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Institutions and the "Resource Curse": Evidence From Cases of Oil-Related Bribery

Paasha Mahdavi[1]

Abstract

While some resource-rich countries are highly corrupt, others have transparent and well-functioning governments. What explains this wide variation in so-called "resource-cursed" states? I show that these differences result from domestic institutional choices over how resource extraction is governed. Some governments grant procurement authority—the ability to award contracts for production rights—to state-owned enterprises, whereas others place this authority in ministries. Building upon agency theory, I argue that this choice matters: The relative political autonomy of state-owned enterprises compared with ministries fosters an opaque regulatory environment that incentivizes malfeasance. Using new data on transnational bribes in 59 oil-producing countries, I show evidence for a robust link between oil-related institutions and bribery, even after addressing the endogeneity of institutional choice via instrumental variables analysis. This research has implications not only for the political economy of the resource curse hypothesis but also for existing theories on corruption and regulatory independence.

Keywords

resource curse, corruption, state-owned enterprises, regulatory independence

[1]University of California, Santa Barbara, USA

Corresponding Author:
Paasha Mahdavi, Assistant Professor, Department of Political Science, University of California, Santa Barbara, Ellison 3834, Mail Code: 9420, Santa Barbara, CA 93106-9420, USA.
Email: paasha@ucsb.edu

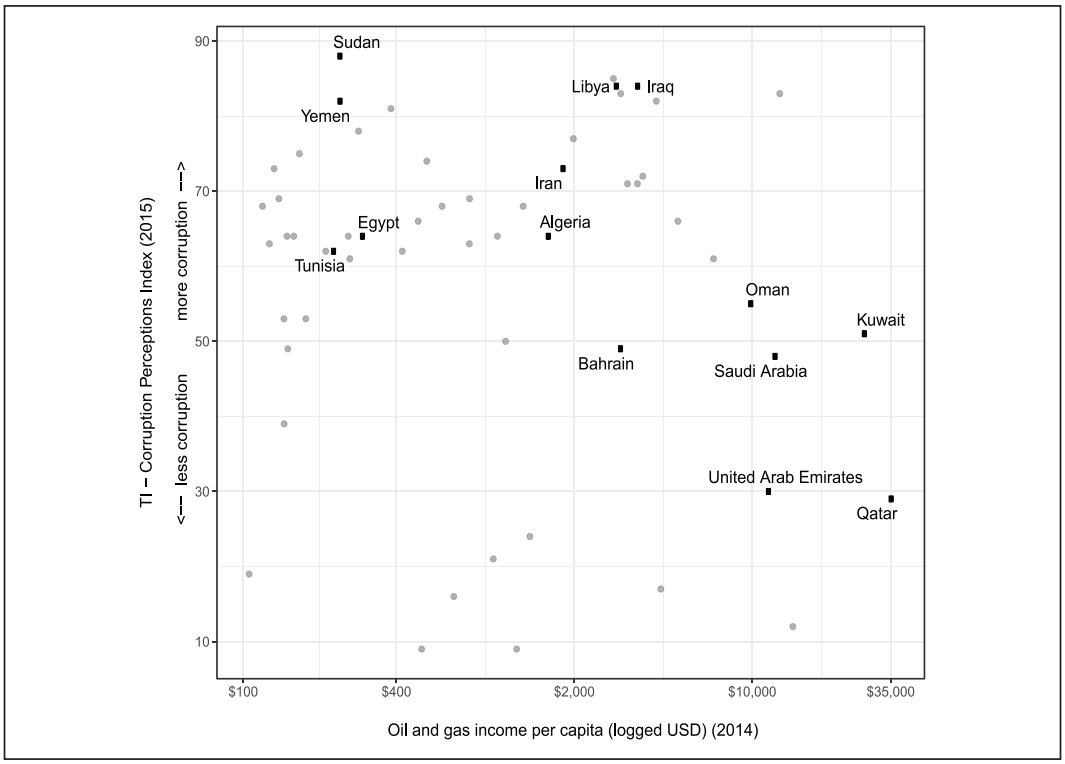

Figure 1. Oil and perceptions of corruption in 2014-2015.
Scatterplot of oil and gas income per capita (exponentiated from the log scale) and Transparency International's Corruption Perceptions Index (transformed so that higher values represent more corruption) for major oil producers. Countries in the Middle East and North Africa are highlighted and labeled. TI = Transparency International.

Why do resource-rich countries exhibit wide variation in corruption? What specific factors explain why some countries seem "cursed" by oil while others seem "blessed" by it? Figure 1 provides a more systematic basis for this puzzle across all 60 major oil-producing countries: more oil wealth does not necessarily mean more corruption.[1] Despite this high variance, some scholars suggest a positive linear relationship between extractive resources and corruption (Arezki & Brückner, 2012; Bhattacharyya & Hodler, 2010; Brollo, Nannicini, Perotti, & Tabellini, 2013; Karl, 1997; Knutsen, Kotsadam, Olsen, & Wig, 2017; Vicente, 2010), while others find no such relationship (Ades & Di Tella, 1999; Aslaksen, 2007; Leite & Weidmann, 1999; Treisman, 2007). The general perception is that indeed oil *causes* corruption—to the point that there are several policy initiatives and non-government organizations (NGOs) with the stated objective of reducing oil's corrupting effects. Yet, even if there were a causal relationship between oil and corruption, why does the effect vary so greatly across countries?

This article builds on the broader debate over whether extractive resources hinder good governance (Brooks & Kurtz, 2016; Dunning, 2008; Haber &

Menaldo, 2011; Hong, 2018; Ross, 2012; Smith, 2004, 2007), but looks to unearth the specific mechanisms linking oil production to corrupt outcomes. The proponents of a "conditional resource curse" aver that the impact of oil on the quality of government is mediated by political institutions (Jones Luong & Weinthal, 2010; Mehlum, Moene, & Torvik, 2006; Menaldo, 2016; Robinson, Torvik, & Verdier, 2006; Wright, 2008). Their central tenet is that these conditions depend on whether or not "good institutional characteristics emerged prior to the discovery of natural resources" (Lederman & Maloney, 2008, p. 32).

The separate literature on political corruption has similarly shown that rent-seeking is exacerbated by so-called "bad" institutions (Krueger, 1974; Rose-Ackerman, 1975, 1999), as opposed to cultures of corruption and moral proclivities toward malfeasance (Fisman & Miguel, 2007; Nye, 1967). For cases of grand corruption, bribery is facilitated by the ease of making illicit payments without punishment and when "state officials have the power to allocate scarce benefits and impose onerous costs" (Rose-Ackerman, 1999, p. 39). Extortion often occurs in the process of awarding government contracts (Olken, 2007), especially when officials have more regulatory discretion (Kaufmann & Wei, 1999). "Good" institutions, on the other hand, foster accountability, transparency, and therefore low levels of corruption. More competitive electoral institutions promote greater transparency and accountability of public officials (Montinola & Jackman, 2002), while freedom of information laws and a free press can work to increase the probability and cost for public officials of getting caught engaging in corrupt behavior (Besley, 2006).

Yet, these institutions often remain vague scholarly constructs—both within the realm of resource politics and in the general context of the political economy of development—with little attention to what specific institutions promote or prevent corruption. In addition, what has made the question of whether institutions matter for corruption difficult to answer is both the lack of theory-building on how these institutions emerged in the first place, and the challenges in empirically distinguishing their effects from the factors that determine institutional choice.

The main goals of this study are to provide a theoretically informed explanation for why resource wealth affects corruption in some states but not others, and to test implications of this argument using new measures of oil-related institutions and corruption. I argue that domestic institutions governing petroleum wealth explain much of the variation in corrupt outcomes across oil-producing countries. I claim not only that institutions matter—a long-held view in political economy—but also which specific institutions are relevant to the study of the resource curse and corruption and *why* they matter. Specifically, when the oil sector is regulated by national oil companies

(NOCs) instead of government ministries, there are greater incentives for malfeasance by state officials. This is one manifestation of what I argue is a broader pattern of negative governance outcomes when state-owned enterprises (SOEs), not government agencies, hold regulatory authority.

The argument is rooted in agency theory and importantly goes beyond the study of oil; all regulatory entities serve as agents on behalf of the state but have differing incentive structures to act in the state's best interests (Banks & Weingast, 1992; Weingast, 1984). In particular, the degree of regulatory autonomy plays an important role in shaping these incentives (see Levy & Spiller, 1994). Given their financial independence, SOEs in extractive resources sectors—and in the non-resource economy—operate in opaque institutional environments that lack oversight (Marcel, 2006; Slaski, 2018; Victor, 2013; Victor, Hults, & Thurber, 2012). In contrast, extractive resource ministries are subject to greater oversight due to their formal ties to governing institutions and fiscal reliance on the state (Heller, 2017; Heller & Marcel, 2012; Organisation for Economic Co-operation and Development, 2015; Sayne, Gillies, & Watkins, 2017). Although both types of regulatory entities have incentives to act opportunistically, SOEs will be relatively less constrained when compared with ministries due to the larger informational asymmetries between the government and its SOE (Stevens, 2008). This is a problem for governance over not only natural resources such as oil but also broader sectors such as public utilities and mining, where SOEs similarly play dominant roles.

The context of public procurement—the process of bidding for and winning government contracts—offers the key testing ground for the argument given this activity's high vulnerability to corruption (Golden & Picci, 2005; Olken, 2007). If states vest contract-awarding authority in SOEs rather than ministries, this institutional design will reduce the visibility of how bids are decided and thereby incentivize officials to solicit bribes. I find empirical evidence in support of both implications. First, drawing on an original database of regulatory institutions, I show with panel regressions that there is weaker government oversight and lower public disclosure of contracts in sectors where the procurement process is regulated by SOEs as opposed to ministries. Second, I use new cross-sectional data on transnational bribery to find that corruption is higher in countries where NOCs award contracts, even after addressing the endogeneity of institutional choice via instrumental variables analysis.

