Appendices for
Institutions and the 'resource curse':
Evidence from cases of oil-related bribery

Contents

Appendix 1: Additional figures & tables

Bayesian model specification

$$
\begin{aligned}
Y &\sim \mathcal{N}(\mathbf{X}\beta, 1/\sigma) \\
\beta &\sim \mathcal{N}(\mu_\beta, \sigma_\beta) \\
\sigma &\sim \Gamma(a_\sigma, b_\sigma)
\end{aligned}
$$

$$
\begin{aligned}
\mu_\beta &= 0 \\
\sigma_\beta &= 5 \\
a_\sigma &= 0.01 \\
b_\sigma &= 0.01
\end{aligned}
$$

Following Stan Development Team (2015, p. 53), I use weakly informative priors for the coefficients β. Given that all variables are standardized with zero mean and unit variance, the $|\hat{\beta}|$ is not expected to be greater than five (such that a one standard deviation change in X would correspond to a five standard deviation change in Y). As such, I use a weakly informative prior that each coefficient parameter is normally distributed with zero mean and standard deviation 5.

Table 3: Case descriptions of prosecuted FCPA violations in the oil and gas sectors

Defendant	Year	Countries Involved	Description	Origin
ABB Vetco	2004	Nigeria	Bribes paid to NNPC subsidiaries	S
Applied PPO	1983	Mexico	Bribes paid to Pemex	W
Baker Hughes Inc.	2007	Kazakhstan, Uzbekistan	Bribes paid to Kazakhoil	W
C.E. Miller Corp	1982	Mexico	Bribes paid to Pemex	W
Chevron Corp.	2007	Iraq	Connected to Oil-for-Food Program (OFP)	J
Control Components	2009	Brazil, China, Indonesia, South Korea, Malaysia, United Arab Emirates	Bribes paid to multiple NOCs including CNOOC, KHNP, Petronas, NPCC, and Petrobras	P
Crawford Enterprises	1982	Mexico	Bribes paid to Pemex	W
Daniel Ray Rothrock	2001	Russia	Bribes paid to RVO Nesco (former USSR)	?
El Paso Corp.	2007	Iraq	Bribes connected to OFP	J
Fiat S.p.A.	2008	Iraq	Bribes connected to OFP	J
Flowserve Corp.	2008	Iraq	Bribes connected to OFP	J
GlobalSanteFe Corp.	2010	Angola, Equatorial Guinea, Gabon, Nigeria	Bribes paid to Sonangol and NNPC, and customs officials in Gabon & Eq. Guinea	J
Helmerich & Payne Inc.	2009	Argentina, Venezuela	Bribes to customs officials for oil rig imports	S
Innospec	2010	Iraq	Bribes paid to Oil Ministry, part of OFP	W
International Harvester	1982	Mexico	Bribes paid to Pemex	W
JGC Corporation	2011	Nigeria	Bribes paid to NNPC and Petroleum Ministry	P
Kellogg Brown & Root	2009	Nigeria	Halliburton subsidiary. Bribes paid to NNPC and Petroleum Ministry	W
Marubeni Corporation	2012	Nigeria	Bribes paid to NNPC and Nigeria-LNG	P
Mercator Corporation	2010	Kazakhstan	Bribes paid to Kazakh president and PM, former Mobil CEO was involved	W
Misao Hioki	2008	Argentina, Brazil, Ecuador, Mexico, Venezuela	Bribes to various (unidentified) NOC officials	J
Noble Corp.	2010	Nigeria	Bribes paid to Nigerian customs officials	J
Paradigm B.V.	2007	China, Indonesia, Mexico, Kazakhstan Venezuela	Bribes paid to multiple NOCs including CNOOC, KazMunaiGaz, NNPC, Pemex, Pertamina	S
Parker Drilling Co.	2013	Nigeria	Bribes paid to Ministry of Finance	J
Pride International	2010	India, Kazakhstan, Mexico, Venezuela	Bribes paid to PDVSA, Indian judges, and Mexican & Kazakh customs agents	J
Royal Dutch/Shell	2010	Nigeria	Bribes paid to NNPC and Ministry of Finance	J
Ruston Gas Turbines	1982	Mexico	Bribes paid to Pemex	W
Siemens	2008	Iraq	Bribes paid to Oil Ministry, part of OFP	P
Snamprogetti	2011	Nigeria	Bribes paid to NNPC and Petroleum Ministry	P
Statoil ASA	2009	Iran	Bribes paid to NIOC officials	W
Technip S.A.	2010	Nigeria	Bribes paid to NNPC and Petroleum Ministry	P
Tidewater	2010	Azerbaijan, Nigeria, United Arab Emirates	Bribes paid to various (unidentified) Ministry of Finance officials	J
Total S.A	2013	Iran	Bribes paid to NIOC officials	P
Transocean Inc.	2010	Nigeria	Bribes paid to Nigerian customs officials	J
Triton Energy	1997	Indonesia	Bribes paid to Pertamina officials	J
Tyco International	2012	Congo, Egypt, Laos, Libya, Madagascar, Mauritania, Niger, Syria, Thailand, Turkey, Vietnam	Over $26 mn in bribes paid to state officials to secure contracts for piping & flow control (note: this case also included non-oil contracts which are omitted from the data)	S
Tyco VCME	2012	Iran, Saudi Arabia, United Arab Emirates	Bribes paid to various (unidentified) NOC officials	S
Vetco Gray Controls	2007	Nigeria	Bribes paid to Ministry of Finance	P
Viktor Kozeny	2005	Azerbaijan	Bribes paid to SOCAR officials	W
Weatherford Int'l	2013	Algeria, Angola, Congo, Iraq, United Arab Emirates	Bribes through agents to Sonangol, Iraqi oil ministers, ADNOC officials, and various (unidentified) parties	W
Willbros Group	2008	Ecuador, Nigeria	Bribes to NNPC and PetroEcuador officials	W
Williams, James Bryan	2003	Kazakhstan	Executive at Mobil; Bribes to Kazakh officials	W

Information collected from case documents publicly available from DoJ and SEC websites. Origin column indicates the reason for initial investigation: ***J*** *(initiated by Do****J*** *or SEC),* ***P*** *(suspicion based on information revealed in a* ***p****rior FCPA case),* ***S*** *(voluntary* ***s****elf-disclosure),* ***W*** *(****w****histle-blower).*

Table 4: Oil-related institutions and transparent reporting practices

	Dependent variable:			
	HRV Transparency Index (mean centered)			
	(OLS)	(REML)	(OLS)	(REML)
Non-regulatory NOC	−0.017	−0.016		
	(0.016)	(0.015)		
Regulatory NOC	−0.126***	−0.122***		
	(0.017)	(0.016)		
Regulatory NOC (binary)			−0.118***	−0.115***
			(0.015)	(0.014)
Oil income per capita (logged)	0.026***	0.023***	0.025***	0.022***
	(0.003)	(0.003)	(0.003)	(0.003)
Regime (Polity)	−0.002**	−0.001	−0.002**	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Time trend	0.004***	0.004***	0.004***	0.004***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Constant	−0.233***	−0.062***	−0.231***	−0.064***
	(0.036)	(0.016)	(0.036)	(0.016)
Observations	3,094	3,094	3,094	3,094
Number of groups		121		121
Fixed effects?	✓		✓	
Random effects?		✓		✓
R^2	0.641		0.640	
Adjusted R^2	0.625		0.625	
Log Likelihood		1,946		1,949
Akaike Inf. Crit.		−3,877		−3,884
Bayesian Inf. Crit.		−3,829		−3,842
Note:				*p<0.05; **p<0.01; ***p<0.001

OLS and REML panel regression of weighted (by oil reliance) HRV transparency index and ownership structure in all states, 1980–2005. REML models use an identity covariance structure. OLS regressions include country fixed effects which are omitted from the table for brevity.

Table 5: **Results from Bayesian analysis of FCPA-related bribes in the oil sector**

	Mean (β)	Std. dev.	2.5%	97.5%	$Pr(\beta > 0)$
Intercept	-0.202	0.144	-0.489	0.081	0.078
Regulatory NOC	0.514	0.257	0.006	1.021	0.977
GDP (logged)	0.046	0.171	-0.296	0.379	0.611
Oil income (logged)	0.328	0.163	0.015	0.647	0.979
Regime (Polity)	-0.030	0.231	-0.478	0.427	0.447
Press freedom	0.013	0.254	-0.494	0.514	0.528
Population (logged)	0.488	0.133	0.222	0.749	1.000
UNGA-Percent Agree with US	-0.359	0.232	-0.828	0.099	0.057

Posterior coefficients from Bayesian linear analysis: mean, standard deviation, 95% credible interval range, and probability that the coefficient is greater than zero (for positive β's, 1 minus this probability can be compared to a p value in the frequentist framework). MCMC analysis performed using five chains with 1,000,000 iterations each, thinning every 1,000 iterations, and discarding the first 10,000 from each chain as burn-in. Full diagnostics will be available online upon publication.

Table 6: **Results from Bayesian analysis of FCPA-related bribes, excluding established democracies**

	Mean (β)	Std. dev.	2.5%	97.5%	$Pr(\beta > 0)$
Intercept	-0.045	0.178	-0.404	0.301	0.398
Regulatory NOC	0.524	0.271	0.005	1.054	0.976
GDP (logged)	0.025	0.183	-0.337	0.374	0.560
Oil income (logged)	0.447	0.187	0.086	0.826	0.991
Regime (Polity)	-0.148	0.253	-0.643	0.354	0.272
Press freedom	-0.182	0.298	-0.773	0.405	0.268
Population (logged)	0.574	0.147	0.284	0.859	1.000
UNGA-Percent Agree with US	-0.010	0.328	-0.644	0.655	0.486

Posterior coefficients from Bayesian linear analysis, excluding long-established democracies (Australia, Canada, Denmark, Netherlands, Norway, New Zealand, and the UK) from the sample. Compare to results in Table 5

Table 7: **Results from Bayesian analysis of FCPA-related bribes including region fixed effects**

	Mean (β)	Std. dev.	2.5%	97.5%	$Pr(\beta > 0)$
Intercept	-0.109	0.224	-0.563	0.332	0.309
Regulatory NOC	0.509	0.257	0.015	1.035	0.978
GDP (logged)	0.149	0.193	-0.228	0.534	0.779
Oil income (logged)	0.304	0.174	-0.033	0.647	0.960
Regime (Polity)	-0.162	0.283	-0.716	0.398	0.283
Press freedom	-0.060	0.271	-0.591	0.467	0.408
Population (logged)	0.532	0.141	0.261	0.812	1.000
UNGA-Percent Agree with US	-0.480	0.313	-1.106	0.133	0.062
Sub-Saharan Africa	0.167	0.390	-0.592	0.937	0.662
Middle East & North Africa	-0.392	0.379	-1.129	0.341	0.148
Latin America	-0.076	0.388	-0.853	0.716	0.419

Posterior coefficients from Bayesian linear analysis, including region fixed effects. The excluded category is the set of countries in Asia and Europe. Compare to results in Table 5

Table 8: **Results from Bayesian analysis of Transparency International Corruption Perception Index**

	Mean (β)	Std. dev.	2.5%	97.5%	$Pr(\beta > 0)$
Intercept	-0.021	0.025	-0.069	0.028	0.194
Regulatory NOC	0.163	0.029	0.106	0.221	1.000
GDP (logged)	-0.028	0.014	-0.056	0.000	0.026
Oil income (logged)	0.021	0.013	-0.004	0.046	0.950
Regime (Polity)	0.014	0.019	-0.023	0.050	0.770
Press freedom	0.028	0.020	-0.011	0.068	0.926
Population (logged)	-0.012	0.010	-0.032	0.008	0.117
UNGA-Percent Agree with US	0.130	0.100	-0.062	0.324	0.900

Posterior coefficients from Bayesian linear analysis, using weighted TI CPI scores as a dependent variable, rescaled so that higher values correspond to greater perceived corruption. Compare to results in Table 5

