer, oil seems to reduce transparency in autocracies, *despite* making them richer.

Many earlier studies find that oil makes countries less democratic overall; is this reduced budget transparency merely a consequence of this reduced accountability? To explore this possibility, in column four I add to the model *Polity,* an indicator drawn from the Polity IV dataset that measures a

country's regime type on a 21-point scale; this allows us to control for variations in the accountability of autocratic states. The *Oil Income* variable remains significantly correlated with less transparency.

It is also possible that oil makes autocratic regimes more repressive, and their lower OBI scores are simply an artifact of this repression. I probe this issue in column 5 by replacing *Polity* with a variable called *Human Rights,* which I take from the Cingranelli-Richards data, and that gauges the annual incidence of torture, extrajudicial killing, political imprisonment, and disappearances that are attributable to the government. Once again, the *Oil Income* variable remains significantly linked to lower OBI scores, even after accounting for variations in human rights abuses among autocracies. These regressions suggest oil has an additional impact on the quality of governance – reducing its budget transparency, above and beyond its effects on government accountability.

Is oil linked to a *specific* facet of budget transparency, or simply to an overall measure like the OBI score? One way to find out is to once again divide the OBI score into its three subcomponents, and see which ones are affected by a country's oil income (Table 7). The first column shows once again the link between a country's *Oil Income* and its OBI score; the following three columns replace the OBI score with its three subcomponents. In each case, *Oil Income* is correlated with less transparency – through a weaker role for the legislature (column 2), a weaker supreme audit institution (column 3), and a more opaque budgeting process in the executive branch (column 4). Oil wealth is not merely linked to a single feature of budget transparency, but to each of its measured features.

Table 7: Correlates of Open Budget Index 2008 Among Autocracies

	(1) OBI	(2) Legislative Strength	(3) SAI Strength	(4) OBI
Oil Income (log)	-4.059 (3.87)***	-1.910 (2.23)**	-2.963 (2.32)**	-2.476 (2.98)***
Income (log)	12.018 (3.11)***	4.530 (1.45)	8.418 (1.88)*	7.860 (2.35)**
SAI Strength				0.291 (2.02)*
Legislative Strength				0.378 (2.00)*
Observations	34	34	34	34
R-squared	0.36	0.13	0.18	0.56

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

Since we are analyzing a small number of cases – just 34 autocracies have OBI scores for 2008 – these results should be interpreted cautiously. If we use other definitions of democracy, we see a similar but somewhat weaker correlation between oil and opacity. In Table 8 columns 1 and 2, I replace the Cheibub, Gandhi, and Vreeland democracy measure with a dichotomized version of Polity,

in which countries with scores of "5" or below on the -10-+10 scale are classified as "autocracies."[23] In the bivariate OLS regression in column 1, *Oil Income* is negatively correlated with OBI scores among autocracies, but falls short of statistical significance; once we control for income in column 2, the *Oil Income* coefficient doubles in size and becomes significant at the .05 level. In column 3 and 4 I identify non-democracies using Freedom House's classification of countries that are either "partly free" or "not free"; again, the negative correlation between *Oil Income* and budget transparency falls short of statistical significance in column three, but more than doubles in size and becomes highly significant when income is controlled for in column 4.[24]

Table 8: Correlates of Open Budget Index 2008 – alternative democracy measures

	(1)	(2)	(3)	(4)
Oil Income (log)	-1.366	-2.540**	-1.189	-2.818***
	(0.967)	(1.165)	(0.884)	(1.019)
Income (log)		6.348		8.814***
		(4.434)		(3.266)
Sample	Polity Autocracies	Polity Autocracies	FH Partly/Not Free	FH Partly/Not Free
Observations	32	32	51	51
R-squared	0.059	0.115	0.037	0.150

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

In short, among democracies oil wealth is correlated with greater budget transparency, although this could merely reflect the greater wealth of the oil producers. But oil seems to be bad for budget transparency in autocracies, and adversely affects each subcomponent of a country's OBI score.

6 Non-fuel Mineral Wealth and Budget Transparency

Non-fuel mineral wealth strangely has the opposite relationship with budget transparency: among democracies, there is no link; but among autocracies, mineral wealth is associated with *greater* transparency.