The choice to focus on bribery is based not only on keeping a tractable scope of analysis, but also on its importance in the context of political and economic development. Consider that the costs of bribery alone are estimated at US$1.5 to US$2 trillion per year, or 2% of global GDP, when factoring just the amount of money spent in these illicit transactions.[2] Given the lucrative,

high-stakes nature of its business, the oil industry is particularly prone to bribery: corruption surveys often list the sector as one of the most vulnerable to bribe solicitation, lagging only behind the construction and property development sectors (Riaño & Hodess, 2008). Using the measure of transnational bribery introduced in this study, the oil sector is the top industry implicated in bribery prosecutions under the U.S. Foreign Corrupt Practices Act (FCPA), far ahead of the defense and infrastructure sectors.

In addition, procurement-related bribery adversely affects innovation and productivity. Social welfare is maximized when the most skilled operator—highest long-term production at lowest cost—wins the contract, not the most skilled briber (see Mauro, 1995). In the oil sector in particular, transnational bribery has been linked to the selection of "underqualified or irresponsible companies that were unable to effectively execute the project" (Sayne et al., 2017, p. 3). Bribery can also deter investment by firms unwilling to enter markets where extortion is pervasive, or can encourage firms to side-step regulations altogether (see Shleifer & Vishny, 1993).

A final point is warranted before proceeding. Corruption is an inherently difficult phenomenon to observe and measure with precision. Trying to effectively capture bribery in particular is a challenging feat for several reasons, not least of which is the fact that bribe solicitors and payers go to extraordinary lengths to conceal their activities from transnational authorities such as the Department of Justice (DOJ). As such, the measures of corruption I use suffer from measurement error and content validity beyond levels typically associated with other measures in political economy. This is an important point to consider when evaluating the rigor of the study's empirical tests, but should not dissuade us from tackling this critical, albeit hard to measure, issue of governance.

Theorizing Regulatory SOEs

With respect to oil wealth and corrupt activity, scholars expect corruption somewhere in the fiscal pathway of oil revenues from the well-head to the treasury because of the large amount and opacity of petroleum rents (Karl, 1997; Leite & Weidmann, 1999; Ross, 2012). I propose that the regulatory structure of a country's oil sector is one institution that explains variance in oil-related corruption. Countries where SOEs have upstream regulatory authority—awarding contracts for drilling rights, supervising companies involved in exploration and production, and overseeing payments of taxes, fees, and royalties to the government, among other responsibilities—have the greatest opportunities for corruption broadly defined when compared with countries where regulatory powers are vested in ministries or agencies.

While there are different types of SOEs and different types of ministries, the salient variation for the argument is binary. Granting contract-awarding authority to SOEs—which I refer to as "regulatory SOEs"—will foster an opaque environment, one in which bids are evaluated with little public disclosure and with little oversight by other governmental elements.[3] Such is the case in countries such as Algeria, Iran, and Kuwait, where NOCs are not required to disclose decision-making criteria for awarding licenses. In the specific context of procurement, this opacity leads to greater bribery because it lowers the probability of getting caught for both the briber and the bribe recipient.[4]

The alternative structure is to vest licensing authority in a governing agency, such as a ministry or regulatory body. For example, contracts in Saudi Arabia are overseen by the Supreme Economic Council, not the NOC (Saudi Aramco): in Oman by the Directorate General on Management of Petroleum Investments, not the NOC (Petroleum Development of Oman), and in the UAE by the Supreme Petroleum Council, not the Abu Dhabi National Oil Company. These "regulatory ministries" are typically overseen by a country's legislature, a higher regulatory agency, or even the executive office. In Abu Dhabi, for example, Law 1 of 1988 mandates that the Supreme Petroleum Council's decisions must be approved by both the monarch (who is the *de jure* chair of the council) and the *Majlis al-Wattani al-Ittihadi*. In the emerging producer Uganda, Act 3 of 2013 (§ 47.4) stipulates that the contract-awarding Petroleum Authority must systematically report to parliament both on the initial opening up of exploration areas for bidding and the subsequent awarding of any new contracts. Ministry personnel are also incentivized toward opportunism; indeed, corruption is widespread within extractive resource ministries (Revenue Watch Institute, 2013). But given the relative ease with which the state can monitor ministry behavior compared with SOE behavior, there will be relatively less corruption when regulatory authority is vested in ministries as opposed to SOEs.

Beyond just the context of oil governance, both these types of regulatory bodies—ministries and contract-awarding SOEs in general—can be characterized as agents acting on behalf of their principals in government. If not overseen effectively and consistently, such entities may lack the incentives to act in the public's best interest of no corruption in the procurement process (Weingast, 1984). Classic principal-agent theory suggests that monitoring is one reason, *inter alia*, for this mismatch. Opportunism arises when the principal has difficulties in continuously monitoring the agent's behavior (Holmstrom, 1979). In this case, such moral hazard is the result of asymmetric preferences given the delegation of regulation to an agent that has different incentives than the principal (Besley, 2006, p. 76). Whereas the government desires to maximize resource revenues to the treasury (e.g., to

fund survival-enhancing expenditures), the regulatory official desires to maximize personal utility. The latter includes growing resource revenues for the state—if strong performance results in improved compensation—but also includes increasing take-home pay via illicit means if the probability of detection and punishment is low. And while the government holds the regulator formally accountable given its ability to sanction officials *via* removal (see Fearon, 1999), it is difficult to punish opportunism if its detection proves challenging.

How does this differ for SOEs compared with ministries? The key difference with respect to monitoring and enforcement of these two types of agents lies in their relative political autonomy. In the oil sector, NOCs gain considerable autonomy *vis-à-vis* the state because of their fiscal importance. SOEs actively generate revenues from the production and/or sales of extractive resources, giving these entities financial leverage over the state (McPherson, 2003). In extreme cases such as Saudi Arabia, for example, the NOC is the direct source of upto 90% of the government's overall revenues. Extractive ministries do not have such fiscal activities to rely upon, and instead are financed entirely through the state budget (J. M. Davis, Ossowski, & Fedelino, 2003). NOCs are also autonomous given their exceptional status in the legal regime. So as not to bog down the NOC with political interference, states often enact petroleum laws that assign lax reporting and oversight rules that are different from national laws to which non-petroleum companies adhere (Victor et al., 2012). Such weak oversight is granted to NOCs of all types—whether they have regulatory authority or not—so that the state can improve NOC operational and fiscal efficiency. The downside is that both fiscal independence and lenient legal standards lead to the phenomenon of the NOC becoming a "state within the state," whereby it makes decisions unilaterally without consulting any other branches of government (Stevens, 2008). This financial independence, coupled with legal exceptionalism, thereby gives SOE officials relatively greater autonomy than their ministerial counterparts. This independence is not limited to oil SOEs, but would generally apply to SOEs in other sectors such as mining, electricity, manufacturing, transportation, and water. Chile's state-owned copper company Codelco, for example, single-handedly accounts for 13% of government revenue and wields considerable power over mining policy (Revenue Watch Institute, 2013).

Agency theory implies that this political autonomy provides an incentive for SOE officials to keep information hidden from the government (Weingast & Moran, 1983). Empirically, there is scholarly consensus that NOCs are not transparent entities (see Mommer, 2002; Victor, 2013). This even applies to so-called internal transparency: NOCs do not disclose complete information about operations, cash flows, and expenditures to the government, let alone

to the public (Revenue Watch Institute, 2013). In the context of procurement, extractive resource SOEs maintain complex, subjective criteria in bidding processes that can be difficult to track by other governing agencies (Sayne et al., 2017). By minimizing and misreporting financial disclosures, the informational asymmetry gained from institutional autonomy thus offers cover to engage in opportunistic behavior such as embezzlement, graft, and bribery when granted the ability to regulate other firms in the sector. Ironically, while the knowledge gap between multinational operators and the host government shrinks when the SOE regulates operations—a key reason why this institutional design is chosen in the first place, as I elaborate below—an asymmetry emerges between SOE and government.

Of course, ministries can also foster information asymmetries. The classic case of the principal-agent problem in political science is between the legislature and its bureaucracies (Weingast, 1984). But these gaps are narrower than is the case for SOEs given ministries' relatively less autonomous position due to their financial reliance on the state. Consider again the case of Uganda, where the Petroleum Authority is entirely financed by parliamentary appropriation (Act 3 of 2013, § 33[a]). In general, this makes it relatively easier—compared with SOEs—for the government to monitor and sanction officials at ministries and other regulatory agencies. One manifestation of this relative ease is punishment via personnel replacement. Under Dos Santos' governing regime in Angola, for example, ministries and agencies were staffed with rotating casts of political appointees while the state-owned oil company Sonangol maintained continuity of staff over time—keeping many of the same personnel since the country's independence in 1979 (Croese, 2017). Even in Nigeria, where each incoming president completely overhauls the NOC's board and C-level management, mid-level managers stay on across administrations (Heller, 2017). This autonomy gives SOEs a level of bureaucratic discretion akin to the general case of independent regulatory agencies (Gilardi, 2002; Scott, 2000). Unlike extractive resource ministries, SOEs are an archetype of independent regulatory agencies as defined by their ability to "take day-to-day decisions without the interference of politicians in terms of the offering of inducements or threats and/or the consideration of political preferences" (Koop & Hanretty, 2018, p. 42).[5]

Separating regulation from production may appear at first to be an obvious solution to mitigate corruption. But this perspective challenges the conventional notion that ministry-level "bureaucrats with control rights over firms can create mechanisms to extract . . . rents through bribes," no different than managers at SOEs (Ades & Di Tella, 1997, p. 1024). In addition, bureaucrats may face greater pressures from higher-level politicians to solicit bribes than SOE managers. Bureaucrats are holders of "direct control" over awarding

contracts but politicians with power over bureaucrats have "indirect control," thus leveraging their position to "extract rents from corruption in which the [bureaucrat] is engaged" (Bussell, 2015, p. 39). Politicians lack this indirect control when regulatory authority is vested in SOEs given their relative political autonomy. This suggests that, in the context of a rent-seeking government, bureaucrat-centered theories imply that granting procurement authority to ministries instead of SOEs would *increase* the level of corruption because bribes will be demanded not only by bureaucrats but also by their bosses. This runs parallel to the discussion of government fragmentation and the "grabbing hand": with more people in the decision chain, there are more people to bribe—and hence a larger overall sum of bribery (Shleifer & Vishny, 1998).

