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Are oil and gas firms more likely to engage in unethical practices than other firms?

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ABSTRACT

In this study we investigate the unethical practices undertaken by the oil and gas firms vis-à-vis other firms. We find that oil and gas firms operating in non-competitive industries are more likely to engage in unethical practices. The results are particularly strong in countries that rank poorly in legal enforcement, regulations and institutional framework, and import less oil. Policy makers should consider undertaking steps to encourage competition in the industry to limit unethical practices. Further, the country-level enforcement laws, regulations, and institutional quality need to be reformed, especially in developing countries, to discourage firms from gaining undue benefits.

1. Introduction

The role of oil and gas firms engaged in unethical practices[1] to gain undue benefits remains controversial with a number of studies indicating that corruption is prevalent in the oil and gas industry. In an influential report published by OECD (Foreign Bribery Report),[2] more than 400 cases of bribery are investigated. Out of these cases extractive industries (19%) emerged a most corrupt industry. Similarly, a report published by Transparency International, a global advocate of the fight against corruption, found the oil and gas sector was third amongst the 19 bribery-prone sectors surveyed.[3] Al-Kasim et al. (2013) conduct an in-depth interview with Norwegian specialists in oil regulation, while Ofori and Lujala (2015) study the Ghana market. Both the papers indicate that corruption is a concern in an oil and gas industry. However, as highlighted by Al-Kasim et al. (2013), empirical evidence into the relationships between oil and gas industries and corruption is limited to date.

The role of country-level determinants in discouraging oil and gas firms from engaging in unethical practices has been overlooked in the literature. For example, as per the resource curse phenomenon, resource boom leads to lower GDP (Robinson et al., 2006). Countries that are rich in natural resources can experience either positive or negative economic growth (Kolstad and Wiig, 2009; Al-Kasim et al., 2013; Leite and Weidmann, 1999). In fact, Mehlum et al., (2006a, 2006b) and Robinson et al. (2006) suggest that the relationship between natural resources and growth of a country is conditional on the quality of institutions. Abundant natural resources and better institutional quality play a complementary role in increasing the economic growth. On the country, countries that have poor institutional quality have lower economic growth even if there is abundant supply of natural resources. Further Majbouri (2016) shows that resource-rich countries have a lower level of entrepreneurship as the focus turns from increasing productivity and efficiency to rent-seeking and patronage.

Additionally, there is a dearth of studies investigating the role of competition in driving firms to engage in unethical practices. This is highlighted by Al-Kasim et al. (2013), where the authors indicate competition levels and governance influence unethical practices. Similarly, Gupta (2016) shows that competition in an industry is a strong determinant of oil and gas stock returns.

We address this gap using a comprehensive dataset of 25,702 firm-year observations drawn from 53 countries spanning 2002–2012. We show that oil and gas firms are not more likely to engage in unethical practices as compared to other firms. However, the relationship between oil and gas firms and unethical practices is stronger and statistically significant when we condition our results on the competition level of the industry. We show that oil and gas firms operating in a non-competitive industry are more likely to engage in unethical practices.

Next, we examine the role of country-level determinants in

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[1] We include a range of misconducts, such as corruption, bribery, lobbying, money laundering etc. under the common term “unethical practices”.

[2] http://www.oecd.org/corruption/oecd-foreign-bribery-report-9789264226616-en.htm.

[3] http://archive.transparency.org/publications/publications/bribe_payers_index_2011.

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dissuading firms from engaging in unethical practices. We find the oil and gas firms operating in non-competitive industries are more likely to be involved in unethical practices and this is predominantly seen in countries that rank poorly in legal enforcement, regulations, and institutional quality. This suggests that a weak institutional framework may exacerbate corruption and potentially increases the firm's intention to engage in unethical practices. Additionally, we find the effect is stronger in oil-rich countries, i.e., countries that depend less on oil imports. Thus our results support the resource curse phenomenon where resource-rich countries suffer from rent-seeking, patronage and corruption primarily due to poor institutional quality.

This study contributes to the literature in a number of ways. First, prior studies mostly use case studies to highlight the corruption practices in the oil and gas industries. Although, these studies enhance our understanding of why firms engage in unethical practices, the empirical evidence that includes firm-level data from multiple countries is limited to date. To the best of our knowledge, this is the first study to test this link using a comprehensive firm-level data covering multiple countries.

Second, previous studies mostly undertake an analysis on a single country and therefore cross-country variation in regulations, laws and institutional quality are not properly explored. For instance, considerable evidence suggests that the tendency to undertake unethical practices is linked to the socioeconomic condition of the country, such as the resource curse phenomenon. This is also consistent with Jeong and Weiner (2012), where the authors note that country-level determinants play an important role in controlling the firm's intention to engage in unethical practices. Therefore, we complement the literature by empirically documenting that country-level determinants are important attributes in explaining the likelihood of firms engaging in unethical practices.

Third, considerable evidence indicates that product market competition influences corporate decision-making. For instance, Shleifer and Vishny (1997 p.738) claim that product market competition is “the most powerful force toward economic efficiency in the world”. In the context of oil and gas firms, Gupta (2016) show that the stock returns and oil price shocks are different for the firms operating in a competitive vis-à-vis non-competitive industry. In this paper, we show that the competition level is also an important factor that influences a firm's tendency to engage in unethical practices.

The results from this paper may be of particular interest to policy makers, regulators and market participants. Extractive industries, such as oil and gas, have a significant impact on the economy of the country through revenue generation, tax collection and export. One of the prime challenges is to control rent-seeking, patronage and corruption and to develop strong institutional framework that encourages productivity, efficiency and innovation (Kolstad and Søreide, 2009). The results from this study suggest that low competition in the oil and gas industry increases the likelihood of firms engaging in unethical practices. Therefore, policy makers should consider undertaking steps to encourage competition in the industry. Encouraging competition will increase efficiency, productivity, and cost control and at the same time limit the ill effects of rent-seeking and patronage. The results also suggest that country-level enforcement laws, regulations and institutional quality need to be reformed, especially in developing countries, to discourage firms from gaining undue benefits.

Extractive Industries Transparency Initiative (EITI) and other initiatives are undertaken to encourage countries and firms to be more transparent in disclosing revenues. However, becoming a member of EITI is although an important step, but not the only way to limit unethical practices in the extractive industries. Following Kolstad and Søreide (2009), policy makers should focus more on curbing rent-seeking, patronage and corruption problems than macroeconomic management.

The rest of this paper is organised as follows: The literature is reviewed in Section 2. Data and Methodology is presented in Section 3. In Section 4, we present empirical results and their implications. Finally, Section 5 summarises research findings and concludes.

2. Background literature

The issue of corruption and its negative effect on the business environment has been well documented in literature. The focus of the literature is on the resource curse phenomenon and this arises mainly from rent-seeking, patronage, poor institutional quality and corruption (Al-Kasim et al., 2013; Kolstad and Søreide, 2009). Rent-seeking occurs when individuals are more interested in obtaining economic benefits from society through manipulation of the social and political environment. Patronage refers to a situation where government attempts to stay in power by providing economic and other incentives to its supporters. Consistent with this, Frynas (2010) alleges that the incentives to engage in unethical practices are higher in the oil and gas industry as it has great political power. Resource curse phenomenon is primarily seen in resource-rich countries with poor institutional quality, but is not limited to these countries. For instance, evidence suggests that energy firms deliberately reported lower prices than the actual market price in order to pay a lower royalty cost (New York Times, 1/23/2006).[4]

Several theoretical models are developed to explain why firms are engaged in unethical practices. For instance, Harstad and Svensson (2011) present a theoretical model and illustrates that firms can either comply, bribe or lobby in order to extract favourable regulations. Similarly, Fredriksson et al. (2004) present a theoretical model and show that an increase in corruption leads to a less stringent energy policy.