In Table 9 column 1, mineral wealth among all states is correlated with higher OBI scores, a pattern that holds in column 2 when we control for income. When we divide the sample into autocracies and democracies, however, we see that mineral rents are unrelated to transparency in democracies (columns 3 and 4), but strongly associated with greater transparency in autocracies, whether or not we control for income (columns 5 and 6. When the OBI index is divided into its three subcomponents, *Mineral Rents* is strongly correlated with each part of the budget process (not shown). Using the

[23] I chose five as the cut-point to generate a similar number of autocracies and democracies as the Cheibub, Gandhi, and Vreeland measure. The results are unchanged if the cut-point is raised to six or lowered to zero. To avoid losing observations, I gave three countries that are not scored by Polity – Afghanistan, Bosnia, and Sao Tome – the same designations as Cheibub et al in Cheibub, Jose Antonio, Jennifer Gandhi, and James R. Vreeland, "Democracy and Dictatorship Revisited," *Public Choice*, vol. 143, no. 1-2 (April 2010), pp. 1-35.

[24] If we look at Freedom House's "partial democracies" alone – just eight of whom are oil producers – there is no obvious link between oil and budget transparency.

alternative measures of democracy described above (Table 10), the results are unchanged: among autocracies, non-fuel mineral wealth is associated with heightened budget transparency.

Table 9: Correlates of Open Budget Index 2008 – Non-fuel Minerals

	(1)	(2)	(3)	(4)	(5)	(6)
Mineral Rents (log)	4.690***	2.972**	2.553	0.798	6.591***	6.420***
	(1.306)	(1.278)	(1.757)	(1.447)	(1.722)	(1.764)
Income (log)		11.15***		13.34***		1.081
		(2.193)		(1.923)		(3.339)
Sample	All	All	Democracies	Democracies	Autocracies	Autocracies
Observations	84	84	50	50	34	34
R-squared	0.117	0.354	0.039	0.480	0.299	0.301

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

Table 10: OBI 2008 and Non-fuel Minerals – alternative democracy measures

	(1)	(2)	(3)	(4)
Mineral Rents (log)	0.241***	0.241***	0.207***	0.199***
	(0.0493)	(0.0508)	(0.0549)	(0.0581)
Income (log)		0.290		2.348
		(3.374)		(2.850)
Sample	Polity autocracies	Polity autocracies	FH Partly/Not Free	FH Partly/Not Free
Observations	32	32	51	51
R-squared	0.225	0.226	0.104	0.117

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

Figure 5 shows the relationship between the log of *Mineral Rents* and budget transparency among autocracies in a scatterplot: autocracies with abundant non-fuel minerals like South Africa, Botswana, Russia, Zambia and Namibia are in the upper-right quadrant; autocracies with little non-fuel minerals like Burkina Faso, Angola, Vietnam and Equatorial Guinea are clustered in the lower-left corner.

Are these opposing patterns – less transparency in the oil autocracies but more transparency in the mineral autocracies – an artifact of the non-random sample of countries rated in the OBI? One way to check is by looking at a similar transparency measure that is available for a larger number of states – the "Freedom of the Press" scores produced by Freedom House. The simple correlation between the two indicators is .65; a scatterplot (Figure 6) shows they are at least broadly correlated.

As Figures 7 and 8 suggest, *Oil Income* and *Mineral Rents* have the same relationships with *Freedom of the Press* as they do with *OBI,* even though there are 74 autocracies with *Freedom of the Press* scores but just 34 autocracies with OBI scores.