Yet, these perspectives underestimate the effects of political autonomy on corruption. By attributing more theoretical weight to the preferences of bureaucrats' principals than to institutional constraints, these arguments mischaracterize the opportunities for corruption (Brierley, 2018). Indeed, the level of bribery can be high in ministerial contexts where politicians have indirect control; but it is higher still when institutions are designed to give officials free reign to engage in malfeasance.

In either case, why would leaders opt for one type of institution over another? This question is orthogonal to the issue of nationalization in the first place, a process which hinges on several political and economic factors such as market conditions, international diffusion, executive constraints, bureaucratic quality, and time horizons (Albertus & Menaldo, 2012; Jones Luong & Weinthal, 2010; Kobrin, 1984; Wilson & Wright, 2017). When it comes to institutional choice after nationalization occurs, case studies suggest that less democratic states are more likely to opt for the all-in-one NOC rather than the separation-of-powers model of an NOC only involved in commercial activities (Thurber, Hults, & Heller, 2011; Victor et al., 2012). This is also likely in less economically developed contexts, where limited state capacity hinders the ability to establish effective bureaucracies distinct from the SOE (van der Linde, 2000). Low economic development can also make the state more reliant on outside investment that can be best secured by monolithic SOEs rather than other agencies (Klapp, 1982). In addition to these political determinants, research on NOC formation suggests that the government's choice of a regulatory agent is also dependent on geological risk at the time of nationalization. Low-risk geological environments tend to favor regulation and production by an NOC, whereas high-risk environments necessitate regulation of private producing firms by the government directly (Nolan & Thurber, 2010; Victor et al., 2012).

A key factor in this decision rests on whether or not the NOC can simultaneously manage its own production while also assessing the ability of foreign

firms to operate the country's oil fields. Among other things, this ability depends on the complexity of a country's oil fields. When oil is easy to extract, NOCs—which are generally less efficient and technologically capable than multinationals such as ExxonMobil, Shell, and BP (Wolf, 2009)—will be able to manage production without setbacks while also regulating multinational firms. The government expects that a newly established SOE can regulate firms without concerns over underbidding for contracts, misreporting of costs, or identifying appropriate contractors. In other words, easy geology narrows informational asymmetries between regulators and firms, such that a state entity can effectively oversee the contract-awarding process while simultaneously handling a variety of non-regulatory activities (such as exploration and production). When oil is difficult to extract, NOCs will not only suffer from production difficulties but will also find it harder to monitor these firms and determine which are best for the job. In these cases, informational asymmetries between operating firms and regulatory SOEs will be large. This leads to the government granting contract-awarding authority to an agency or ministry whose sole purpose is to regulate firms and find the right bidders to undertake production.[6] Since geology changes slowly over time, institutional choices tend to be "sticky" such that countries sparingly undertake NOC reform.

To summarize, I consider the following testable hypothesis:

> **Hypothesis 1:** Among oil producers, bribery is more likely in states with NOCs with contract-awarding authority than in states where contract-awarding authority is vested in ministries or other agencies.

To test the mechanisms linking regulatory institutions and incentives for bribery, I examine (a) whether fiscal transparency is lower in regulatory NOCs compared with regulatory ministries, and (b) whether NOCs are subject to less government oversight than ministries, as positied by the "state within a state" argument.

NOC Reform in Kazakhstan

A rare instance of NOC restructuring, the 2010 oil sector reform in Kazakhstan provides a *prima facie* illustration of the argument.[7] In the decade prior to reform, the sector was managed by the regulatory NOC KazMunaiGaz (KMG; previously KazakhOil). Faced with ongoing technical challenges in developing the country's increasingly complex oil geology, KMG was relieved of its regulatory authority by a newly resurrected Ministry of Oil and Gas on March 12, 2010, and became a company exclusively focused on

operations and commercial activities. As part of the reform, parliament began monitoring contracts and mandated the Ministry of Oil and Gas to provide regular reports on procurement.[8]

Bribery was rampant in the oil sector prior to the reform: the total amount of oil-related bribes prosecuted under the FCPA was US$91,322,250, second only to Nigeria on the global list. Beyond the FCPA prosecutions data, interviews conducted by the University of Bremen with 58 petroleum insiders in Astana and Almaty in 2009 indicated that bribes were inherently fixed into the oil and gas procurement process, such that "the usual payment for award of a contract is 10 per cent of the total amount" (Quoted in Heinrich & Pleines, 2012, p. 213). Such payments (not prosecuted under the FCPA) included a US$55 million bribe by Belgian company Tractebel for natural gas concessions and payments totaling US$115 million by Phillips and BP/Amoco to offshore accounts held by President Nazarbayev and his close associates (Peck, 2004). The trove of documents from the Unaoil email leak of 2016 highlighted the prominent roles played by two oil companies in bribing KMG officials—Italian firm Eni and Halliburton subsidiary KBR—who were funneling money through Monaco-based Unaoil to secure sensitive information on tenders to outbid their competitors. In one case from 2007, for example, over US$10 million in bribes went to Unaoil via Eni to reveal sensitive information about other bidders so that KBR could win tender 2007-0588 for drilling rigs to the Kashagan oil field.[9]

But these bribes petered out after the reform. The leaked Unaoil emails show no evidence of payments or kickbacks from either Eni or KBR after December 2009, despite evidence of both companies bribing officials in other oil-producing countries in 2010-2012. And there are no FCPA cases documenting bribes paid since 2010; the only major prosecuted domestic case in the oil sector was filed against Murat Ospanov, chairman of the Agency for Regulation of Natural Monopolies, for accepting bribes totaling US$300,000.[10]

Outside the oil sector, broad measures show that corruption remained a problem in the general economy before and after the reform. Prior to 2010, Kazakhstan ranked between the 67th and 83rd percentile of most corrupt countries in the Transparency International's Corruption Perceptions Index (CPI), while staying roughly in this position, between the 66th and 79th percentile, in each year up to 2015. The annual World Economic Forum (WEF) Executive Opinions Survey identified corruption as either the first or second most problematic factor in conducting day-to-day business transactions every year between 2005 and 2014. Bribery prosecutions remained high outside the oil sector, including allegations against arms manufacturer UkrSpetsExport for US$1.5 million in bribes for a US$40 million contract between 2011 and

2013, and the U.K.Serious Fraud Office (SFO) investigation into mining giant Eurasian Natural Resources Corporation (ENRC) for potentially more than US$100 million in bribes paid in 2012 for iron ore contracts in Kazakhstan.

Why did oil-related corruption decline over time?[11] The regulatory SOE argument would suggest that the 2010 reforms laid the foundation for increased oversight and transparency in the oil sector. The relatively lower political autonomy of the post-reform ministry compared with pre-reform KMG increased the cost of corruption as a means of securing contracts. This new environment fostered a decline in transnational bribery, not only in terms of FCPA prosecutions but also as revealed by the pattern of bribery from firms such as Eni and KBR doing business in Kazakhstan before and after the reform. The change in corruption dynamics could not have been due to systemic factors such as the political system, institutional capacity, size of the public sector, economic growth, or international integration, all of which remained largely stable throughout the period and help explain why non-oil corruption remained problematic.[12] Within the oil sector specifically, there were few changes other than geological conditions (which led to the reform in the first place), while the size of the sector and the opportunities for new investment both increased. If anything, the latter would suggest *higher* levels of corruption given the greater chances for extorted bribes amid a growing need to issue new contracts and licenses for operations. But with increased government scrutiny and transparency in the procurement process, relieving KMG from its authority in awarding contracts thus fostered a tougher environment in which to extort bribes.

Categorizing NOCs and Measuring Foreign Bribery

Turning now to the cross-national analysis, I define and measure a regulatory (contract-awarding) NOC as having the capacity to solicit and award contracts for oil exploration and production to operating companies such as ExxonMobil or BP, or service companies such as Halliburton or Schlumberger. For example, state-owned oil company Petroecuador is outfitted with the authority for engaging in joint venture contracts and participatory production agreements with outside firms. The NOC directly conducts negotiations with foreign oil companies, with minimal interference from other agents within the government.[13] This is in contrast with contexts where regulation is vested in a ministry, regulatory agency, or government department. In Peru, for example, state-owned PeruPetro does not have authority over awarding production contracts. Instead, the Ministry of Energy & Mining has the authority to award licenses to operating firms for participation in joint ventures with

PeruPetro, subject to parliamentary review.[14]I use petroleum laws and NOC/ministry documents (listed in Supplemental Appendix 4) to categorize the regulatory structure of all oil-producing states, shown in Table 1. This includes oil-producing countries without NOCs (labeled with asterisks) whose regulatory structure is the same as the non-regulatory NOC cases where ministries or agencies have authority to award contracts. Hence, there are two general types of contract-awarding institutions—regulatory NOCs and regulatory ministries—lending to a binary variable in the analyses below. I initially focus on regulatory structures as of 2012,[15] but for the instrumental variables analysis, I measure regulatory structure in the year of nationalization, which varies across countries.

In contrast, measuring bribery has proven difficult in cross-national settings (Escresa & Picci, 2015; Fazekas & Kocsis, 2017; Treisman, 2007). Early studies on corruption relied on survey-based measures of experts' perceptions of corruption in a given country, notably Transparency International's CPI or the World Bank Governance Index (see Treisman, 2000).

Yet, these measures do not allow for analysis of quantifiable acts of bribery as opposed to corruption broadly construed.[16] Nor can perceptions-based measures be employed for analysis of corruption in sector-specific contexts. Some address this problem by measuring differences in prices and costs of services such as infrastructure construction over time (Golden & Picci, 2005; Olken, 2007). Yet, as Daniel Treisman (2007) notes, "clearly, these approaches would be hard to extend cross-nationally" (p. 216).