Another strand of literature highlights the nexus between unethical practices, regulation and lobbying. Bjertnæs and Fæhn (2008) document that energy-dependent industries are often exempt from paying taxes in many countries. The possible reason for this favourable treatment is likely to be attributed to powerful lobby groups. They also add that the likelihood of engaging in corruption increases significantly in the oil and gas industry as the sector involves high-value investment and interaction with government officials. Schweitzer (2010) allege that oil companies are likelier to spend a significant amount of money on lobbying to promote their self-interest. Further, Slack (2012) documents that firms are more interested in window dressing socially responsible practices and this is prevalent in developing countries.

Literature also suggests that group lobbying can influence regulation. For instance, four major oil companies (BP, Caltex, Mobil and Shell) in Australia successfully lobbied against the Australian Government to remove the regulation of unleaded petrol prices (Valadkhani, 2013). Similarly, Marques et al. (2010) states that oil and gas companies lobby against alternative energy to protect their self-interest. This finding is supported by Huang et al. (2007) and Sovacool (2009) who note that strong lobbying from traditional energy sources results in a delay of alternative energy usage. Collectively, the evidence suggests that firms engage in unethical practices in order to extract favourable regulation and to generate positive perception through lobbying and other activities.

Several studies show that in addition to firm-level determinants, country-level determinants also drive incentive to engage in unethical practices. For instance, Jeong and Weiner (2012) find that country-level determinants play an important role in controlling the firm's intention to engage in unethical practices. The authors note that firms are likelier to engage in unethical practices in countries that have poor legal enforcement and regulations. Similarly, Baughn et al. (2010) indicate that the chances of firms engaging in corruption are likely to be greater in countries where corruption is tolerated. In a different context, Voyer and Beamish (2004) show that the flow of Foreign

[4] http://faculty.washington.edu/mturn/NYT1-27-06Oilprofits.pdf.

Direct Investment (FDI) is impeded the presence of a weak country-level legal framework and regulations. The authors show that a negative relationship exists between corruption in emerging economies and Japanese FDI. Thus, trust and reputation influences the investment flow in a country.

With a view to curb corruption, especially in resource-rich countries, EITI was launched in 2002. The major objective of EITI is to increase transparency and raise public awareness in Government revenue and company payments in the extractive industry. However, the effectiveness of EITI in curbing corruption is debatable. For instance, Kasekende et al. (2016) show that EITI has not helped in reducing corruption scores.

3. Data and methodology

We use the Asset4 dataset which primarily covers firm-level information related to environmental, social, economic and governance (ESG) indicators. Within this dataset, a binary indicator reports whether a firm is suspected of engaging in unethical practices. This indicator is defined as, "Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?" Asset4 returns "Y" if the firm is reportedly engaged in unethical practices. We term this indicator as "Unethical Practices". Asset4 does not solely rely on the feedback of the company as multiple sources, such as stock exchanges filings, annual reports, company websites and various other media outlets are used to verify the accuracy and quality of the information. We restrict our sample period from 2002 to 2012 as the coverage of the Asset4 dataset starts from 2002.

3.1. Product market competition

We construct *Sales Herfindahl-Hirschman Index (HHI)* as a proxy for product market competition. This measure is extensively used in the literature, particularly in the industrial organisation literature (see Tirole, 1988, among others). It is calculated by squaring the market share of each firm in the industry within the country and then adding the resulting numbers. The competition measure is calculated for each industry within a country and represented as a formula below:

$$Sales\ HHI_{j,c,t} = \sum_{i=1}^{N_j} s_{i,j,c,t}^2 \quad (1)$$

where $s_{i,j,c,t}$ is the sales market share of firm i in industry j, country c, in year t. By the measure of construction, the theoretical range of HHI measure lies between zero and one. A low HHI suggests that the industry is competitive, whereas a high HHI suggests that the industry is non-competitive. We use the Worldscope database to obtain sales figures of publicly listed firms.

3.2. Control variables

In order to control the effect of other variables that influence a firms' intention to engage in unethical practices, we use the size of the firm, risk, growth opportunities, and block holdings. To control the influence of firm size on unethical practices, we include a log of total assets, with the value of total assets converted from domestic currency to equivalent US$. We include leverage, the stock return standard deviation and illiquidity as the measures of riskiness of the firm. We measure leverage as a long-term debt divided by the total assets. Return SD is computed as the daily standard deviation of stock returns over the last one year. We calculate illiquidity as per the Lesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid. To proxy growth opportunities, we include PTBV and ROA. PTBV is the price to book value and ROA is the return on assets. We include Blockholding (percentage shares closely held) as a measure of monitoring by large owners. We retrieve these variables from Datastream and Worldscope. We winsorize the control variables at the 1 and 99 percentile to minimize the effect of outliers. To improve the quality of the data, we follow Ince and Porter (2006) and Chui et al. (2010) to address the data issues noted in Datastream and Worldscope. The empirical analysis is undertaken using Stata Special Edition (version 13.1).[5]

3.3. Data description

In Table 1, we present a brief description of our sample and country-level determinants. The final sample consists of 25,702 firm-year observations from 53 countries, dependent territories, and off-shore financial centres. We find that many countries have a small number of firm-year observations, such as Jordan, Nigeria and the United Arab Emirates. We consider excluding countries with less than 10 firm-year observations but these do not alter our main findings. Similarly, excluding dependent territories and off-shore financial centres, such as the British Virgin Islands and Cayman Islands, among others, do not affect our main findings.

We also report country-level determinants retrieved from the World Economic Forum (WEF) report. The first country-level determinant is *Irregular Payment and Bribes*. As per the WEF, this variable is the average score across the five components of the Executive Opinion Survey defined as, "In your country, how common is it for firms to make undocumented extra payments or bribes connected with (a) imports and exports; (b) public utilities; (c) annual tax payments; (d) awarding of public contracts and licenses; (e) obtaining favourable judicial decisions? ". The higher the score, the less likely irregular payments and bribes are made.

The second country-level determinant we include in this study is *Favoritism in Decisions of Government Officials*. This variable is also derived from the Executive Opinion Survey and defined as, "To what extent do government officials in your country show favoritism to well-connected firms and individuals when deciding upon policies and contracts?" The higher the score, the less likely the government officials show favoritism in the country.

The third country-level determinant is *Ethical Behaviour of Firms*. This variable is defined as, "How would you compare the corporate ethics (ethical behaviour in interactions with public officials, politicians, and other enterprises) of firms in your country with those of other countries in the world?" A higher score indicates less likelihood of the firms engaging in unethical practices.

The last country-level determinant we include in this study is *Trustworthiness and Confidence*. Similar to the previous three determinants, the higher the score, the more trustworthy the firms in the country.

In Table 2 report, we group the firms into oil and gas firms and other firms. We use the International Classification Benchmark (ICB) provided by FTSE International to assign stocks to either oil and gas or other industries. As expected, the oil and gas firms comprise a small percentage (6.92%) of the overall sample. We find that the sample coverage has progressively increased from 2002 except in the year 2012.