Figure 5: Non-fuel Mineral Rents and OBI Scores, autocracies only

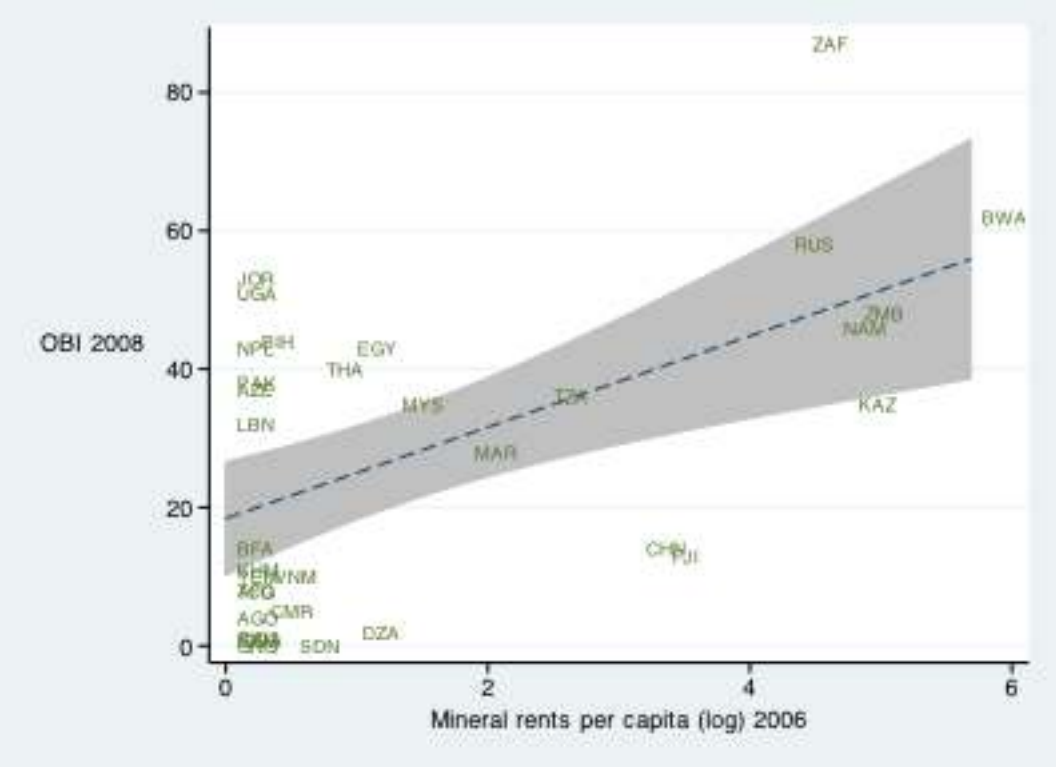


Figure 6: OBI Scores and Press Freedom Scores