I leverage a new cross-national dataset of high-profile bribery that is not only comparative and quantifiable but also sector-specific. The measure is constructed using bribes paid by multinational firms to foreign government officials that are revealed in violations of the FCPA in the oil and gas sector. The FCPA was enacted in 1977 to prosecute any firm—either based in the United States or with securities listed in U.S. stock exchanges—bribing "any officer or employee of a foreign government or any department, agency, or instrumentality thereof," including officials at SOEs.[17] Prosecutions are made by the DOJ and Securities and Exchange Commission (SEC). To get a sense of the global scope of prosecutable companies, consider that 76 of the *Oil and Gas Journal* "Top 100" petroleum companies *outside* the United States are eligible for prosecution under the FCPA given their listings on American stock exchanges, including NOCs such as China National Offshore Oil Corporation (CNOOC; Nasdaq: CEO), PetroChina (New York Stock Exchange [NYSE]: PTR), and Gazprom (NYSE: OGZPY).[18]

Since 1977 up to 2013, there have been 143 prosecuted cases, with 41 cases involving firms accused of bribing officials for contracts related to the petroleum industry. Within these 41 cases, there are 337 specific violations of

Table 1. Regulatory Categorization for Oil-Producing States, 1997-2012.

Region	Regulatory ministry	Regulatory NOC
Americas	Argentina	Bolivia
	Barbados[a]	Ecuador
	Belize[a]	Mexico
	Brazil	
	Canada[a]	
	Colombia	
	Cuba[a]	
	Peru	
	Suriname[a]	
	Trinidad	
	USA[a]	
	Venezuela	
Asia & Oceania	*Australia*[a]	Brunei
	India[b]	China[b]
	New Zealand[a]	Indonesia
	Pakistan[b]	Malaysia
	Papua New Guinea[a]	Vietnam
	Thailand[a]	
	Timor-Leste[a]	
Europe and Eurasia	Croatia[a]	Azerbaijan
	Denmark	Kazakhstan
	Hungary[a]	Uzbekistan
	Netherlands	
	Norway	
	Romania[a]	
	Russia	
	Turkmenistan	
	Ukraine[a]	
	United Kingdom[a]	
Middle East & North Africa	Bahrain	Algeria
	Egypt	Iran
	Oman	Iraq
	Qatar	Kuwait
	Saudi Arabia	Libya
	Tunisia	Syria
	UAE	Yemen
Sub-Saharan Africa	Chad[a]	Angola
	Gabon[a]	Cameroon
	Ghana[b]	Congo, Dem. Rep.[b]
	Equatorial Guinea	Congo, Rep.
	Uganda[b]	Nigeria
		Sudan
Total (major oil producers only):	37	22

Countries in *italics* are long-established democracies (since 1950) which are dropped in robustness checks. All countries are coded based on majority of years of NOC status across 1997-2012. NOC = national oil company; ONGC = Oil And Natural Gas Corporation.

a. Do not have upstream NOC. b. Do not meet threshold for major oil producer, but included for illustrative purposes given prominent political role of NOCs (e.g., Sinopec in China, ONGC in India).

the FCPA occurring in 35 unique oil-producing countries.[19] Unfortunately most cases do not provide the exact timing of bribery but rather indicate multiyear periods in which bribes were paid. For this reason, I cannot leverage the temporal nature of the data and instead must focus on a cross section of bribery data, summing across all instances occurring between 1997 and 2013.[20]

To create this measure, I aggregate bribe amounts reported in all oil-related FCPA cases by country.[21] Consider the example of Total, a French oil firm traded on the NYSE. From 1995 to 2002, Total paid roughly US$60 million in bribes to NOC officials in Iran to win the rights to produce oil and gas offshore. Information purporting illegal activity was reported by a whistle-blower to the SEC and French authorities, with the case ultimately settled in May 2013. All bribe-related activity took place in Iran, so the bribe amount is added to bribe amounts from other FCPA cases in Iran. For some cases, there are bribes directed toward foreign officials in multiple countries; in these instances, DOJ documents provide bribes broken down by country. Supplemental Appendix Table 3 contains the full list of cases. Countries in which no oil-related FCPA violations were prosecuted but in which there were violations in other economic sectors are coded as having zero oil-related bribes. Restricting the analysis to oil-producing countries (as defined above), this leaves a total sample of 59 countries with data on FCPA violations out of a possible 60 oil-producing countries.[22]

Typical of nearly all cross-national measures, this variable comes with notable shortcomings. First, FCPA cases are prosecuted with political motivations (K. E. Davis, 2015). The DOJ and SEC might be *a priori* inclined to pursue some companies more than others, making the probability of being caught unequal across cases of prosecutable bribery. If there were a protectionist executive agenda that pressures the DOJ to go after non-American firms, the resulting FCPA measure of corruption might be over-estimating bribes in Franco-phone and Anglo-phone countries relative to countries where primarily U.S.-based firms do business. With respect to oil-related bribery, this pattern is difficult to accept based on the data: Because the oil industry is dominated by a small number of international oil companies, nearly all major oil companies have been prosecuted with FCPA violations, be they American (Chevron, ExxonMobil, ConocoPhillips, Baker Hughes) or non-American (Total, BP, Shell, Eni).

Relatedly, prosecutorial bias may also lead to the DOJ and SEC refraining from investigations in countries that are "friends of the US" while focusing on corruption occurring in "unfriendly" countries. This could lead to omitted variables bias in the models below if non-allies were more likely to adopt regulatory NOCs. In addition, it could be that international investigators find

NOCs easier to police and monitor given their activities in the global market compared with the more domestically focused activities of ministries. I leave a thorough discussion and analysis of these kinds of prosecutorial bias (as well as measurement error) to Supplemental Appendix 3, where I use two-step models and Heckman models to capture possible selection effects. In short, while there is evidence of the DOJ going after violations in countries not aligned with the United States politically, the main findings are robust to controlling for these elements of bias.

So as not to hinge the empirical analysis on any one measure—especially one that is new and untested in the literature—I employ as outcome variables both the proposed FCPA measure and the CPI, the most commonly used measure in the existing literature. Importantly, using the CPI expands scope and sample size. The CPI covers all aspects of corruption: bribery, embezzlement, nepotistic appointments, and other uses of public office for private gains. It also expands the sample size from 59 to 155 countries, including those that fall outside the purview of being major oil producers. Furthermore, it captures corruption by all possible actors and not just publicly traded firms. As an additional robustness check, I use the Escresa and Picci's (2015) PACI measure of prosecuted bribery which includes violations of the FCPA, the Organization for Economic Co-operation and Development (OECD) Anti-Bribery Convention, the U.K. SFO, and several third-party jurisdictions, notably the Chinese Central Commission for Discipline Inspection and the Russian Prosecutor General's Office.

Are Regulatory NOCs Less Transparent?

I use two datasets to assess whether regulatory NOCs are less fiscally transparent and subject to less oversight than regulatory agencies. The first is the Resource Governance Index's (RGI) three measures of transparency and oversight specifically in the natural resources sector: (a) *public reporting practices* regarding revenues and contracts, (b) the *enabling environment*, which captures government oversight, the opacity of budgets, and broad accountability, and (c) the *composite* general score of transparency in the sector. Each index runs from 0 to 100, with higher values representing more transparency and oversight.[23] The second is the Hollyer-Rosendorff-Vreeland panel dataset on transparency in government reporting across all economic sectors. This measure regards transparency as "the disclosure of policy-relevant information by the government to the public."[24]

Using the RGI measure, the data support the hypothesis that regulatory NOCs are fiscally opaque and largely free from government oversight. Figure 2 shows this across all three measures of resource governance: reporting

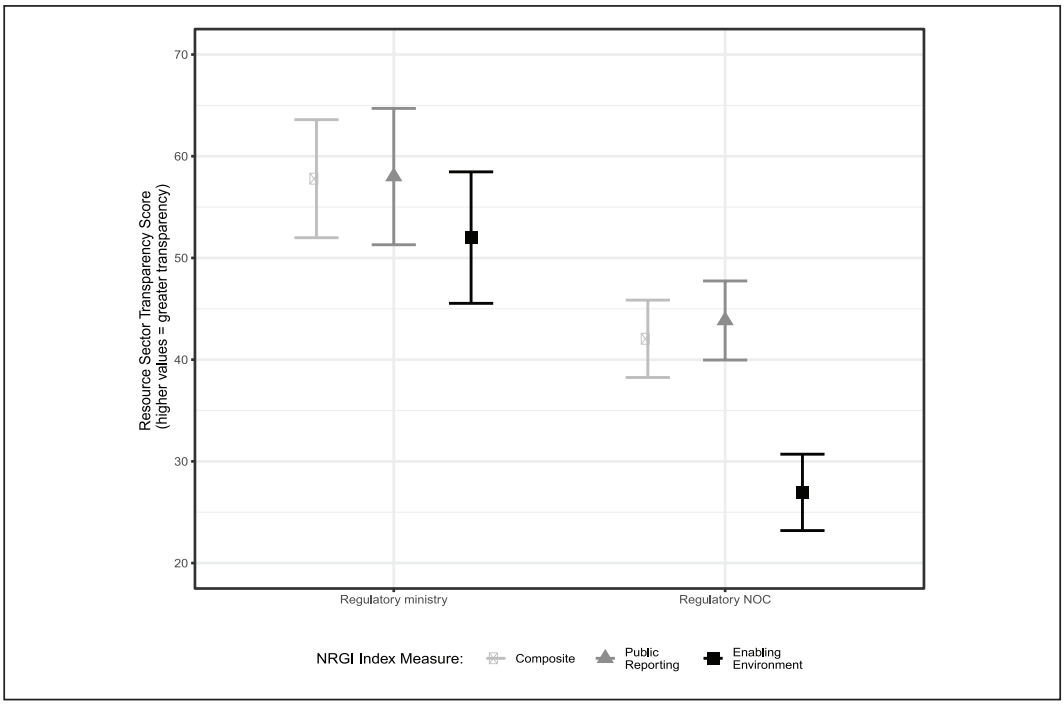

Figure 2. Oversight and transparency in oil governance, 2012.
Measured using the Resource Governance Index; range: 0 to 100, higher values indicate better governance. Means by group are plotted with 95% confidence bands (mean *SE*). Refer to Table 1 for a listing of countries by category. NOC = national oil company.

practices, enabling environment (oversight), and a general score of transparency in the natural resources sector.