In Table 3, we report the summary statistics of the key variables used in this study. We find on average 10% of firms reported in the media are suspected of bribery, corruption, political corruption or lobbying. The mean and median Sales HHI is 0.152 and 0.091 respectively, indicating that on average firms operate in a moderately competitive industry. The indicators of riskiness in the firm-average leverage ratio, return SD and illiquidity are reported as 18.37%, 2.30% and 7.26% respectively. The growth indicators of the firm-average

[5] The data and commands are available from the author on request.

Table 1
Sample description and country-level determinants.

	Country	Firm-year	Irregular payments & bribes	Favoritism in decisions of government officials	Ethical behaviour of firms	Trustworthiness & confidence
1	Australia	1591	5.71	4.04	5.45	6.32
2	Austria	147	5.39	3.87	5.56	4.98
3	Belgium	213	5.61	4.04	5.34	4.61
4	Bermuda	373	NA	NA	NA	NA
5	Brazil	174	3.87	2.9	3.75	4.96
6	British Virgin Islands	7	NA	NA	NA	NA
7	Canada	1438	5.77	4.22	5.69	5.76
8	Cayman Islands	211	NA	NA	NA	NA
9	Chile	77	5.66	4.12	5.1	5.25
10	China	310	3.99	4	4.17	4.62
11	Czech Republic	14	3.69	2.42	3.55	4.94
12	Denmark	204	6.08	4.42	6.15	5.4
13	Egypt	24	3.35	2.95	4.09	3.48
14	Finland	231	6.65	5.27	6.44	6.18
15	France	796	5.4	3.85	5.22	5.1
16	Germany	545	5.67	4.63	5.67	5.06
17	Gibraltar	5	NA	NA	NA	NA
18	Greece	111	3.57	2.55	3.48	3.16
19	Hong Kong	375	6.11	4.05	5.62	6.53
20	Hungary	13	4.33	2.49	3.73	4.84
21	India	327	3.22	2.79	3.75	5.47
22	Ireland	221	6.14	4.12	5.42	4.41
23	Israel	51	5.39	3.32	4.88	5.63
24	Italy	412	3.84	2.37	3.63	3.73
25	Japan	3535	6.13	4.8	5.81	5.28
26	Jersey	73	NA	NA	NA	NA
27	Jordan	3	4.94	3.78	4.42	3.93
28	Kuwait	7	4.45	2.75	3.95	4.31
29	Luxembourg	40	6.24	4.44	5.92	5.32
30	Malaysia	145	4.7	4.05	5.01	6
31	Mexico	52	3.59	2.91	3.75	4.95
32	Netherlands	303	6.09	5.12	6.01	4.92
33	New Zealand	87	6.69	5.31	6.57	6.46
34	Nigeria	3	2.57	2.16	3.24	4.93
35	Norway	165	6.29	4.99	6.19	5.59
36	Panama	19	4	2.9	3.96	5.06
37	Philippines	60	3.31	3.03	3.98	4.65
38	Poland	79	4.76	3.13	4.08	5.53
39	Portugal	101	5.16	3.05	4.39	3.78
40	Russia	131	3.24	2.59	3.66	3.49
41	Saudi Arabia	23	5.52	4.24	5.11	5.08
42	Singapore	346	6.51	5.42	6.33	6.47
43	South Africa	336	4.59	2.46	4.73	6.72
44	South Korea	358	4.35	2.96	3.81	4.59
45	Spain	389	4.75	3.14	4.14	4.14
46	Sweden	449	6.16	5.33	6.17	5.76
47	Switzerland	565	6.17	4.88	6.24	5.69
48	Taiwan	427	5.11	4.23	5	4.97
49	Thailand	83	3.76	2.83	3.98	4.88
50	Turkey	91	4.48	3.35	4.21	4.76
51	United Arab Emirates	3	6.36	5.07	5.67	4.8
52	United Kingdom	2624	5.99	4.35	5.76	5.51
53	United States	7335	4.94	3.34	4.9	5.54
	Total	**25,702**				

PTBV and ROA are 2.737% and 6.18% respectively. We also find that on average 25.58% of shares are closely-held. In summary, we find the values of the variables fall within the expected range.

Before undertaking any empirical analysis, we check if the variables have a unit root problem. We perform a modified Dickey-Fuller *t*-test, proposed by Elliott et al. (1996) to check if the unit root problem exists. In unreported results, we find that all our variables are stationary. The DF-GLS *tau*- statistic is outside of the one percent critical value in all four lags and therefore the null hypothesis of unit root is rejected.

In Table 4, we present the correlation coefficient between our key variables. We find that the relationship between unethical practices of the oil and gas firms dummy is statistically not significant. Larger firms are likelier to engage in unethical practices, while more profitable firms and closely held firm are less likely to do so. We also investigate the possibility of high multi-collinearity between our independent variables. In Table 4, we do not find a correlation coefficient exceeding absolute 0.50.

4. Empirical results

4.1. Main results

We model the likelihood of oil and gas firms engaging in unethical practices by performing the following logit model:

Table 2
Year-wise distribution of sample.

Year	Oil firm-years	Non-oil firm-years	Total
2002	39	780	819
2003	40	1117	1157
2004	109	1715	1824
2005	126	1836	1962
2006	137	1858	1995
2007	150	1968	2118
2008	220	2500	2720
2009	240	2878	3118
2010	258	3217	3475
2011	271	3447	3718
2012	190	2606	2796
Total	**1780**	**23,922**	**25,702**

In Table 2, we report the year-wise breakdown of a full sample into oil and gas firms and other firms. We use the International Classification Benchmark (ICB) provided by FTSE International to assign stocks to the oil and gas and other industries.

Table 3
Summary statistics of key variables.

Variable	Mean	StDev	Median	Skewness	Kurtosis
Unethical Dummy	0.101	0.301	0.000	2.655	8.051
Oil Dummy	0.069	0.254	0.000	3.393	12.514
Sales HHI	0.152	0.147	0.091	2.319	9.644
Log of Asset (~US$)	15.701	1.677	15.558	0.379	3.659
Leverage	18.37%	15.74%	15.88%	0.953	3.840
PTBV	2.737	3.185	1.900	5.441	50.259
ROA (%)	6.183	8.460	5.380	0.512	14.918
Blockholding (%)	25.581	23.869	19.220	0.806	2.671
Return SD	2.30%	1.20%	2.01%	3.599	62.934
Illiquidity	7.26%	6.02%	5.75%	4.183	35.973

In Table 3, we report summary statistics of the key variables used in this study. Unethical Dummy is a binary indicator defined as, "Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?" Oil Dummy is a dummy variable indicating whether the firm is located in the oil and gas industry. Log of Assets is the value of total assets converted from domestic currency to equivalent US$. We measure leverage as a long-term debt divided by the total assets. Return SD is computed as daily standard deviation of stock returns over the last one year. We calculate illiquidity as per the Lesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid. PTBV is price to book value and ROA is return on assets. We include Block holding (% shares closely held) as a measure of monitoring of the firm.

$$U_{i,t} = \propto_0 + \beta_1 OILDummy_{i,t} + \beta_2 LogofAsset_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 PTBV_{i,t} + \beta_5 RoA_{i,t} + \beta_6 Blockholding_{i,t} + \beta_7 ReturnSD_{i,t} + \beta_8 Illiquidity_{i,t} + YearDummies + CountryDummies + \varepsilon_{i,t} \quad (2)$$

where $U_{i,t}$ is a dummy variable of firm i and year t taking the value of one if the firm is reported in the media as involved in bribery, corruption, political corruption, money laundering or lobbying. $Oil\ Dummy_{i,t}$ is a dummy variable indicating whether or not the firm is in the oil and gas industry.