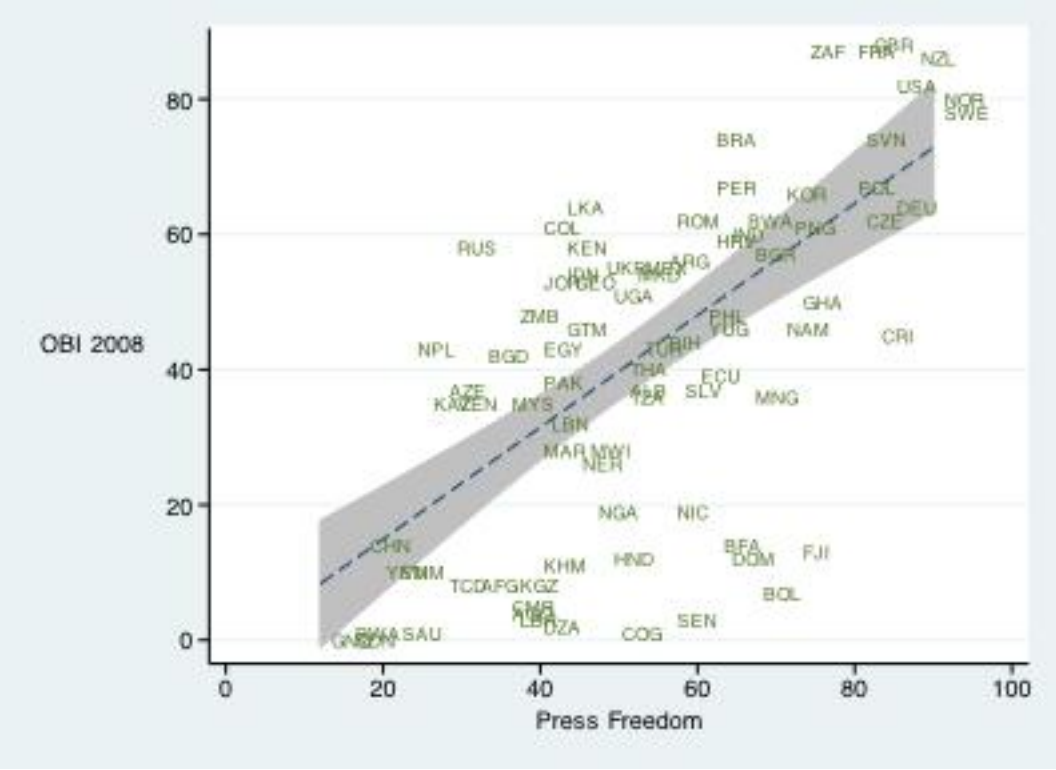


Figure 7: Oil Income and Press Freedom, autocracies only

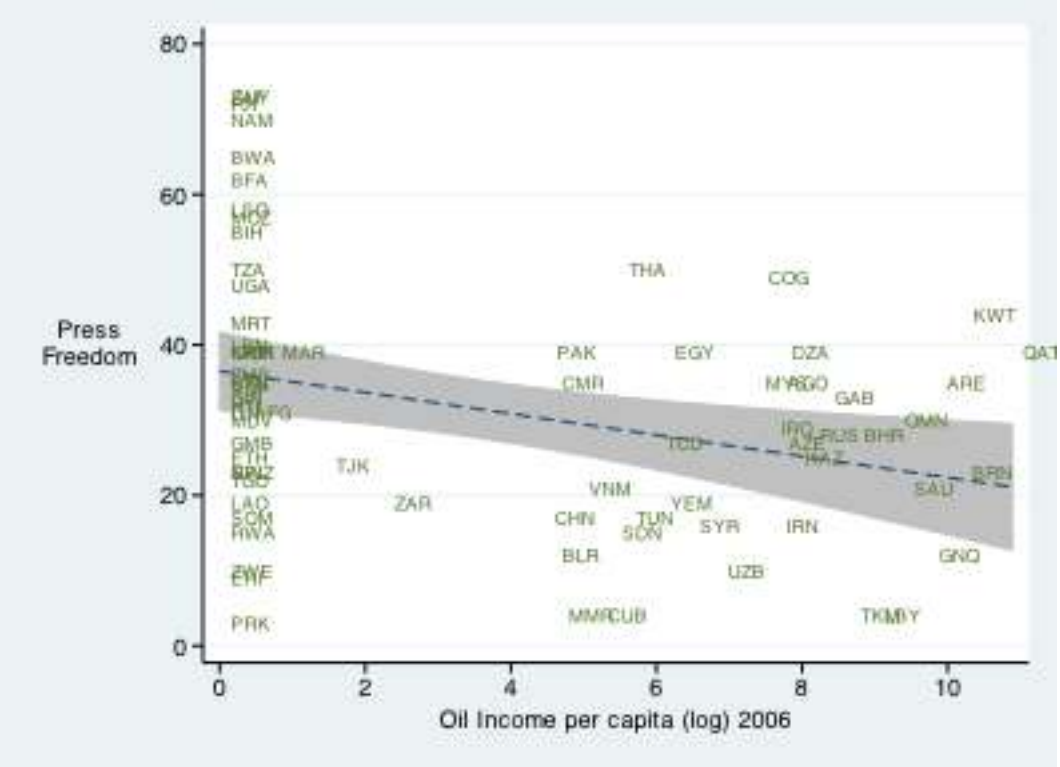
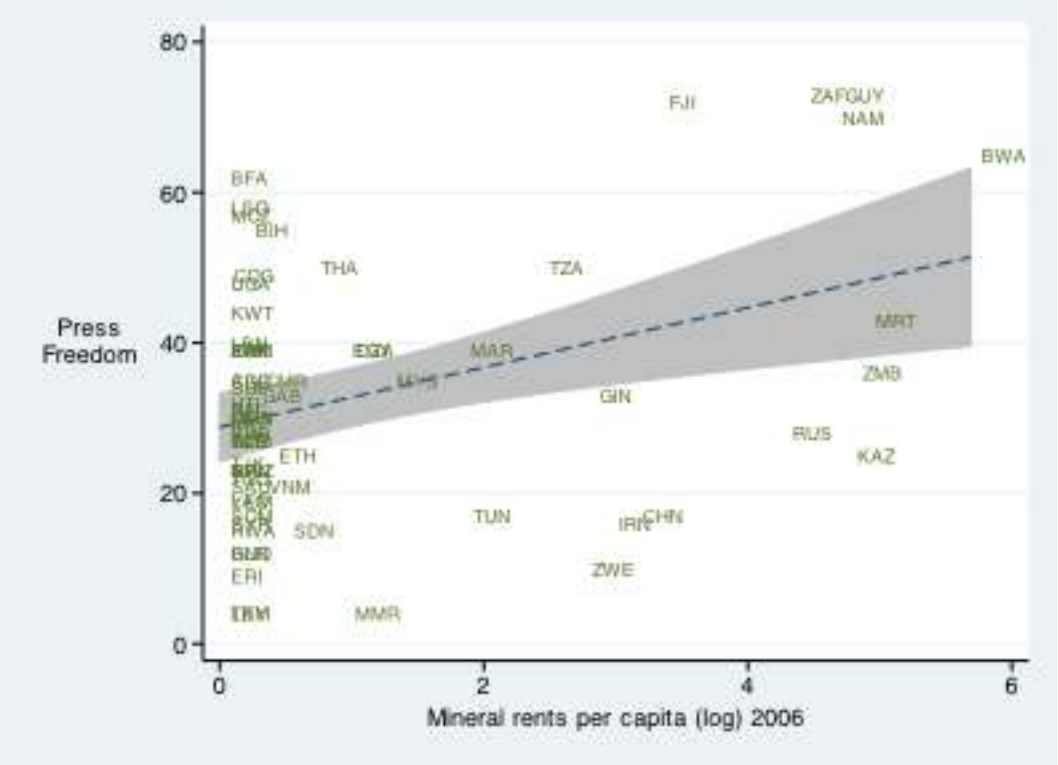