I similarly find that states with regulatory NOCs have opaque fiscal institutions using panel regressions on transparency in government reporting from 1980 to 2005. As this measure is not specific to the natural resources sector, I weight it using a measure of country-level oil reliance, measured as oil and gas income as a percentage of GDP, rescaled from 0 to 1 ("oil rents % of GDP" from the World Bank World Development Indicators [WDI]). Given the longitudinal nature of the data with a largely time-invariant independent variable, I use restricted maximum likelihood with country random intercepts. Controls include oil and gas income per capita, regime (Polity), and time (years).[25] These results, presented in Table 2, indicate that states with regulatory NOCs have lower levels of transparency in government reporting.[26] Considering the variance in the oil-weighted transparency index ($\sigma = 0.19$), a regulatory NOC corresponds to a 0.31 standard deviation decline ($\hat{\beta} = -0.06$) in government reporting. This is roughly the difference in 1980 between Saudi Arabia ($HRV = -0.31$, regulatory ministry) and Iraq ($HRV = -0.39$, regulatory NOC).

Table 2. Regulatory Institutions and Transparency, 1980-2005.

	Dependent variable: HRV transparency index (mean centered)			
	(OLS)	(REML)	(OLS)	(REML)
Regulatory NOC	−0.059***	−0.115***	−0.054**	−0.170***
	(0.010)	(0.014)	(0.018)	(0.027)
Oil income per capita (logged)	0.013***	0.022***	0.009*	0.028***
	(0.001)	(0.003)	(0.004)	(0.006)
Regime (Polity)	0.005***	−0.001	0.015***	−0.0002
	(0.0005)	(0.001)	(0.001)	(0.002)
Time trend	0.002***	0.004***	0.007***	0.009***
	(0.0005)	(0.0003)	(0.001)	(0.001)
Constant	−0.039***	−0.065***	−0.072***	−0.148***
	(0.007)	(0.016)	(0.027)	(0.054)
Observations	3,107	3,107	1,128	1,128
Number of countries	121	121	43	43
Random effects?		Y		Y
R^2	.100		.202	
Adjusted R^2	.099		.199	
Log likelihood		1,963.647		180.808
Akaike Inf. Crit.		−3,913.293		−347.615
Bayesian Inf. Crit.		−3,871.015		−312.449

OLS and REML panel regression of HRV transparency index, weighted by oil reliance, and ownership structure in 1980-2005 in all states (columns 1-2) and in major oil-producing states only (columns 3-4). The baseline category refers to countries with regulatory authority vested in ministries, even in non-oil-producing countries where this is the default regulatory structure prior to resource discovery. REML models use an identity covariance structure to account for temporal autocorrelation. OLS = ordinary least squares; NOC = national oil company.
*$p < .05$. **$p < .01$. ***$p < .001$.

Both tests show empirical support for the first step in understanding why institutional choice in the oil sector influences corruption; regulatory NOCs operate in oil sectors with little oversight and opaque fiscal environments, where government reporting practices are poor and budget transparency is relatively nonexistent.

Do Regulatory NOCs Foster Higher Levels of Bribery?

For the analysis of institutional choice and bribery, the outcome measure is the country-level amount of bribes connected to oil-related FCPA violations

discussed above. As a second outcome measure, I use the CPI from 2012. Because this is a broad measure of corruption, to capture the relationship between corruption and regulatory choice in the petroleum sector, I weight the CPI by oil reliance (in the same manner as with the transparency index above). I include seven predictors measured at the country level, averaged across the time-frame of FCPA data considered, 1997-2013: a binary variable for the existence of a regulatory NOC, and controls based on existing explanations for corruption, including logged GDP per capita (WDI), logged oil income per capita (Ross), democratic institutions (Polity), press freedom (Freedom House), and logged population (WDI). I also include percent agreement with the United States at the UN General Assembly (Bailey, Strezhnev, & Voeten, 2017) as a control for potential prosecutorial bias in the FCPA measure (a full discussion of this variable and other determinants of bias using FCPA data can be found in Supplemental Appendix 3). I present the full model specification in Supplemental Appendix 1.

These models are estimated using a Bayesian framework. Among others, two reasons stand out for this methodological choice. First, Bayesian analysis allows for easier interpretation of results and the uncertainty of estimated quantities (Jackman, 2009). Second, computation of second-order variables, such as predictions and uncertainty in marginal effects, is more straightforward using Markov Chain Monte Carlo methods given the small sample size ($n = 59$). For robustness, all models are estimated using conventional ordinary least squares (OLS) regressions with results presented in Supplemental Appendix 1. To test against the endogeneity of institutional choice, I use instrumental variables regression.

Results from the Bayesian model are plotted in Figure 3, which visualizes the posterior distributions of the estimated coefficients of the regulatory NOC indicator and the various control measures for oil-related bribes connected to FCPA violations. To allow for ease of comparison (and computation), both the outcome measure and all control variables have been standardized. Model results in table format can be found in Supplemental Appendix Table 4. A baseline bivariate specification (i.e., without controls) is presented in Supplemental Appendix Table 10, column 1.

I find that a regulatory NOC structure corresponds to an increase in corruption by 0.51 standard deviations.[27] The integral of the posterior distribution less than zero—akin to a frequentist *p* value—is .024. Posterior predictions imply that the *average* country with contract-awarding authority vested in a ministry is predicted to have between US$10 and US$608 in FCPA-related bribes, whereas a country with a regulatory NOC is predicted to have between US$214 and US$48,090 in FCPA-related bribes.

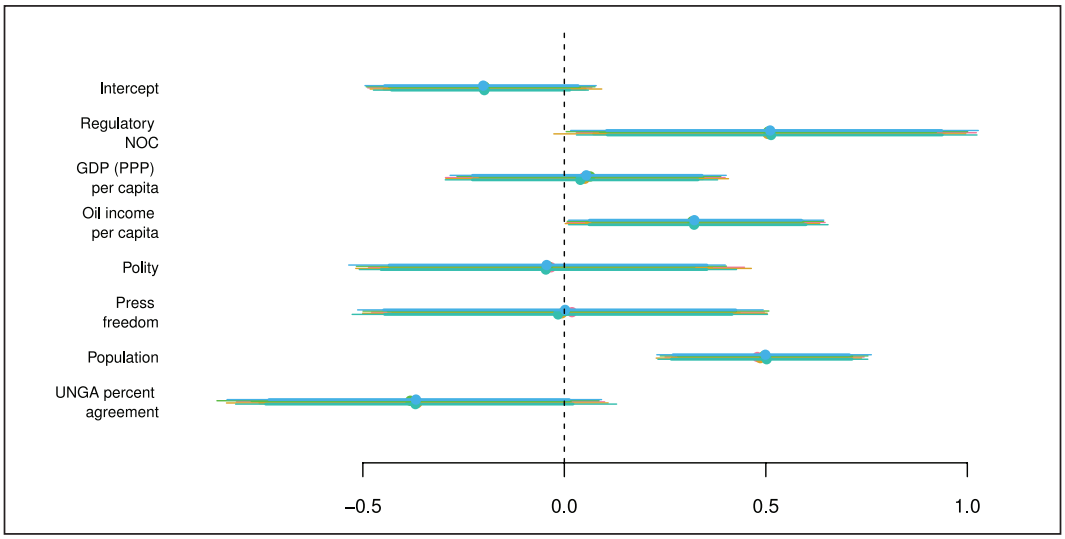

Figure 3. Results from Bayesian linear analysis: Bribery.
Posterior distributions of coefficients for the Bayesian linear model with FCPA-related bribes as the outcome measure ($n = 59$). The posterior medians from each of the five MCMC chains are plotted, along with 95% (outer) and 68% (inner) credible intervals. FCPA = Foreign Corrupt Practices Act; NOC = national oil company.

To put these numbers in perspective, consider a country such as Saudi Arabia—taking into account specific covariate values—where the difference in median predicted bribes would be US$90,743 if it had a regulatory ministry and US$3,605,120 if it had a regulatory NOC.[28] In the database, Saudi Arabia has US$120,000 in reported bribes (and has a regulatory ministry). It is interesting to note that while corruption may be scant in the oil sector, it is prevalent in other sectors of the Kingdom's economy; in 2014, for example, the DOJ prosecuted French-based Alstom for paying roughly US$40 million in bribes to secure rights to build power plants, with much of this money funneled to officials at the state-owned Saudi Electric Company, which regulates contracts.[29] This further supports the argument that it is politically autonomous regulatory institutions, and not "bad governments" per se, that foster opportunism.

Turning back to the results in Figure 3, there is no statistically discernible relationship between bribery and GDP, polity, and press freedom. These findings suggest that within the realm of oil-related extortion, countries exhibit both high and low levels of corruption irrespective of wealth and political institutions. I do find a positive correlation between logged population and corruption, supporting early work showing that governments in larger countries have more difficulty preventing officials from partaking in malfeasance (Root, 1999). It could be the case that population is also picking up