Table 9: Results from OLS analysis of FCPA-related bribes

	Dependent variable:					
	Bribery (logged $)					
	(1)	(2)	(3)	(4)	(5)	(6)
Regulatory NOC	0.971***	0.616**	0.562**	0.533**	0.492*	0.517**
	(0.237)	(0.242)	(0.246)	(0.251)	(0.248)	(0.248)
GDP per capita (logged)		−0.149	−0.076	−0.059	0.157	0.046
		(0.143)	(0.155)	(0.158)	(0.220)	(0.169)
Oil income (logged)		0.456***	0.364**	0.361**	0.326*	0.329**
		(0.141)	(0.160)	(0.161)	(0.169)	(0.160)
Population (logged)		0.448***	0.452***	0.424***	0.495***	0.487***
		(0.118)	(0.117)	(0.125)	(0.132)	(0.130)
Regime (Polity)			−0.154	−0.032	−0.163	−0.035
			(0.129)	(0.229)	(0.241)	(0.226)
Press freedom				0.153	−0.068	0.005
				(0.236)	(0.282)	(0.251)
TI - CPI score					0.310	
					(0.227)	
UNGA agreement						−0.359
						(0.229)
Constant	−0.365**	−0.216	−0.196	−0.187	−0.184	−0.205
	(0.148)	(0.139)	(0.139)	(0.141)	(0.140)	(0.139)
Observations	59	59	59	59	58	59
R^2	0.227	0.429	0.444	0.448	0.479	0.474
Adjusted R^2	0.213	0.387	0.391	0.385	0.406	0.402
Note:						*p<0.1; **p<0.05; ***p<0.01

OLS cross-sectional regression of energy-sector FCPA-related bribes and ownership structure in the oil-producing states, disaggregated into two groups: no NOC or non-regulatory NOC, and regulatory NOC. The no NOC or non-regulatory NOC case is captured by the constant term. Model 1 includes no control variables. Model 2 adds GDP and oil income, both per capita and in logged dollars, and logged population. Model 3 adds regime type (Polity index). Model 4 adds press freedom (Freedom House). Model 5 adds the Transparency International Corruption Perceptions Index (2012), rescaled so that higher values represent greater perceptions of corruption. Model 6 replaces TI-CPI score with the measure of a country's percentage agreement with the US at the UN General Assembly. All covariates are averaged across the 1997-2013 period.

Table 10: Results from OLS analysis of Transparency International Corruption Perceptions Index, all countries

	Dependent variable:				
	Weighted CPI (rescaled: higher values = more corrupt)				
	(1)	(2)	(3)	(4)	(5)
Regulatory NOC	0.185***	0.162***	0.162***	0.156***	0.158***
	(0.024)	(0.028)	(0.029)	(0.029)	(0.029)
Oil income (logged)		0.022*	0.022*	0.019	0.020
		(0.012)	(0.012)	(0.012)	(0.012)
GDP per capita (logged)		−0.028***	−0.028**	−0.022*	−0.021*
		(0.010)	(0.012)	(0.013)	(0.013)
Population (logged)		−0.008	−0.008	−0.007	−0.009
		(0.010)	(0.010)	(0.010)	(0.010)
Regime (Polity)			−0.001		0.017
			(0.011)		(0.018)
Press freedom				0.010	0.024
				(0.012)	(0.020)
Constant	0.003	0.007	0.007	0.008	0.008
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Observations	155	155	155	155	155
R^2	0.272	0.310	0.310	0.313	0.317
Adjusted R^2	0.267	0.292	0.287	0.290	0.289
Note:					*p<0.1; **p<0.05; ***p<0.01

OLS cross-sectional regression of perceived corruption (CPI scores, weighted by oil reliance) and ownership structure in all states with available data. Compare to model results in Table 9.

Table 11: Results from OLS analysis of Transparency International Corruption Perceptions Index, oil-producers only

	Dependent variable:				
	Weighted CPI (rescaled: higher values = more corrupt)				
	(1)	(2)	(3)	(4)	(5)
Regulatory NOC	0.176***	0.111**	0.111**	0.099**	0.074
	(0.044)	(0.047)	(0.049)	(0.049)	(0.050)
Oil income (logged)		0.038	0.038	0.037	0.018
		(0.028)	(0.032)	(0.032)	(0.033)
GDP per capita (logged)		−0.093***	−0.093***	−0.086***	−0.083***
		(0.028)	(0.031)	(0.031)	(0.030)
Population (logged)		−0.006	−0.006	−0.019	−0.042
		(0.025)	(0.025)	(0.026)	(0.029)
Regime (Polity)			0.0004	0.054	0.056
			(0.026)	(0.045)	(0.044)
Press freedom				0.067	0.060
				(0.046)	(0.045)
FCPA-related bribes					0.048*
					(0.027)
Constant	0.002	0.025	0.025	0.029	0.038
	(0.028)	(0.027)	(0.028)	(0.027)	(0.027)
Observations	58	58	58	58	58
R^2	0.220	0.362	0.362	0.387	0.424
Adjusted R^2	0.206	0.314	0.301	0.315	0.343
Note:					*p<0.1; **p<0.05; ***p<0.01

OLS cross-sectional regression of perceived corruption (CPI scores, weighted by oil reliance) and ownership structure in oil-producing states. Compare to model results in Table 9.

Table 12: Results from OLS analysis of FCPA-related bribes, excluding established democracies

	Dependent variable:					
	Bribery (logged $)					
	(1)	(2)	(3)	(4)	(5)	(6)
Regulatory NOC	0.863***	0.507**	0.501*	0.526**	0.511*	0.525**
	(0.260)	(0.245)	(0.250)	(0.255)	(0.259)	(0.258)
GDP per capita (logged)		0.013	0.021	0.021	0.049	0.024
		(0.161)	(0.169)	(0.170)	(0.246)	(0.180)
Oil income (logged)		0.451***	0.434**	0.444**	0.469**	0.442**
		(0.148)	(0.173)	(0.175)	(0.198)	(0.182)
Population (logged)			−0.029	−0.151	−0.176	−0.149
			(0.142)	(0.241)	(0.250)	(0.248)
Regime (Polity)		0.532***	0.531***	0.574***	0.630***	0.574***
		(0.123)	(0.124)	(0.142)	(0.154)	(0.144)
Press freedom				−0.180	−0.189	−0.180
				(0.284)	(0.299)	(0.287)
TI - CPI score					0.047	
					(0.305)	
UNGA agreement						−0.017
						(0.313)
Constant	−0.257	−0.057	−0.059	−0.045	−0.067	−0.049
	(0.173)	(0.151)	(0.153)	(0.156)	(0.160)	(0.171)
Observations	52	52	52	52	51	52
R^2	0.181	0.456	0.456	0.461	0.472	0.461
Adjusted R^2	0.164	0.409	0.397	0.389	0.386	0.375
Note:						*p<0.1; **p<0.05; ***p<0.01

OLS cross-sectional regression of energy-sector FCPA-related bribes and ownership structure in the oil-producing states, excluding long-established democracies (Australia, Canada, Denmark, Netherlands, Norway, New Zealand, and the UK) from the sample. Compare to model results in Table 9.

Table 13: Results from OLS analysis of FCPA-related bribes per dollar of oil income per capita

	Dependent variable:					
	Bribes per dollar of oil income					
	(1)	(2)	(3)	(4)	(5)	(6)
Regulatory NOC	1.009***	0.676***	0.642**	0.650**	0.623**	0.635**
	(0.235)	(0.243)	(0.249)	(0.255)	(0.256)	(0.252)
GDP per capita (logged)		−0.145	−0.100	−0.105	0.028	−0.002
		(0.144)	(0.157)	(0.161)	(0.226)	(0.173)
Oil income (logged)		0.317**	0.260	0.260	0.252	0.229
		(0.142)	(0.162)	(0.164)	(0.174)	(0.163)
Population (logged)		0.468***	0.470***	0.478***	0.544***	0.540***
		(0.118)	(0.119)	(0.128)	(0.136)	(0.132)
Regime (Polity)			−0.097	−0.132	−0.219	−0.136
			(0.131)	(0.233)	(0.248)	(0.230)
Press freedom				−0.044	−0.180	−0.189
				(0.240)	(0.290)	(0.256)
TI - CPI score					0.188	
					(0.233)	
UNGA agreement						−0.353
						(0.233)
Constant	−0.381**	−0.240*	−0.228	−0.230	−0.234	−0.248*
	(0.147)	(0.139)	(0.141)	(0.143)	(0.144)	(0.142)
Observations	59	59	59	59	58	59
R^2	0.244	0.425	0.431	0.431	0.450	0.455
Adjusted R^2	0.231	0.382	0.377	0.365	0.373	0.381
Note:						*p<0.1; **p<0.05; ***p<0.01

OLS cross-sectional regression of energy-sector FCPA-related bribes and ownership structure in the oil-producing states, using bribes per dollar of oil income per capita as the dependent variable. This variable is constructed by dividing bribes by oilincome, and transforming to the log scale to account for skew. Compare to model results in Table 9.

Table 14: Results from OLS analysis of FCPA-related bribes, using trichotomous measure of institutions

	Dependent variable:					
	Bribery (logged $)					
	(1)	(2)	(3)	(4)	(5)	(6)
No NOC	−0.655***	−0.224	−0.154	−0.134	−0.087	−0.011
	(0.204)	(0.224)	(0.230)	(0.234)	(0.233)	(0.238)
Non-regulatory NOC	−0.074	−0.209	−0.229	−0.228	−0.258	−0.366*
	(0.204)	(0.202)	(0.202)	(0.203)	(0.200)	(0.212)
Regulatory NOC	0.606***	0.401**	0.360*	0.338*	0.292	0.271
	(0.181)	(0.183)	(0.186)	(0.189)	(0.188)	(0.189)
GDP per capita (logged)		−0.149	−0.073	−0.054	0.177	0.095
		(0.144)	(0.157)	(0.160)	(0.224)	(0.176)
Oil income (logged)		0.452***	0.377**	0.377**	0.352*	0.381**
		(0.160)	(0.171)	(0.172)	(0.178)	(0.168)
Population (logged)		0.445***	0.464***	0.439***	0.523***	0.559***
		(0.130)	(0.130)	(0.136)	(0.144)	(0.148)
Regime (Polity)			−0.161	−0.035	−0.176	−0.051
			(0.134)	(0.232)	(0.244)	(0.227)
Press freedom				0.159	−0.067	−0.014
				(0.239)	(0.284)	(0.252)
TI - CPI score					0.324	
					(0.230)	
UNGA agreement						−0.461*
						(0.250)
Observations	59	59	59	59	58	59
R^2	0.279	0.429	0.445	0.449	0.482	0.484
Adjusted R^2	0.240	0.365	0.370	0.363	0.387	0.392
Note:						*p<0.1; **p<0.05; ***p<0.01

OLS cross-sectional regression of energy-sector FCPA-related bribes and ownership structure in the oil-producing states, disaggregated into three groups: no NOC, non-regulatory NOC, and regulatory NOC. The no NOC case is captured by the constant term. Compare to model results in Table 9.