Figure 8: Mineral Rents and Press Freedom, autocracies only



7 Explaining the Impact of Mineral Wealth

Why do oil wealth and non-fuel mineral wealth have strong and opposing effects on budget transparency? Our ability to distinguish among the competing explanations is quite limited, due to the scarcity of transparency data; still, it is possible to make some modest inferences about three of the four factors discussed above.

If oil autocracies were less transparent because they needed less foreign investment, we should observe a) no correlation among oil states between foreign investment transparency and b) a correlation among non-oil states between foreign investment and transparency.[25] Table 11 columns one and two include only oil states; whether or not we control for income, there appears to be no link between foreign investment inflows (measured on a per capita basis) and transparency, consistent with the first claim. Columns three and four include only the non-oil states; there is once again no link between foreign investment and budget transparency, which is *not* consistent with the second claim. This suggests there is little *prima facie* evidence that reduced pressures for FDI explain the lack of transparency in the oil states.

Table 11: Causal Mechanisms – FDI

	(1) OBI 2008	(2) OBI 2008	(3) OBI 2008	(4) OBI 2008
FDI inflows	-0.00377 (0.00824)	-0.00126 (0.00440)	-0.00929 (0.0143)	-0.0113 (0.00846)
Income (log)		20.36*** (4.253)	- -	12.78*** (2.033)
Sample	Oil states	Oil states	Non-oil states	Non-oil states
Observations	30	30	47	47
R-squared	.009	.458	.011	.396

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

We can also do a simple check of the EITI hypothesis. If EITI pressures were responsible for the exception transparency of mineral-producing autocracies, we would expect that most highly-transparent mineral autocracies would be EITI members. Consider once again Figure 5: the authoritarian mineral producers that are relatively transparent are in the Northeast quadrant of the scatterplot. Of these five – South Africa, Russia, Botswana, Namibia and Zambia – only one (Zambia) is a member of EITI. In fact, the mineral-producing autocracies that are EITI members (Zambia and Kazakhstan) have *lower* OBI scores than the mineral-producing autocracies than are not members, although the differences are not statistically significant.[26] There is no *prima facie* evidence that pressures from EITI can explain why the mineral producers are more transparent than the oil producers.

[25] There are too few mineral-rich autocracies – just six – to examine the third claim: that among mineral-producing autocracies, transparency is correlated with more FDI.

[26] This holds true whether we look only at autocracies or at all states.

The evidence is more promising for the final claim, that oil leads to less transparency because it helps autocrats maintain control. Table 12 (column 1) shows a simple OLS regression in which a country's income per capita is positively correlated, and its *Oil Income* is negatively correlated, with its Polity score. When a term interacting *Oil Income* and OBI scores is added to the model (column 2), it is significantly and negatively correlated with *Polity,* and its inclusion causes *Oil Income* to change signs and become positively correlated with *Polity.* Adding the *OBI 2008* score to the model, in addition to the interaction term (column 3), does not change the basic result, although it causes *Oil Income* to lose statistical significance. This could be interpreted as evidence that oil wealth only makes countries less democratic when it is paired with less transparency. For oil-funded autocrats, low transparency might be essential for maintaining power.