The model includes a set of control variables that can potentially influence a firm's decision to engage in unethical practices. Following Gormley and Matsa (2014), we use fixed effects to capture unobservable heterogeneity and omitted factors that are potentially related to both unethical practices and industry. We use year-fixed effects to control for time trends. Our results are qualitatively unchanged if we use the probit model.

In Table 5, we present our baseline regressions. In Model 1, we find that the Oil Dummy coefficient is 0.0335 but statistically is not significant (*t-stat 0.38*), suggesting that on an average oil and gas firms are not more likely to engage in unethical practices. The results suggest that larger firms with more growth opportunities, profitable firms, with less closely-held shares (i.e. less monitoring), and liquid firms are likelier to engage in unethical firms. The pseudo R-square of the model is 20.4%.

In Model 2, we introduce the effect of *Sales HHI* and check whether product market competition can influence a firm's decision to engage in unethical practices. We interact *Oil Dummy* with the *Sales HHI* of the industry using the following equation:

$$U_{i,t} = \propto_0 + \beta_1 OILDummy_{i,t} + \beta_2 LogofAsset_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 PTBV_{i,t} + \beta_5 RoA_{i,t} + \beta_6 Blockholding_{i,t} + \beta_7 ReturnSD_{i,t} + \beta_8 Illiquidity_{i,t} + \beta_9 (OilDummy \times SalesHHI)_{i,t} + YearDummies + CountryDummies + \varepsilon_{i,t} \quad (3)$$

We find the *Oil Dummy X Sales HHI* coefficient is 0.905 and is statistically significant at the one percent level. This suggests that the engagement in unethical practices is strongly influenced by the competition level within the industry. Oil and gas firms that operate in a non-competitive industry are more likely to engage in unethical practices.

To verify the robustness of our result, we create (2×1) vector of *Sales HHI* dummies and interact with the *Oil Dummy* in Model 3. The

Table 4
Correlation coefficient.

	Unethical dummy	Oil dummy	Log of asset (~US$)	Leverage	PTBV	ROA (%)	Blockholding (%)	Return SD	Illiquidity
Unethical Dummy	1								
Oil Dummy	0.000971	1							
Log of Asset (~US$)	0.306***	−0.0237***	1						
Leverage	−0.00133	0.000512	0.0790***	1					
PTBV	−0.0138*	−0.0249***	−0.218***	0.0126*	1				
ROA (%)	−0.0187**	0.0333***	−0.197***	−0.122***	0.328***	1			
Blockholding (%)	−0.0882***	−0.0284***	−0.0682***	−0.0600***	0.0189**	0.0484***	1		
Return SD	−0.0256***	0.0722***	−0.150***	0.0142*	−0.0895***	−0.214***	0.0443***	1	
Illiquidity	−0.101***	−0.0344***	−0.189***	−0.0428***	−0.0611***	−0.0707***	0.187***	−0.0240***	1

In this table, we report a correlation among the key variables used in the study. Unethical Dummy is a binary indicator defined as, "Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?" Oil Dummy is a dummy variable indicating whether the firm is located in the oil and gas industry. Log of Assets is the value of total assets converted from domestic currency to equivalent US$. We measure leverage as a long-term debt divided by the total assets. Return SD is computed as daily standard deviation of stock returns over the last one year. We calculate illiquidity as per the Lesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid. PTBV is price to book value and ROA is return on assets. We include Block holding (% shares closely held) as a measure of monitoring of the firm.

* Statistically significant at the 10%.
** Statistically significant at the five percent.
*** Statistically significant at the one percent level.

Table 5
Oil and gas firms and unethical practices.

	(1) Logistic Regression	(2)	(3)	(4) Panel Regression	(5)	(6)
Dependent Variable	**Unethical Dummy**	**Unethical Dummy**	**Unethical Dummy**	**Total Controversies**	**Total Controversies**	**Total Controversies**
Oil Dummy	0.0335			0.0903***		
	(0.706)			(0.000)		
Oil Dummy X Sales HHI		0.905***			0.362***	
		(0.001)			(0.000)	
Oil Dummy x Low HHI			−0.671*			−0.00406
			(0.084)			(0.826)
Oil Dummy x High HHI			0.256**			0.120***
			(0.014)			(0.000)
Log of Asset (~US$)	0.648***	0.655***	0.679***	0.143***	0.146***	0.147***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	−0.0795	−0.163	−0.219	−0.215***	−0.229***	−0.232***
	(0.588)	(0.277)	(0.149)	(0.000)	(0.000)	(0.000)
PTBV	0.0395***	0.0418***	0.0405***	0.00948***	0.00973***	0.00988***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA (%)	0.0238***	0.0213***	0.0214***	0.00329***	0.00317***	0.00315***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Blockholding (%)	−0.00546***	−0.00523***	−0.00498***	−0.00120***	−0.00118***	−0.00116***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Return SD	1.369	1.935	2.331	2.860***	3.056***	3.033***
	(0.580)	(0.441)	(0.355)	(0.000)	(0.000)	(0.000)
Illiquidity	−2.591***	−2.607***	−2.507***	0.493***	0.497***	0.498***
	(0.001)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
Country F.E.?	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.?	Yes	Yes	Yes	Yes	Yes	Yes
N	25,702	25,151	25,151	25,702	25,170	25,170
Pseudo R^2	0.204	0.208	0.209			
Adjusted R^2				0.108	0.110	0.110

In this table, we run a logistic regression. The dependent variable is a binary variable, Unethical Dummy, defined as, "Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?" Oil Dummy is a dummy variable indicating whether the firm is located in the oil and gas industry. Sales HHI is industry concentration ratio. Low HHI and High HHI are dummy variables formed using the median values of Sales HHI. Log of Assets is the value of total assets converted from domestic currency to equivalent US$. We measure leverage as a long-term debt divided by the total assets. Return SD is computed as daily standard deviation of stock returns over the last one year. We calculate illiquidity as per the Lesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid. PTBV is price to book value and ROA is return on assets. We include Block holding (% shares closely held) as a measure of monitoring of the firm. The model includes country and year fixed effect.