Table 15: Results from OLS analysis of FCPA-related penalties in the oil sector

	Dependent variable:					
	FCPA-related penalties (logged $)					
	(1)	(2)	(3)	(4)	(5)	(6)
Regulatory NOC	0.775***	0.674**	0.657**	0.600**	0.575**	0.606**
	(0.266)	(0.273)	(0.276)	(0.280)	(0.280)	(0.283)
GDP per capita (logged)		−0.090	−0.026	0.027	0.271	0.067
		(0.190)	(0.213)	(0.218)	(0.301)	(0.238)
Oil income (logged)		0.341*	0.277	0.263	0.206	0.236
		(0.178)	(0.202)	(0.202)	(0.207)	(0.214)
Population (logged)		0.385**	0.409**	0.397**	0.454**	0.398**
		(0.174)	(0.179)	(0.178)	(0.184)	(0.180)
Regime (Polity)			−0.100	0.108	−0.026	0.100
			(0.146)	(0.237)	(0.263)	(0.240)
Press freedom				0.297	0.034	0.240
				(0.268)	(0.349)	(0.299)
TI - CPI score					0.364	
					(0.312)	
UNGA agreement						−0.117
						(0.264)
Non-oil FCPA penalties		0.400***	0.391***	0.361***	0.304**	0.362***
		(0.122)	(0.124)	(0.126)	(0.135)	(0.128)
Constant	−0.364*	−0.408**	−0.409**	−0.405**	−0.411**	−0.411**
	(0.182)	(0.169)	(0.170)	(0.170)	(0.169)	(0.172)
Observations	49	49	49	49	49	49
R^2	0.153	0.471	0.476	0.492	0.508	0.494
Adjusted R^2	0.135	0.409	0.402	0.405	0.410	0.393
Note:						*p<0.1; **p<0.05; ***p<0.01

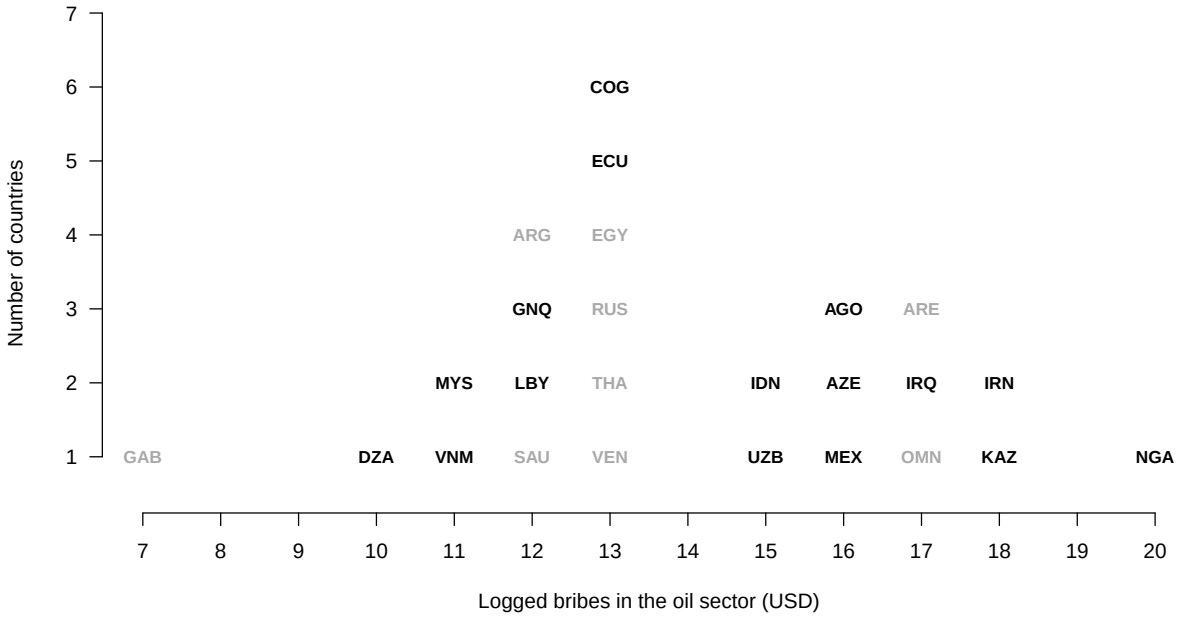
OLS cross-sectional regression of oil FCPA-related penalties and ownership structure in oil-producing states. Penalties are assessed by the DOJ and SEC in proportion to the amount of bribes paid, with adjustments for firm and/or individual compliance during the investigation. Compare to model results in Table 9.

Table 16: Results from OLS analysis of FCPA-related bribes, using binary indicator of bribery as an outcome

	Dependent variable:			
	Bribery dummy			
	OLS		*logistic*	
	(1)	(2)	(3)	(4)
Regulatory NOC (binary)	0.193		0.825	
	(0.125)		(0.967)	
Regulatory NOC (trichot.)		0.028		−0.867
		(0.170)		(1.436)
GDP per capita (logged)	0.147	0.187	0.718	0.979
	(0.112)	(0.114)	(1.286)	(1.289)
Oil income (logged)	0.138	0.172*	1.935*	2.621*
	(0.085)	(0.088)	(1.131)	(1.395)
Population (logged)	0.252***	0.302***	2.442***	3.202***
	(0.069)	(0.077)	(0.805)	(1.111)
Regime (Polity)	−0.043	−0.057	0.009	−0.095
	(0.121)	(0.120)	(0.912)	(0.975)
Press freedom	−0.052	−0.070	0.136	0.034
	(0.145)	(0.144)	(1.210)	(1.317)
UNGA agreement	−0.168	−0.237*	−1.036	−1.682
	(0.117)	(0.126)	(1.189)	(1.180)
TI - CPI score	0.164	0.172	1.519	1.819
	(0.116)	(0.115)	(1.164)	(1.214)
Constant	0.335***	0.472***	−1.496**	−0.183
	(0.070)	(0.119)	(0.697)	(1.009)
Observations	58	58	58	58
R^2	0.480	0.501		
Adjusted R^2	0.395	0.408		
Log Likelihood			−19.787	−18.501
Akaike Inf. Crit.			57.574	57.002
Note:				*p<0.1; **p<0.05; ***p<0.01

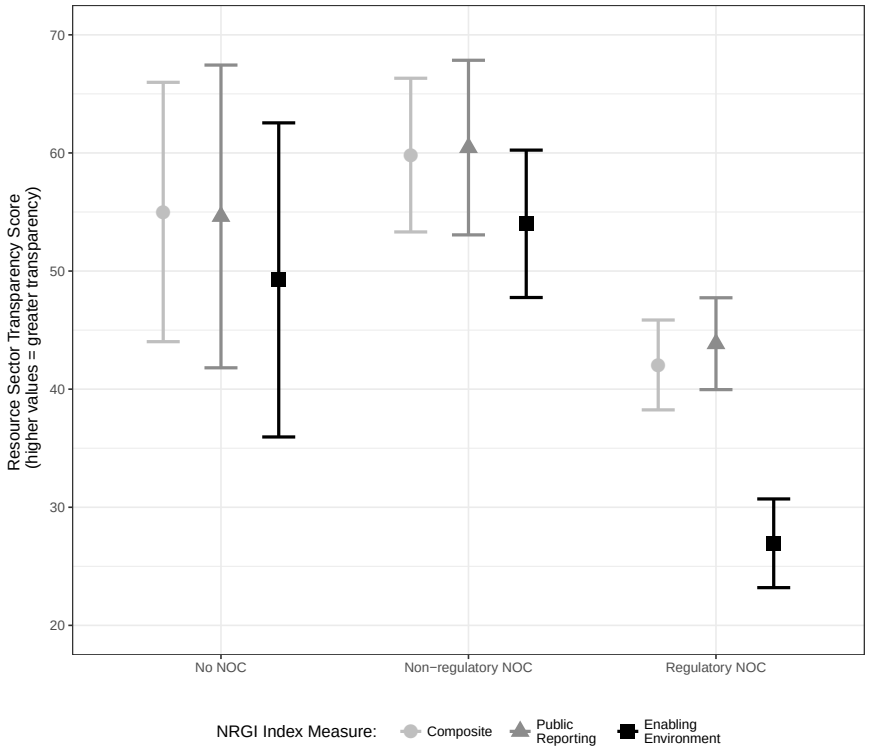
OLS (1-2) and logit (3-4) cross-sectional regression of energy-sector FCPA-related bribes and ownership structure in the oil-producing states, using dichotomous bribe variable. Bribery = 0 if no bribes were recorded in a given country, and bribery = 1 otherwise. Compare to model results in Table 9.

Figure 7: Distribution of oil-related bribery among major producers, 1997-2013



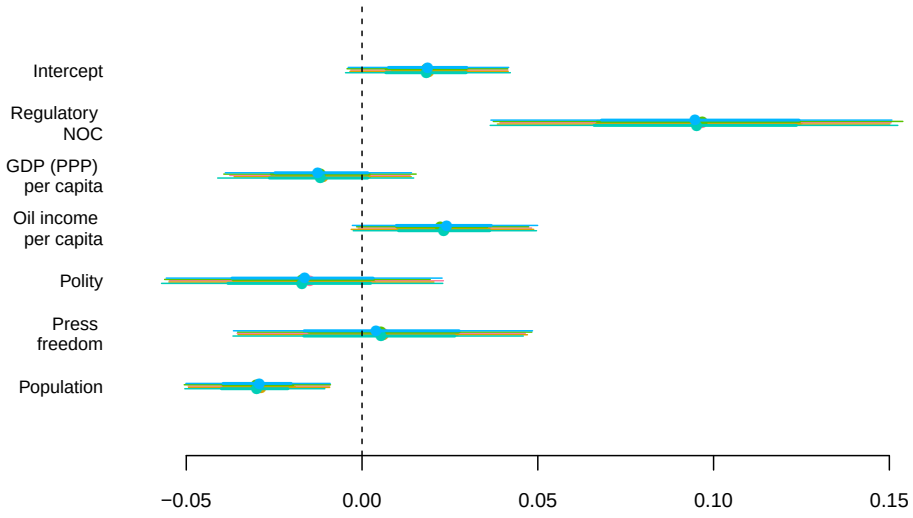
Histogram of bribery with a bin width of 1 logged US dollar. Cases are labeled using World Bank three-letter codes: countries with regulatory NOCs are in black, countries with non-regulatory NOCs or no NOC in dark gray. Countries with zero bribes are omitted from the graph.

Figure 8: Oversight and transparency in oil governance for 39 oil-producing countries, 2012.



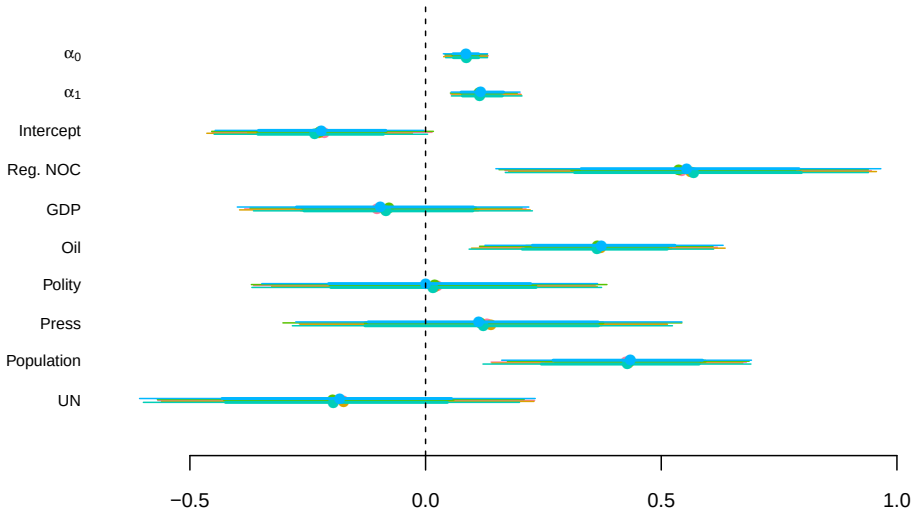
Oversight and transparency is measured by the RGI (range: 0-100, higher values indicate better governance). Means by group are plotted along with 95% confidence bands (mean SE). Refer to Table 17 for a listing of countries by category. Note that the sample size drops from 59 to 39 given missing data in the RGI. The list of missing cases includes: Argentina, Australia, Barbados, Belize, Brunei Darussalam, Chad, Congo, Croatia, Cuba, Denmark, Hungary, Netherlands, New Zealand, Oman, Papua New Guinea, Peru, Romania, Senegal, Sudan, Suriname, Syrian Arab Republic, Thailand, Tunisia, Ukraine, United Arab Emirates, Uzbekistan. RGI includes the following countries not in the main oil-producer sample: Cambodia, China, India, Mozambique, and Myanmar.