Table 12: Causal Mechanisms - Democracy

	(1)	(2)	(3)
Income (log)	0.988***	0.595***	0.358
	(0.171)	(0.191)	(0.234)
Oil Income (log)	-0.260**	0.441***	0.192
	(0.103)	(0.156)	(0.143)
OBI *Oil Inc (log)		-0.0100***	-0.00531**
		(0.00199)	(0.00244)
OBI 2008			0.0363**
			(0.0164)
Sample	All states	All States	All States
Observations	83	83	83
R-squared	.240	.405	.440

OLS estimations. Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

8 Conclusion

This paper shows that in a nonrandom sample of 83 countries, mineral wealth is correlated with budget transparency in a limited and vexing way: there is no robust link between mineral wealth and budget transparency among democratic states, but among authoritarian states more oil is associated with less transparency, while more non-fuel minerals is associated with greater transparency.

Explaining this pattern is a challenge – due to both the limited availability of data, and puzzling differences between oil and non-oil minerals. I find no *prima facie* evidence that either foreign investment flows or EITI membership can explain these correlations. There is modest evidence that the diminished transparency of oil-funded autocracies has an important political function – and that it helps explain why oil tends to hinder democratic transitions. Still, there is no easy way to account for the ostensibly transparency-promoting effects of non-fuel minerals.

The failure to explain the effects of non-fuel minerals should not overshadow the significance of the paper's other findings. The most important may be that among autocracies – but only autocracies – more oil seems to lead to less transparency. In recent months, this link may have become stronger. The paper shows that Russia appears to be an important exception to the overall pattern, since it is

both oil-rich and authoritarian but has relatively high transparency levels – much higher than the next-most transparent oil autocracy. Unfortunately, in April 2010 much of this transparency disappeared when Prime Minister Vladimir Putin signed a decree that suspended the publication of information about the assets, revenues, and expenditures of Russia's two oil funds, as well as the government's oil and gas revenues.[27] The suspension was to remain in effect until 2013 – well after Russia's upcoming 2012 elections. Russia is no longer an anomaly.

It may also be significant that oil wealth is not associated with less transparency in democracies; it may even be linked to greater transparency, although this correlation could easily be explained in other ways. This does not imply that transparency gains in democratic oil producers (and for that matter, non-fuel minerals producers) are unimportant: they may still lead to more accountability and less corruption. But if reduced transparency is an essential feature of oil-producing autocracies – a policy that is necessary for translating oil revenues into political power – it may imply that a) as long as they remain undemocratic, these governments will strongly resist pressures to become more transparent, and b) transparency increases in these states may be politically-destabilizing, causing autocrats to lose their grip on power.

A priority for future studies will be to explain the different affects of petroleum and non-fuel minerals. There are some important differences between petroleum and hard rock minerals. One is scale: petroleum wealth produces vastly more government revenues than non-fuel mineral wealth. The richest oil producer in 2006 – Qatar – produced about $45,000 per capita worth of petroleum; the world's richest minerals producer, Chile, produced about $1200 per capita. There were 25 autocracies that generated more than $300 per capita from oil and gas, but not a single minerals producer.[28]

Still, the negative link between oil and transparency is not merely produced by countries with exceptional petroleum wealth. Even if we limit the sample of countries to oil producers that earned no more than $300 per capita in oil and gas, the negative correlation remains.

Another potentially-significant difference is state ownership: in almost all autocracies, the state claims ownership of petroleum reserves and manages their extraction through a national oil company. Although the role of these companies varies considerably, most of them give oil-rich governments an easy way to cloak their finances. By contrast, the extraction of non-fuel minerals is more frequently carried out by the private sector, and state-owned minerals companies are less common. While this might explain why non-fuel mineral wealth does not have the transparency-reducing effects as petroleum wealth, it does not explain why it might have a transparency-enhancing effect.

[27] See www.revenuewatch.org/news-article/russia/russia-suspends-most-oil-and-gas disclosures.

[28] The measure of minerals rent does not include, however, gemstones; if gemstones were counted, Botswana and perhaps a couple of other states would have higher totals.

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