In specification 1, we use the following model: $U_{i,t} = \propto_0 + \beta_1 OILDummy_{i,t} + \beta_2 LogofAsset_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 PTBV_{i,t} + \beta_5 RoA_{i,t} + \beta_6 Blockholding_{i,t} + \beta_7 ReturnSD_{i,t} + \beta_8 Illiquidity_{i,t} + YearDummies + CountryDummies + \varepsilon_{i,t}$

In specification 2, we use the following model: $U_{i,t} = \propto_0 + \beta_1 OILDummy_{i,t} + \beta_2 LogofAsset_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 PTBV_{i,t} + \beta_5 RoA_{i,t} + \beta_6 Blockholding_{i,t} + \beta_7 ReturnSD_{i,t} + \beta_8 Illiquidity_{i,t} + \beta_9 (OilDummy \times SalesHHI)_{i,t} + YearDummies + CountryDummies + \varepsilon_{i,t}$

In specification 3, we use the following model: $U_{i,t} = \propto_0 + \beta_1 OILDummy_{i,t} + \beta_2 LogofAsset_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 PTBV_{i,t} + \beta_5 RoA_{i,t} + \beta_6 Blockholding_{i,t} + \beta_7 ReturnSD_{i,t} + \beta_8 Illiquidity_{i,t} + \beta_9 (OilDummy \times LowSalesHHI)_{i,t} + \beta_{10} (OilDummy \times HighSalesHHI)_{i,t} + \beta_{11} LowSalesHHI_{i,t} + YearDummies + CountryDummies + \varepsilon_{i,t}$

In specification 4, 5, and 6 we replace the dependent variable Unethical Dummy with Total Controversies.
Standard errors are clustered at the firm-level.
* statistically significant at the 10%.
** statistically significant at the five percent.
*** statistically significant at the one percent level. *p-values* are given in parentheses and are based on robust standard errors.

quantiles are formed on the basis of whether the firm is located in the lowest HHI industry or the highest. This procedure will capture varying degrees of competition within the industry. We also include *Low Sales HHI* dummy to control for the direct effect of competition on the *Unethical Dummy* but do not report in the table due to paucity of space. We model this relationship using the following equation:

$$U_{i,t} = \propto_0 + \beta_1 OILDummy_{i,t} + \beta_2 LogofAsset_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 PTBV_{i,t} + \beta_5 RoA_{i,t} + \beta_6 Blockholding_{i,t} + \beta_7 ReturnSD_{i,t} + \beta_8 Illiquidity_{i,t} + \beta_9 (OilDummy \times LowSalesHHIDummy)_{i,t} + \beta_{10} (OilDummy \times HighSalesHHIDummy)_{i,t} + \beta_{11} LowSalesHHIDummy_{i,t} + YearDummies + CountryDummies + \varepsilon_{i,t} \quad (4)$$

The results indicate that oil and gas firms operating in a competitive industry are less likely to engage in unethical practices. The *Oil Dummy X Low HHI* dummy is −0.671 and is statistically significant only at the 10% level, suggesting that the evidence is not very strong. On the contrary, we find that oil and gas firms that operate in a less-competitive industry are more likely to engage in unethical practices. The *Oil Dummy X High HHI* dummy is positive and statistically significant at the five percent level.

In Model 4, 5, and 6 we use total number of controversies reported for a firm.[6] This addresses the concern that in a logit model we are grouping together a firm that is reported in media as engaged in one unethical practice vis-à-vis multiple unethical practices. We retrieve the total number of controversies from Asset4, defined as "Number of controversies published in the media linked to public health or industrial accidents harming the health & safety of third parties (non-employees and non-customers); business ethics in general, political contributions or bribery and corruption; tax fraud, parallel imports or money laundering; anti-competitive behaviour (e.g., anti-trust and monopoly), price-fixing or kickbacks; and activities in critical, undemocratic countries that do not respect fundamental human rights principles."

In Model 4, we find that Oil Dummy is positive and statistically significant at the one percent level. This suggests that, as compared to logit model, oil and gas firms appear to be more likely to engage in unethical practices. The results are different compared to the logit model as in Model 1 we do not find statistically significant results for the Oil Dummy. In Model 5, we interact Oil Dummy with Sales HHI and find a statistically significant coefficient of 0.362. This indicates that the competition level is an important determinant of unethical practices. In fact, the results from Model 6 suggest that the tendency of firms involved in unethical practices is prevalent in non-competitive industries. Summing up, the results from Table 5 suggest that oil and gas firms operating in non-competitive industries are more likely to engage in unethical practices. Thus, firms are more likely to take advantage of the dominant position in the industry in order to maintain dominance over the long run and to potentially create entrance barriers for new firms by undertaking activities, such as bribing, corruption and lobbying.

4.2. Country-level determinants

In Table 5, we document that oil & gas firms operating in non-competitive industries are more likely to engage in unethical practices. However, we have not explicitly considered cross-country differences in institutional quality. For instance, the resource curse phenomenon suggests that countries rich in natural resources can experience either positive or negative economic growth (Kolstad and Wiig, 2009; Al-Kasim et al., 2013; Leite and Weidmann, 1999). In fact, Mehlum et al. (2006a, 2006b) and Robinson et al. (2006) suggest that the relationship between natural resources and growth of a country is conditional on the quality of institutions. Abundant natural resources and better institutional quality play a complementary role in increasing the economic growth. On the country, countries that have poor institutional quality have lower economic growth even if there is abundant supply of natural resources. Similarly, the country-level legal enforcement, regulatory and institutionary framework can discourage firms from engaging in unethical practices (Baughn et al., 2010; Jeong and Weiner, 2012). Therefore, in Table 6, we investigate the role of country-level determinants in influencing the firm's decision to engage in unethical practices. We consider four different proxies of country-level determinants that indicate the level of unethical practices acceptable in the country. We report our findings using the interacted variable of oil and gas firms and Sales HHI score. This step is undertaken to avoid a few observations resulting from the interaction of two dummy variables (*Oil Dummy* and *Sales HHI* dummy). For instance, the interaction term will take the value of zero if the firm is not located in the oil and gas industry and if it operates in a competitive industry.[7] This problem is exacerbated when we split the sample using various country-level determinants.

In Model 1 and Model 2, we bifurcate the sample into Low and High, based on the median value of *Irregular Payments & Bribes*. We document that countries in which unethical practices are widespread, firms operating in non-competitive industries are more likely to engage in unethical practices. The Low and High *Oil Dummy X Sales HHI* coefficient is 1.281 (*t-stat 3.84*) and 0.243 (*t-stat 0.54*) respectively. This is consistent with our initial expectation that firms located in a weak institutional framework are more likely to engage in unethical practices. Thus, it appears that firms take advantage of weak regulations, laws and poor enforcement in pursuing rent-seeking and patronage behaviour.

We next split the sample using the median values of *Favoritism in Decisions of Government Officials* in Model 3 and Model 4. We find consistent results as the *Oil Dummy X Sales HHI* coefficient is positive and statistically significant only for the countries that rank low in the *Favoritism* index. The third country-level determinant we include is *Unethical Behaviour of Firms*. It can be argued that firms are more likely to engage in unethical practices if they observe other firms doing the same and deriving undue benefits. Similar to our previous two country-level proxies, we find that firms are more likely to engage in unethical practices if the unethical behaviour of firms in a country is tolerated. The Low and High *Oil Dummy X Sales HHI* coefficient is 1.292 (*t-stat 3.59*) and 0.435 (*t-stat 1.04*) respectively.

The last proxy we include is *Trustworthiness & Confidence* in Model 7 and Model 8. We show that the tendency to engage in unethical practices increases as the level of trustworthiness and confidence falls. The above results collectively suggest that the competition level within the industry and the country-level legal enforcement, regulatory and institutional framework are important determinants of the firm's tendency to engage in unethical practices. Our results are in line with Baughn et al. (2010) and Jeong and Weiner (2012) who indicate that the chances of a firm engaging in corruption are likely to increase in countries where corruption is tolerated.