Figure 9: Results from Bayesian linear analysis: Escresa Picci *PACI* measure



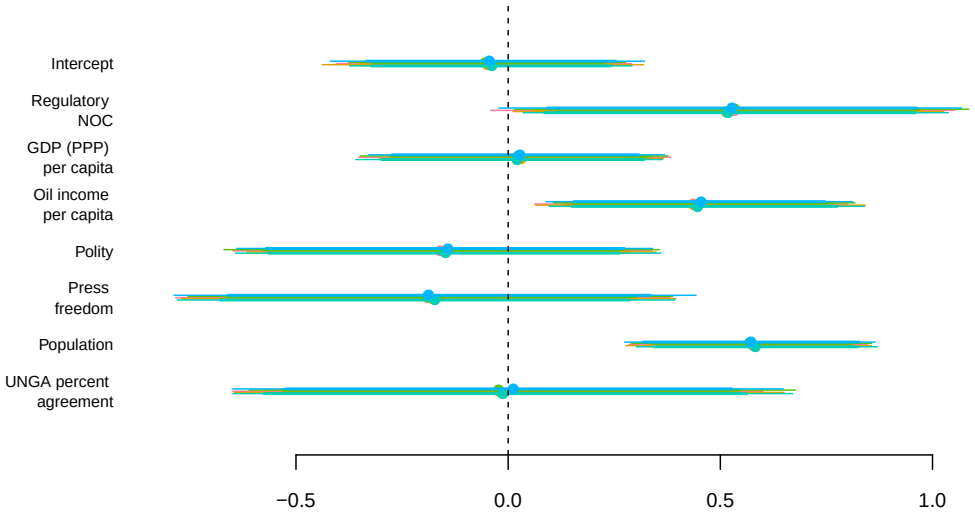
Posterior distributions of coefficients for the Bayesian linear model with the weighted Escresa-Picci PACI as the outcome measure, weighted using the WDI oil reliance ("oil rents % of GDP") measure rescaled to 0–1. All variables except the Regulatory NOC indicator are standardized to allow for ease of comparison. The posterior medians from each of the five MCMC chains are plotted, along with 95% (outer) and 68% (inner) credible intervals. The sample ($n = 117$) includes all countries, not just oil producers, with non-missing data on the weighted PACI measure.

Figure 10: Results from Bayesian measurement model



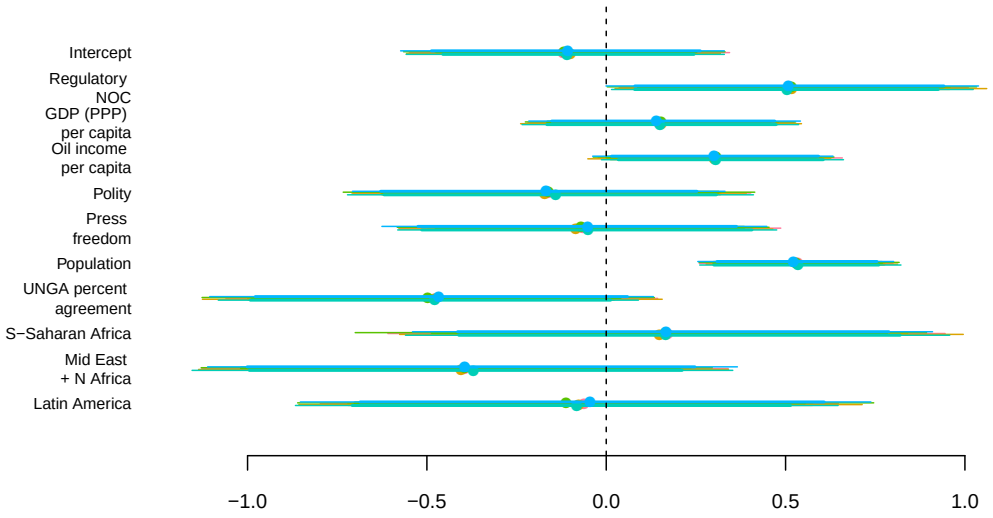
Posterior distributions of coefficients for the Bayesian measurement model with FCPA bribery and the weighted CPI as the outcome variables ($n = 58$). Note that the coefficient estimate for α_1 is equivalent to the γ parameter in the main text. The posterior medians from each of the five MCMC chains are plotted, along with 95% (outer) and 68% (inner) credible intervals.

Figure 11: Results from Bayesian linear analysis, removing established democracies



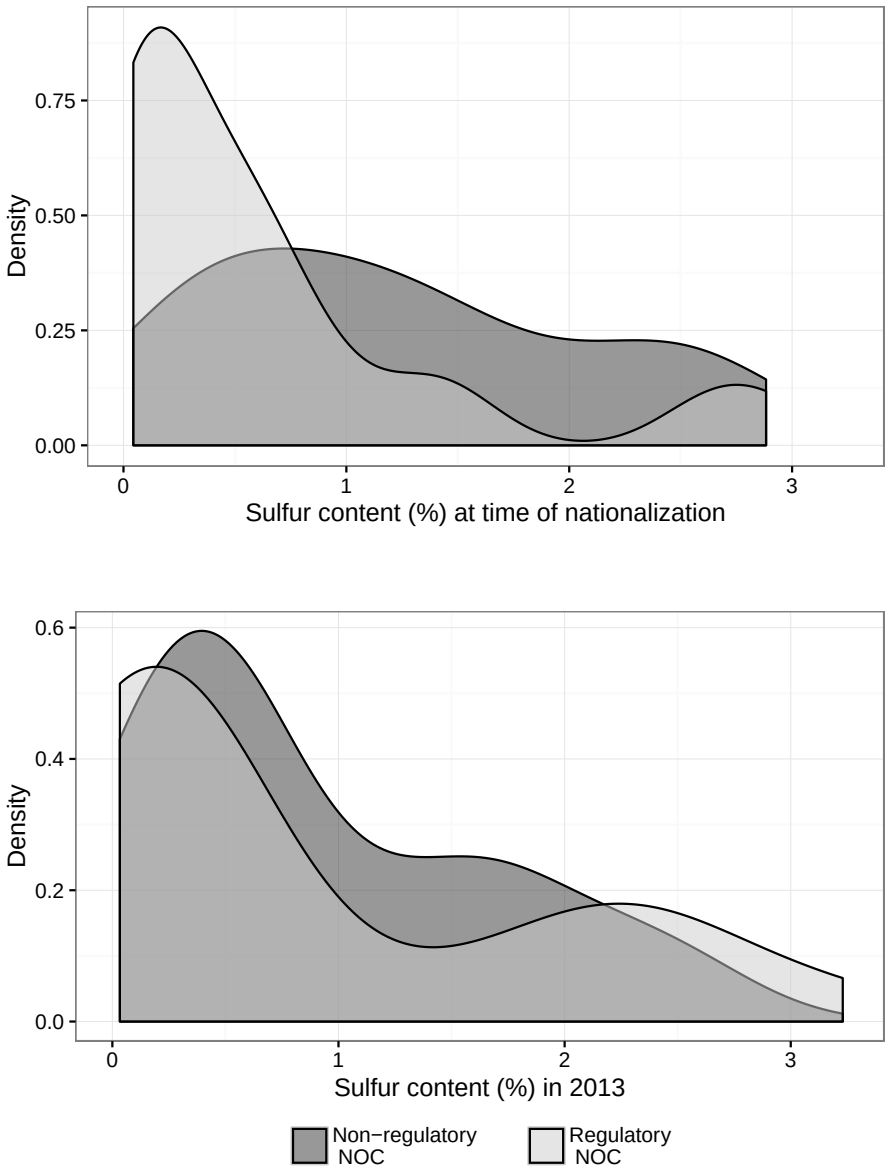
Posterior distributions of coefficients from the Bayesian linear model, excluding established democracies from the list of major oil-producing states. The sample ($n = 52$) excludes Australia, Canada, Denmark, Netherlands, Norway, New Zealand, and the United Kingdom.

Figure 12: Results from Bayesian linear analysis, adding region fixed effects



Posterior distributions of coefficients from the Bayesian linear model, including regional fixed effects dummies for Sub-Saharan Africa, Middle East and North Africa, and Latin America. There is little evidence for regional effects when compared to the baseline (Europe and Asia) on corruption not already captured by existing covariates. The sample ($n = 59$) includes all major oil-producing states excluding the USA.

Figure 13: Geological favorability by institutional choice



Distributions of two instrumental variables by institutional choice, plotted as overlapping density curves. Top: sulfur content of crude oil being produced prior to nationalization. Bottom: sulfur content of crude oil produced in 2013 (used as placebo instrument). The sample ($n = 44$) excludes the following countries with no NOCs: Australia, Barbados, Belize, Chad, Croatia, Cuba, Hungary, New Zealand, Papua New Guinea, Senegal, Suriname, Thailand, Timor-Leste, and Ukraine. The sample also excludes Bolivia, Romania, and Russia based on the inability to locate sulfur contents at the time of the creation of the first NOCs in 1936, 1948, and 1916, respectively.

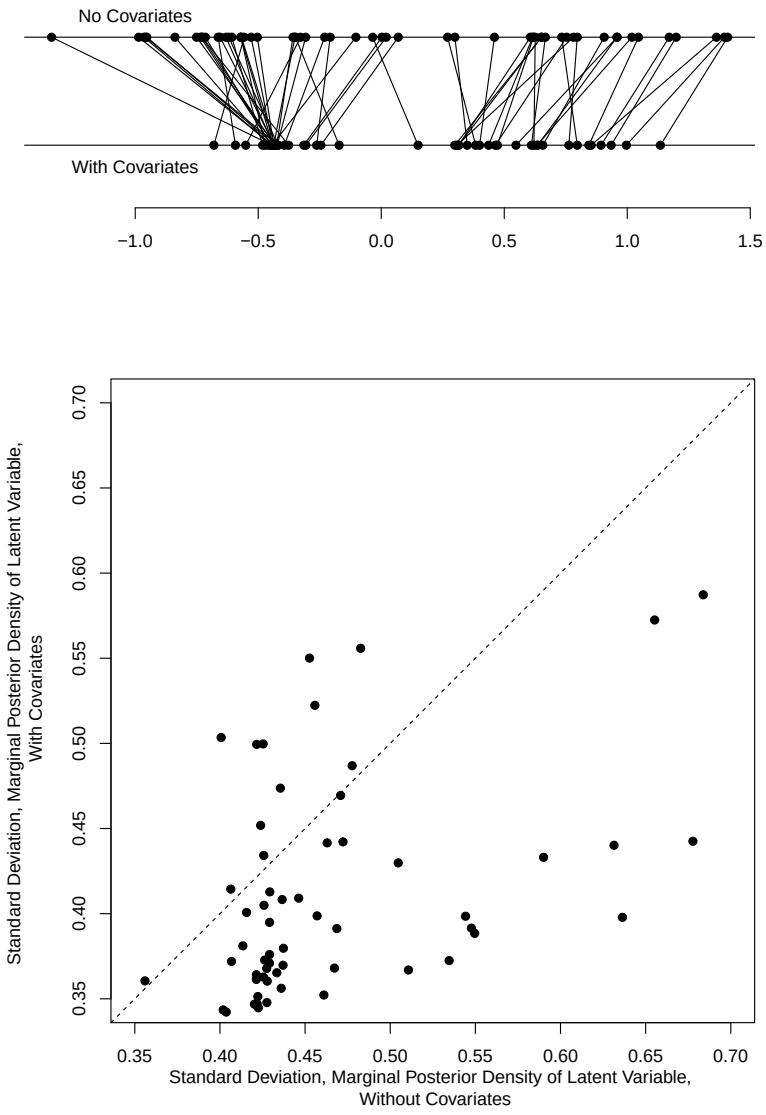


Figure 14: Comparison of means (upper panel) and standard deviations (lower panel) of the marginal posterior densities of latent variables from the hierarchical measurement model versus the measurement model without covariates (i.e., without hierarchical structure). The plots show that adding information via covariates improves the variance of the estimated latent measures of corruption.

Appendix 2: Institutional choice—what drives the decision to establish a regulatory vs non-regulatory NOC?

The categorization of cases into no NOC, non-regulatory NOC, and regulatory NOC is presented in Table 17, disaggregated by broad region to allow for ease of geographical comparison. There is little geographical clustering of institution types, such that no one region dominates a specific regulatory structure nor does one regulatory structure dominate a given region. Nearly all Middle Eastern and African states have NOCs, though there is reasonable balance across both regulatory and non-regulatory NOCs in each region. Here I provide more details on why governments choose one structure over another and I present further comparisons between countries with regulatory NOCs and countries with non-regulatory NOCs.

Conditional on nationalization, what factors might influence a state to choose a regulatory NOC over a non-regulatory NOC? While the case study in the text discusses this choice in detail for the NOC reforms in Kazakhstan, here I review selected examples of NOC formation to trace out the process of this institutional choice.