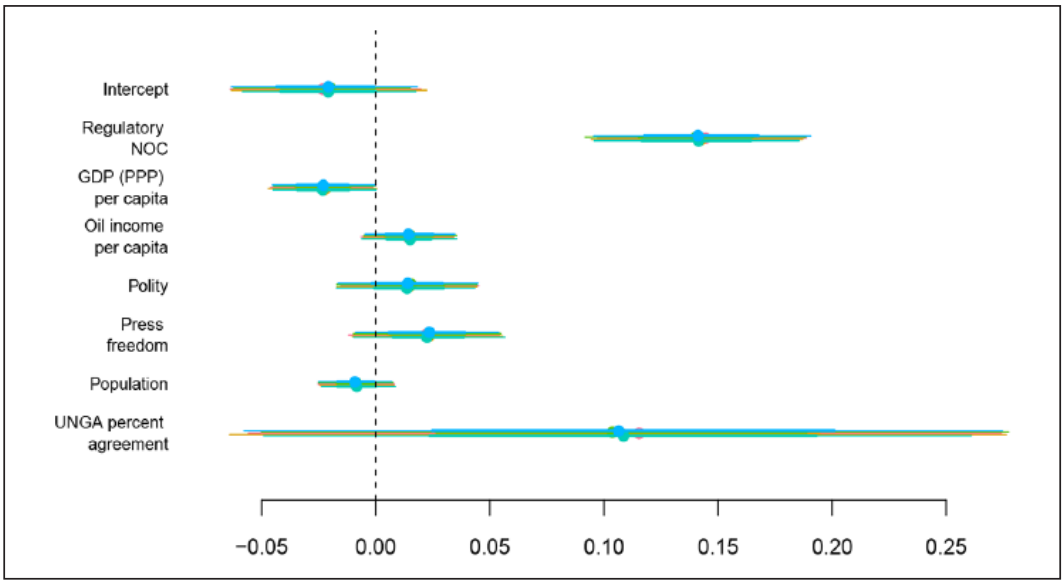

Figure 4. Results from Bayesian linear analysis: Weighted CPI.
Posterior distributions of coefficients for the Bayesian linear model with weighted CPI as the outcome, rescaled so that higher values indicate more corruption ($n = 155$). Weights are assigned based on oil reliance (0-1, with 1 indicating a country whose GDP is 100% reliant on oil rents). The posterior medians from each of the five MCMC chains are plotted, along with 95% (outer) and 68% (inner) credible intervals. CPI = Corruption Perceptions Index; NOC = national oil company.

prosecutorial bias, such that the DOJ and SEC target larger countries to increase the likelihood of finding corruption. I also find a positive, significant coefficient for oil income—suggesting oil has corrupting effects beyond those conditioned by regulatory institutions.

In an analysis of all states—not just oil producers—I find similar evidence for the relationship between regulatory structure and corruption broadly construed, as measured by CPI scores weighted by a country's reliance on oil. Results presented in Figure 4 show that the correlation is smaller in magnitude—where having a regulatory NOC corresponds to a 0.142 standard deviation increase in corruption—but indicate less uncertainty (akin to frequentist $p < .001$) relative to other coefficients in the model (Supplemental Appendix Tables 7 and 12). These results also indicate that high-income countries correspond to lower corruption, whereas oil-rich countries correspond to higher corruption (both significant at the 5% level in a one-tailed credible interval). The same pattern holds when using the PACI measure (Supplemental Appendix Figure 8).

Additional models indicate that the results are robust to dropping established democracies from the sample[30] because none of these countries have regulatory NOCs and typically have low levels of bribery (Supplemental

Appendix Table 13, Figure 9). The results also do not change when including region fixed effects (Supplemental Appendix Table 6, Figure 10), when controlling for NOCs with de facto control over production (Supplemental Appendix Table 8), and when including dummies for the top prosecuted countries of Iran, Iraq, and Nigeria (Supplemental Appendix Table 9).

Results are also robust to rescaling the dependent variable to bribes per barrel of oil (Supplemental Appendix Table 14): to using a trichotomous measure of no NOCs, non-regulatory NOCs, and regulatory NOCs (Supplemental Appendix Table 15), and to using FCPA-related penalties assessed by the DOJ and SEC instead of bribe amounts (Supplemental Appendix Table 16).[31]

Importantly, results are *not* robust to using a dummy variable for whether or not a country was implicated in an oil-related FCPA violation (0 if the country has US$0 in FCPA-related bribes, 1 otherwise). This null result, presented in Supplemental Appendix Table 17, suggests that propensity for prosecution by the DOJ does not vary by institutional structure.[32] In Supplemental Appendix 3, I provide additional evidence to dispel the notion that prosecutorial bias hinders the ability to make valid inferences with this measure. Results from two-step models and Heckman selection models indicate that the main findings are robust to incorporating potential sources of prosecutorial bias in FCPA case selection.

Instrumenting for Institutional Choice With Geology

Because of its plausible exogeneity to corruption outcomes, I use geology in the years prior to nationalization as an instrument for the formation of regulatory NOCs. There are several ways to measure geological risks of oil fields: API gravity (lower levels are harder to refine into gasoline), sulfur content (higher levels make oil more difficult to extract and to refine), well pressure and temperature, offshore depth, acidity, and the need for enhanced (tertiary) oil recovery. Ideally one could use all this information to capture how risky geological conditions were prior to nationalization, yet most of these measures are either not publicly available, not recorded for countries with early nationalizations, or too confounded with other covariates.[33] Based on these concerns, I code geological risks using the average sulfur content of oil being produced prior to nationalization in each country.[34] One implication from prior research on NOCs is that countries with higher levels of sulfur in oil production—otherwise known as "sour" oil, with sulfur contents above 1%—will be less likely to create regulatory NOCs, whereas those with lower sulfur contents will be more likely to establish regulatory NOCs (Johnston, 2003; Lima de Oliveira, 2017; Nolan & Thurber, 2010).[35]

One potential violation of the exclusion restriction is that states with favorable geology in the past could attract foreign firms with higher propensities for giving bribes. To check against this possibility, I employ a falsification test of the exclusion restriction using sulfur content *in the current period* as a placebo instrument. Null results from this test are illustrative of the weak correlation between current geological conditions and institutional choice, as well as the modest relationship between past and current geology (especially for states which nationalized in the 1970s and earlier). In other words, the null effect of the placebo instrument suggests that, in a contemporaneous setting, corruption is just as likely when the extraction process is easy (low sulfur) or difficult (high sulfur).

A second possible threat to the exclusion restriction is that favorable geology could lead to higher oil rents over time (Lima de Oliveira, 2017), which in turn could generate greater incentives for bribery. I account for this by controlling for current oil income (averaged for the 1997-2013 period).[36] The results do not lend support for this causal pathway and this suggests a weak relationship between past sulfur content and future oil revenues. Indeed, some of the wealthiest oil states today produced both from sour reserves prior to nationalization—notably Iran (pre-1951 sulfur content: 1.50%), Kuwait (pre-1961 sulfur content: 2.88%), and Venezuela (pre-1960 sulfur content: 2.83%)—and from sweet reserves prior to nationalization, notably Algeria (pre-1963 sulfur content: 0.11%), Angola (pre-1976 sulfur content: 0.17%), and Malaysia (pre-1974 sulfur content: 0.10%).

A third possible violation is if sulfur content is predicted by pre-nationalization factors that influence NOC choice. These include regional effects, regime type, and state capacity (Jones Luong & Weinthal, 2010), population (Nolan & Thurber, 2010), and the size of the oil sector (Victor et al., 2012). In regressions presented and discussed in Supplemental Appendix 2.2, I find that none of the pre-nationalization covariates (including region dummies) is a statistically significant predictor of the sulfur content of oil being produced prior to NOC choice.Given the arguments above, I expect that states with favorable geology (low sulfur content) will have higher levels of bribery in the oil sector. Both the raw distribution of sulfur content by institutional choice in Figure 5 and first-stage results support the claim that, *at the time of nationalization*, states with favorable geology opt for regulatory NOCs.[37] The second stage results in Table 3 (Models 1 and 2) indicate that states with regulatory NOCs are predicted to have higher levels of bribes than states with non-regulatory NOCs, controlling for economic development, current oil rents, the strength of political institutions (polity and press freedom), population, and determinants of FCPA prosecutorial bias (United Nations General Assembly [UNGA] agreement).[38] Substantively the results are similar to the

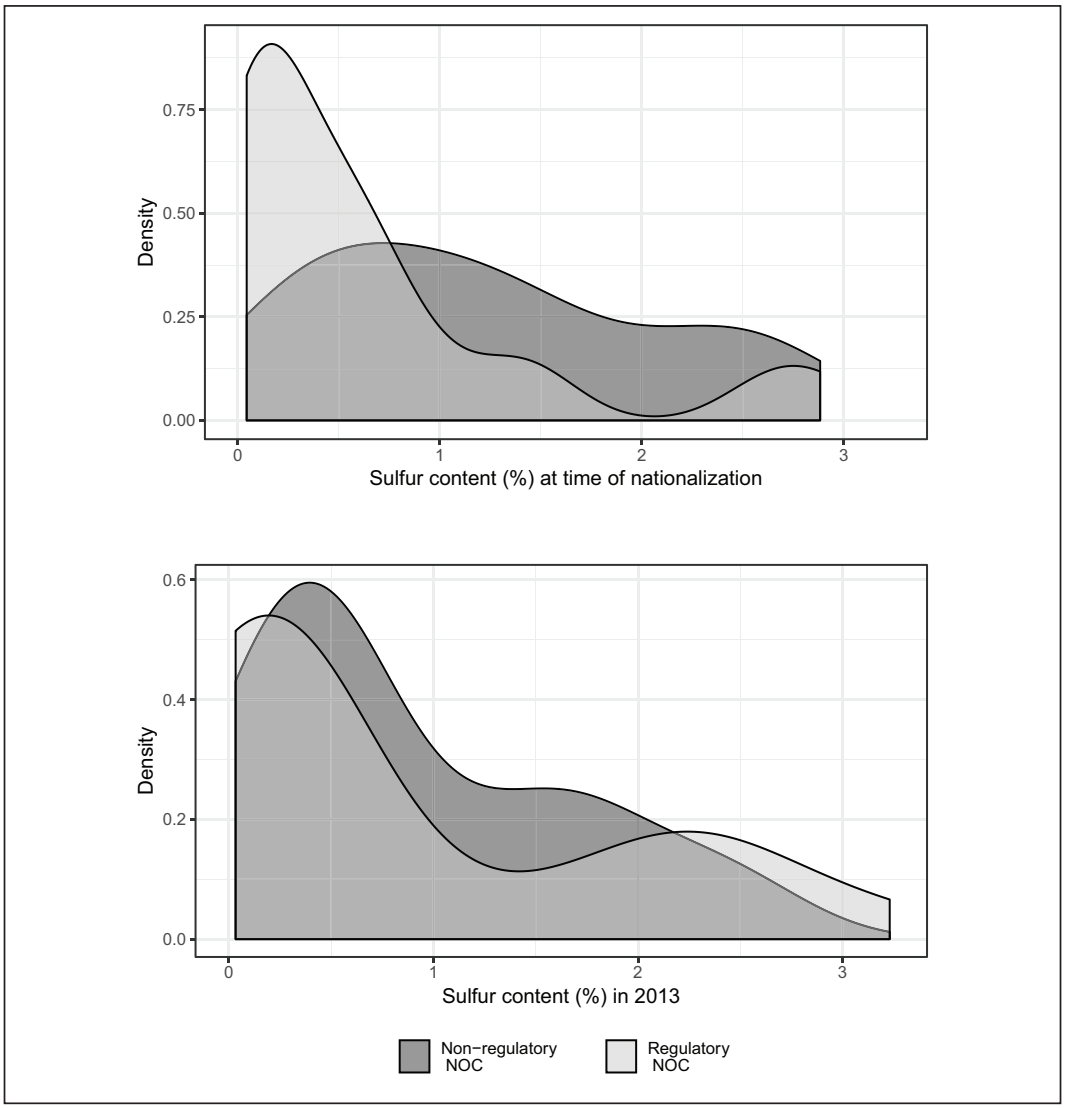

Figure 5. Geological favorability by institutional choice.
Source. EIA and USGS Minerals Yearbooks.
Distributions of two instrumental variables by institutional choice, plotted as overlapping density curves. Top panel: Sulfur content (% H_2S) of crude oil being produced prior to nationalization. Bottom panel: Sulfur content of crude oil produced in 2013, used as placebo instrument. NOC = national oil company.