4.3. Level of oil import

In Table 7, we check whether the level of oil imports can explain the firm's likelihood to engage in unethical practices. Majbouri (2016) show that firms operated in oil-rich countries are less keen on increasing productive and transparency and are more inclined towards rent-seeking and patronage. This can be due to a number of reasons, including to maintain dominance in the domestic market and to create obstacles in the free flow of oil trade through unfair practices. To this end, we retrieve country-level oil import data available from the US Energy Information Administration (USEIA) website. We split the sample into Low and High oil importing countries, using the median oil import of all countries each year as a cut-off.

We find that *Oil Dummy X Sales HHI* coefficient is statistically significant only for low oil importing countries. The Low and High *Oil Dummy X Sales HHI* coefficient is 0.937 (*t-stat 2.80*) and 0.919 (*t-stat 1.60*) respectively. This indicates that when the oil and gas firms operate in a non-competitive industry, it is more likely that they are to maintain dominance in the domestic market and to limit the free flow trade of oil and gas trading. Our results are in a similar context to Lee and Weng (2013) who note that bribery in one's home country dampens a firm's exports.

[6] We thank an anonymous referee for suggesting this additional test.

[7] As reported in Table 2, around 93% of the observations pertain to non-oil and gas firms.

Table 6
Role of country-level determinants.

	Irregular payments & bribes		Favoritism		Unethical behaviour of firms		Trustworthiness and confidence	
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)
Oil Dummy X Sales HHI	1.281***	0.243	1.122***	0.531	1.292***	0.435	1.031***	0.203
	(0.000)	(0.590)	(0.001)	(0.247)	(0.000)	(0.299)	(0.000)	(0.797)
Log of asset (~US$)	0.671***	0.633***	0.693***	0.608***	0.674***	0.631***	0.646***	0.683***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	−0.440**	0.266	−0.436**	0.373	−0.459**	0.294	−0.239	0.326
	(0.028)	(0.240)	(0.025)	(0.117)	(0.023)	(0.191)	(0.138)	(0.447)
PTBV	0.0382***	0.0527***	0.0370***	0.0569***	0.0386***	0.0521***	0.0402***	0.0489***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)
ROA (%)	0.0216***	0.0197***	0.0250***	0.0125*	0.0214***	0.0198***	0.0208***	0.0197**
	(0.000)	(0.001)	(0.000)	(0.085)	(0.000)	(0.001)	(0.000)	(0.011)
Blockholding (%)	−0.00456***	−0.00592***	−0.00441***	−0.00568***	−0.00439***	−0.00611***	−0.00546***	−0.00345
	(0.006)	(0.004)	(0.007)	(0.008)	(0.008)	(0.003)	(0.000)	(0.251)
Return SD	4.477	−4.960	2.058	2.404	4.546	−5.150	3.142	−11.51
	(0.125)	(0.340)	(0.483)	(0.641)	(0.121)	(0.315)	(0.229)	(0.263)
Illiquidity	−1.421	−3.597***	−2.519**	−2.959**	−1.387	−3.599***	−2.322**	−2.443*
	(0.248)	(0.001)	(0.030)	(0.013)	(0.259)	(0.001)	(0.026)	(0.079)
Country F.E.?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	12,063	12,456	13,010	11,509	11,942	12,577	18,913	5606
Pseudo R^2	0.186	0.207	0.200	0.191	0.186	0.206	0.194	0.227

In this table, we run a logistic regression to investigate the role of country-level determinants in influencing the firm's decision to engage in unethical practices. We consider four different proxies of country-level determinants that indicate the level of unethical practices acceptable in the country. These proxies are from the WEF 2013 report and the definition is provided in Appendix A of this paper. The dependent variable is the binary variable, Unethical Dummy, defined as, "Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?" Oil Dummy is a dummy variable indicating whether the firm is located in the oil and gas industry. Sales HHI is industry concentration ratio. Log of Assets is the value of total assets converted from domestic currency to equivalent US$. We measure leverage as a long-term debt divided by the total assets. Return SD is computed as daily standard deviation of stock returns over the last one year. We calculate illiquidity as per the Lesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid. PTBV is price to book value and ROA is return on assets. We include Block holding (% shares closely held) as a measure of monitoring of the firm. The model includes country and year fixed effect. Standard errors are clustered at the firm-level.

* Statistically significant at the 10%.

** Statistically significant at the five percent.

*** Statistically significant at the one percent level. *p-values* are given in parentheses and are based on robust standard errors.

4.4. Robustness checks

4.4.1. Product market competition and classification

We report a number of robustness checks in this section. The first concern we address is whether the Sales HHI is a poor proxy of product market competition. We address this concern by using *Asset HHI* index where we substitute sales with total assets. The rationale is that large firms in an industry may create entry barriers for new companies or ready to sustain losses in the short term to discourage other firms from entering the industry (Benoit, 1984). Also, due to their large asset base, these companies may have economies of scale (Bolton and Scharfstein, 1990).

In addition to *Asset HHI*, we also use *Employee HHI*. We define *Employee HHI* as the concentration of employees in a given industry. The notion here is that firms operating in non-competitive industries will employ a much larger workforce than their competitors. Therefore, a high *Employee HHI* suggests that the majority of the workforce is employed in a small number of firms.

The second concern we address is whether firms are incorrectly identified into oil and gas firms. To negate this concern, we use 48 industry classifications (FF48) provided by Fama and French (1997). This classification in turn is drawn from the Standard Industrial Classification (SIC)'s four-digit code. We report the results using alternative proxy of industry concentration and industry classification in Table 8. We find that the results reported in Table 8 are largely consistent with our baseline findings. We find that oil and gas firms operating in non-competitive industries are likelier to engage in unethical practices using alternative measures of product market competition or industry classification. The interacted coefficient of *Oil Dummy* and product market competition measure are positive and statistically significant at the one percent level in all three models reported in Table 8.

4.4.2. Alternative measure of unethical practices

We primarily base our main findings using logistic regression. However, the main dependent variable (*Unethical Dummy*) is binary and therefore the extent and severity to which the firms are engaged in unethical practices is not very clear.[8] Further, we retrieve the data from Asset4 where the firm is given a score of one, if the firm is reported in the media with the news of corruption, bribery, political contribution or lobbying. However, it is important to verify the robustness of this indicator. Although finding a perfect substitute is difficult, we argue that firms engaged in unethical practices are also prone to earnings management. The motivation to use earnings management comes from Halter et al. (2009) and Al-Kasim et al. (2013), who suggest that the firm should increase transparency in order to reduce corruption.

We use two different models of the earnings management to check the consistency of our result. In Model 1, we use the Dechow and Dichev (2002) (DD) model for estimating accruals quality. More specifically, we regress changes in working capital on the current, past and future cash flow from operation, i.e.,

$$\Delta WC_{j,t} = b_o + b_1{*}CFO_{j,t-1} + b_2{*}CFO_{j,t} + b_3{*}CFOj_{t+1} + \varepsilon_{j,t} \quad (5)$$

where $\Delta WC_{j,t}$ is total current accruals calculated as Δcurrent assets- Δcurrent liabilities- Δcash + Δdebt in current liabilities of firm *j* in year *t*. The changes here refer to the current and previous year. *CFO* is cash

[8] We partly address this concern in Table 5 by including total number of controversies reported against a firm.

Table 7
Level of oil import.