Consider the case of nationalization in the United Arab Emirates. When Sheykh Zeyed established the Abu Dhabi National Oil Company (ADNOC) in 1971, he and his council decided that contract-awarding authority would be vested in another agency and not ADNOC. This other agency was known as "The Petroleum Department" and managed both ADNOC and foreign oil companies partnered with the NOC in joint ventures and participatory agreements. In accordance with Law No. 8 of 1978, "all oil operations and relations with the operating companies of those which have concession agreements should be carried out" by the regulatory agency and not ADNOC. This agency was re-established as the Supreme Petroleum Council (SPC) by Law No. 1 of 1988, with decisions regarding contracts to be made in conjunction with both the monarch and the *Majlis al-Wattani al-Ittihadi* (Parliament).

This was part of a broader agenda of what Zeyed called "partial nationalization" that would allow international oil companies to continue with favorable contracts and regulations, a choice which Rai and Victor attribute to the high geological risks inherent in the country's nascent oil and gas fields.[1] The largest of these was the offshore Umm Shaif field, nearly 9,000 feet below the seabed of the Persian Gulf (which for modern standards is not quite "ultra deep" but when the field was first discovered in 1958 drilling presented formidable challenges). Things were not any easier in the Abu Dhabi's onshore fields: the Murban field was not only deep at 12,500 feet below the surface, but highly pressurized (natural for deeper wells) and rich in sulfur.[2]

In contrast, exploration and production in nearby Kuwait was not so risky given the history of commercial oil operations since 1934.[3] The process of nationalization was formalized by Emir Sabah III al-Sabah with the General Agreement on Participation in 1972 whereby companies would be compensated by the state to the tune of $200 per barrel of oil capacity to gain state-owned equity shares. In Kuwait, the originally agreed upon 25%

[1] Rai and Victor 2012

[2] See http://www.geoexpro.com/articles/2011/03/the-abu-dhabi-oil-discoveries.

[3] Ward 1965.

Table 17: Categorization of regulatory structures for all oil-producing states, 1997–2012

Region	No NOC	Non-regulatory NOC	Regulatory NOC
Americas	Belize Barbados *Canada* Cuba Suriname *USA*	Argentina Brazil Colombia† Peru Trinidad Venezuela	Bolivia Ecuador Mexico
Asia & Oceania	*Australia* *New Zealand* Papua New Guinea Thailand Timor-Leste	India* Pakistan*	Brunei China* Indonesia Malaysia Vietnam
Europe & Eurasia	Croatia Hungary Romania Ukraine *United Kingdom*	*Denmark* *Netherlands* *Norway* Russia Turkmenistan	Azerbaijan Kazakhstan† Uzbekistan
Middle East & North Africa		Bahrain Egypt Oman Qatar Saudi Arabia Tunisia UAE	Algeria Iran Iraq Kuwait Libya Syria Yemen
Sub-Saharan Africa	Chad Gabon	Ghana* Equatorial Guinea Uganda*	Angola Cameroon Congo, Dem. Rep.* Congo, Rep. Nigeria Sudan
Total:	*18*	*23*	*24*

* *Though they do not meet the threshold requirement of oil producer, these countries are included in the table for illustrative purposes given the prominent role their NOCs (CNOOC, CNPC, and Sinopec in China; Perenco in DRC; GNPC in Ghana; ONGC in India; PSO in Pakistan; and UNOC in Uganda) play in their respective political economies. Countries with less-prominent NOCs that do not meet the threshold of oil-producer (and not represented in this table) are Chile, Poland, and South Africa.*

† *Colombia and Kazakhstan restructured from a regulatory NOC to a non-regulatory NOC in June 2003 and March 2010, respectively. Each is coded based on the majority of years of NOC status across 1997-2012.*

Countries labeled in italics are long-established democracies, defined as sustaining a democratic government since 1950. These countries are dropped in robustness checks.

share was increased to 40% in 1972, to 60% in early 1974, and to 100% in mid 1974, when the Western-owned Kuwait Oil Company (KOC) and others became a fully state-owned company. After the nationalization of KOC, Emir Jaber al-Sabah established the Kuwait Petroleum Corporation (KPC) as both the lead producer of the country's oil fields and the regulator of all joint ventures and production-sharing agreements.[4] The petroleum law stipulates in particular that "the Board of Directors (of KOC) shall have powers for ... takeover of existing companies, participating therein, or cooperating therewith in joint activities."[5]

Unlike the UAE, Kuwait's monarchs were not influenced by tough geological constraints which would have forced the state to adopt a strong regulatory agency to manage licenses to international firms.[6] The country's largest producing field is Burgan, which holds nearly 70% of all of Kuwait's oil reserves, and despite high sulfur contents (between 2.5 and 3.1%) production prior to nationalization came from shallow (less than 3,500 ft.) wells with low pressure and moderate temperatures.[7]

It is interesting to note that the decision to vest regulatory authority in a NOC is not necessarily tied to a NOC's production capacity or its ability to participate in day-to-day operations. Table 18 shows a breakdown of 50 countries with NOCs as of 2012. There is a nearly-even split in production capacity of any kind between NOCs with regulatory authority (20) and NOCs without regulatory authority (21). When the bar is raised for what qualifies as production capacity—using a simple metric of producing the majority ($> 50\%$) of the country's oil—the breakdown is similarly even across categories, with slightly *more* producing regulatory NOCs (15) than producing non-regulatory NOCs (11).

In Cameroon, for example, the nationalization of the French oil company Elf Aquitaine in 1980 led to the creation of the state-owned oil company, Société Nationale de Hydrocarbures (SNH). In contrast to ADNOC or KPC, SNH was not founded as an operator or producer of oil; the company only plays a regulatory role wherein SNH manages licensing contracts. Article 4 from Presidential Decree 13-3 of March 1981 stipulates that "the National Hydrocarbon Company (SNH) conducts all studies, collects all information, supervises the execution of contracts between the state and foreign oil companies, and undertakes the training of Cameroonian personnel relative to the petroleum industry."[8] While the state decided against establishing a producing NOC, it opted for a NOC with contract-awarding authority to serve as an intermediary between the state and foreign oil companies in joint ventures.[9] Given favorable geology, the NOC can monitor foreign operators with little information asymmetry, making licensing oversight a relatively straightforward endeavor without having to shift to a more established and intricate regulatory agency. Much of the country's oil is offshore but in relatively shallow waters (less than 75 feet deep) and the quality of crude is high (around 34 API gravity and mostly free of sulfur).

[4] Stevens 2008.

[5] Decree Promulgating Law No. 6 Concerning the Establishment of the Kuwait Petroleum Corporation, amended 4 Sep, 1980.

[6] Zahlan 1998.

[7] See http://www.geoexpro.com/articles/2012/05/the-great-burgan-field-kuwait. Drilling activity since the late 1980s has come from much deeper reservoirs within the Burgan, and coupled with the need for tertiary recovery, has increased geological risks in Kuwait.

[8] Translation from French provided in Mark D. DeLancey, Rebecca Mbuh, and Mark W. DeLancy (eds.) (2010), *Historical Dictionary of the Republic of Cameroon* (Lanham, MD: Scarecrow Press, p. 347).

[9] Gauthier and Zeufack 2009.

Table 18: Variation in institutional pathways, 2012

		Regulatory Authority	
		No	**Yes**
Production Capacity (any)	**No**	3	6
	Yes	21	20

		Regulatory Authority	
		No	**Yes**
Production Capacity (major)	**No**	13	11
	Yes	11	15

Disaggregation of 50 countries with NOCs with respect to production and regulatory capacity. The top table shows production capacity as defined as the ability of the NOC to physically extract and produce crude oil. The bottom table shows production capacity as defined more conservatively as a NOC which produces the majority of a country's oil production. See Table 1 in the main text for the list of countries with NOCs; the table shown here also includes three countries with NOCs but without major commercial oil production: Chile, Poland, and South Africa.

In neighboring Equatorial Guinea, the NOC (Gepetrole) similarly lacks operational capacity, which is handled exclusively by international oil companies. But here the geology is more complex than in Cameroon given the location of wells in deepwater offshore fields.[10] As such, President Obiang opted for a structure wherein the NOC neither produces nor regulates but instead only serves to collect revenues from other operating firms.[11] Because the state lacks even the capacity to discern the appropriate firms to explore and produce its oil, some contract-awarding authority is outsourced to Western oil services firms such as InSies Terra and Glencore.[12] This makes for a non-regulatory and non-producing NOC where theft might be rampant,[13] but there is little opportunity for government agents to solicit bribes from operating firms.

While far from being an exhaustive list of cases, these four are representative of institutional choices in developing countries that have nationalized the oil sector. Political factors may drive the decision to nationalize[14] but the specific institutional choices made by leaders upon nationalization appear driven to a larger extent by geological context and the timing of nationalization with respect to the country's oil production history. Further, countries with high levels of corruption prior to nationalization—such as Cameroon and Equatorial

[10] Mobbs 2001.
[11] Victor, Hults, and Thurber 2012.
[12] Silverstein 2014; Soares de Oliveira 2007.
[13] McSherry 2006.
[14] Luong and Weinthal 2010; Warshaw 2012.

Guinea—opt for both regulatory and non-regulatory NOCs, providing preliminary evidence that even in countries with extremely high levels of corruption and generally poor governance, leaders are not embracing one NOC institutional choice over the other.

2.1. Does pre-existing corruption determine institutional choice?

If countries with pre-existing corruption were more likely to establish regulatory NOCs, then the relationship between NOC choice and bribery could be driven by the effects of pre-existing corruption on both outcomes. Aside from using instrumental variable analysis in the main text, testing for this possibility is difficult given that most nationalizers adopted their regulatory framework in the 1970s, whereas reliable cross-national data on perceptions-based corruption only exists after 1980.

I test whether pre-existing corruption determines a regulatory NOC structure by analyzing the few post-1980 nationalization cases where a new NOC was formed with or without regulatory authority; these cases are listed in Table 19. Across different modeling specifications in Table 20 there is no statistical difference in pre-existing corruption levels across both non-regulatory and regulatory frameworks. While the sample size is too small ($n = 16$) to allow for strong inference, these results show little evidence that pre-existing corruption determines the establishment of regulatory NOCs.

Table 19: NOCs established in 1979-2012

Country	Year established	NOC type
Argentina	2012	Non-regulatory
Azerbaijan	1992	Regulatory
Brunei	2007	Regulatory
Cameroon	1980	Regulatory
Rep. of Congo	1998	Regulatory
Dem. Rep. of Congo	1999	Regulatory
Denmark	1984	Non-regulatory
Equatorial Guinea	2001	Non-regulatory
Gabon*	1979	Non-regulatory
Ghana	1983	Non-regulatory
Jordan	1995	Non-regulatory
Kazakhstan	1996	Regulatory
Sudan	1996	Regulatory
Turkmenistan†	1992	Regulatory
Uganda	2012	Non-regulatory
Uzbekistan	1992	Regulatory

Note that this list only includes countries which pass the "oil-producing" threshold of having at least $100 in oil income per capita in 2011.

* *Gabon effectively privatized its upstream oil sector in 1989 when its NOC, Petrogab, went bankrupt.*

† *Turkmenistan adopted a non-regulatory NOC framework in 1995–1996 with the integration of the Ministry of Oil and Gas.*

Table 20: Pre-existing corruption and NOC choice

	Dependent variable: Regulatory NOC (1=yes, 0=no)			
	Logistic			*OLS (LPM)*
	(1)	(2)	(3)	(4)
Corruption (pct rank)	−2.401	0.235	3.740	0.192
high = less corrupt	(2.104)	(2.682)	(4.963)	(0.508)
Polity score		−0.274	−0.556	−0.050*
high = more democratic		(0.195)	(0.363)	(0.024)
Num. years producing			1.771*	0.189**
(logged)			(1.001)	(0.073)
Observations	16	16	16	16
AIC	24.541	23.486	18.446	
BIC	26.086	25.804	21.537	
Log Likelihood	−10.271	−8.743	−5.223	
R^2				0.512
Adj. R^2				0.391

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Pre-existing corruption levels and the establishment of regulatory NOC structure for 16 countries with nationalization occurring after 1980. Pre-existing corruption is measured using two sources. For the pre-1996 nationalizers, the Business International corruption scores are used; for post-1996 nationalizers, the World Bank KKZ scores are used. For each country, I measure the corruption score for at least one year prior to nationalization. However, since scores are not comparable across time nor across data sources, I operationalize pre-existing corruption as the percentile rank of a country's score in that year compared to all countries for which there is data. This results in a pre-existing corruption rank score which ranges from 0 (most corrupt) to 1 (least corrupt).