non-IV (baseline) model, albeit with greater uncertainty. The instrumented regulatory NOC increases the amount of bribery in the average country by 0.83 standard deviations, compared with 0.51 standard deviations in the baseline model, while the standard error grows to 0.31 from 0.25.

In Models 3 and 4, I use a placebo instrument to test against claims of violating the exclusion restriction. Using sulfur content in 2013—as opposed to sulfur content at the time of nationalization—as an instrument, the second

Table 3. Results From Instrumental Variables Analysis.

	Geology instrument		Placebo instrument	
	Full sample	Reduced sample (no established democracies)	Full sample	Reduced sample (no established democracies)
	(1)	(2)	(3)	(4)
First-stage results, DV: Regulatory NOC (binary)				
Sulfur content (pct) (prior to nationalization)	−0.202*	−0.206*		
	(0.0694)	(0.0716)		
Sulfur content (pct) (2013)			−0.0641*	−0.0687
			(0.0156)	(0.0283)
GDP per capita (logged)	−0.315	−0.344	−0.407*	−0.432
	(0.141)	(0.150)	(0.142)	(0.171)
Oil income (logged)	0.435	0.472	0.403	0.466
	(0.161)	(0.195)	(0.209)	(0.236)
Regime (Polity)	0.0606	0.0832	0.139	0.135
	(0.0746)	(0.0691)	(0.110)	(0.109)
Press freedom	0.167	0.165	0.197	0.171
	(0.0838)	(0.101)	(0.106)	(0.0913)
Population (logged)	0.0916	0.0787	0.0371	0.0489
	(0.0423)	(0.0398)	(0.0432)	(0.0310)
UNGA agreement	0.0194	−0.0574	0.0370	0.0729
	(0.0586)	(0.0918)	(0.0927)	(0.235)
Constant	0.359**	0.313*	0.375*	0.378
	(0.0547)	(0.0846)	(0.0848)	(0.164)
Wald *F*	8.494	8.238	16.79	5.885
Second stage results, DV: FCPA-related bribes (logged $)				
Regulatory NOC	0.828**	0.745**	−0.479	−0.245
	(0.306)	(0.254)	(1.109)	(1.274)
GDP per capita (logged)	−0.0879	−0.186	−0.626	−0.578
	(0.265)	(0.234)	(0.565)	(0.742)
Oil income (logged)	0.994**	1.306***	1.532**	1.683*
	(0.309)	(0.288)	(0.557)	(0.780)
Regime (Polity)	−0.0274	−0.117	0.165	0.00888
	(0.180)	(0.204)	(0.163)	(0.264)
Press freedom	0.112	−0.0207	0.400	0.253
	(0.207)	(0.307)	(0.225)	(0.409)
Population (logged)	0.744***	0.876***	0.802***	0.929***
	(0.144)	(0.112)	(0.140)	(0.0883)
UNGA agreement	−0.104	0.374	−0.0430	1.036***
	(0.0890)	(0.224)	(0.160)	(0.305)
Constant	−0.561***	−0.372**	−0.105	0.258
	(0.127)	(0.133)	(0.447)	(0.319)
Observations	43	38	43	38

Standard errors clustered by region in parentheses. DV = dependent variable; NOC = national oil company; UNGA = United Nations General Assembly; FCPA = Foreign Corrupt Practices Act.
*$p < .05$. **$p < .01$. ***$p < .001$.

stage results show statistically null effects for regulatory NOCs and corruption. While the first-stage results show a modest correlation between current sulfur content and regulatory NOC choice, the high LR test *p* value (.33) confirms the placebo is a rather weak instrument. This conforms with the distributions plotted in the bottom panel of Figure 5. These results provide refutative evidence that present-day geology is a potential confounder to the relationship between regulatory design and corruption. Although it is difficult to fully disqualify the existence of reverse causality and spurious correlations with observational data, the instrumental variables analysis offers suggestive evidence that the statistical relationship between bribery and institutions is not driven by endogeneity.

Conclusion

Public officials operating in institutional environments with weak oversight and strong political independence have an incentive to engage in corrupt activities. This is a result of opportunities for bad behavior rather than any underlying proclivity toward malfeasance. As a consequence, bribery reigns supreme and markets are comprised not of the most productive firms, but rather of the most effective bribers.

This article shows that regulatory institutions help explain the wide variation in corruption across oil-producing countries. A decision made by governments in the past largely on the basis of petroleum geology creates incentives in the present for bureaucrats in some oil sectors to engage in opportunism, whereas in others it dissuades civil servants from malfeasance. The data and statistical results show that states with contract-awarding NOCs, such as Ecuador, Kuwait, and Uzbekistan, foster relatively greater bribery than states with contract-awarding authority vested in ministries and other agencies, such as Peru, Saudi Arabia, and Turkmenistan. The Kazakhstan example illustrates how reforming the oil sector by granting contract-awarding authority to the ministry rather than the NOC led to a decline in oil-related bribery.

Results from this study corroborate claims in the broader literature on the importance of institutional design, highlighting the need for a better understanding of which specific aspects of institutional choice affect public officials' incentives for corruption (see Fisman & Golden, 2018). State officials within regulatory SOEs are in the position to solicit bribes given their power to grant lucrative contracts with very little oversight and public disclosure. The relative political autonomy of these institutions gives rise to information asymmetries *vis-à-vis* the state, which faces greater difficulties in monitoring and sanctioning when compared with oversight of agencies that lack fiscal and political autonomy (Banks & Weingast, 1992; Weingast & Moran, 1983).

While much of the focus here is on transnational bribery in the oil sector, the regulatory SOE argument suggests that placing contract-awarding authority in SOEs will also incentivize graft, embezzlement, and even petty corruption at lower levels of management. Broadly, this is a specific case that implies a general phenomenon: Corruption is more likely when governments vest authority in para-statal institutions such as SOEs and independent regulatory agencies rather than in bureaucracies. This is troubling given the prevalence of SOEs in the "commanding heights" of the economy—namely electricity, water, and manufacturing—across the developing world, as well as SOE dominance in coal, metals, minerals, and other materials that drive the global economy.

The theory and findings presented here support the idea of a conditional resource curse, whereby the discovery and production of oil may not necessarily drive a state toward bad governance (Brooks & Kurtz, 2016; Liou & Musgrave, 2014; Menaldo, 2016; Smith, 2007). But the argument goes further to dive into the mechanisms that explain why some resource-rich states suffer from corruption while others escape it, despite sharing similar pre-resource-discovery political characteristics (see Menaldo, 2016). Broad constructs such as the "presence of democratic government" or "high levels of economic development" prior to discovery lack the specificity and explanatory power to account for the variation in corruption across resource-rich governments. Instead, this study challenges scholars of the resource curse to explore precise and well-defined conditions for why resource wealth hinders good governance in some contexts but not others. In doing so, it follows excellent studies that have examined the role that NOCs play in bad governance, such as patronage, underdevelopment of fiscal institutions, and opacity in fuel subsidies (Andersen & Ross, 2013; Cheon, Lackner, & Urpelainen, 2015; Jones Luong & Weinthal, 2010; Victor, 2013). Jones Luong and Weinthal (2001, 2010) in particular emphasize the troubling consequence of enfeebled state capacity and weak tax regimes when the state opts to control resource extraction. Building on this emerging literature, the originality of this article lies in its argument that the choice of regulatory institution—and not just the decision to nationalize in general—specifically impacts governance when political autonomy and financial independence offer cover for officials to engage in malfeasance. By identifying one of the chief perversions of the resource curse—corruption—this article systematically tests claims about SOE governance that have either been limited to in-depth investigations of single countries or have remained untested empirically. In addition, it introduces the use of geological variables specific to the extractive sector as a means to gain greater purchase on the causal identification of natural resources and governance outcomes.

These findings suggest that reforming SOEs into non-regulatory entities will reduce the incidence of corruption. For the oil sector, this is in line with current policy reforms for states to adopt the "Norwegian Model" of separation of powers where SOEs perform operations, ministries implement policy, and agencies regulate SOEs as well as private operators (Thurber et al., 2011). Note that splitting policy-implementing and market-oversight authorities between ministries and separate regulatory agencies is not evaluated here; but the argument implies that any decoupling of regulatory powers should reduce opportunities for corruption by shrinking the information gap between government and agent. For states seeking to retain control over the extractive sector, reforms such as these offer a more palatable solution to improving governance when compared with the oft-recommended but seldom-implemented Washington Consensus policies of SOE privatization. Of course, reforming the regulatory structure in the oil industry will not turn countries such as Mexico, Iran, or Nigeria into Norway overnight; but these reforms can work to achieve the relatively low oil-related corruption levels found in Trinidad, Oman, or Ghana.