	Oil Import	
	Low (1)	High (2)
Oil dummy X sales HHI	0.937***	0.919
	(0.005)	(0.109)
Log of asset (~US$)	0.627***	0.698***
	(0.000)	(0.000)
Leverage	0.241	−0.492**
	(0.337)	(0.014)
PTBV	0.0489***	0.0429***
	(0.000)	(0.000)
ROA (%)	0.0220***	0.0233***
	(0.000)	(0.000)
Blockholding (%)	−0.00449**	−0.00685***
	(0.018)	(0.000)
Return SD	−6.315	6.338**
	(0.227)	(0.040)
Illiquidity	−2.596**	−2.809*
	(0.023)	(0.066)
Country F.E.?	Yes	Yes
Year F.E.?	Yes	Yes
N	10,877	12,677
Pseudo R^2	0.217	0.200

In this table, we run a logistic regression to investigate whether the level of oil import can explain the firm's likelihood to engage in unethical practices. We retrieve oil import data available from the US Energy Information Administration (USEIA) website. We split the sample into Low and High oil importing countries, using the median oil import of all countries each year as a cut-off measure. The dependent variable is the binary variable, Unethical Dummy, defined as, "Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?" Oil Dummy is a dummy variable indicating whether the firm is located in the oil and gas industry. Sales HHI is industry concentration ratio. Log of Assets is the value of total assets converted from domestic currency to equivalent US$. We measure leverage as a long-term debt divided by the total assets. Return SD is computed as daily standard deviation of stock returns over the last one year. We calculate illiquidity as per the Lesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid. PTBV is price to book value and ROA is return on assets. We include Block holding (% shares closely held) as a measure of monitoring of the firm. The model includes country and year fixed effect. Standard errors are clustered at the firm-level.

* Statistically significant at the 10%.

** Statistically significant at the five percent.

*** Statistically significant at the one percent level. *p-values* are given in parentheses and are based on robust standard errors.

Table 8
Alternative industry concentration and alternative industry classification.

	Using public and private firms data		
	Using Fama and French industry classification		
	(1)	(2)	(3)
Oil dummy X sales HHI	1.209***		
	(0.000)		
Oil dummy X asset HHI		1.066***	
		(0.000)	
Oil dummy X employee HHI			1.067***
			(0.000)
Log of asset (~US$)	0.666***	0.650***	0.650***
	(0.000)	(0.000)	(0.000)
Leverage	−0.116	−0.0847	−0.0858
	(0.447)	(0.568)	(0.566)
PTBV	0.0394***	0.0413***	0.0398***
	(0.000)	(0.000)	(0.000)
ROA (%)	0.0238***	0.0232***	0.0216***
	(0.000)	(0.000)	(0.000)
Blockholding (%)	−0.00576***	−0.00603***	−0.00623***
	(0.000)	(0.000)	(0.000)
Return SD	−0.117	2.348	2.035
	(0.965)	(0.340)	(0.413)
Illiquidity	−2.653***	−2.478***	−3.249***
	(0.002)	(0.002)	(0.000)
Country F.E.?	Yes	Yes	Yes
Year F.E.?	Yes	Yes	Yes
N	23,448	25,273	24,709
Pseudo R^2	0.215	0.207	0.208

In this table, we report the results using alternative proxy of industry concentration and industry classification. The dependent variable is the binary variable, Unethical Dummy, defined as, "Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?" Oil Dummy is a dummy variable indicating whether the firm is located in the oil and gas industry. We use Fama and French (1997) FF48 industry classification. Sales HHI is industry concentration ratio. Asset HHI is calculated by squaring the market asset share of each firm in the industry within the country and then adding the resulting numbers. Employee HHI is the concentration of employees in a given industry. Log of Assets is the value of total assets converted from domestic currency to equivalent US$. We measure leverage as a long-term debt divided by the total assets. Return SD is computed as daily standard deviation of stock returns over the last one year. We calculate illiquidity as per the Lesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid. PTBV is price to book value and ROA is return on assets. We include Block holding (% shares closely held) as a measure of monitoring of the firm. The model includes country and year fixed effect. Standard errors are clustered at the firm-level.

* Statistically significant at the 10%.

** Statistically significant at the five percent.

*** Statistically significant at the one percent level. *p-values* are given in parentheses and are based on robust standard errors.

flow from operations calculated as net income before extraordinary items less total accruals. Total accruals is calculated as current accruals less depreciation and amortization expense. All the variables are scaled by the average of total assets over the current and previous year. A higher absolute value of residual suggests lower earnings quality.

In Model 2, we use earnings volatility (the standard deviation of earnings) as a measure of a firms' earnings management (EV). We follow Dechow and Dichev (2002) and measure the earnings standard deviation as the standard deviation of a firm's net income before extraordinary items scaled by beginning of year total assets. A rolling window of 10 years is used to compute standard deviation. Larger values of the earnings volatility suggest that earnings are less transparent.

We present both the models in Table 9. In Model 1, we find evidence that oil and gas firms operating in non-competitive markets are more likely to manage earnings. However, the evidence is weak as the *Oil Dummy X Sales HHI* coefficient is statistically significant only at the 10% level. In Model 2, we use the EV model and find strong evidence that oil and gas firms operating in non-competitive markets have lower earnings quality. We find the *Oil Dummy X Sales HHI* coefficient positive and statistically significant (*t-stat 2.19*).

We also consider the possibility that our results are driven primarily by the US-domiciled firms as they comprise around 28% of the sample observation. In unreported results, we exclude US-domiciled firms and find qualitatively similar results. Additionally, we cluster the standard errors at the country-and industry-level in order to allow the observations within a country or industry to correlate in some unknown way. In un-tabulated results, we still find that oil and gas firms operating in non-competitive industries are more likely to engage in unethical practices.

5. Conclusions and policy implications

Extractive industries, such as oil and gas have a significant impact on the economy of the country through revenue generation, tax collection and export. Unethical practices in the oil and gas industry

Table 9
Oil and gas firms and earnings management.

	DDstdev (1)	MDDstdev (2)	SMstdev (3)
Oil dummy X sales HHI	0.00341*	0.00316	0.0365**
	(0.091)	(0.112)	(0.028)
Log of asset (~US$)	−0.00612***	−0.00704***	−0.0553***
	(0.000)	(0.000)	(0.000)
Leverage	−0.0107***	−0.00476	−0.165***
	(0.001)	(0.186)	(0.000)
PTBV	0.000944***	0.000698***	−0.00293**
	(0.000)	(0.005)	(0.011)
ROA (%)	0.000327**	0.000136	0.00433***
	(0.017)	(0.433)	(0.000)
Blockholding (%)	0.0000613	0.0000292	0.000237
	(0.183)	(0.320)	(0.284)
Return SD	0.889***	0.684***	7.821***
	(0.000)	(0.000)	(0.000)
Illiquidity	0.0223**	0.0587***	−0.260***
	(0.040)	(0.002)	(0.000)
Country F.E.?	Yes	Yes	Yes
Year F.E.?	Yes	Yes	Yes
N	11,116	6867	12,516
Adj. R^2	0.126	0.229	0.084

In this table we use an alternative measure of unethical practices, i.e., earnings management. We use two different models of the earnings management to check the consistency of our result. In Model 1, we use the Dechow and Dichev (2002) (DD) model for estimating accruals quality. In Model 2, we use earnings volatility (the standard deviation of earnings) as a measure of a firms' earnings management (EV). We follow Dechow and Dichev (2002) and measure earnings standard deviation as the standard deviation of a firm's net income before extraordinary items scaled by beginning of year total assets. A rolling window of 10 years is used to compute standard deviation. Larger values of the earnings volatility suggest that earnings are less transparent. Oil Dummy is a dummy variable indicating whether the firm is located in the oil and gas industry. Sales HHI is industry concentration ratio. Log of Assets is the value of total assets converted from domestic currency to equivalent US$. We measure leverage as a long-term debt divided by the total assets. Return SD is computed as daily standard deviation of stock returns over the last one year. We calculate illiquidity as per the Lesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid. PTBV is price to book value and ROA is return on assets. We include Block holding (% shares closely held) as a measure of monitoring of the firm. The model includes country and year fixed effect. Standard errors are clustered at the firm-level.