2.2. Pre-nationalization factors and sulfur content

A potential violation of the exclusion restriction in the instrumental variables analysis in the text is if the instrument, sulfur content (specifically hydrogen-sulfide, or H_2S), is itself predicted by factors that determine the choice to establish a NOC in the first place. Beyond geology, these factors include population, regime type/state capacity, the size of the oil sector, and regional effects. I test for this violation by regressing sulfur content of oil production prior to nationalization on pre-nationalization population levels, various state capacity measures, oil production levels, and regional dummy variables. For example, to predict the sulfur content of Angola prior to the 1976 nationalization (0.17% H_2S), I use covariates from 1975.

I collected data on population (Maddison, 2007), oil production levels (Ross, 2013), and use basic regional categories of Asia, Europe, Latin America, Middle East & North Africa, and Sub-Saharan Africa. Because state capacity can be measured in several different ways, I use four different variables in the analysis: GDP per capita (following Fearon and Laitin (2003); Data from WDI), regime type as measured by a semi-continuous variable (Marshall, Jaggers, and Gurr, 2011), regime type as measured by a binary democracy variable (Cheibub, Gandhi, and Vreeland, 2010), and the age of the regime in power the in year prior to nationalization (Cheibub, Gandhi, and Vreeland, 2010).

The sample size is 58 countries which have created national oil companies at some point since 1900, but data on sulfur content are missing for 8 of these countries due to the historically early year of nationalization or the small size of oil production levels. The list of missing countries, with nationalization year in parentheses, includes: Italy (1926), Bolivia (1936), France (1941), Poland (1944), Austria (1956), South Africa (1965), Japan (1967), and Jordan (1995). Note that of the countries on this list, only Bolivia qualifies as a major oil-producing state in the analyses presented in the main text.

Results from OLS regression with region fixed effects are presented in Table 21. All coefficients are statistically indistinguishable from zero at the 5% level, suggesting little correlation between sulfur content and pre-nationalization factors of NOC choice. At the 10% level, I find that in one model population is significant—indicating that smaller countries tend to have higher sulfur contents—but this result disappears once any additional covariate is added to the model. A closer look at the data suggests that this result is driven by three countries with high sulfur contents and low populations: Bahrain (2.50% H_2S), Kuwait (2.89%), and Qatar (2.49%). In terms of NOC choice, Bahrain and Qatar adopted non-regulatory NOCs, while Kuwait adopted a regulatory NOC (see above).

In model 1, which only includes region dummies, I find that Asian producers tended to have lower sulfur contents prior to nationalization, while MENA producers tended to have higher levels. While the latter can also be chalked up to the Gulf states (plus Iraq at 2.62% H_2S), the former is driven by the relatively sweet crudes of Brunei (0.08% H_2S) and Indonesia (0.09% H_2S). These results become statistically insignificant in all other models. There is also some evidence for lower sulfur levels in Sub-Saharan Africa, though these results are only significant in two models (and not in the region dummies-only model).

Table 21: Results from OLS analysis of pre-nationalization sulfur content

	Dependent variable:						
	Sulfur content (percent)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Population (logged)		−0.244*	−0.205	0.092	0.135	0.114	0.125
		(0.145)	(0.153)	(0.248)	(0.268)	(0.304)	(0.285)
Oil production (logged)			0.218	0.136	0.129	0.149	0.146
			(0.145)	(0.153)	(0.155)	(0.213)	(0.219)
GDP per capita (logged)				0.383	0.421	0.417	0.429
				(0.254)	(0.270)	(0.311)	(0.297)
Polity score					−0.096		
					(0.212)		
Democracy dummy (CGV)						0.049	
						(0.673)	
Regime age (CGV)							−0.006
							(0.217)
Central and East Asia	−0.539*	−0.387	−0.399	−0.459	−0.482	−0.582	−0.581
	(0.316)	(0.323)	(0.322)	(0.319)	(0.327)	(0.398)	(0.403)
Europe and North America	0.198	0.308	0.136	−0.221	−0.127	−0.298	−0.259
	(0.358)	(0.357)	(0.382)	(0.444)	(0.495)	(0.644)	(0.557)
Latin America	0.079	0.076	0.158	0.153	0.206	−0.099	−0.060
	(0.316)	(0.310)	(0.327)	(0.322)	(0.345)	(0.688)	(0.402)
Mid East and North Africa	0.457*	0.313	0.290	0.409	0.359	0.433	0.437
	(0.237)	(0.247)	(0.247)	(0.255)	(0.280)	(0.292)	(0.286)
Sub-Saharan Africa	−0.506	−0.527*	−0.523*	−0.222	−0.242	−0.231	−0.223
	(0.316)	(0.310)	(0.308)	(0.363)	(0.369)	(0.440)	(0.425)
Observations	50	50	48	48	48	41	41
R^2	0.175	0.225	0.276	0.315	0.319	0.283	0.283
Adjusted R^2	0.084	0.119	0.153	0.178	0.162	0.081	0.081
Note:							*p<0.1; **p<0.05; ***p<0.01

The intercept is omitted from all models to allow for estimation of all five regional dummies. All continuous variables are standardized for ease of interpretation.

2.3. NOC reform in Kazakhstan: Additional details

At the time Kazakhoil was established in 1997, production came primarily from Tengiz (largest in terms of reserves) and other onshore fields. When development first began at Tengiz in 1979, geological complexities were plentiful: the field is onshore but 13,000 feet deep, highly sulfurous (up to 5% hydrogen-sulfide), and rich in carbon dioxide. From 1993 to 1997 Chevron, Tengiz's majority operator, constructed large-scale desulfurization plants and modernized oil processing facilities to ease extraction and subsequent pre-processing before the crude was transported to refineries outside the country.[15] With these upgrades, production costs for Tengiz dropped from $10 per barrel in 1993 to less than $3 per barrel in 1997 (Peck, 2004, 156). What had once been a formidable technical challenge during the Soviet era became "old reliable" once the field was opened to foreign investment after the Soviet collapse. Fields beyond Tengiz were easier to develop given low sulfur contents and relatively shallow deposits.[16] After an initial turbulent period wherein the head of Kazakhoil, Nurlan Balgimbayev, was promoted to prime minister to replace the outgoing PM, Nazerbayev decided in the summer of 1997 that the company would absorb the regulatory responsibilities of the Ministry of Oil and Gas, which would be dismantled until its re-establishment in the 2010 reform.

The prevailing notion was that the NOC, while staffed with novice domestic engineers and managers, could handle monitoring foreign firms operating these onshore fields given the ease of extraction from non-Tengiz fields and that concerns over complexity of Tengiz had been allayed by Chevron's upgrades (Ipek, 2007). Despite its *de jure* inclusion in joint ventures and production sharing agreements, Kazakhoil itself played less of a role in operations than it did in oversight.

Matters changed in the late 2000s with ongoing difficulties at the newly discovered but not yet operational offshore Kashagan field, one of the largest oil discoveries worldwide since the 1970s.[17] Because of its size and because of the projected decline in long-term production from Tengiz and others, Kashagan was to be the future of the industry: according to Nazerbayev, it would make Kazakhstan "bigger than Venezuela."[18] Production was supposed to begin by 2005, but was delayed because the deposits presented the greatest technical challenges to date in the country's oil sector: the field is 14,000 feet under the sea floor of the shallow but often-frozen waters of the northern Caspian Sea (compared to an average depth of 5,000 feet for other offshore Caspian fields), very highly pressurized, scathingly hot (up to 125 degrees Celsius), and extremely sulfurous (between 15 to 20% hydrogen-sulfide, which according to one report was at the time "the biggest concentration ever seen in the offshore oil industry").[19]

At the same time, Nazarbayev grew frustrated with the lack of domestic technical development at KMG, especially with offshore fields. A classified report commissioned by the

[15] Accessed from Tengizchevroil website http://www.tengizchevroil.com/about/milestones on 19 July 2016.

[16] Oil from Kumkol, for example, averages 0.02% hydrogen-sulfide and 1km well-depth. *LukOil Fact Book 2012*, pp. 38-39. Accessed from http://www.lukoil.com/materials/doc/FactBook/2012/part03eng.pdf on 19 July 2016.

[17] Holding an estimated 35 billion barrels, Kashagan's reserves are equivalent to 2.7% of global proven reserves. See "Kashagan oil field starts production." *Oil and Gas Journal*. 11 September 2013.

[18] "How a giant oil project went awry." *The Wall Street Journal*. 31 March 2014.

[19] "Giant oil field in Kazakhstan is a ticking time bomb" *Mondiaal Nieuws*. 29 January 2014.

president cited the company's numerous engineering deficiencies, notably a "lack of technologies and work experience in increasing productivity of old fields", "little experience in the work at the offshore fields", and perhaps most damning, "[t]he company's leadership does not have enough experience in managing such large oil and gas projects as Kashagan."[20] Coupled with the geological complexity of recent discoveries, the need for enhanced oil recovery at Tengiz in the future created pressure on the NOC: no longer could it feasibly monitor IOCs while simultaneously managing its own operational capacity – and importantly having to focus its efforts on improving the domestic talent base among its managers and workers. Faced with this dilemma Nazarbayev decreed on March 12th, 2010, "the activities of KazMunaiGaz should be purely commercial" and that a newly resurrected Ministry of Oil and Gas would relieve KMG of its contract-awarding authority.[21]

Did the reform coincide with other major structural changes?

What else spurred the decline in oil-related corruption besides the 2010 reform? It could be the case that the dropoff in transnational bribery in Kazakhstan's oil sector was the result of forces beyond the NOC restructuring. In indicators presented in Table 22, I show there is little evidence of changes in other leading determinants of corrupt behavior before and after 2010. In short, political factors held constant: Nazarbayev continued his reign as personal dictator, with few changes in the irrelevance of state institutions in checking his power. Economic conditions (outside of 2008–09) and international integration were relatively stable, largely tracking the patterns of regional neighbors such as Azerbaijan, Kyrgyzstan, and Uzbekistan.

In terms of structural political factors, Nazarbayev remained in power as personalist dictator, institutions such as parliament and the judiciary maintained irrelevance in constraining the executive, and the institutional quality of bureaucracies across the political spectrum remained poor.[22] The government's censoring of media outlets continued unabated, with state crackdowns on anti-regime political expressions a regular occurrence. Freedom House's freedom of the press index (out of 100, higher scores are worse) averaged 77 across 2005-2010 and 83 across 2011-2016, with Kazakhstan's press keeping its rank typically between the 170th and 181st least free out of 194-202 countries.

Economic fundamentals were similarly unchanged: total GDP growth continued at a pace of 4-7% since 2010, and growth was at similar levels prior to 2010 with the exception of the 2008-2009 global recession (WDI). Since 2010, unemployment remained constant between 5-6% and wages persisted at 3% of GDP (IMF Article IV reports; hereafter, 'IMF'). The size of government remained flat relative to the economy: 11.1% of GDP in 2007 vs. 10.7% in 2014, and between 10.2-11.7% throughout the period (WDI).

Nor is it the case that corruption declined because the economy increased its ties to international networks of exchange and organization (Gerring and Thacker, 2005). From 2008

[20] "The main problems and opportunities of KazMunayGas in realization of its oil & gas projects" *Wikileaks* Attached File #177891, 10 May 2010 (Report dated February 2010). Accessed 3 July 2016.

[21] "Kazakhstan creates new oil and gas ministry in a major government reshuffle." *Eurasia.* Accessed from https://www.en.neweurasia.info/events-and-opinions1/369-kazakhstan-creates-new-oil-and-gas-ministry-in-a-major-government-reshuffle on 2 July 2016. For details on the reform, see the 2010 Subsoil Act and Chapter 3, Article 12 of the Law on Licensing of the Republic of Kazakhstan.