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Notes

1. I use the term "oil" to refer to both oil and natural gas. A major producer is defined as having at least US$100 of annual oil and gas income per capita averaged across 1997-2013. See Ross (2012) for a discussion of this threshold. This list is similar if I use a production level threshold of 1 million metric tons per year.
2. Estimates from former World Bank Institute director Daniel Kaufmann. See http://www.newsx.com/world/11,830-two-percent-global-gdp-lost-to-corruption-every-year and https://twitter.com/kaufpost/status/654,134,209,490,104,322, accessed October 14, 2015.
3. These avenues for corruption may not exist if the state-owned enterprise (SOE) dominates production. In closed-off oil sectors such as pre-2015 Mexico or 1990s Iran, opportunities for transnational corruption were limited by the lack of international contracts. This is an important caveat to consider when evaluating the argument in other restricted contexts, such as Myanmar (gemstones) or Ethiopia (niobium and tantalum).

4. Firms' willingness to pay bribes is assumed to be uniform. Relaxing this assumption would likely lead to the same result, due to differences in firms' perceived probabilities of being caught paying bribes to officials in opaque institutional contexts.
5. Despite its title, the *Regulatory Ministry/Agency* institutional structure identified here does not qualify as an independent regulatory agency in the strict sense given its lack of insulation from political pressure. See Koop and Hanretty (2018) for a discussion of this term.
6. Despite better positioning of national oil companies (NOCs) to award contracts, I argue that governments still prefer regulatory ministries in geologically tough environments. Although states forego revenues captured by multinational companies (MNCs) regulated by less-experienced ministries, states can garner increased revenues from NOCs focused solely on operations.
7. The only other instances of reform occurred in Colombia 2003 and Mexico 2015; given the period of analysis here, the Kazakhstan case allows for the most balanced pre/post comparison of institutional effects on corruption. The statistical results are robust to dropping Kazakhstan from the sample, suggesting that it is not a high-leverage case. See Supplemental Appendix 2.3 for these results and for further details on the reform.
8. Government Decree N 117, February 10, 2011, § 1-3. The Ministry also began publicly releasing extensive information about results from auction rounds such as bids received, winning bids, and information on final contract awards and blocks licensed. See Resource Governance Index 2012, Kazakhstan questionnaire, Q.1.2.006.b. In addition, all submitted contracts were to be vetted by the Ministry of Justice for "legal verification" and any existing contract found noncompliant would be terminated (Government Decree N 177, § 3.16; see also Law N 291-IV.2, June 24, 2010, § 62).
9. Leaked email from Stefano Borghi (Managing director, Eni) to Cyrus Ahsani (CEO, Unaoil) titled "ciro," sent October 16, 2007. Accessed from http://www.theage.com.au/interactive/2016/the-bribe-factory/common/emails/single-page-emails/2__ciro.pdf on July 18, 2016.
10. "Court issued warrant for arrest of NMRA head Murat Ospanov." *KazPravda*. July 3, 2014. Accessed from http://www.kazpravda.kz/en/news/incidents/court-issued-warrant-for-arrest-of-nmra-head-murat-ospanov/ on July 18, 2016.
11. This refers solely to changes in oil-related bribery. Data on offshore transfers to known tax havens suggest (but do not rule out) that bribery was not replaced by embezzlement after the 2010 reforms; see Supplemental Appendix Figure 12.
12. See Supplemental Appendix Table 21.
13. Article 2, Law No. 2967 (1978) and subsequent amendments. During the 1970s, CEPE (the predecessor to Petroecuador) had *de jure* authority over awarding contracts, but in practice, the Hydrocarbon Ministry made contract-awarding decisions. Petroecuador is coded *de facto* regulatory NOC, whereas pre-Petroecuador is coded *de facto* regulatory ministry.

14. Article 6, Law No. 26,221 (1993) and subsequent amendments grant PeruPetro *de jure* contract-awarding authority, but in practice, the company is unable to award contracts without Ministry approval.
15. The categorization of NOCs in 2012 is the same as in 1997, the starting point in the analysis below, except for Colombia and Kazakhstan which switched to a non-regulatory NOC in 2003 and 2010, respectively, and three new NOCs in Congo-Kinshasa, Congo-Brazzaville, and Equatorial Guinea in 1998-2001.
16. Measures that are more experience-based—such as UNICRI and WBES—ask respondents about their experiences in which a government official asked for bribes for rendered services, but do not capture grand corruption. An excellent exception is a new database on bribery in public procurement by Fazekas and Kocsis (2017); Because its coverage is restricted to European states, I do not consider these data in the empirical analysis below.
17. 15 U.S.C. § § 78dd-1. See also § 78m regarding prosecution of foreign-based firms with shares listed on U.S. stock markets.
18. A list of the Top 100 companies by production is available at http://www.ogj.com/content/dam/ogj/print-articles/Volume111/sept-02/OGJ100-Leading-oil-and-gas-companies-outside-the-US.pdf. Note that though some firms may be subject to greater scrutiny given past violations (e.g., "repeat offenders"), this should not pose a challenge to making inferences about the recipients of bribes (oil-producing countries) given the global reach of each payer of bribes (multinational oil firms).
19. One "case" encompasses a collection of multiple counts of "violations" of the Foreign Corrupt Practices Act (FCPA; e.g., one set of bribes paid to one government official), with no given minimum or maximum number of violations sufficient to warrant prosecution.
20. The starting point is chosen because, prior to 1997, only Mexico was implicated in oil-related FCPA violations. Starting in 1997, FCPA investigations into oil-related cases expanded to all other countries.
21. For each case, the Department of Justice (DOJ) or Securities and Exchange Commission (SEC) provides detailed information outlining the following facts: (a) firm involved in bribery allegations, (b) country in which bribery was taking place, (c) government agency soliciting/accepting bribes in the host country, (d) penalties paid by prosecuted firms for violating the FCPA—penalties are proportional to the estimated net gain in revenue from having won a contract for which a bribe was paid—and importantly (e) the amount of bribes paid or intended to be paid to foreign officials by the firm in question. There is also information on the value of contracts for which bribes were extorted, though these data are not available for all cases.
22. The United States is excluded because inbound bribes to U.S. officials are not prosecutable under the FCPA. Supplemental Appendix Figure 7 shows the distribution of non-zero bribes using the FCPA measure.
23. The index is compiled by surveying country experts about how easy it is for a member of the public to access a variety of information about the natural resource sector. See Revenue Watch Institute (2013).

24. "HRV Transparency Project" website, http://0001c70.wcomhost.com/wp2/, accessed October 5, 2015.
25. Results are robust to using ordinary least squares (OLS) with country fixed effects, but these specifications are highly dependent on 19 countries—out of 121 total—with institutional reform over time (primarily, privatizations and nationalizations in the 1990s).
26. Note the small sample size of 43 in the latter case—compared with the full set of 59 countries in the main analysis—because the Resource Governance Index (RGI) does not have data for 16 oil-producing states.
27. This is nearly identical to using OLS; see Supplemental Appendix Table 10, column 6.
28. Akin to the difference between Malaysia (US$98,000 in bribes) and Indonesia (US$2,741,749 in bribes) in the FCPA sample.
29. *USA vs. Alstom S.A.* 3:14-CR-00,246-JBA, USDC District of Connecticut, filed December 22, 2014.
30. Australia, Canada, Denmark, Netherlands, Norway, New Zealand, and the United Kingdom.
31. A sensitivity analysis suggests that results are potentially subject to omitted variables bias, but only for confounders that are correlated with both bribery and regulatory NOCs with correlation coefficients above ± 0.3 (Supplemental Appendix Figure 11). Beyond existing concerns for endogeneity, this is further justification for the instrumental variables analysis in Table 3.
32. On the other hand, the absence of a null finding would imply that prosecutors are more or less likely to investigate violations in countries with regulatory NOCs irrespective of their actual level of corruption.
33. Although proprietary data are available on offshore depth and enhanced oil recovery, these metrics are confounded with the historical timing of production: deep-water offshore drilling only commercially emerged in the 1980s, while secondary/tertiary recovery is only necessary for aging fields. Both implicitly measure the rate of technological change in the global industry rather than geological risks specific to a given country. To capture the former, I use the year of nationalization as an alternate variable to capture such temporal effects, but first-stage results using this proxy indicate it is a rather weak instrument.
34. Data are drawn from EIA and USGS *Minerals Yearbooks*.
35. The sample for the instrumental variables analysis excludes countries without NOCs so that the first-stage model is conditional on having nationalized. There is unlikely to be an exclusion restriction violation due to selection bias: that is, tough geology does not preclude nationalization but rather affects the decision to establish a regulatory SOE once a government decides to nationalize. Figure 5 illustrates the empirical variance in sulfur content across nationalized states, suggesting that nationalization occurred in countries with both low- and high-sulfur-content reserves. Sulfur content also exhibits a wide distribution in states without upstream NOCs. In 1971, for example, sulfur content ranged from lows of 0.1% in Australia and 0.2% in Gabon to highs of 4.3% in France. Similarly

in 2013, sulfur content ranged from 0.04% in Papua New Guinea and 0.1% in Brunei and Chad, to highs of 1.5% in Gabon and 4.7% in Italy.

36. Controlling for pre-nationalization oil income instead shows the same results; see Supplemental Appendix Table 18.
37. The Wald *F*-statistic of the instrument is moderate at 8.49 (*p* value: .043). This is to be expected given the small sample size and the binary nature of the endogenous variable. When using a logistic regression for the first stage, the likelihood ratio (LR) test of the unrestricted versus restricted models gives a *p* value of .001 ($df = 1$).
38. Missingness in the sulfur dataset (Bolivia and Romania), and the restriction to countries with NOCs, explains why the sample size drops from 59 to 43. In Models 1 and 3, both Canada and the United Kingdom are included given both had NOCs prior to privatization in the 1980s. These two cases, along with Denmark, the Netherlands, and Norway, are omitted from Models 2 and 4.

Supplemental Material

Supplementary material for this article is available online at the CPS website http://journals.sagepub.com/doi/suppl/10.1177/0010414019830727.

ORCID iD

Paasha Mahdavi https://orcid.org/0000-0003-3172-8478

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