* Statistically significant at the 10%.

** Statistically significant at the five percent.

*** Statistically significant at the one percent level. *p-values* are given in parentheses and are based on robust standard errors.

can have a serious repercussion on the economy of the country. Available evidence suggests that unethical practices are widespread in the oil and gas industry but empirical evidence to support this claim is limited to this date. We have shown that oil and gas firms are not more likely to engage in unethical practices. However, we find that industry competition is an important determinant. Oil and gas firms operating in a non-competitive industry are more likely to engage in unethical practices than oil and gas firms operating in a competitive industry. This suggests that oil and gas firms are likely to take advantage of their dominant position in the industry in order to maintain control over the long-run and to potentially create entrance barriers for new firms by undertaking activities, such as bribing, corruption and lobbying. The results also suggest that country-level institutional factors are important, as the occurrence of unethical practices is widespread in countries where corruption is tolerated.

Our study has strong policy implications for government policy makers, regulators and market participants. Policy makers should consider undertaking steps to encourage competition in the industry to increase efficiency, productivity, cost control, and to limit unethical practices. Further, the country-level enforcement laws, regulations, and institutional quality need to be reformed, especially in developing countries, to discourage firms from gaining undue benefits.

EITI and other initiatives are undertaken to encourage countries and firms to be more transparent in disclosing revenues. However, (Kolstad and Wiig, 2009; Kolstad and Søreide, 2009; Papyrakis et al., 2016) suggests that EITI is not the only solution to corruption and multifaceted reforms are needed to control corruption in the extractive industries. For instance, Kolstad and Søreide (2009) and Kolstad and Wiig (2009) argue that EITI unintentionally increases rent-seeking behaviour with the formation of multi-stakeholder committees where the members have a vested interest. Similarly, Ofori and Lujala (2015) argue that participating in EITI does not necessarily increase transparency as observed in Ghana.

Also, as highlighted by Kolstad and Søreide (2009), policy makers should focus more on addressing factors responsible for resource curse, such as rent-seeking, patronage and corruption problems than macroeconomic management. This will encourage firms to pay more attention in improving productivity, efficiency and innovation (Majbouri, 2016). High penalties, disciplinary actions, enforceable anti-corruption measures and effective detection are needed to dissuade firms from undertaking unethical practices (O'Higgins, 2006).

As noted by Slack (2012), firms window dress socially responsible practices that are unlikely to curb unethical practices. A more rigorous, accountable and operational socially responsible practices are needed at the firm-level to address rent-seeking and patronage. Additionally, a better cooperation is needed among countries as oil and gas firms may be domiciled in one country but draw revenue from another country. An effective collaboration among countries will discourage firms from undertaking unethical practices either in the headquartered country or the producing country. Following Al-Kasim et al. (2013), a future empirical research investigating the link between corruption and suboptimal oil production and reserves will further enhance our understanding of how unethical practices is related to suboptimal production. The main challenge here is to access oil production and reserve data at the firm-level across countries.

Appendix A. Variable definitions

	Variable	Definition	Source
A.	**Country-level variables**		
1	Irregular payments & bribes	Average score across the five components of the following Executive Opinion Survey question: In your country, how common is it for firms to make undocumented extra payments or bribes connected with (a) imports and exports; (b) public utilities; (c) annual tax payments; (d) awarding of public contracts and licenses; (e) obtaining favourable judicial decisions? In each case, the answer ranges from 1 (very common) to 7 (never occurs).	WEF 2013 Report
2	Favoritism in Decisions of Government Officials	To what extent do government officials in your country show favoritism to well-connected firms and individuals when deciding upon policies and contracts? [1 = always show favoritism; 7=never show favoritism]	WEF 2013 Report

3	Ethical Behaviour of Firms	How would you compare the corporate ethics (ethical behaviour in interactions with public officials, politicians and other enterprises) of firms in your country with those of other countries in the world? [1=among the worst in the world; 7 =among the best in the world]	WEF 2013 Report
4	Trustworthiness & Confidence	This index is a combination of three financial market development indicators, namely Soundness of banks, Regulations of securities exchange, and Legal rights index. Each of the indicators are defined in turn. Soundness of banks is defined as, "How would you assess the soundness of banks in your country? [1 = insolvent and may require a government bailout;7 = generally healthy with sound balance sheets" Regulation of securities exchanges is defined as, "How would you assess the regulation and supervision of securities exchanges in your country? [1 = ineffective; 7=effective]" Legal rights index is defined as, "Degree of legal protection of borrowers and lenders' rights on a0–10 (best) scale"]	WEF 2013 Report
B.	**Firm-level variables**		
1	Unethical dummy	This binary indicator is defined as, "Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?"	Asset4
2	Total Controversies	Number of controversies published in the media linked to public health or industrial accidents harming the health & safety of third parties (non-employees and non-customers); business ethics in general, political contributions or bribery and corruption; tax fraud, parallel imports or money laundering; anti-competitive behaviour (e.g., anti-trust and monopoly), price-fixing or kickbacks; activities in critical, undemocratic countries that do not respect fundamental human rights principles.	Asset4
3	Oil Dummy	Oil Dummy is a dummy variable indicating whether the firm is located in the oil and gas industry	ICG
4	Log of Asset (~US$)	Log of total assets is the value of total assets converted from domestic currency to equivalent US$	Worldscope
5	Leverage	Leverage is long-term debt divided by the total assets	Worldscope
6	PTBV	Price to book value ratio	Worldscope
7	ROA (%)	Return on assets	Worldscope
8	Block holding	percentage shares closely held	Worldscope
9	Return SD	Daily standard deviation of stock returns over the last one year	Author's own calculation
10	Illiquidity	Illiquidity is calculated as per theLesmond et al. (1999) model, where a stock with no change in price over a period of time is considered illiquid	Author's own calculation
11	DD	Measure of accruals quality that captures the mapping of current accruals into last period and current period into next period cash flows	Author's own calculation
12	EV	Measure of earnings standard deviation calculates as the standard deviation of a firm's net income before extraordinary items scaled by beginning of year total assets. A rolling window of 10 years is used to compute standard deviation.	Author's own calculation
C.	**Industry concentration**		
1	Sales HHI	It is calculated by squaring the market sales share of each firm in the industry within the country and then adding the resulting numbers.	Author's own calculation
2	Asset HHI	It is calculated by squaring the market asset share of each firm in the industry within the country and then adding the resulting numbers.	Author's own calculation
3	Employee HHI	We define Employee HHI as the concentration of employees in a given industry.	Author's own calculation

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