[22] Freedom House *Freedom in the World* reports.

to 2014, the government joined a single additional international organization, the aforementioned EITI, to bring its total to 53 IOs,[23] and signed only three new bilateral investment treaties since 2010. Trade declined from 76% of GDP in 2009 to 63% in 2014 and has yet to recover from pre-recession highs of 91-94% (WDI). Since the 2010 reform, these figures suggest the economy remained at best moderately tied with the international community, largely tracking the patterns of regional neighbors such as Azerbaijan, Kyrgyzstan, and Uzbekistan.

In the oil sector, production grew at a modest but healthy 2.6% compound annual clip between 2005 and 2015, from 1.3 to 1.7 million barrels per day (2% of global production), while new reserves were being discovered within existing basins. Because of rising commodity prices, fiscal revenues from oil increased dramatically and then plateaued after the 2009 financial crisis—to the point that the government's reliance on oil revenues grew from 23.6% in 2003 to 48.9% in 2010 to 47.6% in 2014 (IMF).Revenue from oil exports grew slightly from $55.2 to $56.6 billion inflation-adjusted dollars between 2010 and 2014, despite the drop in oil prices in mid 2014 (IMF). In the oil sector, despite the tougher geology of Kashagan and other new discoveries, production increased while export revenues remained constant. The number of upstream operators held steady from 2009 to 2014, and four new projects were commissioned out as partnerships with KMG after the reform. In terms of sectoral management, Nazerbayev continued making nepotistic appointments to the Ministry and KMG. Despite occasional "elite shuffling", Nazarbayev staffed these institutions with men close to his son-in-law Timur Kulibaev and select members of the *neftyaniki* ('oil men') (Heinrich and Pleines, 2012). For example, Sauat Mynbayev, a member of the 'Kulibaev group,' served as oil minister from 2007 to 2013 (prior to the 2010 reform, his title was energy minister) and subsequently as president of KMG.[24]

Data on continuing operators show no such pattern, as the number of integrated upstream operators held constant at nine from 2009 to 2014,[25] while four new major projects were commissioned out as joint ventures with KMG from 2011 to 2016.[26] There is also little evidence that increasing geological complexity prompted the exit of oil services firms. UK-based Petrofac, one of the companies implicated in the Unaoil scandal that had been operating in Kazakhstan in the 2000s, left the sector after 2009 but allegedly continued paying bribes in Iraq for developing and processing geologically-challenging fields.[27]

[23]CIA World Factbook. Kazakhstan ascended from observer to member at the WTO on 30 November 2015.

[24]See http://www.kmg.kz/en/corporate_management/board/sauat-muhametbaevich-mynbaev/ Accessed 11 July 2016.

[25]These include: Agip, Total, Chevron, CNPC, ExxonMobil, Inpex, Shell, LukArco, ENI and Lukoil. See USGS *Minerals Yearbooks* and "2015: more defeats than victories." *Petroleum: Kazakhstan Analytical Journal*. 98(2): April 2016. Accessed from http://www.petroleumjournal.kz on 19 July 2016.

[26]These include the Zhenis, I-P-2, Mugadzhar, and Isatai projects. Accessed from KMG's website, http://www.kmg.kz/en/manufacturing/reports/international/, on 19 July 2016.

[27]The bids relate to service contracts worth $793 million for the Badra, Rumaila, and Manjoon fields. All three have sulfur contents above 2% and involve enhanced oil recovery techniques, in addition to removing IEDs from the well surface. Accessed from Petrofac's website, http://www.petrofac.com/en-gb/regions/middle-east/projects/iraq-projects-overview/, on 19 July 2016.

Table 22: Potential determinants of bribery: before and after the 2010 NOC reform

Factor	**Pre-reform**	**Post-reform**	**Source**
Political institutions:			
Regime type (dictatorship type)	Personalist	Personalist	Geddes-Wright-Frantz
Executive constraints (1-7; higher=more constraint)	2	2	Polity IV
Quality of government (0-1; higher=higher quality)	0.47	0.45	ICRG (*via* QoG)
Press freedom (0-100; higher=less freedom)	76.4	81.6	Freedom House
Domestic economic conditions:			
GDP growth (%)	6.7	5.9	World Bank WDI
Unemployment (%)	7.3	5.4	World Bank WDI
Government size (% GDP)	10.9	10.7	World Bank WDI
International trade:			
International organization memberships (total)	52	52	CIA World Factbook
Bilateral investment treaties (total signed)	46	49	UNCTAD
Oil sector:			
Production (mn. barrels per day)	1.3	1.7	BP *Statistical Reviews*
Revenue from oil exports ($ bn.)	55.2	55.6	IMF Article IV reports
Number of integrated upstream operators	9	9	USGS *Minerals Yearbooks*

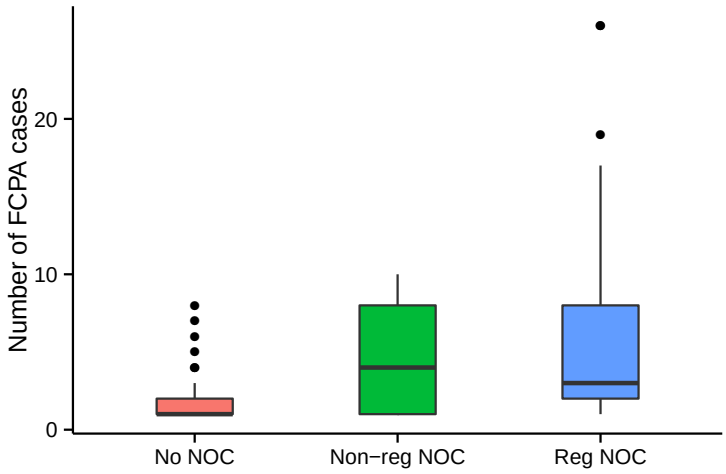
Note: "pre-reform" indicators refer to 2005-2009 averages, "post-reform" refers to 2010–2014 averages.

Appendix 3: Are FCPA data too biased to use as an outcome measure?

Given the reliance on DoJ- and SEC-driven prosecutions and court documents to create the primary outcome measure, we should be concerned about measurement error in the dependent variable and, more importantly (for our estimated coefficients), selection bias. Specifically, FCPA prosecutions could be driven by factors that are conflated with oil-related institutions.

It could be the case, for instance, that US prosecution of corrupt behavior is politically easier when the bribe-recipient is not a formal government official, as is the case when NOC managers receive bribes instead of petroleum ministry officials. The DoJ and SEC may find it more difficult to prosecute FCPA violations against government ministers for fear of political backlash against US economic interests in oil-producing countries, while prosecuting NOC directors bears no such risk of retaliation given their non-governmental affiliations.

Figure 15: Distribution of FCPA cases by regulatory structure



Distribution of the number of FCPA cases in the petroleum sector filed by the Department of Justice or Securities and Exchange Commission, 1997–2013, disaggregated by regulatory structure.

If true, this explanation would suggest that the number of prosecuted cases should be greatest in countries with regulatory NOCs, irrespective of the magnitude of bribes and penalties associated with each case. The data on FCPA prosecutions across all oil-producing states do not show this pattern. As shown in Figure 15, there is no statistical difference in the median number of FCPA cases between countries with the non-regulatory NOC structure versus those with the regulatory NOC structure (if anything, the median is lower in countries with regulatory NOCs). A t-test of the difference in means similarly shows no statistical difference between the two groups. There is, however, a noticeable drop in the number of

FCPA cases in countries without NOCs, though this is due to the inclusion of established democracies such as Australia, Canada, and the UK, along with minor producers in Europe such as Croatia, Hungary, Romania, and the Ukraine.

It could also be the case that the DoJ and SEC go after bribery in certain countries based primarily on political motivations rather than actual corruption on the ground. For example, it is clear that the US maintains strong diplomatic and military ties with some oil producers but not others. As such, we might expect the DoJ to refrain from going after corruption occurring in places that are "friends of the US" while primarily prosecuting companies doing business in "unfriendly" places. We might also expect that countries with bilateral investment treaties with the US may also be spared from DoJ investigations, while companies operating in countries without BITs might be more subject to FCPA violations.

One could construct further arguments for why the FCPA measure of corruption suffers from this kind of selection bias, including the very arguments made about using perceptions-based measures such as the TI-CPI. If these factors were also to be strongly correlated with countries that have regulatory NOCs, then the main findings would indeed be biased by these and otherwise similar omitted variables.

While it is impossible to test against all such omitted variables, I use proxies to capture these constructs and include them as controls in the regression models in the main text. In addition, I model violations as a function of political motivations (again, using proxies) and use the residuals from this model as a dependent variable. The idea is to capture variation in FCPA-related bribes not due to political factors that would influence the DoJ and SEC in prosecuting a firm doing business in a given country. If the model is specified properly, then the resulting residuals should represent investigations driven by the presence of corrupt practices only, without any prosecutorial bias.

In the first step, I consider a number of possible explanations for why the DoJ and SEC would or would not target a given country for FCPA violations. These are proxied by the pattern of voting with the US (*Percent Agreement*) at the United Nations General Assembly (Bailey, Strezhnev, and Voeten, 2016), the number of bilateral investment treaties with the US (Elkins, Guzman, and Simmons, 2006), and whether or not the country has a defense pact with the US (from the Correlates of War project). After regressing these factors on oil-related bribes, I compute the residuals from the model and use them in a regression with the same model specification as the main analysis in the paper.

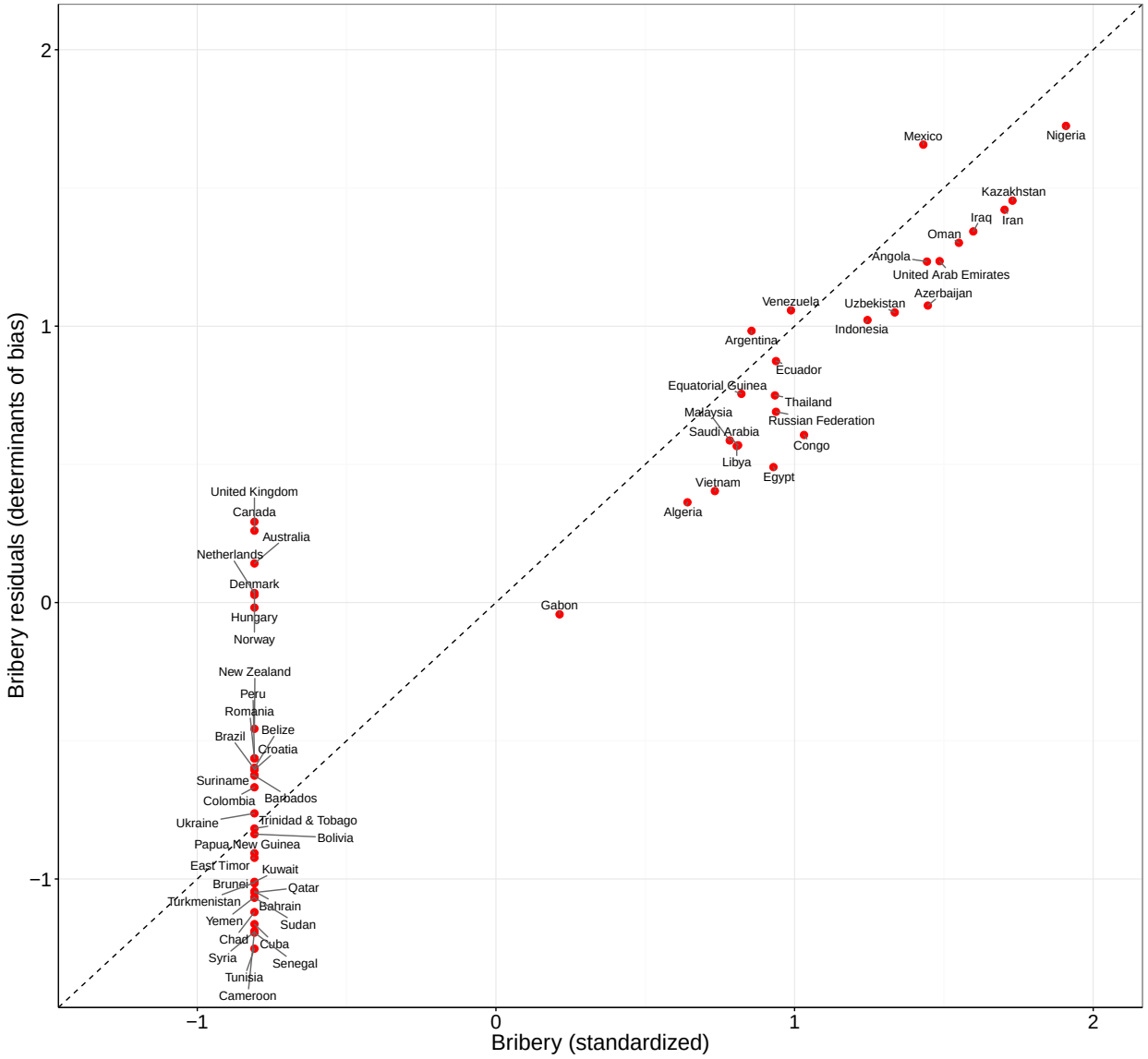
Results from this procedure are shown in Table 23, with the first step estimates in column 1 and the second step in column 2. While countries with high agreement with the US in the UNGA are predicted to have no bribes in the oil sector (and thus no prosecutions), accounting for this bias does not change the main result that countries with regulatory NOCs have higher FCPA-related bribes. Adding in perceptions of corruption as an additional covariate in the first step regression (column 3) nearly halves the UNGA coefficient, but similarly does not alter the coefficient for regulatory NOC in the second step (column 4). As a robustness check, I run a model with all covariates in conventional one-stage OLS and the result for regulatory NOCs persists. Indeed, across all three models (2, 4, and 5) the coefficient for regulatory NOC is close to 0.51, the estimated coefficient from the main model in the text.

While the main result persists in these models, there is nonetheless some evidence for prosecutorial bias present in FCPA investigations. If I plot the residuals from model 1 against the actual amount of bribery captured in FCPA investigations, I can discern where the model

Table 23: Modeling determinants of FCPA prosecutions

	Dependent variable:				
	Bribery	Residuals	Bribery	Residuals	Bribery
	(1)	(2)	(3)	(4)	(5)
UNGA: Percent Agreement with USA	−0.409**		−0.225		−0.365
	(0.196)		(0.254)		(0.244)
BITs (count) with the US	0.207		0.057		0.216
	(0.279)		(0.301)		(0.251)
Defense pact with the US	−0.340		−0.233		−0.280
	(0.296)		(0.308)		(0.342)
Regulatory NOC		0.522**		0.495**	0.489*
		(0.242)		(0.239)	(0.249)
GDP per capita (logged)		0.112		0.200	0.259
		(0.153)		(0.151)	(0.238)
Oil income (logged)		0.322**		0.319**	0.310*
		(0.156)		(0.156)	(0.172)
Regime (Polity)		0.016		−0.097	−0.101
		(0.222)		(0.219)	(0.246)
Press freedom		−0.074		−0.143	−0.218
		(0.228)		(0.225)	(0.306)
Population (logged)		0.502***		0.538***	0.564***
		(0.121)		(0.128)	(0.139)
TI - CPI score			0.233		0.236
			(0.187)		(0.247)
Constant	0.030	−0.183	0.059	−0.198	−0.174
	(0.184)	(0.136)	(0.186)	(0.135)	(0.197)
Observations	59	59	58	58	58
R^2	0.160	0.387	0.181	0.393	0.510
Adjusted R^2	0.114	0.316	0.119	0.321	0.406
Note:					*p<0.1; **p<0.05; ***p<0.01

Figure 16: Visualizing prosecutorial bias in FCPA-related bribery



Comparing actual FCPA-related bribery in the oil sector (used as the main dependent variable in the analysis) with residuals from a model accounting for potential sources of prosecutorial bias. Residuals based on results shown in column 1 in Table 23.

would suggest under-reporting of corruption based on prosecutorial bias—reflected in cases that are far above the 45-degree line—as well as over-reporting of corruption—reflected in cases far below the 45-degree line. I find that there is likely to be under-reporting of corruption in the long-established democracies (Australia, Canada, Denmark, Netherlands, and Norway), which is not surprising given strong economic ties with the US and fear of political backlash for DoJ-led investigations in these countries. This is one reason, among many others, why I omit these cases in robustness checks of the regression analyses in the

main text. Interestingly, there is no strong evidence of over-reporting of corruption, although cases such as Egypt and the Congo (Republic) are roughly 0.5-standard deviations from the fitted line. This would suggest that perhaps the DoJ is going after FCPA violations in these countries at a higher rate than otherwise. Indeed, both states are relatively small oil producers yet have high amounts of reported bribery, a fact that by itself is suggestive of possible over-reporting of corruption in the oil sector.

In addition to the two-step models above, I assess whether these factors of prosecutorial bias influence the decision to investigate an FCPA case in a given country using Heckman's classic selection model. Here I use a binary variable to indicate whether or not a country was implicated in an FCPA case ($D_i = 1$ if bribery is investigated and captured by the DoJ or SEC, $D_i = 0$ otherwise):

$$D_i = \begin{cases} 1 \text{ if } \textit{Bribery}_i > 0 \\ 0 \text{ if } \textit{Bribery}_i = 0 \end{cases}$$

With this variable, I test the following selection and outcome models:

$$\Pr(D_i = 1) = \alpha_0 + \alpha_1 \textit{UN percent agree}_i + \alpha_2 \textit{BIT}_i + \alpha_3 \textit{Defense pact}_i + \alpha_4 \textit{CPI}_i + \epsilon_{1i}$$

$$\begin{aligned} \textit{Bribery}_i = \beta_0 + \beta_1 \textit{Reg NOC}_i + \beta_2 \textit{GDP per capita}_i + \beta_3 \textit{Oil income per capita}_i \\ + \beta_4 \textit{Polity}_i + \beta_5 \textit{Press freedom}_i + \beta_6 \textit{Population}_i + \epsilon_{2i} \end{aligned}$$

where *Bribery*, *GDP per capita*, *Oil income per capita*, and *Population* are logged, and all continuous variables are standardized as in the main regressions. Note that the correlation between ϵ_1 and ϵ_2, denoted by ρ, is estimated from the data (and not assumed to be fixed at zero). I include the TI-CPI scores here as well to assess the degree to which perceived corruption influences DoJ and SEC prosecutions. Results from various specifications of this model are presented in Table 24, with results from the model specification above presented in column 4.

The model including the covariates from the main regressions in the text, in this case column 4, shows that the regulatory NOC finding persists at statistically significant levels, though with coefficients estimated at smaller magnitudes (0.36, compared to the main regression finding of 0.51). As with the two-step models in Table 23, there is evidence that states with similar voting patterns to the US at the UN General Assembly (a proxy for "friends of the US") are much less likely to be investigated by the DoJ and SEC for FCPA violations occurring within their borders. This result persists even after removing the seven long-established democracies from the sample. But again, even after controlling for this prosecutorial bias, my finding that regulatory NOCs have higher levels of corruption remains robust.

It should be noted, however, that the Heckman selection models for columns 1 and 3—where I find the strongest results for the percent agreement variable—may be improperly

specified given the extremely high estimates of ρ.[28] Despite reasonable Mills ratios, these results should thus be interpreted with caution.

Overall, there appears to be little support for the argument that the relationship between NOC structure and corruption is driven by politically-motivated probabilities of prosecution as estimated by two-step models as well as by the raw count of FCPA cases pursued by the DoJ and SEC in a given country. While political factors appear to drive the choice of investigation sites by the DoJ and SEC—notably refraining from investigations in countries with a high percentage of agreement with the US at the UN General Assembly—incorporating these determinants of bias does not change the main finding that regulatory NOCs foster environments with higher levels of bribery.

[28]Estimating ρ from the reported inverse hyperbolic tangent of ρ for these models gives values of $\hat{\rho}$ close to 1.

Table 24: Heckman selection models of FCPA prosecutions

	(1)	(2)	(3)	(4)
First stage results, DV: Binary indicator for FCPA prosecution				
UNGA: Percent agreement with the US	-1.055***	-0.889	-1.853***	-1.069
	(0.363)	(0.577)	(0.383)	(0.670)
BITs with the US		0.241		0.305
		(0.465)		(0.428)
Defense pact with the US		-0.300		-0.367
		(0.444)		(0.441)
TI-CPI score		0.440		0.369
		(0.291)		(0.308)
Constant	-0.397*	-0.475	-0.793***	-0.528
	(0.207)	(0.358)	(0.236)	(0.383)
Second stage results, DV: FCPA-related bribes (logged $)				
Regulatory NOC	0.277*	0.284*	0.242	0.361**
	(0.153)	(0.164)	(0.193)	(0.177)
GDP per capita (logged)			-0.0376	-0.123
			(0.234)	(0.166)
Oil income (logged)			0.0709	0.374**
			(0.116)	(0.164)
Regime (Polity)			-0.322	-0.370**
			(0.224)	(0.168)
Press freedom			-0.203	-0.489*
			(0.347)	(0.258)
Population (logged)			0.199***	0.389***
			(0.00871)	(0.127)
Constant	0.502*	0.799**	0.444***	0.594***
	(0.266)	(0.336)	(0.0891)	(0.218)
atanh ρ	1.804	0.543	17.08	0.693
ln σ	-0.526	-0.879	-0.596	-1.040
λ (Inverse Mills ratio)	0.560	0.206	0.551	0.212
N	59	58	59	58

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix 4: Primary data sources for NOC data

I code whether a country has a regulatory NOC, non-regulatory NOC, or no NOC based on primary documents such as petroleum laws, petroleum contracts, national oil company annual reports, and national oil company websites. I supplement this information at times with secondary accounts of the petroleum history of each country.

To assess the *de facto* institutional structure and to differentiate between contradictions in *de jure* institutional structure and oversight, I draw on accounts from the United States Geological Survey *Minerals Yearbooks* from 1932 to 2014, the International Comparative Legal Guides (ICLG), the Oil, Gas & Energy Law *Global Energy Law & Regulation Portal*, and the Natural Resources Governance Institute *Resource Governance Index* reports.

A full list of primary documents for each country is presented below, including countries which later privatized their national oil companies (Canada, Gabon, and the UK). Unless noted otherwise, all documents are printed and available in English. Petroleum contracts are indicted with brackets referring to the signing date, where avaibable. All contracts are downloaded from the *OpenOil Repository* at repository.openoil.net/wiki.

Note that the list is not intended to be a comprehensive list of a country's petroleum laws or contracts, but rather indicates which documents were consulted to create the NOC database.

Algeria
Hydrocarbon Law, Law No. 86-14 of 19 August 1986
Algeria dd19891023 Exploration-Exploitation [Contract, signed 23 October 1989]

Angola
Law No. 13/78: General Petroleum Activities Law (1978)
Law No. 10/04: Petroleum Activities Law (2004)
Decree 48-06 of 1 September (2006)
Angola Block-5-06 dd20061101 PSC [Contract, signed 1 November 2006]

Argentina
Law 7059 of 6 September 1910
Hydrocarbons Act No. 17,319 (1967)
State Reform Act No. 23,696 (1989)
Hydrocarbons Sovereignty Act No. 26,741 (2012)

Azerbaijan
Article 14, The Constitution of the Republic of Azerbaijan (1995)
State Oil Company of Azerbaijan Republic (SOCAR) Charter (2003)

Bahrain
Law No. 12 (1975), translated from Arabic

Bolivia
Law 21 of December 21st (1936)
Bolivia Block-XX-Tarija-Oeste dd20061028 Operation-Contract [Contract, signed 28 October 2006]

Brazil
Decree-Law No. 395 of 29 April 1938
Decree-Law No. 538 of 7 July 1938
Petroleum Law, Law No. 9.478 (1997)
Pre-Salt Law, Law No. 12.351 (2010)

Brunei
Brunei National Petroleum Company Order of 14 January 2002
Brunei Darussalam Block-L dd20060828 PSC [Contract, signed 28 August 2006]

Cameroon
Article 4 from Presidential Decree 13-3 of March 1981
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